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J. Sullivan

COMBATING HEART DISEASE, CANCER, STROKE, AND OTHER MAJOR DISEASES

HEARINGS

BEFORE THE

SUBCOMMITTEE ON HEALTH

OF THE

COMMITTEE ON

LABOR AND PUBLIC WELFARE

UNITED STATES SENATE

EIGHTY-NINTH CONGRESS

FIRST SESSION

ON

S. 596

A BILL TO PROVIDE ASSISTANCE IN COMBATING HEART DISEASE, CANCER, STROKE, AND OTHER MAJOR DISEASES

FEBRUARY 9 AND 10, 1965

Printed for the use of the
Committee on Labor and Public Welfare

U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON : 1965

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COMBATING HEART DISEASE, CANCER, STROKE, AND OTHER MAJOR DISEASES

295

TUESDAY, FEBRUARY 9, 1965

16

U.S. SENATE,
SUBCOMMITTEE ON HEALTH OF THE
COMMITTEE ON LABOR AND PUBLIC WELFARE,
Washington, D.C.

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The subcommittee met, pursuant to notice, at 10:05 a.m., in room 4232, New Senate Office Building, Senator Lister Hill, chairman of the subcommittee, presiding.

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Present: Senators Hill (chairman), Yarborough, Pell, Kennedy of Massachusetts, and Javits, members of the subcommittee, and Senator Kennedy of New York, member of the full committee.

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Committee staff members present: Stewart E. McClure, chief clerk; John S. Forsythe, general counsel; Robert W. Barclay, professional staff member; and Roy H. Millenson, minority clerk.

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The CHAIRMAN. The subcommittee will kindly come to order.

169

The subcommittee is meeting this morning to receive testimony on S. 596 that would provide assistance in establishing regional medical complexes to combat heart disease, cancer, stroke, and other major diseases.

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(S. 596 and the President's message on health follow:)

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89TH CONGRESS
1ST SESSION

S. 596

IN THE SENATE OF THE UNITED STATES

JANUARY 19, 1965

Mr. HILL introduced the following bill; which was read twice and referred to the Committee on Labor and Public Welfare

A BILL

To amend the Public Health Service Act to assist in combating heart disease, cancer, and stroke, and other major diseases.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*
3 That this Act may be cited as the "Heart Disease, Cancer,
4 and Stroke Amendments of 1965".
5 SEC. 2. The Public Health Service Act (42 U.S.C., ch.
6 6A) is amended by adding at the end thereof the following
7 new title:

1 "TITLE IX—REGIONAL MEDICAL COMPLEXES
2 FOR RESEARCH AND TREATMENT IN HEART
3 DISEASE, CANCER, STROKE, AND OTHER
4 MAJOR DISEASES

5 "PURPOSES

6 "SEC. 900. The purposes of this title are—

7 "(a) Through grants, to encourage and assist in the
8 establishment of regionally coordinated arrangements among
9 medical schools, research institutions, and hospitals for re-
10 search and training and for demonstrations of patient care in
11 the fields of heart disease, cancer, stroke, and other major
12 diseases;

13 "(b) To afford to the medical profession and the med-
14 ical institutions of the Nation, through such coordinated
15 arrangements, the opportunity of making available to their
16 patients the latest advances in the diagnosis and treatment
17 of these diseases; and

18 "(c) To accomplish these ends without interfering with
19 the patterns, or the methods of financing, of patient care or
20 professional practice, or with the administration of hospitals.

21 "AUTHORIZATION OF APPROPRIATIONS

22 "SEC. 901. (a) There are authorized to be appropriated
23 $50,000,000 for the fiscal year ending June 30, 1966, and
24 such sums as may be necessary for each of the next four fis-
25 cal years, for grants to assist public or nonprofit private uni-

1 versities, medical schools, research institutions, and other
2 public or nonprofit private institutions and agencies in plan-
3 ning, establishing, and operating regional medical complexes
4 for research, training, and demonstration activities for carry-
5 ing out the purposes of this title. Sums appropriated under
6 this section for any fiscal year shall remain available for
7 making such grants until the end of the fiscal year following
8 the fiscal year for which the appropriation is made.

9 "(b) A grant under this title shall be for part or all of
10 the cost of the planning or other activities with respect to
11 which the application is made, except that any such grant
12 with respect to construction of, or provision of built-in (as
13 determined in accordance with regulations) equipment for,
14 any facility may not exceed 90 per centum of the cost of such
15 construction or equipment.

16 "(c) Funds appropriated pursuant to this title shall not
17 be available to pay the cost of hospital, medical, or other
18 care of patients except to the extent it is, as determined in
19 accordance with regulations, incident to research, training, or
20 demonstration activities.

21 "DEFINITIONS

22 "SEC. 902. For the purposes of this title—

23 "(a) The term 'regional medical complex' means a
24 group of public or nonprofit private institutions or agencies
25 each of which is engaged in research, training, diagnosis,

1 and treatment relating to heart disease, cancer, or stroke and,
2 at the option of the applicant, any other disease found by the
3 Surgeon General to be of major significance to the health of
4 the Nation; but only if such group—

5 "(1) is situated within a geographic area, composed
6 of any part or parts of any one or more States, which
7 the Surgeon General determines, in accordance with
8 regulations, to be appropriate for carrying out the pur-
9 poses of this title;

10 "(2) consists of one or more medical centers, one
11 or more categorical research centers, and one or more
12 diagnostic and treatment stations; and

13 "(3) has in effect arrangements for the coordina-
14 tion of the activities of its component units which the
15 Surgeon General finds will be adequate for effectively
16 carrying out the purposes of this title.

17 "(b) The term 'medical center' means a medical school
18 and one or more hospitals affiliated therewith for teaching,
19 research, and demonstration purposes.

20 "(c) The term 'categorical research center' means an in-
21 stitution (or part of an institution) the primary function of
22 which is research (including clinical research), training of
23 specialists, and demonstrations and which, in connection
24 therewith, provides specialized, high-quality diagnostic and
25 treatment services for inpatients and outpatients.

1 "(d) The term 'diagnostic and treatment station' means
2 a unit of a hospital or other health facility, the primary func-
3 tion of which is to support and augment local capability for
4 diagnosis and treatment by providing specialized, high-
5 quality diagnostic and treatment services to outpatients and
6 inpatients.

7 "(e) The term 'nonprofit' as applied to any institution
8 or agency means an institution or agency which is owned and
9 operated by one or more nonprofit corporations or associa-
10 tions no part of the net earnings of which inures, or may
11 lawfully inure, to the benefit of any private shareholder or
12 individual.

13 "(f) The term 'construction' includes construction and
14 initial equipment of new buildings, expansion, remodeling
15 and alteration of existing buildings; including architects' serv-
16 ices, but excluding off-site improvements and the acquisition
17 of land.

18 "GRANTS FOR PLANNING AND DEVELOPMENT

19 "SEC. 903. (a) The Surgeon General, after consultation
20 with the National Advisory Council on Medical Complexes
21 established by section 905 (hereinafter in this title referred
22 to as the 'Council'), is authorized to make grants to public
23 or nonprofit private universities, medical schools, research
24 institutions, and other public or nonprofit private agencies

1 and institutions to assist them in planning the development of
2 regional medical complexes.
3 "(b) Grants under this section may be made only upon
4 application therefor approved by the Surgeon General. Any
5 such application may be approved only if it contains or is
6 supported by reasonable assurances that—
7 "(1) Federal funds paid pursuant to any such grant
8 will be used only for the purposes for which paid and in
9 accordance with the applicable provisions of this title
10 and the regulations thereunder;
11 "(2) the applicant will provide for such fiscal con-
12 trol and fund accounting procedures as are required by
13 the Surgeon General to assure proper disbursement of
14 and accounting for such Federal funds;
15 "(3) the applicant will make such reports, in such
16 form and containing such information as the Surgeon
17 General may from time to time reasonably require, and
18 will keep such records and afford such access thereto
19 as the Surgeon General may find necessary to assure the
20 correctness and verification of such reports; and
21 "(4) the applicant will provide for the designation
22 of an advisory group, to advise the applicant (and the
23 resulting regional medical complex and its component
24 units) in formulating and carrying out the plan for the
25 establishment and operation of such regional medical

1 complex, which includes representatives of organizations,
2 institutions, and agencies concerned with activities of the
3 kind to be carried on by the complex and members of
4 the public familiar with the need for the services pro-
5 vided by the complex.

6 "GRANTS FOR ESTABLISHMENT AND OPERATION OF
7 REGIONAL MEDICAL COMPLEXES

8 "SEC. 904 (a) The Surgeon General, after consultation
9 with the Council, is authorized to make grants to public or
10 nonprofit private universities, medical schools, research insti-
11 tutions, and other public or nonprofit private agencies and
12 institutions to assist in establishment and operation of re-
13 gional medical complexes, including construction and equip-
14 ment of facilities in connection therewith.

15 "(b) Grants under this section may be made only upon
16 application therefor approved by the Surgeon General. Any
17 such application may be approved only if it contains or is
18 supported by reasonable assurances that—

19 "(1) Federal funds paid pursuant to any such grant
20 (A) will be used only for the purposes for which paid
21 and in accordance with the applicable provisions of this
22 title and the regulations thereunder, and (B) will not
23 supplant funds that are otherwise available for establish-
24 ment or operation of the regional medical complex with
25 respect to which the grant is made;

1 "(2) the applicant will provide for such fiscal con-
2 trol and fund accounting procedures as are required by
3 the Surgeon General to assure proper disbursement of
4 and accounting for such Federal funds;
5 "(3) the applicant will make such reports, in such
6 form and containing such information as the Surgeon
7 General may from time to time reasonably require, and
8 will keep such records and afford such access thereto as
9 the Surgeon General may find necessary to assure the
10 correctness and verification of such reports;
11 "(4) the applicant has designated or will designate
12 an advisory group, described in paragraph (4) of sec-
13 tion 903(b), to advise in carrying out the plan for the
14 regional medical complex; and
15 "(5) any laborer or mechanic employed by any
16 contractor or subcontractor in the performance of work
17 on any construction aided by payments pursuant to any
18 grant under this section will be paid wages at rates not
19 less than those prevailing on similar construction in the
20 locality as determined by the Secretary of Labor in ac-
21 cordance with the Davis-Bacon Act, as amended (40
22 U.S.C. 276a—276a-5); and the Secretary of Labor
23 shall have, with respect to the labor standards specified
24 in this paragraph, the authority and functions set forth
25 in Reorganization Plan Numbered 14 of 1950 (15 F.R

1 3176; 5 U.S.C. 133z–15) and section 2 of the Act of
2 June 13, 1934, as amended (40 U.S.C. 276c).

3 "NATIONAL ADVISORY COUNCIL ON MEDICAL COMPLEXES

4 "SEC. 905. (a) The Surgeon General, with the ap-
5 proval of the Secretary, may appoint, without regard to the
6 civil service laws, a National Advisory Council on Medical
7 Complexes. The Council shall consist of the Surgeon Gen-
8 eral, who shall be the Chairman, and twelve members, not
9 otherwise in the employ of the United States, who are lead-
10 ers in the fields of the fundamental sciences, the medical sci-
11 ences, or public affairs. At least one of the appointed
12 members shall be outstanding in the study, diagnosis, or
13 treatment of heart disease, one shall be outstanding in the
14 study, diagnosis, or treatment of cancer, and one shall be
15 outstanding in the study, diagnosis, or treatment of stroke.

16 "(b) Each appointed member of the Council shall hold
17 office for a term of four years, except that any member ap-
18 pointed to fill a vacancy prior to the expiration of the term
19 for which his predecessor was appointed shall be appointed
20 for the remainder of such term, and except that the terms of
21 office of the members first taking office shall expire, as
22 designated by the Surgeon General at the time of appoint-
23 ment, four at the end of the first year, four at the end of
24 the second year, and four at the end of the third year after

1 the date of appointment. An appointed member shall not
2 be eligible to serve continuously for more than two terms.
3 "(c) Appointed members of the Council, while attend-
4 ing meetings or conferences thereof or otherwise serving on
5 business of the Council, shall be entitled to receive compen-
6 sation at rates fixed by the Secretary, but not exceeding
7 $100 per day, including travel time, and while so serving
8 away from their homes or regular places of business they
9 may be allowed travel expenses, including per diem in lieu
10 of subsistence, as authorized by section 5 of the Administra-
11 tive Expenses Act of 1946 (5 U.S.C. 73b-2) for persons
12 in the Government service employed intermittently.
13 "(d) The Council shall advise and assist the Surgeon
14 General in the preparation of regulations for, and as to policy
15 matters arising with respect to, the administration of this
16 title. The Council shall consider all applications for grants
17 under this title and shall make recommendations to the
18 Surgeon General with respect to approval of applications
19 for and the amounts of grants under this title.
20 "REGULATIONS
21 "SEC. 906. The Surgeon General, after consultation
22 with the Council, shall prescribe general regulations cover-
23 ing the terms and conditions for approving applications for
24 grants under this title and the coordination of programs
25 assisted under this title with programs for training, research,

1 and demonstrations relating to the same diseases assisted
2 or authorized under other titles of this Act or other Acts of
3 Congress.

4 "REPORT

5 "SEC. 907. On or before June 30, 1969, the Surgeon
6 General, after consultation with the Council, shall submit to
7 the Secretary for transmission to the President and then to
8 the Congress, a report of the activities under this title to-
9 gether with (1) a statement of the relationship between Fed-
10 eral financing and financing from other sources of the activi-
11 ties undertaken pursuant to this title, (2) an appraisal of the
12 activities assisted under this title in the light of their effective-
13 ness in carrying out the purposes of this title, and (3) recom-
14 mendations with respect to extension or modification of this
15 title in the light thereof."

16 SEC. 3. (a) Section 1 of the Public Health Service Ac
17 is amended to read as follows:

18 "SECTION 1. Titles I to IX, inclusive, of this Act may
19 be cited as the 'Public Health Service Act'."

20 (b) The Act of July 1, 1944 (58 Stat. 682), a
21 amended, is further amended by renumbering title IX (as i
22 effect prior to the enactment of this Act) as title X, and b
23 renumbering sections 901 through 914 (as in effect prior t
24 the enactment of this Act), and references thereto, as sectio
25 1001 through 1014, respectively.

89TH CONGRESS
1ST SESSION

S. 596

IN THE SENATE OF THE UNITED STATES

FEBRUARY 1 (legislative day, JANUARY 29), 1965

Referred to the Committee on Labor and Public Welfare and ordered to be printed

AMENDMENTS

Intended to be proposed by Mr LONG of Louisiana to S. 596, a bill to amend the Public Health Service Act to assist in combating heart disease, cancer, and stroke, and other major diseases, viz:

1 On page 10, line 21, immediately after "SEC. 906.",
2 insert the subsection designation "(a)".
3 On page 11, between lines 3 and 4, insert the following:
4 "(b) No part of any appropriated funds may be ex-
5 pended pursuant to authorization given by this title for any
6 grant for any research or development activity unless such
7 expenditure is conditioned upon provisions effective to insure
8 that all information, copyrights, uses, processes, patents,
9 and other developments resulting from that activity will be

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1 made freely available to the general public. Nothing con-
2 tained in this subsection shall deprive the owner of any back-
3 ground patent relating to any such activity, without his con-
4 sent, of any right which that owner may have under that
5 patent. Whenever any information, copyright, use, process,
6 patent, or development resulting from any such research or
7 development activity conducted in whole or in part with
8 appropriated funds expended under authorization of this title
9 is withheld or disposed of by any person, organization, or
10 agency in contravention of the provisions of this subsection or
11 of any condition imposed pursuant to this subsection, the
12 Attorney General shall institute, upon his own motion or
13 upon request made by any person having knowledge of per-
14 tinent facts, an action for the enforcement of the provisions
15 of this subsection in the district court of the United States
16 for any judicial district in which any defendant resides, is
17 found, or has a place of business. Such court shall have
18 jurisdiction to hear and determine such action, and to enter
19 therein such orders and decrees as it shall determine to be
20 required to carry into effect fully the provisions of this sub-
21 section. Process of the district court for any judicial dis-
22 trict in any action instituted under this subsection may be
23 served in any other judicial district of the United States by
24 the United States marshal thereof. Whenever it appears to
25 the court in which any such action is pending that other

1 parties should be brought before the court in such action,
2 the court may cause such other parties to be summoned from
3 any judicial district of the United States."

89TH CONGRESS } HOUSE OF REPRESENTATIVES { DOCUMENT
1st Session } { No. 44

ADVANCING THE NATION'S HEALTH

MESSAGE

FROM

THE PRESIDENT OF THE UNITED STATES

TRANSMITTING

ADVANCING THE NATION'S HEALTH

JANUARY 7, 1965.—Referred to the Committee on Ways and Means and ordered to be printed

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To the Congress of the United States:

In 1787, Thomas Jefferson wrote that, "Without health there is no happiness. An attention to health, then, should take the place of every other object."

That priority has remained fixed in both the private and public values of our society through generations of Americans since.

Our rewards have been immeasurably bountiful. "An attention to health"—of the individual, the family, the community and the Nation—has contributed to the vitality and efficiency of our system as well as to the happiness and prosperity of our people.

Today, at this point in our history, we are privileged to contemplate new horizons of national advance and achievement in many sectors. But it is imperative that we give first attention to our opportunities—and our obligations—for advancing the Nation's health. For the health of our people is, inescapably, the foundation for fulfillment of all our aspirations.

In these years of the 1960's, we live as beneficiaries of this century's great—and continuing—revolution of medical knowledge and capabilities. Smallpox, malaria, yellow fever, and typhus are conquered in this country. Infant deaths have been reduced by half every two decades. Poliomyelitis, which took 3,154 lives so recently as 1952, cost only 5 lives in 1964. Over the brief span of the past two decades, death rates have been reduced for influenza by 88 percent, tuberculosis by 87 percent, rheumatic fever by 90 percent.

A baby born in America today has a life expectancy half again as long as those born in the year the 20th century began.

The successes of the century are many.

The pace of medical progress is rapid.

The potential for the future is unlimited.

But we must not allow the modern miracles of medicine to mesmerize us. The work most needed to advance the Nation's health will not be done for us by miracles. We must undertake that work ourselves through practical, prudent, and patient programs—to put more firmly in place the foundation for the healthiest, happiest, and most hopeful society in the history of man.

Our first concern must be to assure that the advance of medical knowledge leaves none behind. We can—and we must—strive now to assure the availability of and accessibility to the best health care for all Americans, regardless of age or geography or economic status.

With this as our goal, we must strengthen our Nation's health facilities and services, assure the adequacy and quality of our health manpower, continue to assist our States and communities in meeting their health responsibilities, and respond alertly to the new hazards of our new and complex environment.

We must, certainly, continue and intensify our health research and research facilities. Despite all that has been done, we cannot be complacent before the facts that—

> Forty-eight million people now living will become victims of cancer.
>
> Nearly 15 million people suffer from heart disease and this, together with strokes, accounts for more than half the deaths in the United States each year.
>
> Twelve million people suffer arthritis and rheumatic disease and 10 million are burdened with neurological disorders.
>
> Five and one-half million Americans are afflicted by mental retardation and the number increases by 126,000 new cases each year.

In our struggle against disease, great advances have been made, but the battle is far from won. While that battle will not end in our lifetime—or any time to come—we have the high privilege and high promise of making longer strides forward now than any other generation of Americans.

The measures I am outlining today will carry us forward in the oldest tradition of our society—to give "an attention to health" for all our people. Our advances, thus far, have been most dramatic in the field of health knowledge. We are challenged now to give attention to advances in the field of health care—and this is the emphasis of the recommendations I am placing before you at this time.

I. Removing Barriers to Health Care

In this century, medical scientists have done much to improve human health and prolong human life. Yet as these advances come, vital segments of our populace are being left behind—behind barriers of age, economics, geography, or community resources. Today the political community is challenged to help all our people surmount these needless barriers to the enjoyment of the promise and reality of better health.

A. HOSPITAL INSURANCE FOR THE AGED

Thirty years ago, the American people made a basic decision that the later years of life should not be years of despondency and drift. The result was enactment of our social security program, a program now fixed as a valued part of our national life. Since World War II, there has been increasing awareness of the fact that the full value of social security would not be realized unless provision were made to deal with the problem of costs of illnesses among our older citizens.

I believe this year is the year when, with the sure knowledge of public support, the Congress should enact a hospital insurance program for the aged.

The facts of the need are well and widely known:

Four out of five persons 65 or older have a disability or chronic disease.

People over 65 go to the hospital more frequently and stay twice as long as younger people.

Health costs for them are twice as high as for the young.

Where health insurance is available it is usually associated with an employer-employee plan. However, since most of our older people are not employed they are usually not eligible under these plans.

Almost half of the elderly have no health insurance at all.

The average retired couple cannot afford the cost of adequate health protection under private health insurance.

I ask that our social security system—proved and tested by three decades of successful operation—be extended to finance the cost of basic health services. In this way, the specter of catastrophic hospital bills can be lifted from the lives of our older citizens. *I again strongly urge the Congress to enact a hospital insurance program for the aged.*

Such a program should—

Be financed under social security by regular, modest contributions during working years;

Provide protection against the costs of hospital and post-hospital extended care, home nursing services, and outpatient diagnostic services;

Provide similar protection to those who are not now covered by social security, with the costs being paid from the administrative budget;

Clearly indicate that the plan in no way interferes with the patient's complete freedom to select his doctor or hospital.

Like our existing social security cash retirement benefits, this hospital insurance plan will be a basic protection plan. It should cover the heaviest cost elements in serious illnesses. In addition, we should encourage private insurance to provide supplementary protection.

I consider this measure to be of utmost urgency. Compassion and reason dictate that this logical extension of our proven social security system will supply the prudent, feasible, and dignified way to free the aged from the fear of financial hardship in the event of illness.

Also, I urge all States to provide adequate medical assistance under the existing Kerr-Mills program for the aged who cannot afford to meet the noninsured costs.

B. BETTER HEALTH SERVICES FOR CHILDREN AND YOUTH

America's tradition of compassion for the aged is matched by our traditional devotion to our most priceless resource of all—our young. Today, far more than many realize, there are great and growing needs among our children for better health services.

Acute illness strikes children under 15 nearly twice as frequently as it does adults.

One in five children under age 17 is afflicted with a chronic ailment.

Three out of every 100 children suffer some form of paralysis or orthopedic impairment.

At least 2 million children are mentally retarded, with a higher concentration of them from poor families.

Four million children are emotionally disturbed.

At age 15, the average child has more than 10 decayed teeth.

If the health of our Nation is to be substantially improved in the years to come, we must improve the care of the health of our 75 million preschool and school-age children and youth.

There is much to do if we are to make available the medical and dental services our rising generation needs. Nowhere are the needs greater than for the 15 million children of families who live in poverty.

Children in families with incomes of less than $2,000 are able to visit a doctor only half as frequently as those in families with incomes of more than $7,000.

Public assistance payments for medical services to the 3 million needy children receiving dependent children's benefits throughout the Nation average only $2.80 a month, and in some States such medical benefits are not provided at all.

Poor families increasingly are forced to turn to overcrowded hospital emergency rooms and to overburdened city clinics as their only resource to meet their routine health needs.

Military entrance examinations reveal the consequences. Half of those rejected cannot pass the medical tests. Three-fourths of them would benefit from treatment, and earlier treatment would greatly increase recovery and decrease lifelong disability.

The States and localities bear the major responsibility for providing modern medical care to our children and youth. But the Federal Government can help. *I recommend legislation to—*

Increase the authorizations for maternal and child health and crippled children's services, earmarking funds for project grants to provide health screening and diagnosis for children of preschool and school age, as well as treatment and followup care services for disabled children and youth. This should include funds to help defray the operational costs of university-affiliated mental retardation clinical centers. Provisions should also be made for the training of personnel who will operate medical facilities for children.

Broaden the public assistance program to permit specific Federal participation in paying costs of medical and dental care for children in medically needy families, similar to the Kerr-Mills program for the aged.

Extend the grant programs for (*a*) family health services and clinics for domestic agricultural migratory workers and their children and (*b*) community vaccination assistance.

C. IMPROVED COMMUNITY MENTAL HEALTH SERVICES

Mental illness afflicts 1 out of 10 Americans, fills nearly one-half of all the hospital beds in the Nation, and costs $3 billion annually. Fortunately, we are entering a new era in the prevention, treatment, and care of mental illness. Mere custodial care of patients in large, isolated asylums is clearly no longer appropriate. Most patients can be cared for and cured in their own communities.

An important beginning toward community preparation has been made through the legislation enacted by the 88th Congress authorizing aid for constructing community mental health centers. But facilities alone cannot assure services.

It has been estimated that at least 10,000 more psychiatrists are needed.

Few communities have the funds to support adequate programs, particularly during the first years.

Communities with the greatest needs hesitate to build centers without being able to identify the source of operating funds.

Most of the people in need are children, the aged, or patients with low incomes.

I therefore recommend legislation to authorize a 5-year program of grants for the initial costs of personnel to man community mental health centers which offer comprehensive services.

D. A NEW LIFE FOR THE DISABLED

Today, we are rehabilitating about 120,000 disabled persons each year. I recommend a stepped-up program to overcome this costly waste of human resources. My 1966 budget will propose increased funds to rehabilitate an additional 25,000.

Our goal should be at least 200,000 a year. *I recommend legislation to authorize—*

Project grants to help States expand their services.

Special Federal matching so that rehabilitative services can be provided to a greater number of the mentally retarded and other seriously disabled individuals.

Construction and modernization of workshops and rehabilitation centers.

II. Strengthening the Nation's Health Facilities and Services

In our urbanized society today, the availability of health care depends uniquely upon the availability and accessibility of modern facilities, located in convenient and efficient places, and on well-organized and adequately supported services. The lack of such facilities and services is, of itself, a barrier to good health care.

A. MULTIPURPOSE REGIONAL MEDICAL COMPLEXES

In this century, we have made more advance than in all other centuries toward overcoming diseases which have taken the heaviest toll of human life. Today we are challenged to meet and master the 3 killers which alone account for 7 out of 10 deaths in the United States each year—heart disease, cancer, and stroke. The Commission on Heart Disease, Cancer, and Stroke has pointed the way for us toward that goal.

The newest and most effective diagnostic methods and the most recent and most promising methods of treatment often require equipment or skills of great scarcity and expense such as—

open heart surgery;
advanced and very high voltage radiation therapy;
advanced disease detection methods.

It is not necessary for each hospital or clinic to have such facilities, equipment, or services, but it is essential that every patient requiring such specialized and expensive procedures and services have access to them. Multipurpose medical complexes can meet these needs. They would—

speed the application of research knowledge to patient care, so as to turn otherwise hollow laboratory triumphs into health victories;

save thousands of lives now needlessly taken annually by the three great killers—heart disease, cancer, and stroke—and by other major diseases.

A plan to improve our attack upon these major causes of death and disability should become a part of the fabric of our regional and community health services. The services provided under this plan will help the practicing physician keep in touch with the latest medical knowledge and by making available to him the latest techniques, specialized knowledge, and the most efficient methods.

To meet these objectives, such complexes should—

Be regional in scope.

Provide services for a variety of diseases—heart disease, cancer, stroke, and other major illnesses.

Be affiliated with medical schools, teaching hospitals, and medical centers.

Be supported by diagnostic services in community hospitals.

Provide diagnosis and treatment of patients, together with research and teaching in a coordinated system.

Permit clinical trial of advanced techniques and drugs.

Medical complexes—consisting of regional organizations of medical schools, teaching hospitals, and treatment centers tied into community diagnostic and treatment facilities—represent a new kind of organization for providing coordinated teaching, research, and patient care. When we consider that the economic cost of heart disease alone amounts to 540,000 lost man-years annually—worth some $2.5 billion—the urgency and value of effective action is unmistakable.

Action on this new approach, stemming from recommendations of the Commission on Heart Disease, Cancer, and Stroke, will provide significant improvements in many fields of medicine.

I recommend legislation to authorize a 5-year program of project grants to develop multipurpose regional medical complexes for an all-out attack on heart disease, cancer, stroke, and other major diseases.

B. IMPROVED SERVICES FOR THE MENTALLY RETARDED

Mental retardation in any individual is a lifelong problem of the most serious nature for the family and for the community. But we know today that the problem need not and must not lead to tragic hopelessness. Much is being done to provide a decent, dignified, place in society for these unfortunate individuals.

The 88th Congress provided a substantial foundation for building an effective national program for the prevention of mental retardation and care of the mentally retarded. Under this authority, grants are authorized—

For construction of mental retardation research centers, community mental retardation centers, and university-affiliated mental retardation centers.

For planning by all the States of comprehensive action to combat mental retardation at the State and community levels.

The 1966 budget includes $282 million—a $40 million increase—for these programs and other mental retardation services, including preventive activities and the training of teachers of the retarded. I urge that this full amount be appropriated.

Extensive resources and programs need to be developed in the States and communities to prevent mental retardation and to care for the mentally retarded. The existing authority for planning grants will end on June 30, 1965. The developmental needs and effective utilization of the construction grants require followup action.

I recommend the enactment of mental retardation program development grants for 2 additional years to help the States continue this essential work.

C. MODERNIZATION OF HEALTH FACILITIES

Great progress has been made throughout the Nation in the provision of new general hospitals under the Hill-Burton program. But relatively little assistance has been available for modernization of the older hospitals, found particularly in our large cities. Without aid, deterioration threatens and rapid scientific and technical change is passing by these essential links to health care for millions of our people.

The 1966 budget will include funds for a greatly increased hospital modernization effort as well as for expansion in the number and quality of nursing homes. *I urge the Congress to approve the full amount requested for each of these purposes.*

D. AID FOR GROUP PRACTICE FACILITIES

New approaches are needed to stretch the supply of medical specialists and to provide a wider range of medical services in the communities. The growth of voluntary, comprehensive group practice programs has demonstrated the feasibility of grouping health services for the mutual benefit of physicians and patients by—

Integrating the burgeoning medical specialties into an efficient and economical system of patient care.

Reducing the incidence of hospitalization which may now occur because there are few alternative centers for specialized care.

The initial capital requirements for group practice are substantial and the funds are not now sufficiently available to stimulate the expansion and establishment of group practice. To facilitate and encourage this desirable trend, *I recommend legislation to authorize a program of direct loans and loan guarantees to assist voluntary associations in the construction and equipping of facilities for comprehensive group practice.*

III. Manpower for the Health Services

The advance of our Nation's health in this century has, in the final measure, been possible because of the unique quality and fortunate quantity of men and women serving in our health professions. Americans respect and are grateful for our doctors, dentists, nurses, and others who serve our Nation's health. But it is clear that the future requires our support now to increase the quantity and assure the continuing high quality of such vital personnel.

In all sectors of health care, the need for trained personnel continues to outstrip the supply:

At present, the United States has 290,000 physicians. In a decade, we shall need 346,000.

Today we are keeping pace with our needs largely because of the influx of numbers of foreign-trained doctors. Last year 1,600 came into the United States, the equivalent of the output from 16 medical schools and 21 percent of our medical school graduates.

Population growth has badly outpaced the increase in dentists and the shortage of dentists is now acute.

To begin to meet the Nation's health needs, the number of new physicians graduated each year must increase at least 50 percent by 1975, and the output of new dentists by 100 percent.

The Health Professions Educational Assistance Act of 1963, authorizing grants to schools for construction of medical and other health education schools and loans to students, will help meet this problem. The magnitude of the need is demonstrated by the response:

Ninety applications have been received from medical and dental schools, requesting $247 million in Federal aid for construction.

Only $100 million is available in 1965; and the full authorization for 1966, which I will shortly request in the budget I am submitting, will provide $75 million more.

In the light of these needs, *I urge the Congress to appropriate the full amount authorized and requested for the Health Professions Educational Assistance Act program.*

While we must build new medical and dental schools, we must also retain and sustain the ones we have. To be neglectful of such schools would be wasteful folly.

We must face the fact that high operating costs and shortages of operating funds are jeopardizing our health professions educational system. Tuition and fees paid by medical and dental students meet less than half the institutional costs of their education. Several underfinanced medical and dental schools are threatened with failure to meet educational standards. New schools are slow to start, even when construction funds are available due to lack of operating funds.

I therefore recommend legislation to authorize—

formula grants to help cover basic operating costs of our health profession schools in order that they may significantly expand both their capacity and the quality of their educational programs;

project grants to enable health profession schools to experiment and demonstrate new and improved educational methods.

Traditionally, our medical profession has attracted outstanding young talent, and we must be certain that this tradition is not compromised. We must draw the best available talent into the medical profession. Half of last June's medical school graduates came from

families with incomes of over $10,000 a year. The high costs of medical school must not deny access to the medical profession for able youths from low- and middle-income families.

I therefore recommend legislation to authorize scholarships for medical and dental students who would otherwise not be able to enter or complete such training.

Looking to the future

We must also look to the future in planning to meet the health manpower requirements of the Nation.

Unmet health needs are already large. American families are demanding and expecting more and better health services. In the past decades the proportion of our gross national product devoted to health has increased by more than 50 percent. The trend is still upward. If we are to meet our future needs and raise the health of the Nation, we must—

improve utilization of available professional health personnel;

expand the use and training of technicians and ancillary health workers through special schools and under the Vocational Education Act and Manpower Development and Training Act programs;

expand and improve training programs for professional and for supporting health personnel;

plan ahead to meet requirements for which the leadtime is often 10 years or more.

With these objectives in mind, *I have asked the Secretary of Health, Education, and Welfare to develop a long-range health manpower program for the Nation and to recommend to me the steps which should be taken to put it into effect.*

IV. Health Research and Research Facilities

Two decades ago this Nation decided that its Government should be a strong supporter of the health research to advance the well-being of its people. This year that support amounts to more than two-thirds of the total national expenditure of $1.5 billion for health research.

Continued growth of this research is necessary and the 1966 budget includes:

Ten-percent growth in expenditures for health research and for the related training.

Funds to begin an automated system for processing the exploding volume of information on drugs and other chemicals related to health.

Health research, no less than patient care, requires adequate facilities. Over the past 8 years the Health Research Facilities Act has been highly successful in helping provide research facilities to universities and other nonprofit institutions. Federal grants of $320 million to 990 construction projects have generated over $500 million in matching institutional dollars.

This authority expires on June 30, 1966, and *I recommend that it be extended for 5 years with an increased authorization and with a larger Federal share for specialized research facilities of a national or regional character.*

V. Health Grants and Protection Measures

Our complex modern society is creating health hazards never before encountered. The pollution of our environment is assuming such important proportion I shall shortly send to the Congress a special message dealing with this challenge.

But the protection of the public health also requires action on other fronts.

A. HEALTH GRANTS TO COMMUNITIES AND STATES

In safeguarding and advancing the Nation's health, States and communities have long had special responsibilities. General and special-purpose health grants have proved an effective means of strengthening the Federal Government's partnership with them in improving the public health.

I have directed the Secretary of Health, Education, and Welfare to study these programs thoroughly and to recommend to me necessary legislation to increase their usefulness.

Authorizations for many of these programs expire at the close of fiscal year 1966. So that a thorough review may be made, *I recommend that the Congress extend the authorizations through June 30, 1967.*

B. CONSUMERS HEALTH PROTECTION

Modernization of the Federal Food, Drug, and Cosmetic Act is imperative if our health protection program is to keep pace with the technological and industrial advances of recent years.

The health of all Americans depends on the reliability and safety of the products of the—

food industry which alone generates nearly $100 billion in retail sales each year;

drug industry with sales reaching $6 billion;

cosmetic industry which markets $2.5 billion of products.

All must be operated under the highest standards of purity and safety.

Yet, despite recent improvements in food and drug legislation, serious gaps in our ability to protect the consumer still exist. The law should be strengthened to provide adequate authority in the regulation of nonprescription drugs, medical devices, cosmetics, and food.

Narcotics are not alone among the hazardous, habit-forming drugs subject to improper use. Barbiturates, amphetamines, and other drugs have harmful effects when improperly used. Widespread traffic resulting from inadequate controls over the manufacture, distribution, and sale of these drugs is creating a growing problem which must be met. We must also counter the threat from counterfeit drugs.

I recommend legislation to bring the production and distribution of barbiturates, amphetamines, and other psychotoxic drugs under more effective control.

For the fuller protection of our families, *I recommend legislation to require—*

Adequate labeling of hazardous substances.

Safety regulation of cosmetics and therapeutic devices by premarketing examination by the Food and Drug Administration.

Authority to seize counterfeit drugs at their source.

Conclusion

I believe we have come to a rare moment of opportunity and challenge in the evolution of our society. In the message I have presented to you—and in other messages I shall be sending—my purpose is to outline the attainable horizons of a greater society which a confident and prudent people can begin to build for the future.

Whatever we aspire to do together, our success in those enterprises—and our enjoyment of the fruits that result—will rest finally upon the health of our people. We cannot and we will not overcome all the barriers—or surmount all the obstacles—in one effort, no matter how intensive. But in all the sectors I have mentioned we are already behind our capability and our potential. Further delay will only compound our problems and deny our people the health and happiness that could be theirs.

The Eighty-eighth Congress wrote a proud and significant record of accomplishment in the field of health legislation. I have every confidence that this Congress will write an even finer record that will be remembered with honor by generations of Americans to come.

Lyndon B. Johnson.

The White House, *January 7, 1965.*

The CHAIRMAN. The basic objective of this legislation is to improve the medical care of patients. This would be achieved by extending to a wider geographic area and to a broader population base the benefits of the strong programs of clinical care, research, and medical education at our medical centers.

Over the last two decades we have developed new medical knowledge at an unprecedented rate. Leading scientists have testified that the last 20 years has been the most productive era in the history of medicine.

As a result of this progress, the young physicians of this country are no longer required to travel to the capitals of Europe for the best in medical education. In fact, the situation is reversed. Each year thousands of physicians from other countries come to the medical centers of this country to advance their education.

And, an increasing number of patients from other lands are seeking treatment in the United States, because it is recognized that the best medical care available today is being provided at our medical centers which have active research and strong education programs.

The experience of the Veterans' Administration is a good illustration of the close connection between patient care and medical education and research. You will remember that prior to 1945 it was the policy of the Veterans' Administration to operate its hospitals in isolation and apart from the medical resources of the communities in which they were located.

This isolation produced a poor quality of care that was recognized by the American Legion as early as 1941 when its members approved their famous Resolution 528 that was highly critical of the Veterans' Administration. They later recommended than an outstanding member of the medical profession head the Department of Medicine and Surgery and called for a reorganization of the department.

The pressures for reorganization did not abate until 1945 when Gen. Omar Bradley was appointed Administrator of Veterans' Affairs.

General Bradley, Maj. Gen. Paul R. Hawley, chief surgeon of the European Theater, and Brig. Gen. Elliott C. Cutler, professor of surgery at Harvard Medical School, at a conference determined that if the medical care of veterans was to be improved it would be necessary to affiliate veterans' hospitals with the medical educational forces of the United States.

I may say a similar proposal had earlier been advanced by Dr. Paul B. Magnuson, professor of orthopedic surgery at Northwestern University Medical School, but had been rejected by the former Administrator of the Veterans' Administration. As we recall, Dr. Magnuson subsequently served as medical director of the Veterans' Administration.

The program of affiliation and the establishment of the deans committee led to a rapid improvement in the medical care for veterans. Five years later an advisory committee under the chairmanship of Dr. Charles W. Mayo appraised the new medical care program in these terms:

> One of the major reasons for the high caliber of medical care given to the veteran is the constant emphasis placed on education and research. * * * It has been amply demonstrated that the educational program in a veterans hospital, by being available to all physicians in the area, has uplifted the general level of medical practice in the entire community. * * *

The experience of the Veterans' Administration is pertinent in the consideration of this pending legislation, since it vividly portrays the importance of research and education to a high quality program of patient care.

Under the provisions of S. 596, assistance would be provided to communities in strengthening services to patients through the establishment of regional medical complexes that are comprised of a close alliance of clinical care, medical research, and health education programs.

The new program, in effect, is a logical outgrowth and extension of the clinical research center programs administered by the National Institutes of Health since 1959. In the case of the National Cancer Institute, for example, there are 10 clinical research centers throughout the country with approximately 200 beds. All patients are referred to the centers by their personal physicians and are admitted to the centers only when their participation will contribute to a specific medical research study.

The regional medical complex, however, differs from the clinical research center in that it provides for extending the influence of the medical teaching center beyond the confines of the college or university and thereby extends the advances in medical research to more patients.

I may say I am submitting for the record an article that appeared in the New England Journal of Medicine of September 20, 1962. This article describes the Albany regional hospital program that links the Albany Medical College with six hospitals in Schenectady, N.Y., Pittsfield, Mass., Springfield, Mass., and Poughkeepsie, N.Y.

(The article referred to follows:)

THE ALBANY REGIONAL HOSPITAL PROGRAM [1]

A Preliminary Report

(Henry S. M. Uhl, M.D.,[2] William P. Nelson III, M.D.,[3] and Frank M. Woolsey, Jr., M.D.,[4] Albany, N.Y.)

The Albany regional hospital program began formal activities in September 1960. Adequate financing over a 5-year period is assured by support of the National Heart Institute and by an annual contribution by each of the participating hospitals amounting to an average of $12,500 per year.

The project was established within the newly organized Department of Postgraduate Medicine at Albany Medical College, and three full-time members of the medical college faculty and this department are responsible for its administration and direction.

Although a number of medical colleges have developed a variety of plans to improve educational activities in community hospitals, we believe that the Albany regional hospital program is unique in the depth with which it is attacking the many difficult problems and in the frequency and intensity of its efforts to work closely with the educational directors, the chiefs of services, the administration and the trustees of each hospital.

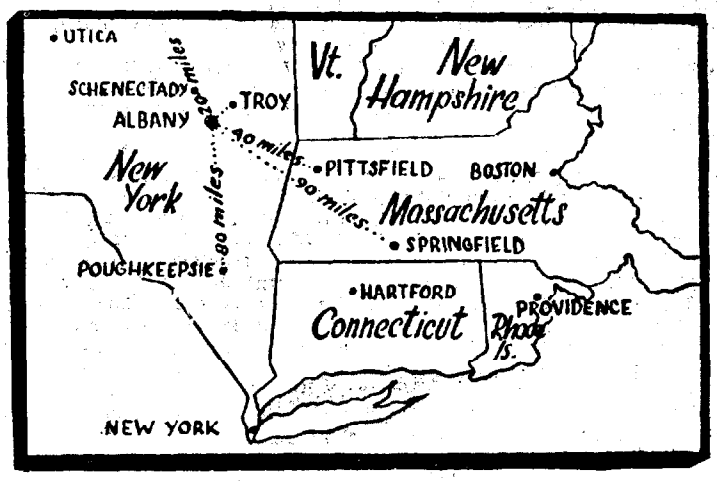
[1] From the Department of Postgraduate Medicine, Albany Medical College of Union University. Presented in part at the annual education meeting, Association of Hospital Directors of Medical Education, Chicago, Ill., Feb. 3, 1962.

[2] Assistant professor of postgraduate medicine, Albany Medical College of Union University.

[3] Associate professor of postgraduate medicine, Albany Medical College of Union University.

[4] Professor of postgraduate medicine and chairman, Department of Postgraduate Medicine, Albany Medical College of Union University.

The five educational programs are located in the Ellis Hospital, Schenectady, N.Y.; the Pittsfield Affiliated Hospitals (the Pittsfield General and St. Luke's hospitals) in Pittsfield, Mass.; St. Clare's Hospital, Schenectady, N.Y.; the Springfield Hospital, Springfield, Mass.; and the Vassar Brothers Hospital in Poughkeepsie, N.Y. (fig. 1). Thus, six general hospitals are directly involved.



The purpose of this program is to determine the extent and degree to which a medical college, through formal collaboration, can contribute to the development of graduate and postgraduate medical education in a selected group of nonuniversity community teaching hospitals. In this paper we shall present a preliminary report describing our experience in the first phase of the project.

EXPOSITION

If this purpose, with its many ramifications, is to be achieved it is necessary to understand and define the special problems of community hospitals. What are their shortcomings? What are the needs that the medical college will have to meet?

Medical educators agree that the complexity and importance of graduate medical education equal those of undergraduate medical education in determining the quality of practice of the physician. Ideally, therefore, graduate medical education ought to be planned, administered, and conducted at the same professional level as undergraduate medical education. However, there are many problems that interfere with the realization of this ideal.[5,6] These may be summarized as follows:

The position of the director of medical education remains one of professional isolation, with a lack of real authority in the conduct of educational activities. Furthermore, because it is a new field of work there is a nationwide shortage of experienced physicians to fill this difficult role.

There is a serious lack of knowledge about medical education among hospital administrators and hospital trustees.

Very few community hospitals possess a teaching faculty.

There is the continuous conflict between the requirements of the standards of medical education and the service demands of the hospital and the visiting staff in the care of patients.

There is a serious lack of knowledgeable department heads for the major clinical divisions, such as medicine, surgery, pediatrics and obstetrics and gynecology.

There is a lack of personnel and special facilities for competent teaching of basic sciences.

[5] Uhl, H. S. M., director of medical education in nonuniversity community teaching hospital, New Eng. J. Med. 266: 647–652, 1962.
[6] Barnes, F. W., Jr., graduate clinical education. J. M. Educ. 37: 192–200, 1962.

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There is a serious lack of continuing education activities in which the visiting staff participates.

There is a lack of appropriate procedures for the recognition and promotion of visiting-staff members on the basis of educational activities.

There is generally a lack of research programs that can contribute effectively to strengthening the graduate education program.

There is a lack of systematic and objective methods for evaluating the progress of the house staff in individual training programs.

Most community hospitals are chronically faced with an insufficient number of interns and residents in their individual training programs. Furthermore, there may be wide shifts in the number of candidates in the program from one year to the next.

This is an extensive list of problems and needs. No doubt other items could be added—for example, the cost of these educational programs and how these costs are to be met by the community hospital.[7]

In the selection of individual hospitals for the Albany regional hospital program searching conferences were held with officials of the visiting staff and the administration, and in some cases with hospital trustees. These special problems of the community hospital were clearly identified. A formal contract was entered into between the medical college and the individual hospital only after agreement was reached that the goals of the project were to establish sound educational activities by working out appropriate solutions to these problems.

Two vital points were stressed: officials of the medical college and of this department would in no way interfere in the internal affairs of the hospital; and the medical college would guarantee nothing in the way of recruitment of interns and residents for any of the hospitals.

OPERATION OF THE PROGRAM

The program is administered by 3 full-time members of the department of postgraduate medicine. It is worth noting that each one has devoted many years to administrative and teaching responsibilities. Dr. Woolsey[8] and Dr. Nelson[9] have for the past 10 years been active in undergraduate, graduate, and postgraduate medical education at the Albany Medical Center, and Dr. Uhl's previous activities include almost 8 years as a full-time educational director in community hospitals. The combined experience has been of practical value in an understanding of the psychology of the practicing physician in his community hospital, and in an evaluation of his commitments to medical education.

Our three basic activities in the Albany regional hospital program include administration, teaching, and consultation. We are continuously involved in scheduling weekly visits for members of the medical-school faculty to each of these hospitals. In addition, one of us visits each of the five participating hospitals each week, with occasional exceptions. During these visits we conduct teaching rounds and conferences, and we carry on informal meetings providing information, advice, and guidance to the director of medical education, to members of the administration and to responsible members of the visiting staff. Consultation activities refer to more formal requests for special meetings in which one or more of us meets with the hospital administrator, trustees, director of education, and key staff officials to discuss long-term problems and policy developments in the program. These meetings are held either at the hospital or at the medical college.

In addition to these three basic and continuous activities we have taken certain steps to assist the regional hospitals in recruitment of interns and residents. We have visited medical schools in Italy and Switzerland to interview American citizens studying abroad who have intended to take their hospital training in the United States. We placed advertisements in several major medical journals, such as the Journal of the American Medical Association and the British Medical Journal, describing briefly the Albany regional hospital program and the various training programs offered. However, we have refused thus far to encourage undergraduate students at Albany Medical College to apply to the regional hospitals, despite some pressure put upon us by one or two of the educational directors.

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[7] Pratt, O. G., and Hill, L. A., "Price of Medical Education: Dissection of One Hospital's Expenditures." "Hospitals," 34: 44–47, 1960.

[8] Associate dean and associate professor of medicine.

[9] Assistant dean and associate professor of medicine.

Finally, we frequently assist the various hospitals in obtaining guest speakers from other medical schools in the northeastern part of the country. In such cases a portion of these costs is paid from special funds provided by a grant-in-aid through the postgraduate program of Merck Sharp & Dohme. This additional support of the formal teaching activities of the regional hospitals has been especially beneficial during the early phase of the project. Occasionally, the visitors take part in special teaching exercises at the medical college.

THE HOSPITALS IN THE PROGRAM

The capacities of these hospitals vary from 250 to 585 beds. There are two Catholic hospitals and four nondenominational, nonprofit private corporations. One hospital has only an approved internship, one hospital has an approved internship, a 2-year general-practice residency and a 2-year residency in pathology, and the other hospitals have approved internships and various residency programs in clinical and laboratory specialties. Two of the programs have full-time, and three have half-time educational directors. The most experienced of these men has been on the job about 3 years. Three are surgeons, of whom one has recently retired from active practice, one is an internist, and one a general physician. Two have prior Albany Medical College faculty appointments, one as an assistant professor of anatomy and one as an instructor in medicine.

In none of these hospitals is there any full-time physician in a clinical field, but all have full-time department heads in pathology and radiology. In one of the hospitals plans are far advanced for the appointment of a full-time chief of medicine, with the probability that this appointment will be followed by full-time chiefs in other clinical departments.

Research activities in these hospitals are limited although there are three in which rather sophisticated original work is being carried out. One of the educational directors is conducting a research program at the medical college, using the facilities of the experimental surgical laboratory.

SPECIFIC ACTIVITIES OF THE PROGRAM

Although each hospital has problems peculiar to its own program, to greater or lesser degree all hospitals exhibit difficulties related to the 11 problems listed in an earlier section of this paper. We wish to describe how the Albany regional hospital program is attempting to deal with these shortcomings and deficiencies. Variations in our approach to each hospital are related essentially to the frequency and intensity with which specific methods and procedures are applied.

Isolation of the director of education

The professional isolation of the educational director is largely relieved by his contacts with staff members from the department of postgraduate medicine. These contacts are achieved through our regular visits and through frequent telephone communication. Our knowledge and experience is used week by week to answer routine questions, and our prestige and authority have been invaluable in supporting the educational director in his dealings with physicians and administrators. The significance of these methods of support becomes even more striking when one recalls that none of the five educational directors had any previous administrative education experience. We believe this feature of the program is one of fundamental value.

Information on medical education

Administrators and trustees of community hospitals generally have little or no knowledge or experience in graduate and postgraduate medical education. To overcome this urgent problem each of us meets as often as possible with the administrator and his staff assistants on our weekly visits. We have held a joint meeting with all administrators at the medical college, and intend to do so periodically in the future. We have provided both administrators and trustees with essential articles and information in this field of medical education. We have made available factual information about the costs of this form of medical education, and the need and justification for these costs. As a byproduct of this activity we are again supporting the educational director.

Lack of teaching faculty

Although few community hospitals possess a teaching faculty, all the hospitals in this program possess skilled and competent attending staffs in the major specialties and in the laboratory fields. We believe that we can stimulate the

development of teaching faculties through two methods: by providing precept and example through our own teaching activities and through frequent visits by effective teachers from the faculty of Albany Medical College; and by offering appointments in the department of postgraduate medicine to physicians who prove their ability to teach and their interest in the program, and who demonstrate their own continuing educational activities. These appointments will be reviewed annually, and there will be renewal or promotion only when such action is clearly justified by the record. Furthermore, we believe that as each hospital makes progress in its educational effort, it will attract outstanding physicians interested in settling in a progressive medical community. Indeed, this has already occurred in one case.

Conflict between medical-education standards and care of patients

We are continuously exerting our influence to establish the concept in each hospital that service to private patients by the house staff should be directly related to an excellent educational program. We are, however, combining realism with idealism, and attempting to meet practical problems with practical solutions. For example, in one of the hospitals where there is a critical shortage of interns, we have recommended the appointment of a full-time salaried experienced general physician to run the emergency ward. This step has relieved the house staff of a service burden that it was being asked to combine with activities on inpatient floors.

Lack of knowledgeable department heads

A most serious difficulty, and one with far-reaching implications, is the fact that the chiefs of the clinical departments in these community hospitals are elected to this position, and often have little qualification and inclination for the challenging job of administering a residency program and directing a staff of practicing physicians. We have been able to help in some cases simply by pointing out the fact that this deficiency existed. In one of our hospitals the problem has been grasped so clearly that the staff and the administration have now accepted the necessity of establishing positions for full-time chiefs, and of searching for the right candidate from outside the hospital and the community. The professor of medicine and the professor of surgery at the medical college have given consultation and advice, and in one case conducted a site visit and survey, to analyze these problems and help the hospital develop its solutions. Undoubtedly, our activities in this area will increase with the passage of time.

Personnel for teaching of basic sciences

The teaching of basic sciences and their correlation with diagnosis and management of the sick human being have become one of the essential elements of graduate and postgraduate medical education. We are approaching this problem, first by establishing a basic curriculum for the academic year in each hospital from September to May. It has been adapted to the individual need of each hospital by the educational director in cooperation with his department heads and with us. Secondly, we have presented formal basic science courses through the use of the two-way FM-radio conference network.[10 11] Thirdly, we have made available to the interns, the residents and the attending staffs of our regional hospitals the opportunity to attend the special teaching days at the medical college. Finally, we have made available information and materials for the presentation of special courses in the regional hospitals through the cooperation of faculty members. For example, in one of the hospitals a series of sessions in surgical anatomy and surgical physiology will be presented by members of the staff. Faculty members in charge of these programs at the medical college are working with these physicians in the planning of the course and in making available teaching aids, such as lantern slides, mimeographed material, and other useful teaching tools.

Continuing education

Continuing education is now available in quality and depth at each hospital. In addition, the practicing physicians are encouraged to attend special teaching days at the medical center. By increasing their participation in teaching con-

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[10] Woolsey, F. M., Jr., "Two-Way Radio Conferences—New Method for Postgraduate Education." GP 19: 185–189, 1959.

[11] Idem. "Two-Way Radio Conferences for Postgraduate Medical Education: 4 Years of Experience With New Method of Presentation." Canadian M. A. J. 82: 717–719, 1960.

ferences and rounds in their own hospitals, they are improving their knowledge of medicine. We hope to stimulate these self-educational efforts by judicious use of faculty appointments, as described above.

Recognition and promotion of staff on the basis of educational activities

The attending staff of each hospital will in the final analysis determine the quality of the education program. It is the rare community hospital that has developed systematic, objective procedures for evaluating the effectiveness of the individual physician in his teaching role and that uses such information in appointments and promotions. The seniority system is still the rule. Our initial efforts have been geared to the simple task of working with the individual director of education to identify the able men, the potentially useful men, and the deficient men. We continually stress the opinion that the attending physician who does no participate in and contribute to the program should not enjoy the benefits of house-staff service and coverage on a daily basis. We have asked the educational director to keep attendance records at teaching conferences, to keep a continuous evaluation of each physician's faithfulness in conducting bedside teaching rounds and to collect, by means of a questionnaire, an evaluation by the intern and the resident of each member of the attending staff under whom he works. Eventually, we believe that the systematic collection of such information will be acceptable as evidence bearing directly upon future appointments and promotions within the attending staff.

Lack of research programs

One of the major differences between graduate and postgraduate medical education in the university hospital and the community hospital is found in the different levels of research. To stimulate the development of sound investigative programs in these regional hospitals, we shall make available our own knowledge, and the extensive experience of the medical school faculty, in the planning and organization of research, in the formulation of proposals for grants, in instruction in techniques, in providing information about the use of newer instruments and wherever the research knowledge of the faculty can be of assistance. There is considerable potential for productive, independent work in more than one of these hospitals in the laboratory departments and in some of the subspecialties in medicine. We shall encourage its development wherever we find the right men to do the job. House-staff members will be encouraged to visit the medical college for advice and information about specific projects being conducted in regional hospitals. The chief surgical resident in one hospital is already involved in one project and, on the basis of his past record, his interest and his work, has received an appointment for next year in the department of anatomy at the medical college.

Progress of the house staff

Everyone recognizes that in graduate medical education systematic, objective methods for evaluating the progress of the intern and resident have never been applied, as they are in the education of the undergraduate medical student. We have been most fortunate in enlisting the cooperation of the National Board of Medical Examiners in developing special examinations for all the interns in our regional hospitals. We are working out plans to test simultaneously the members of the attending staff of each hospital. All intern candidates will be reexamined before the internship has been completed, and these young physicians will take the newly developed part III examination. As our experience indicates, we shall work toward the development of effective testing procedures for residents. This type of evaluation will be correlated with the present commonly accepted method of questionnaires or forms that are filled in by members of the attending staff as they supervise the house officers from month to month and year to year. At the present time standards for reappointment and promotion are minimal, since in most cases the practical necessities and difficulties of recruitment dictate these decisions.

Insufficient interns and residents in training programs

We have taken two specific actions in an effort to assist our hospitals with recruitment of interns and of residents. The visits to foreign medical schools attended by large numbers of Americans in Italy and in Switzerland were an exploratory venture to determine whether or not such personal contact might influence the choice of hospital for internship by these students. More than a few have selected their internships in our hospitals, but we shall not know

the full value of this effort until the final results for the current recruitment year have been assessed. On the other hand, the advertisements placed in several journals distributed throughout the world have resulted in an astonishing interest in the possibility of residency appointments. It seems certain that the regional hospitals will have more than enough candidates to fill all residency positions for the year ahead. It is still too early to know whether this approach will be as useful in recruitment for the internships.

CONCLUSION

We have described the ways in which we are attempting to meet the problems and needs of the community teaching hospitals in the Albany regional hospital program. The single most important feature of this project is that three full-time members of the faculty of the Albany Medical College, whose combined backgrounds include many years of experience in undergraduate, graduate, and postgraduate medical education both in university medical centers and in community hospitals, are in day-by-day and week-by-week contact with the educational directors. If the program had accomplished nothing else in this first phase, it would have been worth the effort and the cost.

An objective or quantitative evaluation of an experimental project in medical education in the community hospital is difficult to achieve, because what one is trying to do is to change the degree of participation in continuing educational activities by individual physicians and to influence the quality of hospital medical care and ultimately all medical care in the community. However, there are certain things that can be measured and compared over a period of several years: the performance of house staff and attending staff in special tests; the quality of medical records; the use of the medical library; the development of research projects; the quality of new appointments to the attending staff; the record of attendance and participation in conferences, seminars, and special teaching activities; changes in the physical plant and special laboratory and clinical facilities in the individual hospital; and the development and establishment of the concept of half-time and full-time subspecialists and clinical department heads in the individual hospital.

Systematic collection and tabulation of this type of information has already provided us with some indication of the impact of the project on each hospital. Our experience to date suggests that in each hospital progress, retrogression, and status quo can exist simultaneously but that an overall pattern of improvement or lack of improvement can be identified.

The initial concern on the part of each hospital that the medical college would interfere in its internal affairs has virtually disappeared; indeed, in some cases our participation in their internal decisions has been and is being actively sought. Furthermore, each hospital has developed a more realistic attitude toward the recruitment of a house staff of quality. No longer are magical solutions expected. Instead, we are more and more devoting our attention to the basic weaknesses and strengths of each hospital to develop long-range policies. In this way we hope that our goal of providing the best in medical care for the public whom the hospitals serve will be achieved.

The CHAIRMAN. In concluding, may I say that this legislation, S. 596, will assist our hospitals across the country in fulfilling their functions and achieving their objectives. These functions and objectives were spelled out most clearly by that great man of medicine, Sir William Osler, in 1911, in an address before the Northumberland and Durham Medical Society in England, when he stated:

First a word on what a hospital stands for in the community. Primarily, for the care of the sick and the relief of suffering; secondly, for the study of the problems of disease; and thirdly, for the training of men and of women to serve the public as doctors and nurses.

Senator Javits?

Senator JAVITS. I thank my chairman.

Mr. Chairman, first, I would like to, as I know I would reflect every member of the committee on both sides of the aisle, again pay tribute to our chairman as a leading figure in my judgment in the Congress o

the United States and in an absolutely unchallenged position in improving the participation of the United States in a tremendous war on disease.

This is but another milestone in a long progress for which the whole Nation should be grateful to Senator Lister Hill, of Alabama.

The CHAIRMAN. Let me express my heartfelt thanks to you for the generous remarks.

Senator JAVITS. It has been for so many years, Mr. Chairman, that no one will challenge them in the Congress, that I know.

The CHAIRMAN. Thank you.

Senator JAVITS. May I say, too, Mr. Chairman, I personally regard this morning's hearing with a particular sentiment, as the very first major measure with which I had anything to do was the sponsorship in the House with then Senator Pepper of the National Heart Act, Public Law 655 of the 80th Congress, signed into law on June 16, 1948. To this day I look back on it as probably the most important single piece of legislation, with the Taft-Ellender housing bill, that I had the honor to sponsor as a Member of the Congress in the House and Senate.

May I say, too, Mr. Chairman, that I am very proud of my party, as ranking member both on this subcommittee and our full committee, in the bipartisan effort to wage this war on disease which incidentally is a crown of glory of our Federal establishment, the most humane, farsighted act in relation to the real welfare of the people over the decades.

I am very proud of the role of my party in the National Heart Act and the National Dental Facility Act of the Republican 80th Congress, and the Medical Survey and Construction Act, National Health Survey Act, the Health Research Facilities Act, the National Library of Medicine Act, the Health Amendments of 1956, and the International Health Research Act of 1960, all of which occurred in the Eisenhower years.

Whatever may have been said by people or myself about our 1964 campaign, we Republicans did pledge our support for medical research in the Federal establishment unequivocally even in that platform.

Mr. Chairman, one further word and then I shall be through. I thank the Chair for calling attention to the Albany, N.Y., regional hospital program, very much a prototype for the kind of thing we are doing here. I am very pleased that my State under its succession of Governors, without regard to parties, and now capped by Governor Rockefeller, is a leader in this field and is such an important prototype for the Nation.

I have only one thing to point out, Mr. Secretary. We do find, in a careful examination of the report of the President's Commission on Heart Disease, Cancer, and Stroke and this bill, some major points which we would like to explore with you as to the extent, the number, and the costs of individual centers. We find the report to have had much greater specificity than does the bill. I find also in the bill a rather open-ended commitment for 4 years with a cost price tag for 1 year. These are things I know you will want to go into with us as well as I want to go into with you.

Mr. Chairman, may I again pledge what I know would be the view of this side of the aisle, that we would join with the chairman and members of the committee on the majority side in the most patriotic

and honorable effort to add yet another milestone thing to the great history which has been written in recent years in this tremendous war of the Federal Government on disease.

The CHAIRMAN. May I confirm all that the distinguished Senator from New York has said about the very important effective part that he was played in so many vital health programs.

He began his fight for health in the House of Representatives, before he came to the Senate. Certainly since he has been in the Senate and a member of this committee, he has played a great part in waging the battle to advance these great programs for the health of our people, for medical research, medical education, and for better clinical treatment.

Senator JAVITS. Thank you.

Senator YARBOROUGH. Mr. Chairman, for 7 years I have been a member of this subcommittee under the chairmanship of the distinguished chairman. I have seen public health measures advanced greatly in this country under the chairman's leadership. Beginning with the Hill-Burton Act, that is just a small measure of what has been accomplished for public health and hospitalization. If we named all of the long list of notable acts that have been passed under your leadership, it would be practically the history of the advance of the Federal Government in alleviating disease in this country. For 27 years our distinguished chairman has been a member of this committee. He comes from a family with a great history in its battle against disease. He has been chairman of this full committee for 10 years and is most widely known for the Hill-Burton Act.

He has pushed so many acts to fruition that I predict success in another, with this S. 596 which Senator Hill has authored. I pledge you my cooperation and assistance, Senator Hill, and I congratulate you in pushing this legislation for an early hearing.

The CHAIRMAN. Senator, no one on this subcommittee has given more help and finer support than you have. I appreciate your help.

Mr. Secretary, we would be very happy indeed, to have you proceed, sir, in your own way on this pending legislation.

We are happy you have with you Dr. Ed Dempsey, your adviser on medical affairs, former dean of Washington University Medical School, and Dr. Dave Price, Deputy Surgeon General of the Public Health Service, and we would be happy to have you proceed.

STATEMENT OF HON. ANTHONY J. CELEBREZZE, SECRETARY OF HEALTH, EDUCATION, AND WELFARE; ACCOMPANIED BY DR. EDWARD W. DEMPSEY, SPECIAL ASSISTANT TO THE SECRETARY; AND DR. DAVID E. PRICE, DEPUTY SURGEON GENERAL

Secretary CELEBREZZE. Thank you, Mr. Chairman.

May I say Dr. Dempsey was also a member of the President's Commission on Heart Disease, Cancer, and Stroke which submitted its report. I regret that Dr. Luther Terry, the Surgeon General, cannot be here but we have budget hearings on in the House and it was his turn on the budget; otherwise, he would be here.

I am most pleased, Mr. Chairman, and members of the committee to present testimony in behalf of the proposed Heart Disease, Cancer, and Stroke Amendments of 1965, S. 596, introduced by the distinguished chairman of this committee. This legislation, if enacted,

will permit the Nation to take a giant stride toward the conquest of the three greatest killers of people.

In 1963, 707,830 people died of, and 25 to 30 million suffered from, heart disease. The direct medical costs were $2.6 billion in 1962; the loss of income that year amounted to $19.8 billion; the total cost was $22.4 billion for this one disease.

Also in 1963, 278,562 people died of cancer, about 830,000 were under treatment, and, it is estimated, 48 million people now living will have cancer. The total annual cost is more than $8 billion.

And in that same year, 201,166 people died of strokes. At least 2 million people now alive have had strokes. Many are paralyzed. The economic cost is more than $1.1 billion per year.

These are the great killers and cripplers. They sap our economy by $31.5 billion each year. They cause untold hardship, anguish, and suffering. They can be made to give ground by an organized attack.

Early in 1964, the President established a Commission on Heart Disease, Cancer, and Stroke. The Commission was instructed to study the scientific and medical problems posed by these three deadly diseases and to recommend national action that would reduce their toll through new knowledge and more complete utilization of the medical knowledge we already have.

The proposed legislation we are considering today is designed to embody the major thrust contained in the first three recommendations of the Commission. I believe that this program will, in fact, save many thousands of lives through the fuller application of existing medical knowledge and by accelerating acquisition of new lifesaving knowledge.

The bill before you today, S. 596, would amend the Public Health Service Act by establishing a new program of grants for the creation of regional medical complexes to serve as a framework through which the best in modern medical knowledge would be made swiftly and surely available to physicians in practice and to their patients who are suffering from heart disease, cancer, stroke, or other major diseases.

Grants would be made to public or nonprofit private universities, medical schools, research institutions, and other public or nonprofit private institutions and agencies. They would serve a twofold purpose:

First, they would permit establishment of regional, coordinated arrangements among the key medical resources, including medical schools, research institutions, and hospitals, for the conduct of research, training, and demonstrations related to heart disease, cancer, stroke, and other major diseases.

Second, the coordinated arrangements thus established would afford to physicians, and to the health institutions in which they practice, the arrangements for them to supply the latest advances in diagnosis and treatment of these diseases.

The proposed program would accomplish these vital ends without interfering with traditional patterns of patient care, professional practice, or the administration of hospitals, or with the methods of financing health care.

Let me develop this last point a little further, Mr. Chairman, because there has been some misunderstanding of the Commission's recommendations. What, basically, we are seeking to do for victims

of these diseases is to equip existing hospitals and their existing medical staffs to provide care of a quality that is available today only in a handful of places in the country. We are not proposing that the Federal Government pay for this care—either hospital costs or physicians' fees—except as the Government already pays for care that is a part of federally supported research. When we speak of making high quality services more widely available, we are speaking not of the economics of health care but of the availability of the needed professional skills and the needed physical equipment in places where they do not exist today. That, plus its stimulus to research, is the purpose of this bill.

What is envisioned is a regional complex of medical facilities and resources functioning as a coordinated unit for the benefit of the physicians and residents of a given geographic area. Each regional medical complex would contain a number of component parts:

(*a*) One or more medical centers—a medical school and its affiliated hospital or hospitals;

(*b*) One or more categorical research centers—an institution or part of an institution whose primary functions are the conduct of research, the training of specialists, and the provision of specialized diagnostic and treatment services related to its research and training programs;

(*c*) One or more diagnostic and treatment stations—a unit of a hospital or other facility whose primary function is to augment local capability by providing specialized high quality diagnostic and treatment services to inpatients and outpatients.

In some regions, facilities and services which serve as parts of the proposed medical complex are already in existence. In others, these would need to be created. In every region, there is essential need for effective coordination of its medical resources.

Thus, it is the goal of the proposed legislation to encourage, develop, and support an administrative framework within which individual components can function efficiently to provide the full range of needed services without unnecessary duplication. Another specific goal is to encourage and support the development of essential new facilities and services within this framework.

Two types of grants are proposed under the legislation.

The first would aid eligible agencies and institutions in the planning and development of regional medical complexes—in the development, that is, of the administrative framework just described.

The second would aid eligible agencies and institutions in establishing and operating the complexes.

Applications for both the planning and the operational grants would be reviewed by a new Council advisory to the Surgeon General, the National Advisory Council on Medical Complexes, which would be established by the proposed legislation. This Council would be made up of 12 members and would include at least one outstanding expert in each of the three disease fields.

Moreover, to assure full cooperation and coordination of all interested agencies and institutions at the local or regional level, each applicant for either a planning or an operational grant would be required to designate or create a local advisory body comprising representatives of relevant health organizations and representatives

of the general public. This advisory group would participate both in planning and in carrying out the operations of the regional medical complex.

The proposed legislation would authorize the appropriation of $50 million for the fiscal year ending June 30, 1966, and such sums as may be necessary for each of the next 4 fiscal years, to carry out the purposes of the bill.

These appropriations would spearhead a national attack on a problem now costing many billions of dollars each year. And it is, moreover, a problem in which the economic cost, staggering though it is, is the least of our concerns.

Seven of every ten of our fellow citizens who die each year fall victim to heart disease, cancer, or stroke.

No one can say with certainty which of these lives, or precisely what proportion of them, might have been saved if the full measure of health protection potentially available to us through advances in medical science had been immediately accessible at the right moment. But the distinguished scientists on the President's Commission and their colleagues across the Nation are unanimous in declaring that the numbers are many—the proportion is high.

The Commission summed up the present status and prospect with respect to heart disease, cancer, and stroke in these terms:

> America need no longer tolerate several hundred thousand unnecessary deaths each year from heart disease, cancer, and stroke.
>
> By bringing to all the people the full benefit of what is now known of prevention, detection, treatment, and cure, we could save, each year, a number of lives equal to the population of a major city.

It is the intent of the legislation before this committee to translate this hope into reality for hundreds of thousands of our people.

I know, Mr. Chairman, that you and your colleagues on this subcommittee are thoroughly conversant with the extensive progress that has been made in advancing the frontiers of medical knowledge through scientific research. Indeed, much of this progress can be traced directly to the enlightened support of the Congress, and especially of this committee and especially the chairman of this committee, Senator Hill, throughout the past two decades. I know, too, that you are deeply concerned with the harsh fact that breakthroughs in the laboratory are too often followed by breakdowns in delivery of services.

Let us examine briefly the problems that underlie these circumstances, and then consider the ways in which the heart disease, cancer, and stroke amendments are designed to bridge the gap between the world of medical science and the world of medical practice.

Delivery of the best in medical care depends first of all upon manpower—adequate supplies of highly skilled physicians and their many professional and technical allies. Despite some progress in the recent past and the promise of more rapid progress in the years ahead, thanks to such legislation as the Health Professions Educational Assistance Act, the fact remains that a health manpower shortage exists today and will continue to exist through the foreseeable future.

I have, Mr. Chairman, a difficult time explaining to people that the mere passage of a Health Profession Act does not create more

physicians. That it still takes 10 years or more to turn out a good physician, and while we are on the right road, we nevertheless will continue to have this gap, because I have found no way yet in turning out instant physicians. It still takes a long time.

Senator YARBOROUGH. Mr. Secretary, I hope we can close that gap a little in the case of San Antonio by awarding a grant for establishing a medical school there.

Secretary CELEBREZZE. I would be most happy. The great State of Texas I have a soft spot in my heart for.

Senator YARBOROUGH. I commend you for bringing that up.

Secretary CELEBREZZE. My boss is from there, too.

Moreover, the pace, Mr. Chairman, the pace of scientific progress has been so rapid in recent years that a great proportion of the physicians now in practice have been unable—because of their total dedication to the care of their patients—to keep abreast of the latest developments.

In terms of health manpower, the needs are threefold:

We need to strengthen and enlarge the institutions charged with the production of health manpower. The medical complexes proposed here will enhance the capacity for training highly skilled specialists so necessary for advanced diagnosis and treatment.

We need to devise patterns of organization which permit maximal utilization of the manpower we now have. This is the purpose of organizing our medical resources into medical complexes.

And we need to develop systems which enhance continuing education and means whereby those in practice can have ready and convenient access to consultants who have new lifesaving knowledge and to new equipment as it is generated in ever-increasing quantity. The Medlars system at the National Library of Medicine is one example of a method to make information more readily available. It is a beginning of an improved communication system.

And I might say, Mr. Chairman, that the index medicus at the Library of Medicine, the index alone, contains 1,800,000 words, that is just the index. That gives you some knowledge of the tremendous impact that has been accomplished in research, and the tremendous burdens then put upon local physicians in order to consume this vast knowledge. But nevertheless, it is something that we think is essential and certainly the establishment of this medical complex, these medical complexes where a physician can refer his patients through the expert who keeps up with this knowledge will save many lives.

Senator YARBOROUGH. Mr. Secretary, have steps been taken in research centers to put these indexes on cards and use computers and automated equipment to get this information and make it more available?

Secretary CELEBREZZE. Yes, it is all automated. It is just a matter of minutes or seconds before we can get the answer for you. I would there project, we haven't gone into this thoroughly but in many areas we would like to set up whereby we could have, for example, teletype machines in which you could call in and we could teletype within a minute back the information that is needed and certainly that would be one area of furnishing information from these complexes.

Senator YARBOROUGH. These complexes would have modern machinery?

Secretary CELEBREZZE. Yes, sir, we are making progress toward disseminating this knowledge to the people who need it but at the rate that we are going, our knowledge is coming in so fast that one of our basic problems, and really the basic reason for this type of legislation is we have the same problem in the field of education, in other words, which do our research, we find out the answer but this gap of carrying the knowledge of a laboratory when the discovery is made and applying it to the people, there is too great a gap there.

Now, how important is it that we get it to the people in a hurry? Well, I think the best example that I could give on that is our research in polio vaccine. When you think back that there were 30,000 or 40,000 cases of polio we now reduce it to a little over a hundred a year, because of the mass immunization programs, because of the cooperation of the medical societies in getting to the people, so that, you see, the longer we wait on this gap the more surge there is. When we find the knowledge, when we find a cure, we have got to get it to the people, we have got to get it to them somehow, whether they can afford or can't afford it we still have to get it to them and that is the primary purpose of these medical complexes, until such time as we can build up the reservoir of skilled manpower which we lack today.

In the field of education we have the same problem. I was checking in my research on the educational bill—I found sometimes there is a gap of 15 to 20 years in the field of education before the research reaches a pupil. That is too long.

Now, the second foundation stone of our system for delivering health services consists of the Nation's hospitals and other medical facilities. In this field, and again thanks to the chairman of this committee, Senator Hill, thanks in a large measure to the Hill-Burton program which has completely redrawn the hospital map of the United States in less than 20 years, progress has been swift and impressive. But problems still remain, problems related to condition, distribution, and use.

In terms of the highly specialized and costly facilities required for an all-out attack on heart disease, cancer, and stroke, there are a few islands of abundance in a sea of unmet need. In some of our major cities there is actually an overabundance of certain types of service—several hospitals, for example, equipped to provide cobalt treatment for cancer patients, each standing unused a large proportion of the time, while not far away patients are dying for lack of such equipment and for lack of the knowledge of how to acquire or to use it.

Thus, the needs for health facilities parallel those for manpower.

First, there is need to encourage and develop specialized kinds of highly advanced facilities and equipment through construction and renovation, designed to serve specific purposes and placed where they will do the most good for the most people;

Second, there is need to develop patterns of coordination which will provide for maximum utilization of the facilities now available and to be developed.

We have been talking almost exclusively about the problem of bringing up-to-date health services within reach of the people whose lives depend upon them. This is the great challenge before the health

professions in our time—the challenge of bringing medical science into the mainstream of medical practice.

But the last word has not yet been spoken in the field of medical science itself. Great as our progress has been, there still remain great things to do. It is said that "what we don't know won't hurt us." This is not true, of course, in the field of health. What we don't know does hurt us; what we don't know kills us. To advance the study of heart disease, cancer, and stroke with all possible speed, there is special need for a greater number of research centers designed for and dedicated to a direct assault on the scientific problems presented by each of these diseases. The need is especially acute in the area where research borders upon practice—the field of clinical research.

The proposed heart disease, cancer, and stroke amendments would create a system of complexes for demonstrations, research, and teaching which would be responsive to all the problems. I have mentioned and to a degree that could not be attained through piecemeal approaches. By approximating the worlds of medical practice, medical research, and medical training, region by region across the Nation, these complexes would yield three principal benefits:

(1) They would permit the full and efficient application of existing health manpower and facilities to critical problems associated with heart disease, cancer, and stroke.

(2) They would assure that new manpower and facilities for the most advanced patient care and research in these fields are developed where the needs are greatest.

(3) They would contribute to the upgrading of all medical services, since each component of the network would serve as a point of transmission of the latest developments in scientific medicine, to both the health professions and to the public.

The proposed regional complexes are not envisioned as a totally new and separate pattern superimposed from above. Rather, and this is important because many people think we are trying to create or superimpose another structure, they are not envisioned as totally new and separate patterns superimposed from above. Rather they are designed to pull together the existing components of our medical system.

In other words, existing universities, existing community hospitals, and other existing agencies and institutions would be the focal points, with new facilities and services being added only as the need to meet regional requirements is demonstrated.

Thus, the plan for medical complexes is designed not to duplicate existing resources but to strengthen them; not to trespass upon traditional prerogatives but to assist in a transition toward more effective application of such resources as now constituted.

The physician in private practice remains at the heart of the medical care system. The regional network will help him to care for his patients by linking him and his community hospital to a national system transmitting the newest and best in health service. At the same time, it would make each doctor a participant in the growing reservoir of knowledge about heart disease, cancer, and stroke.

The system of regional medical complexes will not interfere with existing patterns of payment for health services. General patient

care activities are not included in the proposed legislation which states specifically that funds appropriated shall not be used to pay for hospital, medical, or other care of patients except to the extent that such costs are incident to research, training, or demonstration activities. This, of course, incorporates the traditional pattern upon which payment of costs has been based in clinical research activities.

In summary, the Heart Disease, Cancer, and Stroke Amendments of 1965 propose a plan for the development of regional medical complexes, each serving a large community, metropolitan area, or other geographic region. Each complex is not a building or group of buildings but an administrative framework linking together in coordinated effort the existing and augmented resources of the region. Such development of new facilities as may take place will be derivative of the overall needs of the region.

The first purpose of the plan is to make the best in diagnosis and treatment of heart disease, cancer, and stroke readily available to patients in every community, through their physicians and community hospitals which would be incorporated into the regional complex. The second purpose is to accelerate the development of new scientific knowledge about these diseases.

It is our conviction that both of these purposes would be well served by the proposed legislation, and that important byproducts would accrue, such as better trained health manpower and better organized community health services for the attack on the entire range of health problems facing our people.

President Johnson, in addressing his newly appointed Commission on Heart Disease, Cancer, and Stroke last spring said:

> Unless we do better, two-thirds of all Americans now living will suffer or die from cancer, heart disease, or stroke. I expect you to do something about it.

In responding, the Commission stated: "Something can be done about it."

The American scientific and medical community shares the certainty that something can be done about it. Today, the toll of premature death and unnecessary suffering can be reduced strikingly by using the scientific knowledge we now possess. It can be reduced still more dramatically tomorrow as we cross new thresholds of knowledge.

I urge your favorable consideration of this legislation which represents a vital step toward the achievement of this high purpose.

Mr. Chairman, I have Dr. Dempsey who has prepared some charts which will sum up what the legislation would do and at this time I would like to have him present it.

The CHAIRMAN. All right, Dr. Dempsey.

Dr. DEMPSEY. Thank you.

Senator KENNEDY of Massachusetts. Mr. Chairman, could I be permitted to ask just two brief questions of the Secretary?

I have to go down to vote on the appointment of the Attorney General, in the Judiciary Committee.

The CHAIRMAN. Just 1 minute, Dr. Dempsey. You go ahead, Senator Kennedy.

Senator KENNEDY of Massachusetts. I wanted to ask the Secretary whether he saw a relationship between S. 596 which we are hearing this morning and also S. 595 which is the aid to the medical schools themselves? I am thinking, Mr. Secretary, that the requirements

which have been outlined by your very splendid testimony, and by the legislation itself, are going to put a significant strain on many of the medical schools throughout the country to produce the kind of people that are going to be effective in providing service in these various complexes.

Secretary CELEBREZZE. No. I think one——

Senator KENNEDY of Massachusetts. If I may just continue.

Secretary CELEBREZZE. Excuse me.

Senator KENNEDY of Massachusetts. I am just wondering whether with respect to the need for doctors and technicians who have the adequate training, our medical schools today are going to be able to provide the kind of first-rate service and first-rate skills which would be necessary to accomplish the purpose of this act.

So, I am wondering whether you see a relationship between this or whether you are concerned about this problem, at all.

Secretary CELEBREZZE. Well, we are concerned, as I stated in my opening statement, Senator Kennedy, we are concerned about the shortage of skilled manpower.

Senator KENNEDY of Massachusetts. Yes.

Secretary CELEBREZZE. We took a step in the right direction by passing the Health Professions Act of 1964 in which we make it possible to expand our medical schools and we have pending legislation now to further assist the students on a scholarship and forgiveness feature.

But I think this legislation will help because these complexes include some degree of training. Also our nine existing NIH institutes are making grants available for research and clinical work. I think certainly, as I stated earlier when you were out of the room, that there is no such thing as turning out an instant doctor. It still takes 9 to 10 years to turn out a doctor. But I do think we are taking the necessary steps at this time. The very thing about which you are so concerned, Senator Kennedy, is one of the major reasons for establishing this complex, thereby getting greater utilization of the manpower that we now have while we are building up, during this period, the reservoir of skilled manpower. In other words, we establish complexes in which we can assign the skilled, trained manpower in covering a geographic region, so that the doctor, the practicing physician, can refer his patient there.

And thereby we are making greater utilization of what we already have until such time as we can catch up. I think that is one of the major points about establishing a regional complex.

I think we will continue to have a shortage for some time to come. But we are starting along the road to eliminate it. The Health Professions Act that was passed by Congress last year goes in that direction, but until such time as we can turn these students out in sufficient quantity we have to make greater utilization of what we now have, and establishing these medical complexes is one way of utilizing our trained manpower.

Senator KENNEDY of Massachusetts. Just another question.

The sentiment which I expressed, Mr. Secretary, with all due respect, is a sentiment which has been reflected to me by many of the medical schools up in Massachusetts who are deeply concerned with this question, and are concerned about providing the kind of skilled people which I think we envision in these medical centers, and so this is why I personally feel that it is important that we consider it.

The other question right there——

Secretary CELEBREZZE. May I comment there for just one moment?

Senator KENNEDY of Massachusetts. Yes.

Secretary CELEBREZZE. Actually while you will need additional skilled people, the medical complexes will make utilization of the skilled people in a particular geographic area more effective. It helps the cause rather than being a detriment to it because you may have two medical schools in the geographic area that might cover 100 miles in which they can utilize the existing skilled manpower at a particular time. So, I think that while the medical schools are burdened, and we are aware of that, and while they are making every effort possible to turn out more physicians and dentists, and while we are trying to help them with Federal legislation, the fact remains we have a basic problem in that it is still going to take us a decade or longer, much longer to train professional health personnel in sufficient quantity to meet the demand. We had better utilize what we have to the greatest degree possible.

Senator KENNDEY of Massachusetts. Just one final question: On the bill itself, you talk about disease, cancer, and stroke, and other major diseases. I am wondering if we could just develop your thinking on the other major diseases. What kind of diseases would come under the bill?

Secretary CELEBREZZE. Well, I think that under the bill the Surgeon General determines other major diseases. You might get into the kidney diseases, for example.

Senator KENNEDY of Massachusetts. I am thinking of mental retardation myself.

Secretary CELEBREZZE. Well, that is true, we can. But we do now have community centers for mental retardation.

Senator KENNEDY of Massachusetts. I understand that.

Secretary CELEBREZZE. We gave that our attention 2 years ago, Senator Kennedy.

Senator KENNEDY of Massachusetts. I understand it.

Secretary CELEBREZZE. It doesn't foreclose it but it would seem to me we do have existing machinery——

Senator KENNEDY of Massachusetts. I would think, Mr. Secretary, however, though, that you wouldn't want to prohibit the possibility of seeing if there could be sufficient progress made by using these centers in treating mental illness and retardation. I would certainly think that it would not serve a useful purpose to prohibit the idea that these centers might be used in those areas.

Secretary CELEBREZZE. Under the terms of the bill, the Surgeon General would submit the question to his Advisory Council which is established under the bill. Right now I would say that our emphasis would be on these three matters.

Senator KENNEDY of Massachusetts. I understand that.

Secretary CELEBREZZE. In order to get these complexes started.

Senator KENNEDY of Massachusetts. I agree.

Secretary CELEBREZZE. Once you get the unit started, once you get over this inertia and get the complexes started, the bill does provide care of other diseases, and it may broaden out to the area that you are speaking of, but I thought that we were attacking that pretty strongly

right now with community centers in mental retardation and mental health.

Senator KENNEDY of Massachusetts. Thank you, sir.

The CHAIRMAN. All right, Dr. Dempsey.

Dr. DEMPSEY. Mr. Chairman, and members of the subcommittee, we have prepared a few charts which illustrate some of the points that were made in the Secretary's testimony and which can perhaps serve as an epitome of the principal points that he made.

As he pointed out, of the total number of deaths in the United States in the last year for which we have a full accounting, there were 1,187,558 which were ascribable to heart disease, cancer, and stroke. These represent 71 percent of all of the deaths that occurred during that year.

To repeat his statement about the economic costs of these diseases, the direct costs of patient care, of hospitalization, and the economic cost to the country through lost productivity have been estimated at $31.5 billion for 1962.

Senator YARBOROUGH. Mr. Chairman, may I ask a question here?

The CHAIRMAN. Certainly.

Senator YARBOROUGH. Dr. Dempsey lists $31.5 billion as the annual cost of cancer, heart disease, and stroke. You are not including in that, I assume, the ultimate costs for care of people? You are counting in that only the loss of productivity for their productive years?

Dr. DEMPSEY. That is correct. We are counting the cost of care during that year only, not the forward cost.

Seantor YARBOROUGH. That is just 1 year's care?

Dr. DEMPSEY. And the loss of productivity.

Senator YARBOROUGH. You are not projecting to the future and adding it in?

Dr. DEMPSEY. No, sir.

Senator YARBOROUGH. It would cost just that much in 1 year?

Dr. DEMPSEY. Yes, sir.

Senator YARBOROUGH. $31½ billion.

Dr. DEMPSEY. Yes.

Senator YARBOROUGH. Thank you. It is about 5 percent of our total gross national product of $625 billion a year roughly. Roughly 5 percent of the whole gross national product of the United States is the cost for 1 year of heart disease, cancer, and stroke.

Are you considering in there people in their productive years or are you including in this people who have passed their productive years?

Dr. DEMPSEY. No, sir, we have made allowance in computing the costs for those people who were past the age of 65 and, therefore, would not be productive.

Senator YARBOROUGH. You didn't count those not in their productive years?

Dr. DEMPSEY. Yes, sir. We have also eliminated housewives and have placed no value on their services although their services actually are of some value.

Senator YARBOROUGH. I think when you left out housewives you left out one of the most valuable elements in our society.

Dr. DEMPSEY. I agree with you.

Senator YARBOROUGH. I think this illustrates how modest these figures are when we get an explanation how this $31½ billion is arrived at, people under 65.

Dr. DEMPSEY. Yes, sir.

Senator YARBOROUGH. And only for that 1 year and not including housewives?

Dr. DEMPSEY. Yes, sir.

Senator YARBOROUGH. I think it is a very modest figure. It is low, it is not high. If you included housewives this figure would be much higher than 5 percent of our gross national product?

Dr. DEMPSEY. We believed if we erred we should do so on the conservative side.

Senator YARBOROUGH. Thank you for an explanation of the basic data that went into this computation.

Dr. DEMPSEY. The medical complex which we have discussed is a device that will coordinate various resources as they exist in our system of medical care today. This system includes medical schools, research centers in which clinical and laboratory research is done, and the hospitals in which patient care is delivered. All of these would be coordinated for delivering patient care, for implementing further research, and for improving training.

These complexes would provide for the latest advances in diagnosis and treatment. It would make these advantages available to physicians and to the institutions in which physicians work. All of this would be provided for people who would be in a stated geographical area.

The components of the complex consist basically of a medical school and the related departments in the parent university, the teaching hospitals which are affiliated with the medical school and in which the clinical training of medical students is carried out and also in which specialists are trained after they have graduated from medical schools. It would include clinical research centers—that is a cancer research center, a stroke center, a heart-disease research center—which would be established in relationship to the major medical institutions. All of these in turn would be related to stations for the diagnosis and treatment of heart disease, cancer, and stroke and other diseases in community hospitals throughout the geographic area. I will expand upon that point in a later chart.

The grants that would be provided under this bill are of two kinds. First, the grant for planning which the Secretary mentioned, and second, after the planning had been accomplished, a grant for operation of the complex. This latter grant could be used for the support of the activities listed in this chart—for staff, for renovation, for construction, for equipment, services, research, training, and especially for increasing the accessibility of improved patient care.

The benefits that we believe would be derived from these complexes are primarily that they would save lives, they would also improve the training of physicians and specialists, they would improve the way in which new knowledge would be discovered and brought to bear upon medical practice, and they would have a great virtue in that they would promote efficiency within the community by eliminating duplication and by using efficiently the very scarce highly trained manpower that we have.

A diagram such as this might perhaps indicate some of the relationships we have been discussing. In the center is the medical center consisting of the university medical school, teaching hospitals, and re-

search institutes. In a community surrounding this center the radius of which might be as much as a hundred miles or more, a number of community hosiptals exist. In these community hospitals, stations would be established for stroke, for cancer, or for heart disease.

A large community hospital might have stations for all three of these diseases or even for four or five, if other major diseases are included.

Senator YARBOROUGH. This would be something like an emergency ward for accidents, there would be a place for a person to be taken in the hospital. If they were brought there with one of these diseases, would it be for research, would it be actual treatment or research? What would be the nature of those strokes, cancer, and heart centers in a hospital?

Dr. DEMPSEY. To a degree they would support the emergency ward, but especially they would provide equipment and the knowledge of specialists who would be stationed in the hospital and who would be available as consultants for the voluntary staff of the hospital.

I have some prepared testimony, Mr. Chairman, which will bear upon the question Senator Yarborough has asked, and I could elaborate on it later by giving a hypothetical case example. I believe this would make the matter clear, Senator.

Senator YARBOROUGH.. Yes.

The CHAIRMAN. All right.

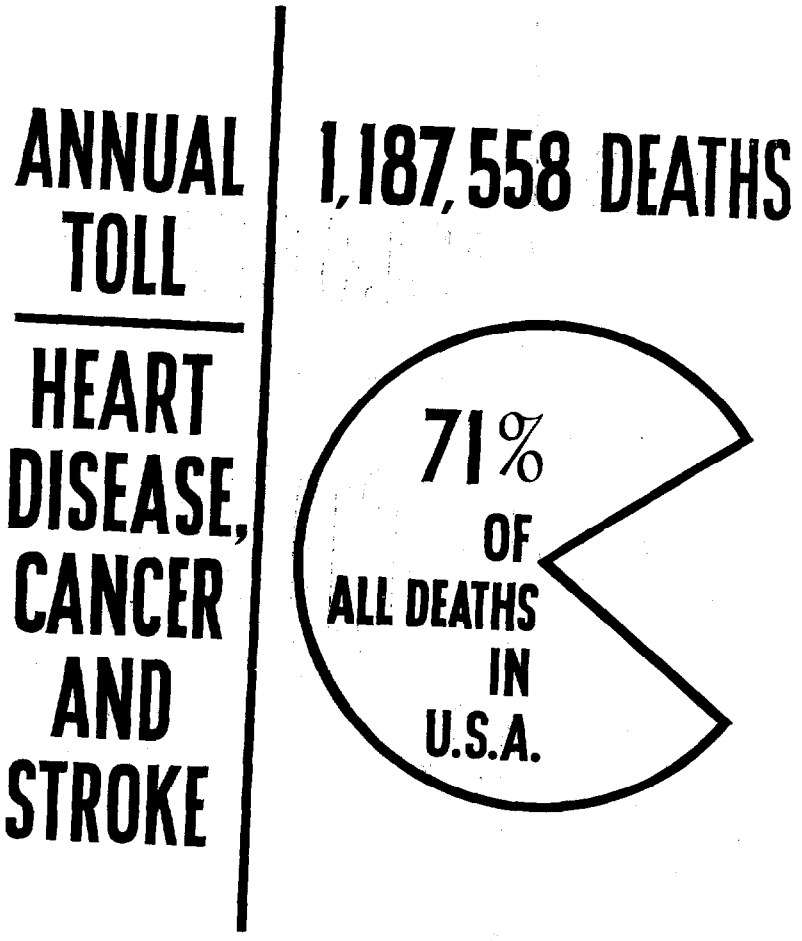
Dr. DEMPSEY. These stations operate as a kind of network among themselves, tying the individual community hospitals together so that knowledge can flow from one to another or patients can be transferred from one to another and so that the special abilities of one hospital can be utilized through the channels established by these stations—each one of them coordinated by the center. The special equipment and special knowledge of any one hospital would be more widely available than is the case when the relations between community hospitals remain haphazard as they are at the present.

For example, a patient with a stroke is admitted to hospital A which has a cancer station. Although the specialist in the cancer station certainly would not be a specialist in the area of stroke, he could refer the physician who admitted the patient to the stroke expert in a neighboring station and thus provide information that the physician would not otherwise have. He would also be able to refer back to the medical center for consultation wherever advisable and possible.

Such a complex as we have described does not necessarily follow State lines. There are many metropolitan areas in which a city or metropolitan region is divided into two or more States. This has been shown diagrammatically here by a hypothetical State line; the medical school and some of the hospitals are in one State, and some of them could be in the neighboring States. The geographical region described makes as large an accommodation to the location of people as it is possible to make.

Mr. Chairman, this is the end of the charts. As I mentioned I do have some prepared testimony.

(The charts referred to previously follow:)


ANNUAL TOLL
HEART DISEASE, CANCER AND STROKE
1,187,558 DEATHS
71%
OF
ALL DEATHS
IN
U.S.A.

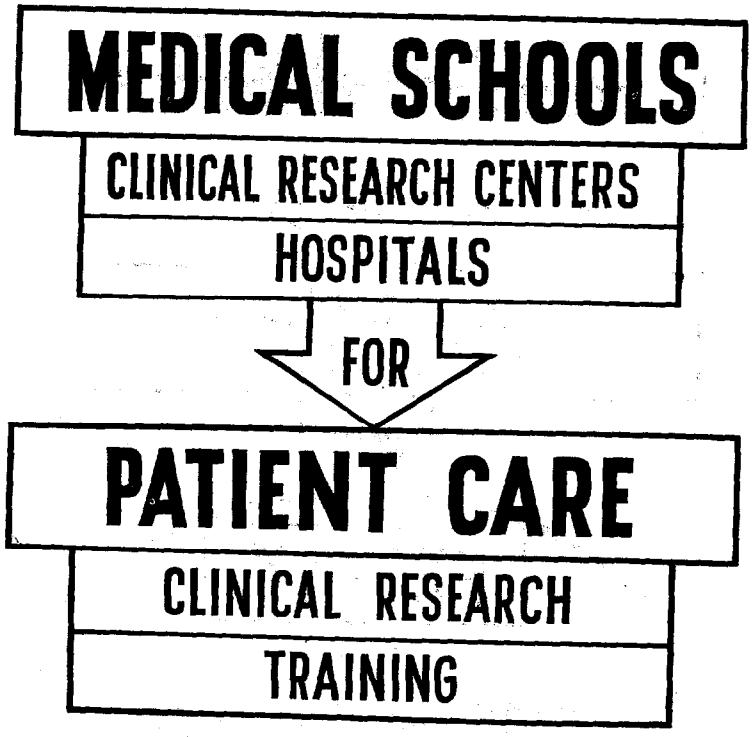
ANNUAL COSTS

HEART DISEASE, CANCER AND STROKE

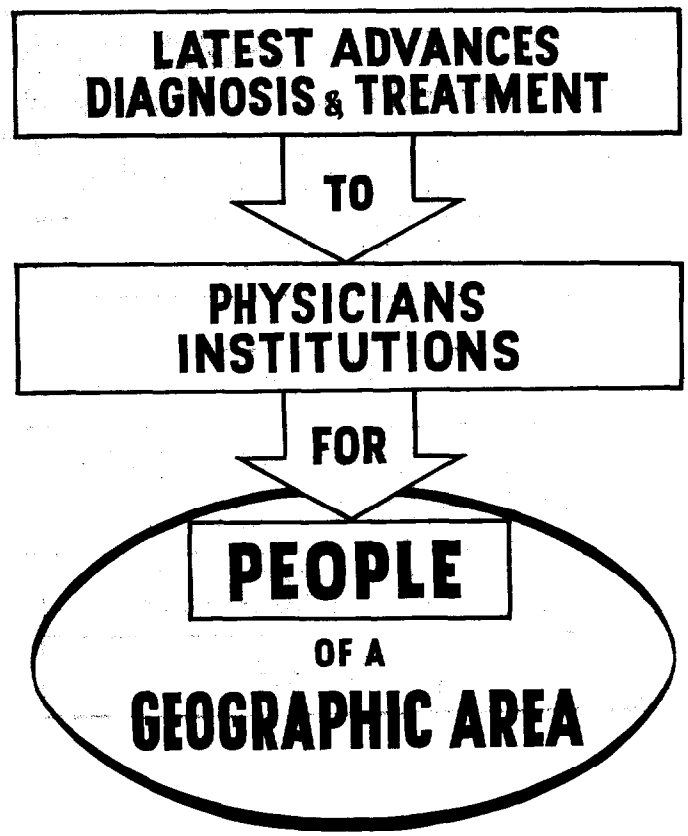
$31.5 BILLION

COSTS

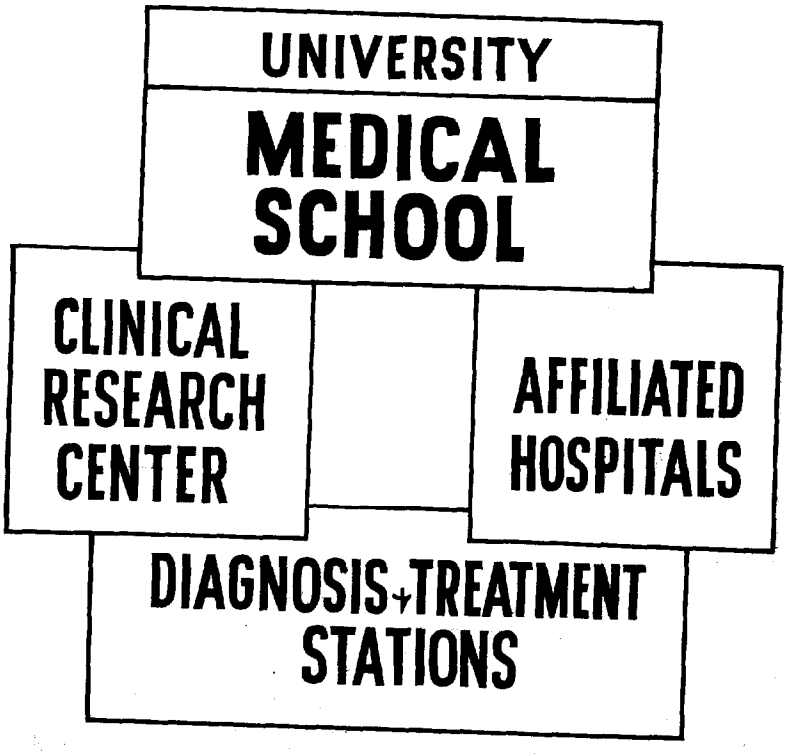
A REGIONAL MEDICAL COMPLEX COORDINATES RESOURCES:

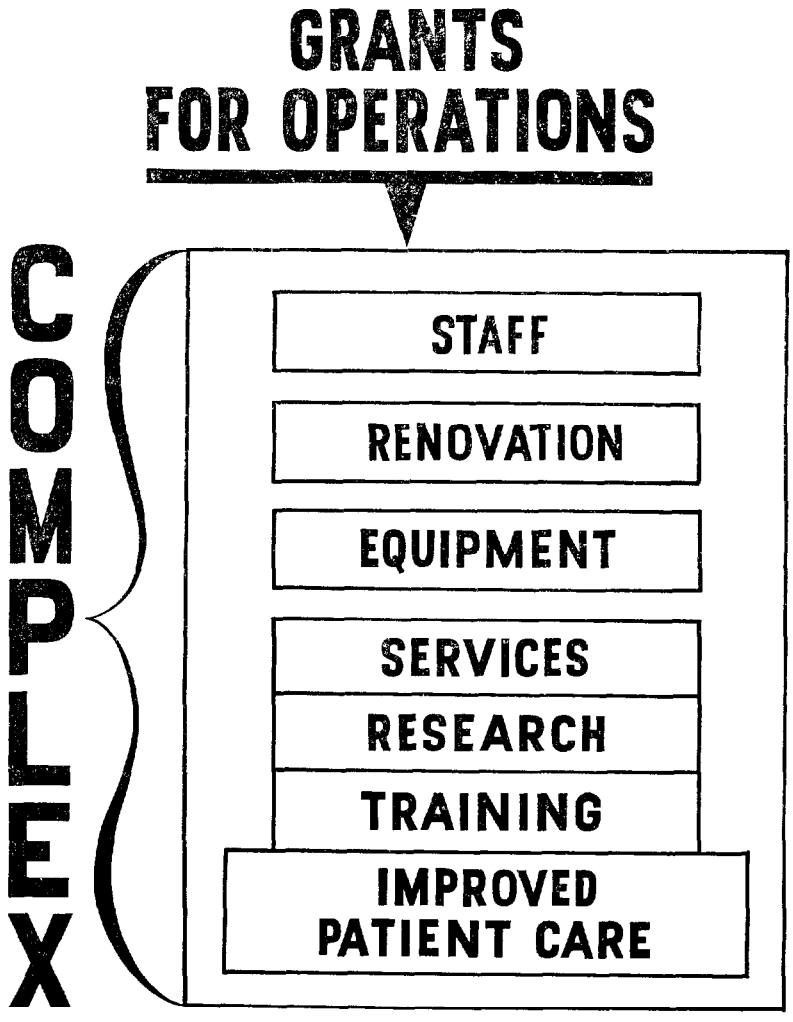


A REGIONAL MEDICAL COMPLEX PROVIDES:



COMPONENTS OF A REGIONAL COMPLEX

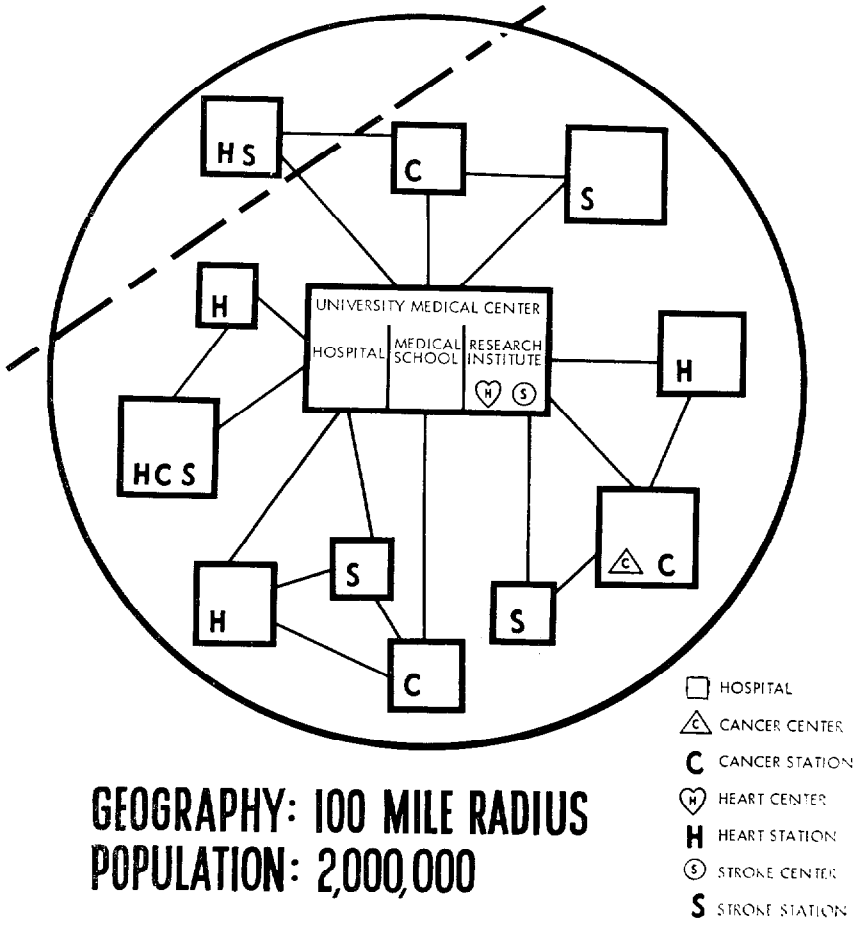



GRANTS
FOR OPERATIONS
COMPLEX
STAFF
RENOVATION
EQUIPMENT
SERVICES
RESEARCH
TRAINING
IMPROVED
PATIENT CARE

BENEFITS

COMPLEX

- SAVE LIVES
- IMPROVE TRAINING
- IMPROVE CLINICAL RESEARCH
- GREATER EFFICIENCY



GEOGRAPHY: 100 MILE RADIUS
POPULATION: 2,000,000

The CHAIRMAN. Suppose you proceed with your further testimony, Doctor.

Dr. DEMPSEY. Mr. Chairman and members of the subcommittee, it is a special pleasure for me to present this to you and to support legislation to advance that part of the President's health message dealing with multipurpose regional medical centers. Our recommendations are embodied in the proposed Heart Disease, Cancer, and Stroke Amendments of 1965, S. 596, introduced by the distinguished chairman of this committee.

I was privileged to serve for a time as a member of the President's Commission on Heart Disease, Cancer, and Stroke, and am pleased that some of its recommendations were included in the President's health message. Secretary Celebrezze has indicated how the present bill proposes to carry part of these objectives forward. He has stressed the fact that improved care can be made available to larger numbers of people by the organization described as a medical complex. It should also be stressed that this primary purpose of the bill—greater availability of better care—is best accomplished in environments and in institutions where research and teachings are also proceeding concurrently. The three faces of medicine—teaching, research, and patient care—must coalesce into one image if the full potential of each is to be realized.

The proposed complexes represent a sound organization. In its report, the President's Commission noted that the proposed regional centers "would be established where possible in conjunction with a major existing medical institution" and that the proposal "represents an outgrowth and extension of an already successful program of the National Institutes of Health."

The clinical research center program, now in its sixth year, has provided evidence that patient costs have not been oppressive, that the clinical research and training programs carried on in the centers have been well accepted by the physicians and institutions with which they are associated, and that a background of successful management procedures is now available. The proposal for establishing medical complexes therefore rests upon a foundation of experience and competence.

Since the proposed bill deals with three or more categorical diseases, each of which is of major interest to at least one of the National Institutes of Health, a word is necessary as to possible duplication and, conversely, as to coordination. The existing categorical programs carried out by the respective Institutes have flourished during the past two decades and have thoroughly proved their great value in stimulating and supporting research on the dread diseases. Moreover, time has proved that all medicine has been nourished and strengthened as a spin-off from the effort made through the categorical approach.

The scientists, supported by a grant from the Heart Institute, participate in the intellectual life of the university, and all science is the better for it. Biochemists, cytologists, or pharmacologists studying the cardiovascular system have made important contributions to their own and to other disciplines or specialties. Indeed, a drug which was one of the first tranquilizers, now so important for mental health programs, was discovered by a scientist searching for a drug having certain desired effects on blood vessels. The record now shows abund-

antly that funds to support categorical activities have helped greatly, not hindered, the broad advance of the health sciences.

A second point to be made concerns the relation of this program to the already existing Institutes. At the outset, one must emphasize again the primary purpose of the medical complex bill: To make available better care for more people. To reach this goal, research must be supported, and that is the primary goal of the categorical Institutes.

Other programs, such as those in the Bureau of State Services, are concerned with the provision of health services. However, any possible duplication can easily be prevented through coordinative procedures prescribed in regulations, such as those which have long been used by the NIH and the National Science Foundation.

In any event, support of activities whereby university medical centers, with their concentrations of highly specialized physicians and equipment, will more widely be available to patients in an entire region is new and does not overlap with existing programs. As in the case of the proposed organization itself, administration of this program rests again on a foundation of experience and competence.

Certain aspects of the program, especially those relating to the development of diagnostic and treatment stations in community hospitals, represent evolving relationships among the Federal Government, teaching and research institutions, and the Nation's system of community hospitals. The evolution of this relationship should be closely watched and evaluated continuously as experience is gained. We regard the support of these stations, therefore, to be in the nature of a demonstration, to be carried out under regulations prescribed by the Surgeon General as provided in section 906 and to be rigorously reevaluated as required by section 907 of the bill.

Since the urgent need for extension of care into the community will stimulate medical schools, research institutes, and other local institutions to much greater than normal effort, it seems necessary to provide matching funds of up to 90 percent of the cost of required renovation and construction. As the program evolves, the ratio of matching funds for construction and renovation as well as for operational costs, should be reexamined and reevaluated in the light of experience.

Mr. Chairman, Secretary Celebrezze and I have thus far spoken in generalities rather than in specifics as to how a complex might be formed and how it might be used. As its very name denotes, a complex is a complicated arrangement. It can appear in different guises to a patient, a practicing physician, a medical administrator, or a civic leader. I should like to describe how a complex might come into being and how it might function in some typical situations.

Let us assume that there is a city with a population of 600,000 near a State line and with about the same number in the surrounding suburbs. Within a radius of 100 miles there are 3 other cities of perhaps 100,000 population each. The entire population of the region is about 2.5 million people.

The central city has a university and a medical school, a university teaching hospital, and several hospitals having 200 or more beds. Two of these (children's and VA hospitals) are affiliated with the medical school. Two of the other cities have one 450-bed hospital each, and the third has two 300-bed hospitals. There is also a State chronic disease

hospital of 800 beds in the area and numerous small, 50- to 100-bed, community hospitals.

PLANNING THE MEDICAL COMPLEX

The university, the medical school, or the medical center in the core city assumes initiative in the planning and future development of the regional medical complex. The first step is the organization of an advisory group representing knowledgeable and interested lay and professional citizens who live and work in the geographic area. Membership in this advisory group might include medical educators, hospital administrators, practicing physicians, research scientists, individuals involved in urban planning, individuals from health or welfare departments, and other community leaders.

This advisory group would assist a staff located at the university or medical school in the initial planning of the regional medical complex and in the preparation of an application for a grant to assist in planning this program. The initial application for planning funds would describe the existing institutions, agencies, and programs which would participate in the formation of the medical complex. It would also describe the relationships between these institutions necessary for the successful operation of the network, the geographic area and population base to be served, and other factors.

After review of the application by the National Advisory Council on Medical Complexes, approval of the application would result in a grant that would assist the detailed planning, contractual negotiations, and other activities essential to the initiation of a program of this scope.

DEVELOPMENT OF THE MEDICAL COMPLEX

The medical complex would evolve gradually over a period of time as specific components are added. The ultimate goals, in the particular illustration presented here, involve development of a cancer clinical research center at the chronic disease hospital that has been developing an interest and expertness in the problems of cancer.

A stroke clinical research center will be connected to the university-teaching hospital where the neurologists, neurosurgeons, and vascular surgeons have been carrying on active research programs and where is now located an active rehabilitation service much interested in the retraining of stroke victims. A heart disease clinical research center is planned for development in 1 of the 9 general hospitals in the core city: 1 hospital, with 350 beds, has recently expressed an interest in affiliating with the medical school. It currently has a satisfactory teaching program with approved internships and residencies in several specialties. The department of medicine at this hospital has a full-time cardiologist who has been doing some independent research on a rather small scale in heart disease in addition to his other responsibilities in the hospital. About 20 diagnostic and treatment stations in this regional medical complex would be placed in several of the voluntary hospitals located in the core city, the 3 or more mentioned in 3 medium-sized cities of 100,000, and a few in the hospitals in the geographic area with 100 beds.

In a few of the largest hospitals, there might be both a heart disease diagnostic and treatment station and a cancer diagnostic and treat-

ment station. At the State chronic disease hospital, in addition to the cancer clinical research center, there would also be a cancer diagnostic and treatment station to which hospitals with less than 100 beds in communities not very distant could send their patients.

The main ingredient in the regional medical complexes is the willingness and desire of individual people, and the programs and agencies which they represent, to work together in an effort to improve the health services in the area and increase their accessibility by bringing to bear the energies and competencies of medical educators and biomedical research scientists in order to enhance the overall quality of patient care. Facilities and equipment are, of course, important. In this hypothetical regional medical complex, it would be necessary to carry out renovation and to provide equipment in order to develop the cancer clinical research center in the State chronic disease hospital. In the case of the heart disease center, the voluntary general hospital within the core city would have to undertake new construction on the hospital ground but this would be related to its currently planned expansion program.

Young physicians, who have recently completed their specialty training, would be designated to head the stations located in the community hospitals. Each of these would be a member of the medical faculty; each would participate in the university's teaching and research; each would assist in the educational program provided by the hospital for its interns and residents; and each would arrange clinical conferences and other seminars through which the hospital's staff would learn new procedures and information known at the medical center but not yet applied at the local hospital. Such continuing education of the staff, and such participation in teaching and research, assure that the system can constantly improve and renew itself.

Mr. Chairman, I think this gives some indication of how Senator Kennedy's concern might be met. The participation of these stations with medical schools would serve as an avenue through which the manpower to staff the station would be available. At the same time, it should be said that the program, as outlined here, would not provide all the added medical manpower which we will need in future years. These must be provided through other kinds of programs carried out in the medical schools themselves.

As examples of improved medical care, I would like to point out that benefits that derive to patients from access to any component of a medical complex can be dramatic. Consider the following hypothetical case:

A 47-year-old schoolteacher suffered a heart attack. He was immediately admitted to hospital A in his community by his physician. His course was satisfactory until the third day in the hospital when his heart stopped beating. Because of a training program in the management of cardiac arrest, which had been conducted by personnel from the heart diagnostic and treatment station in hospital B in the same community, the staff in hospital A had been taught proper emergency procedures. In this situation, an intern applied electrodes to the patient's chest and literally shocked him back to life. A second episode of severe irregularity in heartbeat, and its subsequent arrest, occurred a few hours later. After a second resuscitation, a cardiologist was called into consultation and, subsequently, the patient was referred to the heart disease clinical research center in another city.

Therein, diagnostic studies led to the decision to implant wires connecting the patient's heart to an electronic, artificial pacemaker which would stimulate his heartbeat. The subsequent management of this patient required the working together of the specialists and scientists in the heart disease research center, the specialists in the diagnostic and treatment station, and the patient's own physician.

Lest it be thought that this hypothetical case is too artificial, I might say that one of the Nation's leading professors suffered just such a series of attacks a few years ago. His heart stopped 14 times in the course of it. He is alive, well, and functioning today as a result of the care that he could get in one of the major clinical centers of the country of which he happened to be a member.

Senator YARBOROUGH. Dr. Dempsey, without that care, would any one of those heart stoppages have been fatal?

Dr. DEMPSEY. It would have.

Senator YARBOROUGH. He would have died 14 times if those special cares had not been available?

Dr. DEMPSEY. Yes.

Senator YARBOROUGH. He would have died 14 times?

Dr. DEMPSEY. This outdoes the "proverbial cat."

Senator YARBOROUGH. I think you will have difficulty in finding a more dramatic case than that.

Dr. DEMPSEY. The regional medical complex also permits sharing the resources represented by facilities and equipment. Techniques for monitoring patients' heartbeats, through the use of miniature FM transmitters carried by patients and receiving and recording equipment located in a research center, now exist and permit more accurate management of therapeutic procedures than was formerly possible. The medical complex offers the network for expanding this competence and resource to more physicians and to their patients.

Not only the patient, but the doctor as well, will benefit from the improved services available through the complex. Consider the case of a physician whose patient is hospitalized in order to carry out diagnostic studies concerned with a small growth on her thyroid gland. These studies led the physician to conclude that his patient had cancer of the thyroid. He referred her to a surgeon for consultation. The surgeon felt that, because of the patient's age, high blood pressure, and rather severe lung disease, she would not tolerate surgery. Accordingly, he suggested that the physician refer his patient to the cancer diagnostic and treatment station. At this station, by virtue of its connection with the cancer clinical research center, the physician was put in touch with a research physician trained in nuclear medicine and licensed by the Atomic Energy Commission to administer radioactive iodine 131—an alternative to surgery in the treatment of certain patients with thyroid cancer. Without the availability of such a resource, many patients in the same situation either would be forced to travel great distances to large teaching centers or their physicians would have to rely on less adequate procedures.

Because of this experience, the physician learned of the resources available in the complex. Later, when another patient in his practice had a child with a congenitally deformed heart, he was able, through the cancer specialist who had initially helped him, to meet the cardiologist at the heart disease clinical research center. The

experimental diagnostic and operative procedures being developed there permitted an operation which completely restored the child to health. The physician had been assisted to accomplish something otherwise impossible.

Examples such as there could be multiplied indefinitely. Each would indicate how the organization of the complex aided people. Patients would receive better care, physicians would receive improved assistance, both would benefit from the availability of equipment otherwise too new or too expensive for ready accessibility. The increased efficiency brought about by large-scale community planning and effective use of resources would benefit the population at large.

Mr. Chairman, I believe the proposed legislation will go far toward improving accessibility of high-quality patient care. I earnestly recommend it for your favorable consideration.

Thank you.

The CHAIRMAN. Dr. Price, is there anything you would like to add?

Dr. PRICE. No. I do not have any prepared testimony, Mr. Chairman. I will be pleased to assist in answer questions, sir.

The CHAIRMAN. Dr. Dempsey, where in the Public Health Service would you locate responsibility for the administration and operation of the proposed regional network?

Dr. DEMPSEY. This has not been completely determined, Mr. Chairman. As I indicated in my testimony, there exists in the Public Health Service, particularly in the NIH, a background of competence and experience in managing a similar kind of program. The bill calls for this determination to be made by the Surgeon General, and he has, as I understand, a small task force which is now studying the various aspects of the bill.

The CHAIRMAN. The Commission discussed the matter but did not pinpoint it in one place, did it?

Dr. DEMPSEY. No, sir. The Commission felt that the administrative management of a program had best be left to administrative determination. Although many members of the President's Commission had personal opinions on the subject, the Commission as a whole believed that it should not push too far into the area of prerogatives of the Secretary and of the Surgeon General.

The CHAIRMAN. But there was much comment about NIH, wasn't there, and reference to the experience and background of NIH?

Dr. DEMPSEY. Yes, sir.

Secretary CELEBREZZE. If I may direct myself to that question since it is an administrative question on it——

The CHAIRMAN. Yes.

Secretary CELEBREZZE (continuing). We haven't determined, we discussed it briefly yesterday, as to where in the Public Health Service this would be handled. There are strong sentiments and strong reasons for putting it in NIH.

On the other hand, we think of the National Institutes of Health primarily as a research function, so that the question of just exactly where it will be put has not been determined at this time, Mr. Chairman.

There are strong sentiments for having it in NIH because of their basic knowledge and in the handling of it.

On the other hand, we have always identified NIH primarily as a research bureau. We will give it strong consideration.

The CHAIRMAN. You are considering the matter very carefully now?

Secretary CELEBREZZE. Yes, sir.

The CHAIRMAN. Dr. Dempsey, what did the Commission recommend as a 5-year cost of establishing such a network?

Dr. DEMPSEY. My memory is that it was in the vicinity of a billion 600 million dollars. This is in the report of the Commission.

The CHAIRMAN. We will get that figure from the report.

Dr. DEMPSEY. Sir?

The CHAIRMAN. Doesn't that figure appear in the report?

Dr. DEMPSEY. Yes. This is the cumulative sum over a 5-year period for all components of the medical complexes as we have outlined them.

The CHAIRMAN. How many regional centers did the Commission recommend?

Dr. DEMPSEY. Over a 5-year period, in the neighborhood of 30 complexes.

The CHAIRMAN. The Commission recommended over 30?

Dr. DEMPSEY. Yes. As I remember, there were 30 complexes containing 60 categorical centers. The figures appear in the report.

The CHAIRMAN. In the report of the Commission?

Dr. DEMPSEY. Yes.

The CHAIRMAN. How many diagnostic and treatment stations and hospitals, do you recall?

Dr. DEMPSEY. There were between 500 and 600, as a I remember.

The CHAIRMAN. 500 or 600. That information would be in the report of the Commission?

Dr. DEMPSEY. Yes, sir. In general, the ratio was about 20 stations to 1 of the complexes, as I remember. On the average, it was felt that this was about the proper number. Yes, I see that the Commission's report called for 150 stations for heart disease, 200 for cancer, and 100 for stroke. That would be 450. I am sorry to say I was a little bit high in my memory.

The CHAIRMAN. 450. Now, to what extent are existing hospitals affiliated with medical schools?

Dr. DEMPSEY. The hospitals nearby medical schools are affiliated to various degrees. Each medical school has one or more, sometimes many, closely affiliated hospitals which are ordinarily designated as teaching hospitals. In addition many medical schools have less tightly constructed arrangements with a number of community hospitals in their area in which the medical school may be responsible for one service or one activity. Hospitals are very desirous at the present time of such connections because they assist them greatly in permitting them to attract interns and residents.

The medical schools in my experience are being besieged by requests for affiliation with the community hospitals to a degree to which they are unable to respond at present.

The CHAIRMAN. Is there any figure, any percentage figure, as to what percent of our hospitals are affiliated with medical schools?

Dr. DEMPSEY. I am sorry, I wouldn't know. There are about 7,000 hospitals in the United States. There are 87 medical schools. At

most there would not be more than 400 or 500, I would think, of the hospitals that were closely related to medical schools, so it would be a small percentage.

The CHAIRMAN. Well, as you have indicated, hospitals not affiliated with medical schools have the most difficulty, do they not, in recruiting residents and interns?

Dr. DEMPSEY. Yes, sir. You brought out the same point in your opening statement concerning the improvement of medical care in the Veterans' Administration. Everything that you said in that statement applies equally well to the community hospital which does have a connection with a teaching institution as opposed to one which does not.

The CHAIRMAN. Doctor, could you give us some idea of the cost of organizing, establishing, and operating a regional medical complex, for instance, how much would you need for planning, how much for the training of personnel, how much for construction, how much for administration?

Dr. DEMPSEY. I am sorry, Mr. Chairman, it is very difficult to answer your question at this time with any precision. We have some rule-of-thumb estimates that would indicate that the cost of a total complex such as the one that I have outlined in my testimony, might be somewhere in the vicinity of $10 to $15 million a year as a fully formed, fully functioning activity.

However, the provisions of the bill call for individual community institutions to make application for funds. Until we have such concrete applications with somewhat harder estimates than we have as yet, it is not possible, I think, to be too definite as to individual costs. It is partly for this reason that the development of stations, we think, should be regarded in the light of demonstrations until some greater amount of experience is gained.

The CHAIRMAN. You would have to get that experience to have a more definite idea as to what the operating cost would be?

Dr. DEMPSEY. I also neglected to add that we are aware of the fact that a large institution in a very densely populated area with already excellent facilities may find it possible to begin a complex almost full blown from the very beginning.

In another location it may be possible for a complex to begin on a smaller scale with only some of the component parts assembled. The institution could then build and grow on this beginning. Obviously both the construction and operating costs would be very different in the two situations, and yet in order to obtain the regional distribution which we desire, it may be essential to place a complex in a location in which at the very beginning there is only minimum competence. Again, considerations such as these illustrate the difficulty of making hard and fast financial estimates at the present time.

The CHAIRMAN. Can you foresee now how many of these regional medical complexes might be established in the next 5 years?

Dr. DEMPSEY. I would hope to take at least a shot at the Commission's recommendation of somewhere in the vicinity of 30. This is, again, a somewhat diffuse estimate until we get our feet wet with actual experience.

The CHAIRMAN. Senator Javits.

Senator JAVITS. Thank you very much, Mr. Chairman. I shall be brief. I have another subcommittee meeting also going at this same time.

Mr. Secretary, will you give us your reasons for fixing the first year authorization at $50 million and not fixing any authorization for the succeeding 4 years?

Secretary CELEBREZZE. I think Dr. Dempsey touched on that just a moment ago. You must recall that this report came out in December of this year at a time when all budgets were in, and it was our feeling after analyzing the report that it seemed preferable to launch this kind of a program and evaluate our experiences at the end of 1 year and then present a program which would fit the pattern rather than try to guess, and it would be only a guess at this stage, or make commitments at this time which might be detrimental to the size of the program later.

We thought of it carefully and, as a matter of fact, I am surprised we came in with any kind of legislation because, as I say, this report was just finalized in December of last year, and we are just in February now.

Also the other question which is parallel with this, the Commission recommended much higher percentages in certain categories than we have in our budget. Well, again the same answer would apply because our budgets were in before the report was available. While for some of these categories the 1966 budget, for example, includes about $291.7 million, which is an increase of $23.7 million, the Commission still recommended a higher increase.

We are now evaluating whether to present a supplementary budget or not and that question hasn't been determined yet, but I think basically, Senator, it was because the report was just out and we haven't really had an opportunity to go into it in depth.

Senator JAVITS. The difference, of course, is instead of being before us you would be before the Appropriations Committee once the bill left here. I would be personally in favor of fixing authorized limits for each of the years of the program rather than to let it go out open ended without some consideration by this subcommittee. I don't believe that the final figures ought to be fixed solely on the matter, on the question of money. I think they ought to have a relationship to our interest in the viability of the program and its objectives.

So, I hope we will have your help, Mr. Secretary——

Secretary CELEBREZZE. Yes; well, of course——

Senator JAVITS (continuing). Of trying to give us limits for the other years.

Secretary CELEBREZZE. Of course, the chairman of the Appropriations Subcommittee is the same chairman of this subcommittee.

Senator JAVITS. I think the fact that the personnel of the appropriating and authorizing committees is the same, which I am well aware of, is quite difierent from the expertise and the frame of reference through which figures are established, and I believe this subcommittee should be entitled to evaluate and establish what it considers to be the proper limits for the program.

May I ask you, Mr. Secretary, on the matter of the objectives and purposes of this plan which you have before us, have you and your people arrived at any estimate as to what this could mean, I emphasize

each word advisedly, "this could mean," in terms of cutting down the incidence of deaths attributable to these major diseases as this, in, let us say, the 5-year span of the program. Have you evaluated any percentage that you estimate we could cut of the deaths attributable to these particular diseases if we went ahead with this program as you have laid it before us for the 5-year period?

Secretary CELEBREZZE. Bearing in mind the language of the Commission, without knowing to any degree of certainty whether a person lives or dies but using the language of the Commission, it was their feeling that a substantial proportion of these people who have died could have been saved.

Now, when we get down to basic percentages, Dr. Dempsey, did the Commission have any estimates?

Dr. DEMPSEY. There were some estimates. They lead to very large numbers. There are—as the Secretary pointed out in his testimony—several hundred thousand unnecessary deaths per year, equal to the population of a large city. It is, as you know, very difficult to be definite in such a projection, and one may indeed be accused of sensationalism in giving such a figure, sir.

There are, however, estimates to indicate the magnitudes that we are talking about. There are some 15,000 women who die——

Senator JAVITS. How many?

Dr. DEMPSEY. Fifteen thousand women in the United States die of cervical cancer, and the best evidence is that nearly all of these are preventable and curable. All of the ravages of rheumatic heart disease with its attendant mortality and morbidity which in many ways is more important perhaps to our Nation than the mortality itself, can be prevented today.

The fractions, percentages, or actual numbers are substantial—20 or 30 percent of the deaths that come from these diseases are possibly preventable. I wouldn't care to make a more accurate estimate than that.

Senator JAVITS. So you would put it, just for the sake of order of magnitude, 20 to 30 percent saving in lives which as I just added up in 1963, represents 1,186,000 deaths from heart disease, cancer, and stroke. Let's make it as light as possible. You estimate the possibility of saving 20 to 30 percent of those lives through this program as a possibility?

Dr. DEMPSEY. Yes, sir.

Senator JAVITS. It is very important that we have some concept and order of magnitude of it.

Secretary CELEBREZZE. As I stated in my opening statement, Seator, citing the importance of narrowing this gap between research work and actual application, I used the example of polio. When we think just several years ago polio was running in the thousands upon thousands and because of the immunization and other programs, this year I think it is down to—last year it was 125 cases, not in thousands; that gives you some idea of the advantages when you can get scientific knowledge to the people.

Senator JAVITS. The figures you gave us show that 250,000 to 300,000 lives might conceivably be saved by this program. What you are doing in this legislation, of course, is bridging the gap between the patients and the research. You have found, I gather, that the Federal

Government must in a major way help to bridge this gap because there is apparently much more of a lag between the research and the patient under present circumstances than there ought to be in the national interest. Isn't that the essence of this presentation?

Secretary CELEBREZZE. That is right.

Senator JAVITS. And that of the Commission?

Secretary CELEBREZZE. Yes.

Senator JAVITS. I have just two other very brief questions, Mr. Chairman.

We notice that you call for a report by the Surgeon General according to section 907 on June 30, 1969, and yet we notice from Dr. Dempsey's testimony very strong emphasis on evaluation of this program, for example, he says at page 5:

> The evaluation of this relationship should be closely watched and evaluated continuously as experience is gained.

Would you say that we would not be taxing you unduly if we called for an annual report by the Surgeon General?

Secretary CELEBREZZE. It can be done because actually we are talking about an overall report. Interim departmental reports come in constantly on evaluation but we could do it. I think that a report after the first year or about the middle of the second year after we have had actual operating experience would be useful but a first year, report would possibly merely reflect the mechanism we are setting up, but we could do it.

Senator JAVITS. Mr. Secretary, give us your best advice on reevaluating the provision of section 907 now that I have raised the question. Give us your best advice, we don't want to tax you but I do notice that Dr. Dempsey himself emphasized the continuous evaluation. Give us your best judgment.

Secretary CELEBREZZE. I think that on the initial part of the program it would need a minimum of 2 years.

First of all, you do have a selling job to do to get the communities interested.

Senator JAVITS. So you would call for a report 2 years after?

Secretary CELEBREZZE. Two years after, I think would be sufficient.

Senator JAVITS. I have one other question which you may or may not wish to answer because it may involve a whole complex of Government policy.

If you don't wish to answer it now please say so and you can supply it for the record.

I notice we are faced with Senator Long's amendment with respect to discoveries, and so forth, which may result from these research operations. Now, personally, I have some very grave doubts about our wholesale acceptance of that formula in every bill as to whether it is really productive or counterproductive. And I would greatly appreciate it if we began to get from individual departments and individual programs the specific evaluation of whether or not it is the most desirable in the national interest to have this rather sweeping clause with respect to discoveries or patents or processes as the result of the research. This calls for there "being made freely available to the general public."

If they are in any way, if they are produced in the course of research work which is done with Government, Federal Government health——

Secretary CELEBREZZE. Are you referring to patent rights, is that what you are referring to, the patent rights provision?

Senator JAVITS. That is right. That is an amendment which is before us already and undoubtedly faces the committee or on the floor. I do think we ought to have a critical evaluation of the departments with respect to this matter.

Secretary CELEBREZZE. We can furnish that to you at a later date.

Senator JAVITS. Will you do that?

Finally, you don't have to answer this right off the top of your head that you do not have in this legislation the recapture provision for facilities which are furnished under this legislation if they cease to be used for the purposes furnished which you have in other legislation like the Public Health Service Act, the Mental Retardation Act, and so on.

Would you also advise us whether it is or is not desirable?

Secretary CELEBREZZE. Yes. The reason we didn't put it in is because construction is a very minor part of the bill. The others deal primarily with construction, that is the other legislation.

Senator JAVITS. It may be equipment and so on. Would you reevaluate that and give us your best advice.

Thank you.

The CHAIRMAN. Senator Yarborough.

Senator YARBOROUGH. Mr. Chairman, in view of the lateness of the hour I have very few questions. I think some of these questions were answered as the witnesses testified. I do want to ask this, Mr. Secretary, and also Dr. Dempsey. The $50 million asked in the first year, of course, will not do this job. That is just a pilot program, just to start, and this overall job of getting—I take it your prime priority is this—to all of the doctors, medical personnel of all types and the hospitals of this country information that is already known in the great research centers, is that one of the first tasks?

Secretary CELEBREZZE. Yes.

Senator YARBOROUGH. And the other is to get the information where it can be used in treatment of the people?

Secretary CELEBREZZE. Most of the time now will be spent on planning.

Senator YARBOROUGH. First will be planning, the 50 million?

Secretary CELEBREEZE. You will get very little results in the first year because it requires planning to get these groups together, and at that time we will be in a much better position to come in with tighter estimates for second, third, and fourth years.

Senator YARBOROUGH. Next year, after you can tell us what you actually need to spend the money after you have planned it?

Secretary CELEBREZZE. There are some areas, Dr. Dempsey has testified about it, there are some areas in the Nation today which will be easier to pull together because they have complexes and these complexes will, of course, be much further advanced and much easier to plan for because they have the existing facilities and we can move ahead. But in a vast majority of other areas we have got to do the proper planning and I think we need sound planning of what we are trying to accomplish to provide information to come up with realistic figures for the years 1967, 1968, 1969, and 1970.

Senator YARBOROUGH. Mr. Secretary, you and Dr. Dempsey contemplate 30 projected centers which would have a complex of medical schools, hospitals, and so forth, to provide for the type of coordinated center that you have described, you would necessarily have a large population base to have already in existence to have these medical schools and hospitals.

You are basing this mainly in big population centers?

Secretary CELEBREZZE. Yes. On the other hand, we have a great many areas where there is no medical school. We are not just scratching them from the slate. In the event there is no medical school, then the diagnostic and treatment centers could be coordinated with the existing hospitals in that particular area.

Senator YARBOROUGH. If you had a large population area, you would need a medical center just the same to get this information out to all of the hospitals?

Secretary CELEBREZZE. On the other hand, Senator, we will try under the Health Professions Act to aid more medical schools.

Senator YARBOROUGH. I notice the largest 30 cities of the United States in 1960 embrace populations of 400,000 and over.

Mr. Chairman, I ask to put in the record this table of the population of cities in the over-400,000 class.

The CHAIRMAN. Without objection, we will put it in the record. (The table referred to follows:)

Cities with estimated population of 400,000 and over on January 1, 1964

[In thousands]

Phoenix, Ariz	510.6	Kansas City, Mo	531.6
Los Angeles, Calif	2,677.7	St. Louis, Mo	720.1
San Diego, Calif	639.2	Buffalo, N.Y	516.4
San Francisco, Calif	745.3	New York, N.Y	7,741.2
Denver, Colo	523.8	Cincinnati, Ohio	499.9
Washington, D.C	777.6	Cleveland, Ohio	869.7
Atlanta, Ga	510.0	Columbus, Ohio	514.6
Chicago, Ill	3,534.5	Philadelphia, Pa	1,986.8
Indianapolis, Ind	514.0	Pittsburgh, Pa	578.0
Louisville, Ky	400.9	Memphis, Tenn	546.8
New Orleans, La	652.2	Dallas, Tex	781.3
Baltimore, Md	933.1	Houston, Tex	1,055.7
Boston, Mass	659.7	San Antonio, Tex	653.7
Detroit, Mich	1,614.1	Seattle, Wash	567.1
Minneapolis, Minn	473.5	Milwaukee, Wis	764.6

Source: Sales Management, June 10, 1964, by Julius W. Allen, Chief Economics Division.

Senator YARBOROUGH. Doctor, would this heart disease diagnostic and treatment station be used for only severe cases? Would all cases be sent to the centers or would you just have severe emergency cases?

Dr. DEMPSEY. No, sir. The station would consist of a place in a hospital in which there is specialized apparatus of value in, say, heart disease, and in which there would be people who had expert knowledge in heart disease. These people and this equipment and these facilities would be available to assist any physician in the hospital with any patient who came into the hospital. The degree to which they would assist and participate in the management of any particular case would vary from zero to very active involvement. But it would actually benefit all patients in the hospital and indeed in the area who had heart disease.

Senator YARBOROUGH. Well now, after the centers are set up, would the administrative bodies which now grant permission to doctors to practice in hospitals be the same that would determine access to the facilities of these regional medical centers?

Dr. DEMPSEY. The specific answer to your question is "Yes." There is nothing in the bill which it is planned to alter the responsibilities of the governing boards of any hospital. The one possible exception to this statement is that in the planning arrangements made by the institutions, they would voluntarily agree to accept the station, and to place on the staff of their hospital the designated physicians referred from the medical complex to the station, but this would be a voluntary arrangement made by them, not one imposed on them.

Senator YARBOROUGH. Due to the lateness of time I won't explore that further now, Doctor, but it might be a proper matter for further exploration in the future.

I notice you were on the Commission that studied this matter.

Dr. DEMPSEY. Yes, sir.

Senator YARBOROUGH. We now save in the field of cancer one person in three but a few years ago only one in four was saved who had cancer. You have a number of instances where the percentage saved might be increased markedly.

Dr. DEMPSEY. Yes, sir.

Senator YARBOROUGH. And I take it from the nature of the recommendations that you are very optimistic about the number of those. Here is one that I doubt you are as optimistic about—it says lung cancer can be sharply reduced by reducing cigarette smoking. I think that is one area where you weren't quite as optimistic, Doctor.

Dr. DEMPSEY. We have the problem of human nature, sir.

Senator YARBOROUGH. Thank you. Mr. Chairman.

The CHAIRMAN. Senator Kennedy of Massachusetts?

Senator KENNEDY of Massachusetts. I would like to say for the record I strongly favor this legislation. and the purposes which it is trying to accomplish, Mr. Secretary. and I appreciate your testimony this morning.

I would like to ask just a few questions. if I could. You may have gone over these questions while I was at my other committee meetings this morning.

Could you give us at least some idea of what you might look forward to in the next 5 years. as far as the number of these centers to be located in these regional areas?

Did you cover that earlier this morning?

Secretary CELEBREZZE. We covered that. Senator——

Senator KENNEDY of Massachusetts. You covered that this morning. I would like to ask if you have covered this in your testimony, Mr. Secretary. The proposed legislation would authorize the appropriation of $50 million for fiscal year ending June 30, 1966, and such sums as may be necessary for each of the next 4 fiscal years.

I was wondering if you could give us the amounts which we might be able to expect would be forthcoming and requested through your Department in this next period of time?

Secretary CELEBREZZE. I answered that earlier.

Senator KENNEDY of Massachusetts. I see.

Secretary CELEBREZZE. The basic reason was that the report came out in December of last year, the report has only been available about 2 months.

Senator KENNEDY of Massachusetts. I can't hear you, Mr. Secretary.

Secretary CELEBREZZE. I am sorry.

The basic reason, I explained to Senator Javits, who asked the same question, was that the report came out in December of last year.

Senator KENNEDY of Massachusetts. I see.

Secretary CELEBREZZE. So, of course, it has only been out a short time, and it was our thinking that before recommending appropriations for the second, third, and fourth years, that we would use this $50 million primarily now for planning and for demonstration and at the end of that time we would be in a much better position to come in with realistic figures for the second, third, and fourth year basically.

Senator KENNEDY of Massachusetts. Mr. Secretary, do you know how many centers you are going to have in the next year, and in the next 4 or 5 years?

Secretary CELEBREZZE. We are talking in terms of about 32 centers.

Senator KENNEDY of Massacusetts. Let's use those centers. You are talking about 32 centers. What will it cost to run these centers?

Secretary CELEBREZZE. Well, that may vary depending upon what the existing facilities are as you establish these centers because there are some cities that already have medical facility complexes into which we could move. Others would require an expenditure of perhaps very little for construction or for renovation, expenditures for the purchase of equipment, expenditures for staffing and maintenance.

Senator KENNEDY of Massachusetts. What were the estimates; could you give us some idea as to the range of these figures? If you are talking about 32 centers in various sections of the country, I think there must be at least some figures by which you would be able to determine what the cost will be and what you are going to need for appropriations.

Secretary CELEBREZZE. I was thinking that the $50 million that we asked for——

Senator KENNEDY of Massachusetts. Maybe I am not making myself clear.

I understand this authorization and what it is going to be used for. My question is, What is going to be the amount that this program is really going to cost over this next period of years with respect to the 32 centers that are going to be located in the different regions of the country?

Secretary CELEBREZZE. My answer was that we would be in a better position to answer that once we have established the three or four complexes that we are talking about under the $50 million, using that as rather a demonstration project to come in with more realistic figures.

Senator KENNEDY of Massachusetts. Well, Mr. Chairman, I suggest that we should try to find out the financial commitment of this program. I think this is an area which is a matter of considerable concern. It is to me. I support this concept and support this program, Mr. Secretary.

Secretary CELEBREZZE. I think that it would be unrealistic for the administration to come in on second-, third-, and fourth-year appro-

priations without gaining basic experience at least for 1 year on detailed planning and how fast we can move in these centers.

Senator KENNEDY of Massachusetts. Well, Mr. Chairman, I would only like to suggest that I think that it may be difficult to defend this on the floor of the Senate for those who are not sympathetic to this program. We are not going to be able to be any more responsive to these questions without the projections. I would like to reserve the right to pursue this matter at a later time.

The CHAIRMAN. Certainly.

Senator Kennedy of New York?

Senator KENNEDY of New York. Thank you, Mr. Chairman. I just want to listen to the testimony.

The CHAIRMAN. If you have any questions, we would be happy to have you ask them.

Senator KENNEDY of New York. Thank you.

Senator YARBOROUGH. Dr. Dempsey, is the Public Health Service hospital in Galveston, Tex., affiliated with the University of Texas Medical School in Galveston?

Dr. DEMPSEY. May I refer that to Dr. Price?

Dr. PRICE. It is not affiliated, sir, in the sense in which many community hospitals are affiliated with medical schools. On the other hand, there is a very close relationship between it and the medical school at Galveston. Teaching is conducted in our hospital. Some of the members of our staff participate in the staff activities of the medical school, and I think for all practical purposes one might say that there is a program affiliation, although it is not a formal affiliation in which the medical school participates in the staff management of the hospital.

Senator YARBOROUGH. Of course, one is a State medical school, and one is a Federal Government hospital, but they do work very closely together, don't they?

Dr. PRICE. This has been true for a number of years.

Senator YARBOROUGH. And the University of Texas is the oldest medical school in the State of Texas. You are familiar with that?

Dr. PRICE. I know it is an old one.

Senator YARBOROUGH. Do you think the order to close down this Public Health Service hospital at Galveston, because it has a rated capacity of only 79 beds and a caseload of 134 a day, is going to help the medical complex there in Galveston?

Dr. PRICE. I think the development of a medical complex based on the medical school at Galveston is an issue of somewhat different magnitude, and I am not sufficiently familiar with all of the other resources in the area to know how important this one hospital of the Federal Government might be to the development of such a complex.

Senator YARBOROUGH. Mr. Chairman, in the interest of time, I will not pursue the matter further at this time. But on future occassions I will, when we have other witnesses.

The CHAIRMAN. Anything you would like to add, Mr. Secretary?

Secretary CELEBREZZE. No.

The CHAIRMAN. Anything further you would like to add, Doctor?

Dr. DEMPSEY. No, sir.

Senator YARBOROUGH. Mr. Chairman, I want to commend the witnesses for their appearance. I know it is going to cost money in the future, and I am prepared to support it. I hope we will pass this leg-

islation, and you will go full steam ahead with the development of these centers.

The CHAIRMAN. I certainly want to thank you gentlemen and strongly commend you for the very excellent testimony you have brought us this morning, and I am sure you will give careful consideration to the remarks of the Senator from Massachusetts, Senator Kennedy, with reference to this matter of costs because, naturally, that will be a question that will be recurring not only this year but through the years as long as this program is going forward.

You have brought us some very fine, most excellent testimony, and we deeply appreciate it. We certainly want to thank you for it.

Thank you.

The CHAIRMAN. Dr. George Wolf. Dr. Wolf, you are president of the Association of American Medical Colleges, and vice president of medical and dental affairs at Tufts New England Medical Center.

Dr. WOLF. That is correct, sir.

May I introduce my colleagues. Dr. Robert Berson, on my left, who is executive director of the Association of American Medical Colleges; and Dean Thomas Turner, who is dean of Johns Hopkins University Medical School, and president-elect of the Association of American Medical Colleges.

The CHAIRMAN. We are glad to have you all here today.

Senator KENNEDY of Massachusetts. I would just like to extend a word of welcome to Dr. Wolf from my State of Massachusetts. He is well qualified to talk on this subject and has, I am sure, some very helpful observations on this legislation. I want to welcome him, and extend to him the best wishes of the committee, and the same to the honored gentlemen who come with him this morning.

Dr. WOLF. I would like to have Dr. Berson make a statement.

STATEMENT OF DR. ROBERT BERSON, EXECUTIVE DIRECTOR, ASSOCIATION OF AMERICAN MEDICAL COLLEGES; ACCOMPANIED BY DR. GEORGE WOLF, PRESIDENT, ASSOCIATION OF AMERICAN MEDICAL COLLEGES; AND DR. THOMAS TURNER, PRESIDENT-ELECT, ASSOCIATION OF AMERICAN MEDICAL COLLEGES

Dr. BERSON. Mr. Chairman, with your permission, we would like to make a very brief statement, in view of the late hour, and expand that a little bit in writing in the immediate future.

As you can imagine, it would be easier for us to speak to this measure if we were also talking about S. 595, the Health Professions Education Assistance Amendment of 1965 because this is so much of the same package, and there is a sharp limit to how much anyone can speak for all of the medical schools at this moment, because in the brief period since the President's Commission reported and this legislation was introduced, we have had an opportunity for only a few hours of discussion of this important legislation among representatives of all the schools.

Actually, stated very broadly, the objectives that the President set forth under the headings of "Strengthening the Nation's Health Facilities and Services, Manpower for the Health Services and Health Research, and Research Facilities" in his message to Congress are the objectives of the medical schools of this country which they have been

pursuing for many decades. We continue to support these objectives wholeheartedly, and it is wonderfully encouraging to have such a clear statement of them by the President, now supported by legislation that has been introduced.

The medical schools and their teaching hospitals and affiliated institutions have played a crucial role not only in educating medical students, which used to be about all they did, but also in training many workers in allied health professions in perfecting our great system for training physicians and clinical investigators, advancing knowledge through basic and clinical research, and applying it to the problems of patients in the operating room, at the bedside and in the clinics.

The tremendous role the Federal Government has played in this through many agencies, particularly the Public Health Service, and the National Institutes of Health is very well known to your committee. You are responsible for so much of it that we do not need to elaborate that at this time.

The first point we want to emphasize is when you consider proposals of the magnitude of this bill, it makes it imperative to recognize that our system of providing medical care in this country is interdependent, although it is heterogeneous and not highly organized, and we do not usually think of it as a system.

One simply cannot expect the fulfillment of pledged services to patients without support of and thoughtful consideration for the educational system that underlies it.

Now, about the legislation itself, we support the purposes set forth fully, with the reservation that we do not think they can be achieved unless we do give adequate consideration to the whole basic operation, the whole basic system.

The medical schools and the related institutions which make up the medical center, have become the resources to which patients with specially complicated problems are referred for study and treatment, and they are increasingly effective in this role.

The words of Dr. Osler that you quoted earlier have really been taken seriously. Incidentally, he was one of the earlier presidents of the association that Dr. Wolf now presides over and, as you know, he played a fundamental role in the development of the Hopkins for which Dr. Turner is responsible at this time.

They have been taken seriously, and they have been wonderfully successful all over the country, and it is perfectly logical and natural to try to extend the influence of these institutions and improve the ways they can cooperate with other hospitals, with the medical profession, for the better interest of their patients.

Now, naturally, the medical schools would hate to see any vast disruption of the patterns that have been proven successful in the past—evolution, yes, but not sudden disruptive change.

The members of the medical profession of this country are largely the alumni of our medical schools, so we have a natural interest in the pattern continuing to be one in which the individual physician can achieve maximum effectiveness as well as appropriate professional satisfaction.

It has been well demonstrated that it is highly effective to bring together people who are doing research that is basic, but is also per-

tinent to clinically important problems, with clinical investigators studying these problems and applying their results to the treatment of patients as well as training younger people in the field.

A few independent autonomous institutions have developed which are highly effective in doing this, but there are many other concerted efforts which have developed as fully integrated parts of teaching hospitals or medical schools, and they have been equally or more successful.

Some of the categorical research centers which developed as relatively isolated institutions, have been even more successful after they developed close ties with the medical school and the medical center developing in their area.

We are firmly convinced that the categorical research centers to be developed under this legislation in the future should be intimate parts of medical schools or medical centers and staffed by members of the faculty.

Now, a number of medical schools have had a good bit of experience in trying to perfect regional arrangements that are rather similar to the intentions of this legislation, and they have found it a rewarding and a difficult business.

It has made it very clear that the relations between institutions and the individuals involved are delicate and complex, and it is also painfully difficult to procure and maintain an adequate supply of manpower for this mission. It is simply imperative that careful planning and thorough discussion and understanding precede the activation of any regional complex that is to receive substantial support under this program.

Hasty activation of any such regional complex before adequate staffing and facilities are available, and thorough agreement are reached, will accomplish little, and do a lot of damage.

Each regional complex will have immediate impact on the medical school and the medical center involved. The success of the regional complex would be dependent upon the continued success and growing effectiveness of that medical school and medical center, and the development and success of one regional center will have immediate repercussions on other medical schools, and it may make it easy for the center, the complex, that is making progress to make even more progress by recruiting personnel at other medical schools and medical centers that need it.

We think that the role of the National Advisory Council, as provided in this legislation, is extremely important. So far as the bill specifies who should be on it, it seems good, but we would also urge that it always include at least one member who has had experience in being responsible for the whole of a medical school or a medical center.

Now, back to the manpower business again: The 88th Congress took some very substantial steps, and they are helpful, but we are convinced that a great deal more needs to be done. As this subcommittee knows so well, for 15 years or more, the association has been concerned about the escalating demand for medical manpower, and the painfully slow progress we are making at meeting that demand.

It seems to us that the success of this program and of a good many other programs that will be before this session of Congress are dependent on our making progress with the manpower problem.

We, of course, would like to say more about that when you are considering appropriate legislation.

Now, it is necessary, I think for us to emphasize the imperative need for attention to the manpower problem, but that does not mean that we are not for the purposes of this legislation. It is tremendously encouraging that it has been proposed by the President and is being considered by the Congress as a part of national policy, and it seems very likely that if it is handled on the basis of careful and through planning, development when resources are adequate for the purpose, it can achieve its high purposes without disrupting the rest of our complex system of education, research, and medical care.

This, of course, only if we give adequate attention to the basic problems of the educational system which would be appropriate under other legislation.

Mr. Chairman, it might be useful if Dr. Wolf would make any sort of comment he wanted, and then Dr. Turner, and then we would be delighted to try to respond to any points you wanted to raise.

The CHAIRMAN. Dr. Wolf.

Dr. WOLF. I would like to describe very briefly something that I happen to be connected with that Dr. Dempsey has mentioned in a variety of public utterances, and that is the Bingham Associates Fund which is part of the Tufts Medical Center in Boston.

About 20 odd years ago a Mr. Bingham, a wealthy person in Maine, gave some money to a group of men, trustees, so that they could do something for medical care in the State of Maine, and what they have done over the years now has had many of the elements of the proposed program and, I think, has been quite successful.

A very few, brief examples: One, they now have developed a series of TV tapes for postgraduate education of the physician, and this is tied into the educational TV network in Boston, and going up into Maine.

They have also provided funds for hospitals to get directors of medical education in their smaller community hospitals, and in this way have encouraged the development of an internship and residency program.

In addition, medical students have gone out from Tufts to the smaller hospitals and gained community experience.

They have also paid for part of the salary of a physician who is director of rehabilitation at a small hospital in northern Maine.

Then, finally, they have cooperated in providing consultation services to hospitals in Maine in the areas of nursing, X-ray technology, clinical laboratory, dietetics, record-room library technique, and so forth.

This program has been flexible over the years. It has been very small, of course, but I believe has been successful.

Dr. Turner?

The CHAIRMAN. Dr. Turner.

Dr. TURNER. Thank you very much, Mr. Chairman.

I think all of us recognize the very fine quality of the President's Commission's report. It should be noted, however, that this bill implements only a few of the recommendations in that report and, as Senator Kennedy, I believe, suggested earlier this morning, we cannot help but feel that S. 595, for example, is intimately tied into this picture. We have only limited manpower, which is in short supply, and

we are asking them to do more things and to be better trained, and eventually you come to a point where you simply cannot do these things without more individuals to do them. Thank you.

The CHAIRMAN. You feel then than S. 595 and S. 596 are complementary one to the other, do you not, Dean?

Dr. TURNER. I certainly do, sir; and I might even go a little bit further and say 597 which provides better library facilities must be considered in this picture, too.

The CHAIRMAN. These three in a way constitute a kind of tripod, do they not?

Dr. TURNER. I certainly agree.

The CHAIRMAN. If you are going to do the job we have been talking about this morning to accomplish these ends, we need all three, do we not?

Dr. TURNER. I entirely agree with you.

The CHAIRMAN. Do you gentlemen have any suggestion as to where you would put the responsibility in the Department of HEW for the administration of these proposed networks?

Dr. BERSON. Senator Hill, our association has not gone into this very far, and I am quite sure that there are elements of this that are an administrative decision and must be made by the Secretary or the Surgeon General.

There is one concern that I would express, and that is that however it is administered, the competence that has been gained in the Heart Institute, the National Cancer Institute, and other institutes become involved that this competence and experience be used as a fundamental part of the making, of the decisionmaking, as to what to do.

Now, this could be done by a variety of administrative mechanisms, but I think it would be a shame if this number of years of very successful experience were not made use of in some way.

The CHAIRMAN. You strongly feel that from your experience, do you not, Doctor?

Dr. BERSON. That is right; that is my personal opinion.

The CHAIRMAN. Your experience, too, Dr. Wolf; and your experience, too, Dr. Turner?

Dr. TURNER. Yes, Mr. Chairman. We cannot forget we worked nearly 20 years with the National Institutes of Health in a most excellent relationship with the medical schools, and this does not mean that there are not other administrative mechanisms that will work, perhaps, just as well, but I think this historical fact must be taken into consideration.

The CHAIRMAN. Senator Yarborough.

Senator YARBOROUGH. Dr. Berson, I am very sympathetic to your suggestion that 1 of the 12 members of the National Advisory Council on Medical Complexes represent the medical schools.

However, the law provides that these 12 people shall be leaders in the field of the fundamental sciences in the medical sciences and public affairs; 1 is to be the Surgeon General, 1 is to be an outstanding person in the treatment of heart disease, 1 in the treatment of cancer, and 1 in the treatment of strokes, which makes 4. One from the medical schools would make five.

Now, I say I am sympathetic to that, but the hospitals say they want a member, the research institutes want one, and we will soon

run out, and we won't be able to get that broad spectrum of leaders in the whole field of medical sciences and public affairs.

I do think that the basic institutions that teach medicine ought to have some representation.

Dr. BERSON. Senator, of course I was not thinking of representation. I was thinking of the background experience and viewpoints, and this might be found in men who had had the responsibility for a medical center as a whole, and a few of these men have a background as hospital administrators. But my point is that the law provides to have experts in these subject matter fields.

Now, presumably these men have spent their professional life in those fields, not necessarily responsible for the broader aspects of the institution.

So I would say not necessarily a dean, but someone who has a real background of experience of a responsibility of that magnitude, medical school, or medical center.

Senator YARBOROUGH. You do recognize that we have a problem of how to utilize this limited manpower that Dr. Turner has so graphically described here where many of those men are already teaching and engaged in research at the same time?

Dr. BERSON. Yes.

Senator YARBOROUGH. Thank you.

The CHAIRMAN. Senator Kennedy.

Senator KENNEDY of Massachusetts. I have no questions. I would just like to underscore what the presentation indicated which, I think, you observed so accurately, Mr. Chairman, about the interrelationship of these programs and of the pending legislation. I certainly think this is worth considering.

The CHAIRMAN. In other words, we have got to move forward on all fronts.

Dr. BERSON. That is right.

Senator KENNEDY of Massachusetts. It does not lessen the importance of this legislation in any way.

Dr. BERSON. Oh, no.

Senator KENNEDY of Massachusetts. And I think all of us realize this.

The CHAIRMAN. That is correct.

Senator KENNEDY of Massachusetts. And I appreciate your observations on it.

Dr. BERSON. Thank you very much.

The CHAIRMAN. Anything else you gentlemen would like to add?

Dr. BERSON. No, sir. We would like to submit a written report in a few days.

The CHAIRMAN. Very good. That would state officially the position of your association?

(The statement referred to follows:)

PREPARED STATEMENT FOR THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES CONCERNING S. 596, HEART DISEASE, CANCER, AND STROKE AMENDMENTS OF 1965

The Association of American Medical Colleges greatly appreciates the opportunity to present its views on this important legislation. We would find it easier to speak clearly for the association if we were discussing both S. 596 and the legislation dealing with the needs for manpower, S. 595, Health Professions Educational Assistance Amendments of 1965. And the degree with which anyone can

speak for all the medical schools is sharply limited by the fact that, in the short interval since S. 596 was introduced, it has been possible to have only a few hours discussion of this legislation by the executive council and the institutional members of the association.

Our views on this specific matter will be easier to understand if we first say a few words about the general intent and objectives set forth by the President in his message to Congress titled "Advancing the Nation's Health."

Stated broadly, the objectives the President set forth under the headings "Strengthening the Nation's Health Facilities and Services"; "Manpower for the Health Services," and "Health Research and Research Facilities" are the objectives the medical schools of this country have been pursuing for many decades. We continue to support those objectives wholeheartedly. It is wonderfully encouraging that the President has endorsed those recommendations so strongly and that your committee is in the process of considering this and other legislation, especially S. 512, S. 595, and S. 597, which will do so much toward achieving them.

The medical schools, their teaching hospitals and affiliated institutions have played a crucial role not only in educating medical students, but also in training many workers in allied health professions; in perfecting our great system for training physicians and clinical investigators; advancing knowledge through basic and clinical research and applying it to the problems of patients in the operating room, at the bedside and in the clinics. The tremendously important role the Federal Government has played in this grand development through several agencies, especially the Public Health Service and the National Institutes of Health, is well known to you and needs no elaboration at this time.

The first point we want to emphasize is that considering proposals of this magnitude makes it imperative to recognize that our system of providing medical care is interdependent, although it is heterogenous, not highly organized and not usually discussed as a "system." One cannot expect the fulfillment of pledged services to patients without support of and thoughtful consideration for the educational system that underlies it.

Concerning S. 596, Heart Disease, Cancer, and Stroke Amendments of 1965, specifically, we support the purposes set forth, and we think they can be carried out only with proper attention to the "system" as a whole.

The medical schools and related institutions which make up medical centers have become the resources to which patients with specially complicated problems are referred for study and treatment and are increasingly effective in this role. It is a logical and natural extension of this background to continue to perfect the ways that medical schools, teaching hospitals, and related neighboring institutions can cooperate with each other, with hospitals at some distance, and with the medical profession for the better interests of their patients. The members of the medical profession of this country are largely alumni of the institutional members of the association so we have a natural interest in the pattern of medical care continuing to be one in which the individual physician can achieve maximum effectiveness for his patients and appropriate professional satisfaction.

It has been well demonstrated that it is highly effective to bring together people doing research that is basic and pertinent to clinically important problems (such as heart disease, cancer, stroke, and several others) with clinical investigators studying those problems and applying the results to the treatment of patients as well as training specialists in the field. A few independent and autonomous institutions have developed which are highly effective in doing this. The accomplishments of our great clinics devoted to one "category" of disease or to rehabilitation are so well known to your committee there is no need to elaborate on them. I do want to point out that some of them have been even more successful after they developed close ties with a medical school. It is clearly desirable for these established centers to continue to evolve in a way appropriate for their own setting. And it seems worthy of some emphasis that other such concerted efforts have developed as fully integrated parts of teaching hospitals or medical schools and that they have been equally successful.

We are firmly convinced that the "categorical research centers" to be developed under this legislation in the future should be intimate parts of medical schools or teaching hospitals, staffed by members of the faculty, rather than isolated and independent institutions.

A number of medical schools have had experience in trying to perfect regional arrangements for the orderly referral of patients to the medical center: the

establishment of specialized diagnostic or treatment stations in hospitals at some distance and the transmission of new knowledge to practicing physicians. The examples of Albany and the University of Kentucky were cited by Dr. Dempsey.

Eleven years ago John Deitrick wrote:

"While medical schools and their teaching hospitals were encountering these serious financial difficulties, the public demand for their services was increasing. Medical centers had proved their value in terms of improved medical service. The concept of a medical center rendering many types of medical service had been promoted by several medical schools. Tax-supported schools had generally rendered some direct medical services to their communities or to their States, but they, were constantly being asked to expand this service as the public grew to expect direct and supervised medical care from the medical school.

"The new philosophy is illustrated in a report published by the regents of one State university which included the following statement: 'University personnel and activities constitute many resources that are of potential importance to our community welfare. Consequently, the medical school has extended its interests beyond the limits of its classrooms to the end that its many resources may be made of maximum use to the people of our State.' This medical school supervised or had affiliations with 14 hospitals whose primary function was patient care. One private medical school specifically stated that one of its major objectives was a community medical-care program.

"The philosophy, propounded by national organizations and leaders in the health professions, soon reached the level of the Federal Government. In 1948 a report to the President by the Federal Security Administrator stressed the point that financially the medical schools were unable to meet the need of the Nation for physicians, and at the same time promulgated the need for large medical centers, with a medical school becoming the hub of each center. The President was advised that the Nation's total health resources could best be utilized by a program of Federal-State-community action to develop a system of hospitals and health centers closely integrated with a medical school and medical center in their respective regions, to provide smaller nearby hospitals with various services and professional personnel for patients who required special care.

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"The concept of expanding the influence and responsibility of medical schools for patient care was discussed in 1951 in the publication entitled 'Financial Status and Needs of Medical School,' which was a preliminary report by the Surgeon General's Committee on Medical School Grants and Finances. It stated:

" 'The entire problem of extending the influence of medical schools is becoming of increasing importance. Active regional programs in New England, New York, Michigan, Virginia, and other areas demonstrate the weight attached to these plans by many medical educators and medical administrators. The rapid growth of hospital facilities under provisions of the Hospital Survey and Construction Act will increase the demand for leadership and direction from medical schools.

" '* * * About 30 deans reported to us that a shortage of general funds is the major barrier to the development of these activities * * *. It is clear that an expanding concept of the function of medical schools as part of the community is evolving out of the initiative and experience of the schools themselves. These experiments have proved to be productive, and we foresee a growth of this movement.' [1]

"Obviously these statements represent a radical change in the fundamental concept of the function of a medical school. The medical schools, organized originally as educational institutions, are developing into medical service centers with constantly expanding responsibilities in the health field. Not only does the public expect these institutions to set standards of medical care, but in addition it expects them to provide and supervise the hospital care for large population areas as well as for national medical-service programs." [2]

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[1] Federal Security Agency, Public Health Service, "Report by the Surgeon General's Committee on Medical School Grants and Finances," pt. I, Washington, D.C., U.S. Government Printing Office, 1951, p. 37.

[2] "Medical Schools in the United States at Mid-Century," by John E. Deitrick, M.D., and Robert C. Berson, M.D.

Additional current examples would include Tufts and the Bingham Associates, New York University, the Universities of Michigan, Ohio, Wisconsin, Kansas, Iowa, Rochester, and others. In some instances the initiative has come from the medical school and in others has come from other groups and the medical school has responded.

This experience makes it clear that the professional and institutional relations are complex and delicate. It also makes it clear that it is painfully difficult to procure and maintain an adequate supply of trained manpower. A functioning regionl complex, as recommended by the President's Commission on Heart Disease, Cancer, and Stroke, would make the efforts of the practicing physician more effective, but the development and operation of the "stations" in each hospital and the "categorical research center" will require a marked increase in trained manpower.

It is simply imperative that careful planning and thorough discussion and understanding precede the activation of any "regional complex" that is to receive substantial support under this legislation. Such careful planning can also help to avoid unnecessary duplication of facilities, equipment, and services with its great cost in money and scarce personnel, so the provision of grants for such planning is probably the best feature of the legislation. Hasty activation of any such "regional complex" before adequate staffing and facilities are available and thorough agreements reached would accomplish little and might do much damage.

Each regional complex will have immediate and important impact on the medical school and medical center involved. The success of the regional complex is heavily dependent upon the continued and growing effectiveness of the medical school and the medical center. The development and success of one regional center will have very important implications for other medical schools and medical centers and may enhance the ability of one medical center to grow strong by recruiting trained personnel from a weaker center where they are badly needed. For these reasons it seems to us imperative that the National Advisory Council provided by this legislation always include some individuals who have had experience in carrying the responsibility for medical schools or medical centers as a whole. And it also seems imperative that the role of the National Advisory Council be changed from "consultation" to "advice" and that the legislation make it clear the Surgeon General is not to award grants that have not been approved by the Council.

The Association of American Medical Colleges has not taken a position on which portions of the Public Health Service should administer this program and probably will not do so. From my own experience it would seem wise for this administrative decision to be left to the Surgeon General and the Secretary of Health, Education, and Welfare. I do think it would be wise for the program to make use of and build on the long and successful experience of the National Heart Institute and the National Cancer Institute, particularly in relation to the "categorical research center" portion of each complex.

The 88th Congress took some substantial steps to aid in increasing the supply of trained manpower in the health fields but we are convinced that much more needs to be done. As this committee knows so well, the Association of American Medical Colleges has long been gravely concerned as to whether there will be enough trained manpower to meet the growing demand. The present prospects are that the number of physicians who have graduated from medical schools in this country will continue to decline in relation to the population. The success of this program is absolutely dependent upon an increased supply and appropriate distribution of trained workers and so is the success of other proposals before the Congress in this session. We would like to say much more about this when legislation dealing with health manpower is being considered.

Having expressed our reservations, I want to add that I think that, with sound planning and proper attention to the system of providing research, education, and service as a whole, the problems which concern us can be overcome and progress toward better medical care for everyone can be greatly helped by this legislation.

I would urge the passage of this legislation along with the other legislation to implement relevant recommendations the President made in his message to Congress.

Dr. BERSON. Yes; it will, but it is not different from what we have said this morning.

The CHAIRMAN. I did not think it would change.

Now we have Dr. Carleton B. Chapman, of Dallas, Tex., president of the American Heart Association, and professor of internal medicine, University of Texas, Southwestern Medical School.

Doctor, I have a telegram from you, sir, in which you said you would like to have with you today Dr. James Warren and Dr. Robert Wilkins, past presidents of the American Heart Association, and Mr. Jesse Fillman, member of the board of directors of the association, and Mr. Rome Betts; are they here with you this morning?

Dr. CHAPMAN. Yes, sir; all except Dr. Wilkins who could not come

The CHAIRMAN. Do you have all those who are available?

STATEMENT OF DR. CARLETON B. CHAPMAN, PRESIDENT, AMERICAN HEART ASSOCIATION; ACCOMPANIED BY DR. JAMES V. WARREN, PAST PRESIDENT, JESSE R. FILLMAN, MEMBER, BOARD OF DIRECTORS, AND ROME BETTS, EXECUTIVE SECRETARY, AMERICAN HEART ASSOCIATION

Dr. CHAPMAN. Yes, sir. If I may, I will introduce them.

On my right is Mr. Fillman, who is a member of our board of directors. He is a lawyer, and he comes from Boston.

Also on my right——

The CHAIRMAN. You mean you let lawyers in your association?

Dr. CHAPMAN. Oh, yes, sir. We are a voluntary health association.

The CHAIRMAN. I think that will particularly appeal to members of this committee. Most of us are lawyers, you know.

Dr. CHAPMAN. Also on my right is Dr. James Warren, who is a past president of the American Heart Association and currently professor of medicine at the Ohio University School of Medicine.

On my left is our executive secretary, Mr. Rome Betts, whose executive offices are in New York.

The CHAIRMAN. We are delighted to have you.

Senator YARBOROUGH. Mr. Chairman, at this time I would like to welcome to this committee Dr. Carleton Chapman, president of the American Heart Association. I see we have other "presidents from Texas" on this agenda also. We have quite a complex of presidents. We are very proud of them, and we are proud to have one before this subcommittee at this time, and we are glad to welcome you here before this subcommittee under the leadership of this great chairman, Senator Hill.

It is a personal pleasure for me to see people from Texas coming here supporting this medical legislation. That was not exactly the situation 7 years ago when I first came to this subcommittee.

The CHAIRMAN. There has been a little change of heart. I guess the American Heart Association had a lot to do with it; didn't it, Doctor?

Dr. CHAPMAN. I certainly like to think it has.

The CHAIRMAN. We are certainly glad to have you. You may proceed in your own way.

Dr. CHAPMAN. Thank you.

I am honored to have the opportunity to serve as spokesman for the American Heart Association in connection with the proposal—S. 596—to establish regional medical complexes for research and treatment in heart disease, cancer, stroke, and other major diseases.

Our organization regards the proposal as one of the most significant pieces of health legislation ever to come under consideration in our country and we support its major objective without qualification. That objective, as we understand it, is—

> * * * to afford to the medical profession and the medical institutions of the Nation * * * a more abundant opportunity of making available to their patients the latest advances in the diagnosis and treatment * * *

especially of heart disease and stroke, which are the areas of our special concern and competence. This general aim, in fact, has been an important goal of the American Heart Association for many years.

At the outset, gentlemen, permit me to point out that the American Heart Association is a voluntary health agency and a public service organization. Our reason for being, and our main justification, is the fight against diseases of the heart and blood vessels in particular and the preservation of the health and the vigor of our Nation, speaking more generally.

Our membership is made up of about 40,000 of the Nation's leading public-spirited laymen and about 35,000 physicians (generalists and specialists) who are interested in circulatory diseases. We view this important group of diseases as a public health problem of major magnitude and complexity, and have mobilized all sorts of skills, talents, and intellects in our efforts to cope with it. By the same token, we have called in many of our qualified members, both medical and nonmedical, in studying the bill before us and in preparing this testimony, which we have presented. But we would like to say, too, we have no ax to grind in offering it.

We appear before your subcommittee solely in the public interest and in the hope that we can make some contribution to wise and effective legislation in the health area.

There were many points in the proposal (S. 596) that were of interest to us; so many, in fact, that we elected to take up only the main ones in our presentation this morning. We have relegated details about wording, and an official resolution by the board of directors of the American Heart Association concerning the report of the President's Commission on Heart Disease, Cancer, and Stroke, to an appendix to the main body of our report. But with your permission, we would like to place an appendix and resolution in the record.

The CHAIRMAN. We will have that appear following your testimony in full in the record.

(The information referred to appears on pp. 91–92.)

Dr. CHAPMAN. Thank you, sir.

In our view there are several aspects of the proposal (S. 596) that are of critical importance, and some of which will lead us to make overlapping of some of what has gone before.

By far the most important and pressing, we believe, is that which relates to staffing and training, and the need for trained personnel, in general, the role of the medical schools, in particular.

If the proposal to establish regional medical complexes is enacted, large numbers of highly trained people—physicians and nonphysicians; medical and paramedical—will be needed to staff them. At present, these people are not available in sufficient numbers and there is only one source from which they can come: the medical schools and

their affiliated teaching hospitals which, taken together, are defined in the bill as medical centers.

It follows inescapably, therefore, that if the proposal (S. 596) is to succeed, its most immediate effect must be to strengthen and expand the role of the medical schools and affiliated hospitals in the training of physicians and other health personnel. Without such people in adequate numbers, no amount of physical construction, or any other provision, can make the proposal to establish regional medical complexes even begin to approach its goals.

In this connection, let me point out that the modern American medical school, as you know, sir, characteristically a regional institution, operates training programs in depth and at many levels. It is not only concerned with providing the training required for the M.D. degree; it also, mainly through its clinical departments, trains interns, and residents; physicians seeking specialty training, and other postgraduate groups. The trend today is toward more and more clinical training, much of it highly specialized, after the M.D. degree is attained. And this trend is not solely due to the requirements of specialty groups themselves; the Academy of General Practice, in fact, recently announced that it favors at least 2 years of training after a young physician completes his internship. The trend toward increased training after the internship will, however, be emphasized and accelerated if the proposal to set up regional medical complexes is passed by Congress.

Senator YARBOROUGH. May I interrupt there?

The CHAIRMAN. Yes.

Senator YARBOROUGH. Doctor, this question I should have asked of Dr. Berson, and if he is still here I might direct it to both: We worked very actively on this subcommittee in the past Congress to pass the Health Professions Educational Assistance Act of 1963. Do you think that is being implemented fast enough, the money is forthcoming, medical schools being approved or the applications for new buildings or renovated buildings at existing medical schools being processed fast enough?

Dr. CHAPMAN. I have a view on it, sir, but I would like to defer to Dr. Berson on that point, if he is still here.

Senator YARBOROUGH. Could I interrupt at this point? Dr. Berson, what comment do you have on that?

Dr. BERSON. Senator Yarborough, I think about as fast progress is being made as you can expect. It is a very complicated business, and it involves site visits to many, many institutions.

All of us in the medical schools as well as in the Public Health Service, hope that the next meeting of the Council can reach decisions on a number of more applications, and there is every indication that they will be able to do so.

Senator YARBOROUGH. Is the actual amount provided for student loans, $5 million for fiscal 1964 and $10 million for fiscal 1965 being made available, has it been made available?

Dr. BERSON. Yes.

Senator YARBOROUGH. Is it being made available?

Dr. BERSON. It is being made available; yes. The timing was unfortunate because I have heard Surgeon General Terry mention getting the appropriation after the school year started, which made it very difficult to proceed fast enough.

Senator YARBOROUGH. Because of the long session we had the past year.

Dr. BERSON. Yes.

Senator YARBOROUGH. We hope to remedy it this year.

Is there enough money for the student loans?

Dr. BERSON. No.

Senator YARBOROUGH. I hope you gentlemen ask for it.

The CHAIRMAN. Doctor, may I ask you one question: You spoke of the Council, you mean the Council on the Health Professions Educational Assistance Act?

Dr. BERSON. That is correct. They are scheduled to have meetings in the relatively near future, in a few weeks now, and there is every indication they will be able to consider a large number of applications and make definitive decisions at that time.

Senator YARBOROUGH. Dr. Chapman, pardon my interruption of your testimony, but your testimony, in addition to that of Dr. Turner and the man who preceded you, makes it clear all the time that for these centers to work you have got to have more personnel, and it takes a long time to train them. I think the Nurses Training Act we passed in the last session of Congress will be helpful in this.

Dr. CHAPMAN. Right, sir.

In view of what we have been saying, and Dr. Berson as well, it is not surprising that the framers of the proposed bill put the medical schools and their affiliated hospitals (the medical center) squarely in the middle of the regional medical complexes. It could hardly be otherwise, in view of the vast importance of the medical center training programs—broadly defined to which I have already made reference.

But at the present time these training programs are not producing enough graduates to meet the needs of the program the proposal would set in operation. To establish such a system without first seeing to the expansion of clinical training facilities might, in effect, do more harm than good. It would dilute our existing supply of trained clinical personnel and might well lower, instead of elevating, existing standards of diagnosis and treatment. To give young physicians additional training after internships in the areas encompassed by the proposed bill requires elaborate staffing and planning. Our medical schools and their hospital groupings, in order to meet the needs for staff of the proposed complexes, will have to enlarge their senior clinical teaching staffs and provide a greatly increased number of clinical traineeships for young physicians who happen to be ready for them. Our medical centers will also have to expand their facilities for training other types of personnel—nurses and various technicians, for example. And such expansion of training facilities can hardly be achieved overnight.

It might be well, parenthetically, for funds provided by grants in the first year under the bill, if it is enacted, to be used in some measure for the complicated planning that the expansion of training facilities will inevitably require, and we are glad in this connection to note the interest in planning grants shown by the Secretary's testimony earlier today.

In a few sections of the country, it may be possible to set up pilot projects at the outset, each to consist of a medical center, categorical

research institute, and station for diagnosis and treatment. Suc projects, if carefully planned and operated, may within a few yea yield very valuable guides that are applicable to the Nation as a whol

In essence, then, we believe that the proposed bill should be so de signed and administered as to encourage and assist our medical school and their affiliated hospitals to expand and upgrade their clinical train ing programs, beginning as soon as possible. This should be the firs objective of the bill; the first item in an orderly sequence of develop ment which can, we believe, enable the proposal to contribute impres sively to the improvement of the health of the Nation.

Turning to another item, an item which our groups within the Hear Association considered the next most important, we urge in th strongest terms, and with all deference to previous testimony, that th regional complexes proposal, if it becomes law, be administered as a part of the National Institutes of Health.

We make this recommendation not only because we have utmost confidence in and respect for the National Institutes of Health and fo the men who direct them, but, even more significant, the Institutes collectively represent a splendidly constructed system, built up over more than a decade and ideally suited for the implementation of the regional complexes proposal. This, after all, the complexes proposal, that is, rests very critically and predominantly as has been pointed out, on the continuing recruitment and training of highest level clinical personnel. At the Federal level, the National Institutes of Health can rightly claim expert knowledge of this particular function, and we believe this attribute can be turned to splendid account in the administration of the regional complexes proposal.

In addition, the established traditions of the advisory councils of the National Institutes of Health have been widely accepted and, we think, universally respected in the Nation. And, just as important, the categorical nature of the National Institutes of Health still further qualifies them, in our considered opinion, for administering the regional complexes proposal, an important segment of which is also categorical.

We wish to make it very clear that, in making this strong recommendation, we are well aware of the splendid tradition and the outstanding service of others arms of the U.S. Public Health Service. The Heart Association, in fact, has cordial relations with them, as well as with the National Institutes of Health, and cooperates with them in numerous activities. We have plans for broadening and extending such cooperation, especially on questions concerned with the relation of environment to circulatory disease of all sorts. But the regional complexes proposal is concerned with the provisions of clinical care and training and this, viewing the problem in depth, puts it firmly and squarely alongside the National Institutes of Health. It would, we believe, be a fundamental error not to utilize this ideally-suited body for the administration of the proposed regional complexes.

Our discussion groups considered many other questions in connection with administration of the proposed complexes but we realize that we cannot claim to be experts on the intricacies of the possible and the impossible in Federal administrative practice. The suggestion was made that the National Advisory Council for Regional Complexes be attached directly to the Office of the Director of the National Institutes

of Health, and we submit the suggestion for consideration but without a strong recommendation.

We would, however, consider this suggestion desirable if it should prove to be administratively feasible. It was also noted that as the proposed bill is now worded, the Surgeon General may appoint a National Advisory Council but is not actually required to do so. And the Council, if appointed, is merely advisory to the Surgeon General.

It follows that the Surgeon General may, if he wishes, award a grant that has been specifically rejected by the Council. We believe this to be unwise. We recommend that the wording be altered so that the Surgeon General must appoint a National Advisory Council and must have Council approval before he can award a grant under the bill. He should, however, retain veto power over prior positive Council action, in our opinion.

The CHAIRMAN. Would you please state that reason again.

Dr. CHAPMAN. We think the Surgeon General should have the authority to veto a recommendation for an award under the bill, but that he should not be able to make an award if the Council has actually projected it.

The CHAIRMAN. Unless the Council has made the recommendation.

Dr. CHAPMAN. That is right.

The CHAIRMAN. He can veto the recommendation but he cannot act without the recommendation; is that it?

Dr. CHAPMAN. Exactly, sir. This is exactly the way it is in the law we are most familiar with, in the Institute Law, the Heart Institute.

The CHAIRMAN. It is that way in the Heart Act.

Dr. CHAPMAN. Yes, sir.

Finally, we take note, Mr. Chairman, of the provision for 9-to-1 matching for construction or built-in equipment (S. 596, p. 3, lines 9–15). We recommend that the 9-to-1 requirement be deleted and that, under the proposed bill, it should be made possible to pay the entire cost of construction, or of built-in equipment, from grant funds.

In support of this recommendation, we can only repeat an argument which, although very important and often stated, never seems to have had much effect, and that argument is a matching provision, even at the 9-to-1 level, will tend to exclude qualified but underfinanced medical schools and affiliated hospitals from full participation in the program and, we think, we believe, is contrary to the intent of the proposal. It would, in fact, aggravate existing discrepancies between our best and our worst clinical care and training facilities.

We wonder if it might not be possible for the grantee to offer the land on which a structure is to be built as his contribution. In many cases, the value of the land will be well over 10 percent of the total cost of the structure and, in addition, the land may well appreciate in value as the structure is used.

The CHAIRMAN. Land is absolutely essential, of course.

Dr. CHAPMAN. Yes, sir. But at the moment the grantee is required to supply the land. This is our whole point. Even if this suggestion proves to be unworkable, we still very much hope that the final bill will provide unmatched funds for construction in regional complexes.

In conclusion, sir, the American Heart Association is very much in agreement with the main objective of the proposal (S. 596) which is basically to make it possible for the Nation's physicians to provide our

people with the best possible diagnosis and treatment of heart disease and stroke.

For the proposal to accomplish this high aim, the development must proceed according to an orderly sequence; and the first step is, beyond any question, in our view, to expand and improve the clinical training programs of our country's medical schools and affiliated hospitals. Full development of categorical centers and community stations must inevitably be delayed until the people to man them are available.

The Heart Association, having worked intimately with the National Institutes of Health and other arms of the U.S. Public Health Service for many years, believes very strongly that the regional centers program, if enacted, should be administered through the National Institutes of Health by its own National Advisory Council.

Finally, the American Heart Association urges that nonmatching funds for construction and built-in equipment be made available for the proposed regional complexes.

And that, sir, is all of our prepared testimony. We shall be glad to expand it, or to try to answer questions, if you wish us to do so. But first, I should like to thank you very much on behalf of the American Heart Association for giving us the opportunity to present our views on this extremely important health proposal.

The CHAIRMAN. We certainly thank you. You have brought us a very splendid statement. In fact, your statement was so fine that you answered the questions that I had in my mind.

Senator Yarborough, any questions you have, sir?

Senator YARBOROUGH. Dr. Chapman, I congratulate you and your associates because this shows a very thorough study of this bill. You have come up with concrete proposals.

Let me ask you, aren't the National Institutes of Health primarily concerned with research?

Dr. CHAPMAN. Well, they are concerned with research; yes, sir. But they also, of course, have had by virtue of this very thing very intimate contact down the years with medical schools. They are the groups within the Public Health Service with whom the medical schools have intimate contact and for this reason since the medical schools are a central focus in the proposal to establish regional medical complexes, we feel it would be vastly more efficient to have the NIH administer it.

Senator YARBOROUGH. The problem that worries me is whether you won't take primarily what are research institutes and turn them into mere administrators and have them become primarily an administrative agency.

Dr. CHAPMAN. The only answer I can give you, of course, is to point out that the clinical center is part of the National Institutes of Health at Bethesda, and it gives them a very strong clinical arm, and we believe a very marked understanding of clinical training programs.

The CHAIRMAN. May I ask a question in connection with that? The National Institutes not only make grants but also enter into the contracts with the medical schools in the matter of medical research, and in the field of fellowships and training; isn't that true?

Dr. CHAPMAN. Yes, sir; it is very true. It is one of their more important functions.

The CHAIRMAN. In the field of training and in awarding fellowships.

Dr. CHAPMAN. Yes, sir; that is right.

I wonder, sir, if Dr. Warren might have something more to add. This is a very important question.

The CHAIRMAN. All right, doctor.

Dr. WARREN. Yes, I was going to point out that, of course, the NIH is particularly involved with research, but it is very deeply in the training and, as I understand the original Heart Act, it strongly states this, so that I would agree thoroughly with Dr. Chapman.

If I may, I have just two brief additional points.

The CHAIRMAN. Go right ahead.

Dr. WARREN. The Heart Association has in addition reviewed the bill S. 597, I believe on medical libraries——

The CHAIRMAN. Yes.

Dr. WARREN (continuing). And has voted to support it. We feel that it is a very important part of this package that we have talked about earlier today.

Just a personal comment: In my position at Ohio State University, we have a regional program involving what we often call satellite hospitals in Ohio, something like the Albany program mentioned earlier, and we found a great eagerness of hospitals to enter into this, and we feel it is very successful and it is a step in the direction that we have been talking about.

The CHAIRMAN. In other words, you pioneered in this field.

Dr. WARREN. I think I reluctantly would have to say that Albany did some of these things first, and we have picked it up.

The CHAIRMAN. The work you have done in a way has been somewhat pioneering; has it not?

Dr. WARREN. Yes; I think so.

We have a very vital two-way radio program to staff physicians, I think it is something like 35 hospitals in Ohio, that once a week discuss various medical diagnostic and treatment problems.

The CHAIRMAN. Senator Yarborough.

Senator YARBOROUGH. Dr. Chapman, you say:

> In essence, we believe the proposed bill should be so designed and administered as to encourage and assist our medical schools and their affiliated hospitals to expand and upgrade their clinical training programs.

Now, I strongly support S. 595 and S. 597, and worked on the Health Professions Act and Nursing Act. But it seems to me this act has a somewhat different purpose. I will not take time to recite its purposes, but if you look at section 900, the purposes of this act affect the medical schools. But the purposes in no way imply that this law is more important. We need those programs, and we need to push them, and we are very conscious of the shortage of medical personnel. We have had this over the years. We have had testimony on the number of doctors per 100,000 population, and all those shortages; and it seems to me the main purpose of this act is to take the medical knowledge you have already accumulated in these research centers, in the big hospitals, and through this kind of complex get that knowledge down to the average practitioner, to the small hospital in a small town, everywhere. I am thinking of a typical city of 200,000 population in my home State with five hospitals; one of those hospitals is a city-

county hospital, one is a private hospital, very finely endowed by private grants, some are church-related hospitals. I am not certain about their administration, but I doubt that there is close coordination among them as this bill contemplates in either the stroke or heart disease or cancer areas.

Doctors, of course, know each other and refer patients and call in experts in the field, but not to the extent this law contemplates.

It seems to me this contemplates a different kind of thing, which is to get to the quantum of knowledge you have now through this, what was it, 1,800,000-word index.

I am reminded that the president of the Encylopaedia Britannica told me in 1962 that so great was the explosion of knowledge and learning in this country in the past two decades, they had to change 10 million words out of 33½ million words in the Encyclopaedia Britannica. Never in the history of mankind has there been such a rapid change of words in the language to explain the scientific and technological life for the average man.

So it seems to me we have a little different purpose in this act, although the need is as great for this medical education, and we hope that administratively they will carry out what we legislatively have directed that they do.

I hope the Bureau of the Budget does not cut the money off after we appropriate it. That is one sore spot around here.

Dr. CHAPMAN. I understand it. This is the purpose of this bill, as we understand it, too. But what it would require us to do in terms of manpower—and this is the reason we put the emphasis where we have—we could not do at the moment. For example, in our own State, if Dallas or Houston undertook to set up consultative services for a large number of community hospitals and satellite stations, we would be very hard put to supply these people at the moment. In fact, we could not do so.

This is why we have felt that we should put the emphasis on clinical training at a higher level. It is at a level which we think has been somewhat neglected under previous arrangements; and this is why we have felt it absolutely necessary to place this emphasis where we have.

Senator YARBOROUGH. You and your association have certainly come forward with some stimulating recommendations here, and we congratulate you for having studied this bill.

The CHAIRMAN. Anything else you gentlemen would like to add?

Dr. WARREN. I might just add, as I have been sitting here, I am sure that probably over half of the advanced clinical training of specialists in heart disease, cancer, and stroke, must be supported through the NIH in one way or another.

Now, as Dr. Chapman and you, Senator Yarborough, have alluded to, that much of this is research-oriented, and we have a sort of gap, no way available now for the support of a young doctor who has had his basic medical school internship training but wants to go on just to be a better heart specialist, a better cancer specialist, but not necessarily an academician, a member of a research or full-time medical school team. There is a very sizable area of deficiency of available funds for training, and I would say personally that this would supply a very much needed help in this area.

The CHAIRMAN. Very well.

Senator YARBOROUGH. The young doctor faces generally, after years of medical school and internship, a financial crisis, for most families.

Dr. WARREN. Most of them are married and have two or three dependents by this time and, as I saw in one of the magazines recently, most of them moonlight a little bit.

Senator YARBOROUGH. I read that article, too. It is a regrettable situation that there is not more financial support to permit those with those proven talents to devote their time to research. I agree with you.

The CHAIRMAN. Is there anything you would like to add?

Mr. BETTS. Mr. Chairman, there is just one personal word that I would like to add here. I revert to some of the comments made by Senator Kennedy of Massachusetts when he was attempting to gain a more precise idea as to the sums that may be required when this goes into its second through fifth years of operation.

Again personally endorsing the objectives of this act, and reverting to Dr. Chapman's own testimony with regard to the wisdom of pilot activities in this direction, with particular emphasis on training in order that the manpower may be produced for this larger thrust into the 30 or more centers, it does seem to me that at the outset there could be greater thought given to the fiscal limitations which may be required in order to launch this program successfully on its way, and in order that there may be this precision of definition that I believe the bill presently lacks.

The CHAIRMAN. Is there anything you would like to add, sir?

Mr. FILLMAN. Unusual as it may be for a lawyer, I have nothing to add, Mr. Chairman.

The CHAIRMAN. Well, they say the smart lawyer knows when he has won his case, and therefore he does not continue talking; is that right?

Mr. FILLMAN. That is right.

The CHAIRMAN. Gentlemen, you have certainly given splendid testimony. We not only congratulate you but we express to you our deep appreciation. We want to thank you very, very much.

(The material referred to previously follows:)

APPENDIX I

RECOMMENDED CHANGES IN WORDING (S. 596)

Page 2, line 15: *the opportunity* to be changed to read *a more abundant opportunity.*

Page 6, line 4: to be changed to read: application therefore *and as recommended by the National Advisory Council and* approved by the Surgeon General. [Insertion in italic.]

Page 6, line 21 and 22: Delete *provide for the designation of* and insert *designate.*

Page 7, line 1: Change to read: complex, which *usually* includes representatives of organizations. [Insertion in italic.]

Page 7, line 9: Change to read: with *and as advised by* the Council, etc. [Insertion in italic.]

Page 7, line 16: Change to read: application therefore *and as recommended by the National Advisory Council and* approved by the Surgeon General, etc. [Insertion in italic.]

Page 9, line 5: Change the word *may,* to *shall.* To read: approval of the Secretary, *shall* appoint, etc.

Action of the board of directors of the American Heart Association, January 9, 1965:

> Voted: To endorse the objectives of the Report of the President's Commission on Heart Disease, Cancer, and Stroke:

Further voted: To authorize the president, Carleton B. Chapman, M.
to make whatever arrangements may be appropriate to present constru
tive support and criticism regarding specific proposals to Congress and e
ments of Federal units;

Further voted: That this action specifically includes authorization to wo
in closest cooperation with the American Cancer Society.

The CHAIRMAN. Now, Dr. Murray Copeland, of Houston, Tex. Come around, Doctor.

You are president of the American Cancer Society. Will you brin Dr. Diehl with you?

Doctor, you are associate director of the University of Texas M. D Anderson Hospital & Tumor Institute; is that correct, sir?

Dr. COPELAND. Yes, sir.

Senator YARBOROUGH. We are honored to have another president of a Texas institution presented to the subcommittee.

Dr. Copeland, we are proud of the fact that your work has been such that the specialists in your work over the Nation have elected you president of the American Cancer Society.

The CHAIRMAN. Doctor, we are happy to have you here and we are happy to have our old friend—and when I use the word "old" it has nothing to do with age, but he has been a friend of the committee for many years—Dr. Diehl with you. We are glad to have both of you gentlemen here with us.

STATEMENT OF DR. MURRAY COPELAND, PRESIDENT, AMERICAN CANCER SOCIETY; ACCOMPANIED BY DR. HAROLD S. DIEHL, SENIOR VICE PRESIDENT FOR RESEARCH AND MEDICAL AFFAIRS, AMERICAN CANCER SOCIETY

Dr. COPELAND. Thank you, Senator Hill and Senator Yarborough.

I am pleased to be here to represent the American Cancer Society, the leading voluntary organization in this country dedicated to the control and eradication of cancer. I am also associate director and general surgeon, Department of Surgery, of the University of Texas M. D. Anderson Hospital & Tumor Institute of Houston, Tex.

I am glad to have Dr. Diehl with me to answer appropriate questions which might arise.

Because of the short prior notice relative to the opportunity to testify, the officials of the American Cancer Society feel that only a general statement can be offered at this time, without commenting in depth on some of the concerns which arise in the minds of some of us relative to certain facets of the proposed bill.

At the first opportunity, sir, the proposed bill will be presented to a broader spectrum of the responsible membership of our society, and the consensus of opinion obtained from a study in depth can be given to the subcommittee, by written statement and Mr. Chairman we should like to do so.

I should like to introduce at this time also a statement which was prepared and issued by the American Cancer Society adopted by the board of directors of the American Cancer Society on January 22, 1965, without reading it except to say this, sir: That the American Cancer Society views the report of the President's Commission on Heart Disease, Cancer, and Stroke as an effective instrument in focusing attention on goals in cancer control to which the American people can rightly and sensibly aspire. The Commission has given the public a

thorough analysis of problems and bold suggestions for action, sir.

The CHAIRMAN. We would be happy to have both statements appear in full in the record at this point.

Dr. COPELAND. Thank you, sir.

The CHAIRMAN. Thank you.

(The prepared statement referred to follows:)

PREPARED STATEMENT OF THE AMERICAN CANCER SOCIETY

The American Cancer Society views the report of the President's Commission on Heart Disease, Cancer, and Stroke as an effective instrument in focusing attention on goals in cancer control to which the American people can rightly and sensibly aspire. The Commission has given the public a thorough analysis of problems and bold suggestions for action.

As general recommendations are being translated into legislative proposals, it will be necessary to have further expert consultation and advice in shaping specific policies and programs. The society has had many years' experience in techniques of cancer control. Its committees of physicians, scientists, and informed laymen will always be available to work with those charged with the responsibility of implementing the Commission's proposals. In this, as in other legislative matters affecting cancer control, the society will of course continue its long-established practice of providing expert testimony at congressional hearings and before administrative bodies and its advocacy of the principle of governmental support in private institutions under private control in this field.

The board of directors feels that staff and volunteers should read and discuss the Commission report with care. Its sections on cancer give a striking picture of the seriousness of this disease and the importance of mounting a massive attack on it.

If our country achieves the Commission's major objectives of the best in diagnosis and treatment for all cancer patients, of more and better trained physicians and scientists, of greater support for cancer research, will strengthen the cancer control movement to which the American Cancer Society is dedicated.

The imaginative concept of the vastly increased attack with Government funds on cancer is largely focused in areas where the American Cancer Society has not had the funds to meet the needs it has long pointed out. The traditional program of the society as a voluntary opinion leader, as a public and professional educator, as a catalyst in organizing services for cancer patients, and as a sponsor of research, will be even more vital to insure the full effect of this increased cancer control movement.

As Federal funds increase, the greater the need will be for private funds. Such funds will be needed to assure that private institutions remain private and to meet the added burdens of increased medical care as more patients seek increased care stimulated by the President's message on health. The need to organize people on a voluntary basis—for their own protection and to help others—will remain until cancer is finally brought under control.

ADDITIONAL STATEMENT BY MURRAY M. COPELAND, M.D.

After discussion with the Legislative Committee of the American Cancer Society, I am again expressing the general support of the objectives of the bill in intensifying and broadening the attack on cancer. This support is based upon the experience of the society in research, education, and service, and the avowed purpose of the bill not to interfere with the existing patterns, methods or financing of professional practices of patient care. We would be opposed to the use of any of the funds for the payment of the cost of hospital, medical or other care of patients except incidental to research, training or demonstration, and we believe that the emphasis on the private institution and practitioner must be maintained in the future.

We support the provision of the bill requiring some matching funds for construction grants as consistent with the established practice and the experience of the past, and to insure the support and participation of the private institution and practitioner.

There are already established over a thousand tumor clinics under the leadership of the American College of Surgeons, and there exists a wide distribution among private practitioners of significant and modern diagnosis and treatment in the cancer field. The development of the program envisioned by this bill must

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be careful to utilize these existing facilities and to enlist their cooperation and support, because as the experience of the American Cancer Society has demonstrated, progress in the control of cancer can only be accomplished through the cooperation and support of the private practitioner and professional societies. Through experience and history we have learned that fast and accurate progress in the control of a serious disease can best be accomplished through the concentration of effort on the specific disease alone rather than through the "whole man approach." For this reason we recommend that the inclusion of "other major diseases" in the title and purposes of this bill be deleted, and that the entire fund and administrative energies concerned now be concentrated upon heart disease, cancer, and stroke.

The bill and program outlined under the recommendations of the President's Commission sprang from the ongoing programs in the field of heart disease, cancer, and stroke so well developed by the National Institutes of Health. Within the framework of its councils are the men best qualified by experience, knowledge, and training to advise and shape the extension of the program into the fields of education and patient care included in the new concept of regional complexes. Most of the specialists consulted have indicated that this new program should rely heavily on the existing councils. We join in this opinion and recommend that at least six of the members of the new National Advisory Council on Medical Complexes be selected by the Surgeon General from the membership of the Advisory Councils of the National Institutes of Health. It is recommended that two each be selected from the Cancer Advisory Council, the Heart Advisory Council, and the Council on Neurological Diseases and Blindness, with knowledge in the field of stroke. In this connection we would like to reemphasize the position of the American Cancer Society that the program of the National Cancer Institute is, and will continue to be, of vital importance, and that the support for that program must be enlarged.

We believe the committee should recognize that specialized institutions referred to in this bill as categorical research centers, now in existence are performing much of the program which is envisioned in this bill and in the cancer field have been the source of much of the strength of the present progress against cancer. We recommend, therefore, that in the language of the bill it be made clear that they can furnish essential planning and administrative leadership in regional complexes, and that they are furnishing and should continue to furnish, the type of teaching and training of manpower which is particularly necessary for the successful functioning of the proposed complexes. There do exist areas in which such manpower can best be planned for through teaching institutions not directly affiliated with medical schools. For this reason we recommend that the definitions of the bill be broadened to make this concept clear by amending section 902(b) defining medical centers to read as follows:

"(b) The term 'medical center' means a medical school or a specialized institution for post-graduate medical training and one or more hospitals affiliated therewith for teaching, research, and demonstration purposes."

We also feel that the local advisory council envisioned by the bill as a part of the planning and functioning of the Medical Complex is vitally important and its membership should be included in the application for its grant, and not be left to future creation after the grant. We also feel that the language of the bill in section 903, subsection (b)(4) should include representatives of voluntary health agencies and professional societies which will be vitally concerned in the planning and carrying out of the program, as well as representatives of organizations and institutions and members of the public.

Dr. COPELAND. It is interesting to note that in preparing proposals, the President's Commission categorically identified the dimensions of the problems concerned with heart disease, cancer, and stroke; pinpointed the national needs in attacking each of these disease processes, which accounted for 71 percent of the deaths of the country in 1963; examined the resource potential for combating these diseases and, finally, made recommendations designed to bring together the best in categorical medical care and the best in medical research, region by region, across the country.

As the general recommendations of the President's Commission are being translated into legislative proposals, the American Cancer Society, with its many years of experience in cancer control, welcomes the opportunity to work with those charged with the responsibility

of implementing the President's proposals through S. 596, and its companion bill H.R. 3140. In this, as in other legislative matters affecting cancer control, the society will continue the long-established practice of providing expert testimony at congressional hearings and before administrative bodies, and will continue its advocacy of the principle of governmental support in private institutions under private control in this field.

If our country achieves, through this proposed legislation, the major objectives of the best in diagnosis and treatment for all cancer patients; of more and better trained scientists; and of greater support for cancer research, this will strengthen the cancer control movement to which the American Cancer Society is dedicated.

It seems to us to be a corollary that all of organized medicine must be heavily involved, through the interested medical schools and associated hospitals; the categorical cancer hospitals and tumor institutes, many of which have university connections outside the medical schools; and appropriate community hospitals.

The American Cancer Society feels that the proposed bill envisions a significant forward step in developing and coordinating new concepts in medical care for the victims of major diseases, but the bill, it seems to us, does not appear to provide for the careful correlation of the spectrum of activities cited in this new program with those of the National Institutes of Health. I believe Senator Yarborough has given an answer to this. The specifics sometimes does not necessarily encourage passage of legislation. The American Cancer Society hopes that any new legislation will strengthen the vitally important National Cancer Institute program, as well as the other established cancer hospital and tumor institute center programs. Examples of such institutes are: the Memorial Sloan-Kettering Cancer Center, New York City; the Roswell Park Memorial Institute, Buffalo, N.Y.; the M. D. Anderson Hospital & Tumor Institute, Houston, Tex.; the Children's Cancer Research Foundation, Boston, Mass., and others.

These institutions are making valuable contributions to cancer research, contributing to the care of cancer patients and to the graduate training of physicians in the highly specialized techniques of cancer treatment.

Already, the cancer hospital and tumor institute centers, as well as individual interested medical school cancer programs, are functioning adequately for the purpose of becoming the heart of major medical facilities, as envisioned in the proposed bill. These on-going so-called medical complexes can be utilized immediately in shoring up cancer activities in community hospitals seeking such aid, thus making the best in modern medical care readily accessible to increasing numbers of people suffering from cancer.

The categorical intent of the President's Commission report seems clear to us, and we hope that the legislative act will incorporate the gigantic opportunity to emphasize suitable specific approaches to conquering the three major killers of men today; namely, heart disease, cancer, and stroke, and not dilute the present legislation with explorations into programs for other diseases until the parameters of the present recommended program are established and progress in the control of the three great killers is apparent. This is not to say that there comes a day the program may be elaborated in many directions.

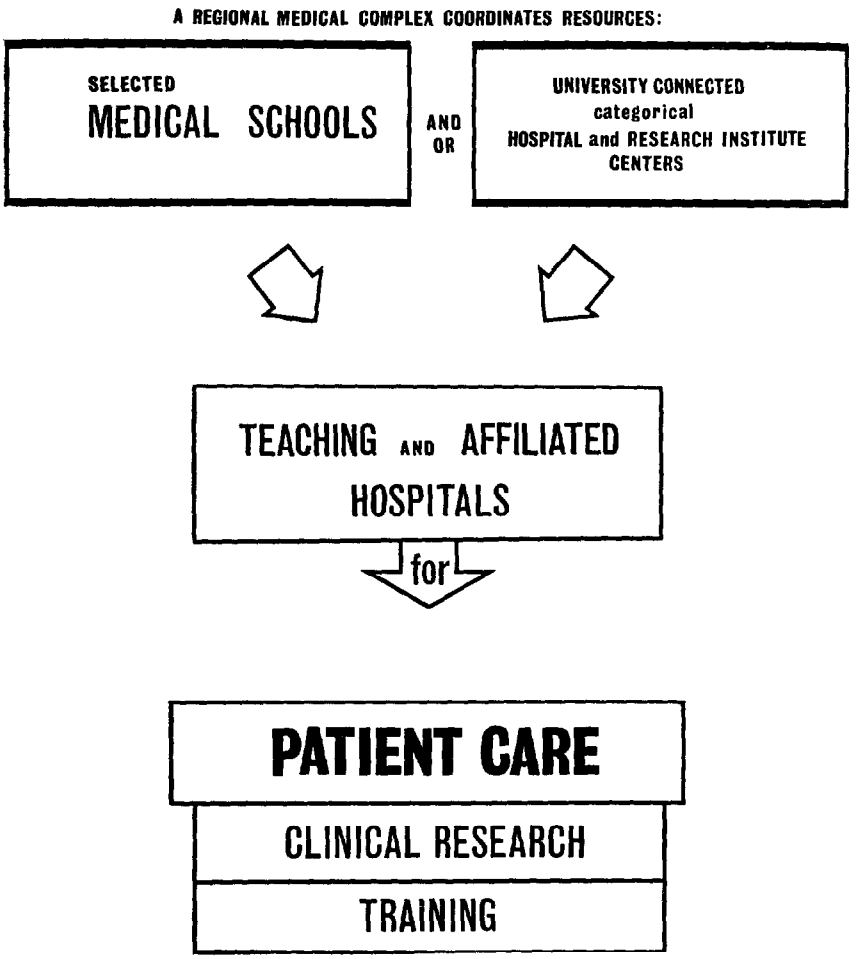
The definitions of "regional medical complexes," "categorical research centers," and "diagnostic and treatment stations" should be

carefully reexamined, to be sure that all currently adequate major medical facilities will be properly evaluated and utilized in the new program. For example, nonmedical school connected, categorical hospital and tumor institutes should be included as being at the heart of certain of the complexes. By this, sir, I refer to this diagram in which we have large letters "Medical School" at the top and "Patient Care" at the bottom. We should like to see categorical nonmedical school, connected institutes, cancer or heart institutes, and the like should they be available as the heart of the complex and have the appropriate authority to carry out the mission.

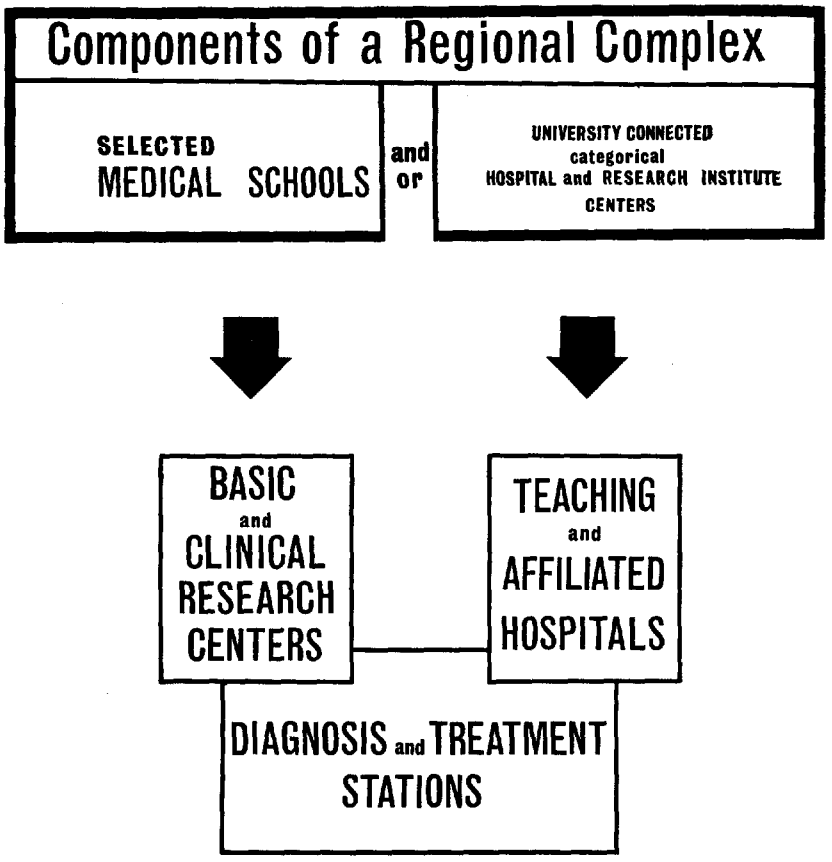
The CHAIRMAN. Doctor, if you have that chart modified, we will be glad to put it in the record. You don't have to do it now, furnish it to us at a later date.

Dr. COPELAND. Yes, sir; thank you, sir.

(The charts referred to above follow:)



DOCUMENT 1-----Revision of 3rd chart in the port folio of charts in Dr. Dempsey's testimony as suggested by Dr. Murray M. Copeland, President of the American Cancer Society in his statement on Senate Bill 596 before the Subcommittee on Health of Committee on Labor and Public Welfare, February 9, 1965.



DOCUMENT 2——Revision of 5th chart in the port folio of charts in Dr. Dempsey's testimony (bearing on same subject) as suggested by Dr. Murray M. Copeland, President of the American Cancer Society in his statement on Senate bill 596 before the Subcommittee on Health of Committee on Labor and Public Welfare, February 9, 1965.

Dr. COPELAND. The American Cancer Society wishes to place emphasis on filling the need for additional trained personnel to carry out the research, educational, and service intent of the legislation, and hopes that the provision of such personnel will be given a top priority in the implementation of the program, and indeed we were pleased today to hear, I think, the very adequate discussion on these points.

The proposal of grants for construction and initial equipment of new buildings; expansion, remodeling, and alteration of existing buildings is a forward-looking one, and deserves every consideration for those institutions demonstrating a real need for improved physical facilities to carry out the mission. We feel that the stewardship of this legislation is rightly placed within the Office of the Surgeon General and strongly recommend that the hands of his Office should not be tied by requiring the appointment of a council or commission outside of the framework of the National Institutes of Health.

We suggest that enabling legislation could permit the appointment of an advisory body to the Surgeon General within the council mechanisms of the National Institutes of Health using the appropriate current advisory councils as adviser to this new council charged with specific responsibilities of the new program. We also feel that the majority of the members of the proposed new council should be individuals who are outstanding in the study, diagnosis and treatment of heart disease, cancer, or stroke.

We are hopeful, also, that the centers, stations and major medical facilities proposed in the bill will have important roles, not only in the treatment but also in the prevention of cancer; and much cancer can be prevented. Concerning this, the President's Commission states:

> It seems apparent that the reduction of cigarette smoking offers great possibilities for the prevention of illness, disability, and premature death in this country, with regard to both cancer and cardiovascular disease.

This refers to the leading cause of cancer deaths in this country today. In fact, from the projections of my epidemiological section of the American Cancer Society, we are convinced that more than 50,000 cancer deaths annually in the United States are attributable to cigarette smoking.

The President's Commission further states that:

> A network of smoking control clinics should be provided to assist those who desire to give up smoking.

Clearly, the prevention of cancer is vastly preferable to even the best cancer diagnosis and treatment. We hope, therefore, that smoking control clinics, as well as other cancer prevention measures, will be an important responsibility of the proposed new program.

As Federal funds increase, the greater will be the need for private funds. Such funds will be necessary to assure that private institutions remain private, and to meet the added burdens of increased medical care, as more patients seek increased care, stimulated by the President's message on health. The need to organize people on a voluntary basis—for their own protection and to help others—will remain until cancer is finally brought under control.

And, sir, I should like to repeat, in completing the statement, that if our country achieves through this proposed legislation the major objectives of the best in diagnosis and treatment of all cancer patients, of more and better trained scientists, and of greater support for cancer research, this will indeed strengthen the cancer control movement to which the American Cancer Society is dedicated. I thank you, sir.

May I, Senator Hill, ask the privilege of turning this over to Dr. Diehl for any statement he might like to make, sir?

The CHAIRMAN. Dr. Diehl, we would be happy to have you make any statement you think essential.

Dr. DIEHL. Thank you, Senator Hill. I collaborated with Dr. Copeland in the preparation of his statement so what I would have said is incorporated with his testimony.

However, it occurs to me that I might make one or two additional points. One is to emphasize what Dr. Copeland has stated about the important role that specialized cancer institutes, which are referred to in this bill as categorical institutes, have made in cancer research, cancer education, and the care of cancer patients—a role that is rather

unique in cancer. There are few if any similar institutes in the field of heart disease.

In his testimony, Dr. Copeland mentioned institutes of this type which have been pioneers and leaders in cancer research, training, and service. Such institutions can and should play a vitally important role in carrying out the purposes of this bill. In fact, these specialized centers could well be a major focus for the special training of physicians in the diagnosis and treatment of cancer.

Another point that I would like to make is that cancer differs also from heart disease and stroke in another regard. That is that there are physicians, internists mostly, who are essentially heart disease specialists, and neurologists, and rehabilitation specialists who are concerned with the field of stroke.

On the other hand, several specialists are concerned with the diagnosis and treatment of cancer. Most cancer patients are cared for by the general surgeon, but cancers of the female genital tract are handled primarily by the gynecologist; cancers of the blood system, like leukemia, are handled primarily by the internist or the pediatrician, and so forth. In addition, other specialized individuals are involved in the treatment of patients with cancer. For example, radiation treatment by highly specialized radiotherapists and the administration of drugs by specialized chemotherapists are important in the treatment of many patients with cancer.

One of the reasons that special cancer institutes and centers have developed is that they bring together teams of such specialists.

These are a couple of points that I would emphasize as important considerations in the development of this program.

The CHAIRMAN. Certainly you and Dr. Diehl have been most helpful here this morning.

Senator Yarborough?

Senator YARBOROUGH. It is a very helpful recommendation, Dr. Copeland, and I believe some of the first I have seen reducing to a practical level what to do about smoking.

The Surgeon General has warned people; we have had all kinds of warnings. I heard last night on a television broadcast that in England they have prohibited the advertising of tobacco on television and radio and are considering prohibiting its advertising in newspapers in the immediate future. That becomes more difficult in America than England where they have the BBC, and have a completely Government-owned broadcasting system. But you recommend a network of smoking control clinics which should be provided to assist those who desire to give up smoking.

I think we have a big problem before they reach the point that they go to a clinic. I fear that you would have relatively a small percentage of our smokers. I think we would have some kind of nationwide shock treatment to the body politic as a whole over this danger.

After the Surgeon General's report, smoking went down, but the sales are now up to an alltime high.

I think if every cigarette smoker would read two paragraphs out of your statement every morning—if we could induce him to do that—that would be more helpful than many other things I have heard suggested.

But you have a suggestion: You are in favor of doing something. The very existence of these clinics would have some beneficial effect, I feel certain.

Thank you for your appearance here and for patiently waiting.

Thank you, Senator Hill, for a very fine hearing.

The CHAIRMAN. We have had an exceptionally fine hearing this morning, and certainly you gentlemen have contributed much to this hearing. We deeply appreciate your splendid statements here and the information and thought that you both brought with you. We are grateful to you. Thank you very, very much.

Dr. COPELAND. Thank you.

The CHAIRMAN. The subcommittee will now stand in recess until tomorrow morning at 10 a.m.

(Whereupon, at 1:30 p.m., the subcommittee recessed, to reconvene at 10 a.m., Wednesday, February 10, 1965.)

COMBATING HEART DISEASE, CANCER, STROKE, AND OTHER MAJOR DISEASES

WEDNESDAY, FEBRUARY 10, 1965

U.S. SENATE,
SUBCOMMITTEE ON HEALTH OF THE
COMMITTEE ON LABOR AND PUBLIC WELFARE,
Washington, D.C.

The subcommittee met, pursuant to recess, at 10:10 a.m., in room 4232, New Senate Office Building, Senator Lister Hill (chairman of the subcommittee) presiding.

Present: Senators Hill, Yarborough, Pell, Kennedy of Massachusetts, and Javits, members of the subcommittee, and Senator Kennedy of New York, member of the full committee.

Committee staff members present: Stewart E. McClure, chief clerk; John S. Forsythe, general counsel; Robert W. Barclay, professional staff member; and Roy H. Millenson, minority clerk.

The CHAIRMAN. The committee will kindly come to order.

Dr. DeBakey, we are very happy to have you and the other members of your committee here with you this morning, and I am going to ask you now to present the members of your committee, and then after that we will have a brief statement by Senator Kennedy, and then I will ask you to proceed in your own way if that is agreeable.

Dr. DEBAKEY. Thank you, Mr. Chairman.

Senator YARBOROUGH. Since Dr. DeBakey is a citizen of my own State of Texas I would like to have the privilege of presenting him to the committee. We are very proud of his discoveries in Texas in the treatment of heart disease and the successful techniques he has developed. I think it well to state at this point that some of those discoveries were made not with the support of all of his colleagues in the profession. He had to fight sometimes singlehandedly as pioneers often do to break through the barriers of lack of knowledge and bring new knowledge for the treatment of human illnesses.

Doctor, we congratulate you not only for the great discovery that you have made but for the great persistence and drive that you showed in the face of great obstacles and even objections from your own profession in the work you had been doing until you actually brought these new techniques to a point of proven success and perfection. It is surprising to me how many people I hear around the world who know of your work. I have been asked about your work in Europe and have been asked about it in Israel. It is known all around this earth in medical circles and we are very proud you are a resident of our State.

I am happy to welcome you here.

The CHAIRMAN. If you will let me, Senator Yarborough, I certainly join with you in all of the very fine and richly deserved things you have had to say about Dr. DeBakey. I have been privileged to know him for several years and I know of the work he has done and I am privileged to join you in this. I may say we have some very outstanding and distinguished members of the panel, and suppose you present them at this time, Doctor.

STATEMENT OF DR. MICHAEL E. DeBAKEY, CHAIRMAN, PRESIDENT'S COMMISSION ON HEART DISEASE, CANCER, AND STROKE

Dr. DEBAKEY. Thank you very much, Senator Hill and Senator Yarborough, you are always gracious and kind. I am deeply appreciative of your kind remarks.

Senator Hill, we have here on the panel some of the key members of the President's Commission on Heart Disease, Cancer, and Stroke. I would like to introduce them.

On my left here is Dr. Sidney Farber, who was not only a member of our Commission but who was the Chairman of the Subcommittee on Cancer of our Commission.

On my right, Dr. Irving Wright, who is the Chairman on the Subcommittee on Heart Disease of our Commission.

Dr. John Stirling Meyer, sitting on his right, who is one of the distinguished neurologists of this country, indeed of the world, not only a member of our Commission but also Chairman of the Subcommittee on Stroke.

Next to him is Dr. Howard A. Rusk, who, of course, is known throughout the world for his pioneering work in rehabilitation, was Chairman of our Subcommittee on Rehabilitation of the President's Commission.

These men are here with me to testify before your subcommittee on S. 596. We are delighted to have this opportunity and we are very grateful to have you allow us to speak on behalf of this bill.

The CHAIRMAN. Dr. DeBakey, I may say we are not only happy to have you but we are very much honored that you are here.

Senator Kennedy, I believe you have a statement you would like to make at this time.

Senator KENNEDY of Massachusetts. Yes; I have.

I, first of all, would like to extend my very good wishes to Dr. Farber, who is one of the really leading citizens of Massachusetts, not only in the medical field but because of his very active interest in so many other public service fields.

As this subcommittee well knows, he is the scientific director of the Children's Research Hospital in Boston. This hospital was the first institution in the world devoted to cancer in children. It was the pioneer in the chemical control of cancer. I feel that this subcommittee is particularly fortunate to have his participation, and the wealth of experience that he has brought to this problem.

Mr. Chairman, with your permission and with the permission of the subcommittee, I would like to read a short statement on my views on this bill.

The CHAIRMAN. You go right ahead, Senator.

Senator KENNEDY of Massachusetts. With your permission I would like to express my support for S. 596 and particularly compliment the chairman on the development of this legislation and the excellent hearings which he has been conducting here. I know something of the needs and the problems to which this legislation is directed. I have watched the magnificent work of Dr. Farber and the Jimmy Fund in Boston in the research and treatment of cancer in children. We, in Massachusetts, have a special pride in this Children's Cancer Research Foundation, as it is formally called, because it was developed through the voluntary contributions of many thousands of people, and because it was the first institution of its kind devoted specially to childhood cancer problems and research. It is also a pioneer in the chemical control of cancer, and I believe that the operations of this foundation will serve as an excellent prototype of the regional cancer centers contemplated by this bill.

As cancer crusade chairman in Massachusetts 4 years ago, I had the opportunity to observe the suffering and disillusionment created by this terrible disease, but more, I saw what success could be achieved through early diagnosis and treatment, and by the use of the latest techniques. This is the point of this legislation. We must bring the latest in detection and treatment methods and equipment out to the people. What we can learn, and will continue to learn, in Boston, we can share with other regions whose research and treatment have not developed as far.

The problem of heart disease and stroke lend themselves to the regional complex approach. Time is of the essence in a majority of cases, and immediate skillful treatment is often the difference between life and death. The therapy and rehabilitation following the heart attack or stroke, both medical and psychological, is crucial. I have seen personally the progress that can be accomplished in this area of treatment. This progress must be made available to as many serious cases as we can reach, and the research must be accelerated to find ways to arrest these diseases long before they become a problem.

We are grateful to Dr. Rusk, who is here today, and who has been so helpful in his excellent work with my father. I am sure that Dr. Rusk appreciates the importance of this legislation in connection with the rehabilitation of patients.

The regional approach to the diagnosis and treatment, provided by this bill, will give us a broad study of the many variations of heart problems. The increasing excellence of computers and other electronic equipment will give our researchers a major lift in analyzing these problems, recommending the treatment, and setting the course toward new research.

With these regional medical centers and diagnostic and treatment stations wired into our medical university complexes, we can convey basic information over thousands of miles to experts in Boston, and in other large cities, and special treatment can be immediately recommended. This is one of the great advantages to a coordinated regional network of medical diagnostic and treatment centers. Modern electronics, much of which has pioneered in my State, has moved rapidly and effectively into the field of medicine. It has eliminated much of the guesswork and trial and error of diagnosis and therapy.

By bringing the latest in electronic and other medical equipment

out to regionally spaced medical centers, we will save many more contribute immeasurably to the human security of our commu and gain giant strides in coordinating information and research

I know something of the need for regional medical centers i area of Massachusetts and New England. We are very fortun having Harvard, MIT, Boston University, and the many wonc hospitals in Boston.

It is the type of center we must build throughout many other in this country. We must use every available medical facilit have, including existing veterans', military and Public Health Se hospitals, and we must coordinate these facilities through elect devices, through cooperative staffing, through the dissemination c latest information, and through a continuing process of cons tion and improved maintenance.

Last week, on the Senate floor, Mr. Chairman, I called for a reg economic development program for New England. I recommen thorough review of this region's hospital and medical facilities services, with a view toward providing the latest in psychiatric, r cal, and surgical care, diagnostic, and special treatment units, hospitals beds, including nursing care units, for every sectio area. The developing fast access road system in southern New land, and an improved and expanded road system in northern England can provide for a reasonable spacing of these medical ce to accommodate broader regions of people.

In Massachusetts there are a number of areas outside the M politan Boston complex which are in substantial need of a regi medical complex. Some of these concern Cape Cod, the Berksl the northeastern, western, and southeastern sections of the State. objective in a New England regional program would be to encou the development of these centers through the greater allocation of S and Federal assistance and planning.

With this legislation, we are particularly concerned with our t most serious diseases, and here we are correct in emphasizing an at on these problems, as a first step. I am hopeful that, as time goe we can accelerate this program measurably into many other ill areas. I feel that we are embarking here on one of the most vital progressive approaches in medical treatment and science ever tempted. We must do everything we can to make it work. We mu particularly mindful of the fact that our medical demands are incr ing substantially, and with the increase in hospital and medical grams more people, who need treatment will seek it out, and dem it. It is our responsibility to a healthy and secure America, to that this medical service is provided to all of our citizens.

The CHAIRMAN. Thank you, Senator. Senator Robert Kenne

Senator KENNEDY of New York. Thank you, Mr. Chairman, I want to welcome Dr. Rusk, Dr. Wright, and Mr. Folsom to this committee and introduce them. They are three citizens of whom I York is very proud and I think the country is very proud. As Sen Kennedy of Massachusetts said, we owe a particular debt to Dr. R who has worked with the family for a long period of time but I war to come before the subcommittee and particularly welcome these tl very eminent and prominent citizens of my State. I know that members of the Panel have contributed tremendously to the health

well-being of our country, but I wanted to particularly point out the citizens from my State of New York. Thank you.

(The statement of Senator Kennedy of New York follows:)

STATEMENT OF HON. ROBERT F. KENNEDY, A U.S. SENATOR FROM THE STATE OF NEW YORK

Mr. KENNEDY of New York. Mr. Chairman, I would like to address a brief statement to the subcommittee concerning my interest in this bill, S. 596 designed to combat heart disease, cancer, stroke, and other major diseases. The deliberations of the Subcommittee on Health are of concern to all citizens of the country, for when 71 percent of all deaths in the Nation are caused by the diseases under discussion, almost no family evades their scourge. Citizens of New York must be additionally concerned because of the particularly high incidence of death from heart disease on the east coast revealed in the statistics presented by the President's Commission. Yet all statistics inadequately describe the personal tragedy suffered by those individuals afflicted by the diseases.

As so eloquently indicated in the Commission's report, these personal losses perhaps might be more philosophically acceptable if they were solely diseases of old age. But the facts presented by the Commission show that this is not the case. For example:

More than 128,000 of the 285,000 people who died from cancer in 1963 were under 65.

More than 25,000 of the people who died from cancer in 1963 were under 45.

Cancer is either the first or second largest killer of children between 1 and 14.

Stroke is the fifth largest killer of people under 65.

Of the deaths caused by heart disease 28 percent occurs to people under 65.

The high incidence of these diseases, particularly cancer, among the young means that we are losing people who may not have reached their most productive periods of activity or are being struck down in the prime of their lives. For these individuals, as well as for the many individuals reaching the period of their lives when they can enjoy the fruits of retirement, we owe a full-scale attack on these outriders of the four horsemen of Apocalypse—heart disease, cancer, and stroke.

The report on the Commission indicates clearly that medical research is beginning to provide some of the answers to the mysteries of these illnesses. We are now able to effect cures that would have been impossible just a few years ago. Some of the recent developments in surgery and medicine include:

Drugs to relieve hypertension related to heart disease.

Direct heart surgery to repair damage or defects.

New techniques for the early detection of uterine cancer.

Chemotherapy for the treatment of cancer.

Early detection of the symptoms of stroke.

New rehabilitative techniques for stroke victims.

These developments offer hope to those who are able to receive the proper diagnosis and treatment from physicians who are aware of these recent medical developments.

Implementation of the recommendations in the Commission's report concerning further research will undoubtedly lead to the development of new techniques and treatments. These developments will offer hope to those who face death from these diseases under the present stages of medical knowledge. We must not only continue the support of medical research that has been so ably initiated by the distinguished chairman of this subcommittee, Senator Hill, but we must also increase our support in those areas that the committee has recommended.

However, as I understand it, the three recommendations of the Commission that are embraced in S. 596 are designed primarily to bridge the gap between the fund of research knowledge that we have developed on heart disease, cancer, and stroke and the patient of the average practitioner who would like to receive the benefits of that research tomorrow.

These recommendations provide for—

1. Regional centers concerned with either heart disease, cancer, or stroke, conducting clinical investigation, teaching local practitioners, and patient care.
2. A national network of diagnostic and treatment stations aimed at bringing the highest medical skills within the reach of every citizen.
3. Medical complexes based on university medical schools where advanced medical equipment, teaching, and the school's research activities would be available to doctors affiliated with the regional centers and the diagnostic and treatment stations.

The report of the Commission indicates that the regional centers and the diagnostic and treatment centers are "oriented toward high-equality services in connection with a specific disease (which) will greatly increase the accessibility of the best in medical practices across the Nation." The establishment of medical complexes would enable existing medical centers to expand their existing resources to aid in the creation of the regional centers and stations. As I understand it, the regional centers, the stations, and the medical complexes to be created under the provisions of S. 596 will bring to the average practitioner the latest information from our medical research efforts and better prepare him to aid the citizen suffering from one of these diseases. The results of such a union of medical knowledge and everyday medical practice can produce dramatic effects on the vital statistics of death. This union has the potential to significantly lengthen the lives of many Americans alive today. I can assure you that the citizens of New York are interested in S. 596 because it affects them directly.

I think it is important that the purposes of S. 596 be made clear, for although the bill authorizes a sum of $50 million for fiscal year 1966, the Commission's report recommends a total of $1,580 million for the purposes I have described during the next 5 years, broken down annually as follows:

	Millions
Fiscal year 1966	$149.25
Fiscal year 1967	230.85
Fiscal year 1968	354.025
Fiscal year 1969	406.650
Fiscal year 1970	439.45

A program of this size is a major step in making the benefits of medical knowledge available to all. I believe that there is some confusion about the purposes of S. 596, as to whether it is designed primarily to place an emphasis on bridging the gap between research and medical service or whether it is primarily designed to further research on heart disease, cancer, and stroke. I know the Subcommittee on Health will remove this confusion during the course of these hearings.

The CHAIRMAN. We are happy to have you here, Senator.

I may say, I have a telegram here from General Sarnoff which I shall read into the record:

> I regret very much that previous important engagements involving a number of people prevent me from accepting your invitation to appear before your committee on Wednesday morning, February 10. As you know I was a member of the President's Commission on Heart Disease, Cancer, and Stroke and participated in its deliberations and in the preparation of its report to the President. As one of the laymen on the Commission I was deeply impressed with the careful analysis of the problems involved and the recommendations developed by the professional and skilled medical members of the Commission.
>
> I strongly endorse the proposals in that report for a national effort to conquer the dread diseases of heart attack, cancer, and stroke, and to make existing medical knowledge and skills more widely available to its victims. While the value of good health and productive life cannot be measured in dollars, it is nevertheless clear that a substantial reduction in the destructive effects of these diseases will save much more than the cost of the recommended program and, therefore, will contribute to the economy as well as the health of our Nation.
>
> DAVID SARNOFF.

Now, Dr. DeBakey, we will be happy to have you proceed, sir.

Dr. DEBAKEY. Thank you, Senator Hill.

The CHAIRMAN. May I say that since we started, our good friend and very distinguished member of our committee, the Honorable Marion Folsom has come in and he has been with us many times in the past and has always been tremendously helpful. He was most outstanding as a Secretary of Health, Education, and Welfare and we are happy to have him here today.

STATEMENT OF DR. MICHAEL E. DeBAKEY—Resumed

Dr. DEBAKEY. Senator Hill, let me say, too, that we of the panel here are delighted he is with us today, and want to express our grateful appreciation to him as a member of the Commision, the President's Commission, because he brought to the President's Commission not only his wisdom but a wealth of experience in matters relating particularly to the health of this Nation.

I would like to speak in support of this bill along with my associates here on the panel, Senator Hill, based upon the studies of the President's Commission embodied in its report to the President.

When the President first met the Commission after establishing the Commission he told the Commission among other things that two-thirds of all Americans would either die or suffer from these three dread diseases, cancer, heart disease, and stroke, and unless we do something about it, this would continue or even increase based upon the evidence we had available to us.

He said to the Commission, "I expect you to do something about it."

The Commission accepted this challenge, regarded it as of the utmost seriousness and immediately went to work to try to find out what could be done about it. The results of its study are embodied in its

report. The Commission had about 9 months to make an intensive study of these matters. It divided itself up in a number of subcommittees, the chairman of some of these subcommittees are here on this panel and will speak a little later about their findings.

There were 166 experts brought to the Commission's hearings, 45 such were held, over 7,500 pages of testimony prepared involving literally millions of words of testimony, data collected and analyzed some of which has never been available previously.

On the basis of these intensive studies during this 9-month period the Commission made a number of specific recommendations, indeed, there were 35 specific recommendations, which the Commission believed with deep conviction would make a real impact upon ways and means of reducing these diseases and perhaps ultimately conquering them.

Some of these recommendations, and particularly the most important innovative aspects of these recommendations are embodied in S. 596 and it is for this reason we are here to testify in support of S. 596 because it is concerned with the establishment of regional centers and complexes.

In our report to the President on this particular problem we indicated that this should be projected over a 5-year period, that the plans for the establishment of these centers would take a certain amount of time to develop, and to produce a truly national network as we envisioned the establishment of these centers in their efforts, in the effort to make a real impact upon these diseases.

This group of recommendations embodied in this bill projected the establishment of a national network of regional heart disease, cancer, and stroke centers for clinical investigation, teaching, and patient care in universities, hospitals, and other institutions across the country. We made certain projections for the number of centers for each year, and indicated the estimated cost of these centers over the first year would be $87.5 million and a total of $841.7 million for the development of 60 such centers over a 5-year period. These were the projections that we made on the estimate that we had based upon the best information we obtained from the best experts in the country on all aspects of this problem.

I believe, Senator Hill, that this Commission made, perhaps, the most exhaustive survey of this subject that has ever been made. Certainly it was able to collect data that was never available before and was able to get the consensus of the most knowledgeable people and the most knowledgeable organizations concerned with these problems, such as the American Heart Association and American Cancer Society and similar health organizations, as well as leading proponents in these fields.

Now, each of the subcommittee chairmen of these key recommendations embodied in this bill are here, along with Mr. Folsom and I should like to call upon them to testify particularly in regard to the material which they have available and the information they have in support of this.

Incidentally, I might call attention to the fact that the Commission prepared its report in two volumes. The first volume embodied the total set of recommendations, and the recommendations regarding the regional network are of course in that volume.

The second volume which will soon appear is a much more voluminous volume. It provides the documentation in support of the recommendations and I have here before me the preprints to give you some idea of the total documentation that will be available in the second volume which provide, I think convincing support for these recommendations.

May I now call upon Dr. Sidney Farber, who was the Chairman of our Subcommittee on Cancer and who headed that Subcommittee in all of its deliberations and provided a report from that Subcommittee which underlies the recommendations in the Commission's report.

The CHAIRMAN. Dr. Farber.

STATEMENT OF DR. SIDNEY FARBER, CHAIRMAN, SUBCOMMITTEE ON CANCER

Dr. FARBER. Mr. Chairman, it is a great privilege as well as a pleasure to appear before you today. I want to thank Senator Kennedy of Massachusetts for his kind words, and say here how happy I am as a citizen of Massachusetts to see him a member of this important subcommittee concerned with health, and how well remembered he is in Massachusetts for the great leadership he gave the crusade for cancer just 4 years ago.

The Subcommittee on Cancer had in its membership Dr. R. Lee Clark, the director of the M. D. Anderson Cancer Hospital in Texas, Senator Yarborough, whom you know very well.

Senator YARBOROUGH. Yes, I know Dr. Clark very well. He comes from a third or fourth generation of educators in Texas. His ancestors and immediate relatives include people who have founded universities, which have grown into great universities and they also include college presidents in our State. He is another distinguished member of one of the most distinguished families the Southwest has ever been graced by. He has done very fine work in the Anderson Tumor Clinic at Houston. You are familiar with its work, I know, from your great knowledge of cancer in America.

Dr. FARBER. He gave us authoritative help throughout all of our deliberations as did all of our Subcommittee, Dr. Frank Horsfall, president, Sloan-Kettering Institute, part of the Memorial Institution of New York, Dr. Charles Mayo of the Mayo Clinic, Dr. Jane Wright, one of the professors of New York University and in charge of cancer chemotherapy in her service. There were also several very knowledgeable and dedicated lay people; Gen. David Sarnoff was a member of this subcommittee; Mrs. Florence Mahoney, who is well known for her tremendous contributions to medical research and health; Mr. John Carter, the distinguished editor and Mr. Emerson Foote, who has concerned himself deeply with matters of health and medical research for many years.

This subcommittee made recommendations, Mr. Chairman, and gentlemen of the subcommittee, which are embodied in the report of the Commission in part I, and now in part II to which Dr. DeBakey made reference. It is my privilege in representing this portion of the Commission to give hearty endorsement to this report and to present its recommendations as printed to the subcommittee. I will not go into detail about them.

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I should say at once that the report of this subcommittee, as indeed the report of the entire Commission, would not have been possible without the support which the Congress through the Appropriations Committees of the Senate and House has given to the programs of medical research and health in general for many, many years. Your distinguished leadership, Mr. Chairman, has made its impact upon the course of medical research in this country, and has been responsible for the great growth of the National Institutes of Health. These research programs in the National Institutes of Health and in other governmental agencies which carry on medical research and give support have made possible the acquisition of new knowledge and the pooling of knowledge in a manner which was never possible before. On the basis of these great contributions of the National Institutes of Health and the other governmental agencies concerned with research in the Public Health Service and outside the Public Health Service, we are in a position to make recommendations which otherwise would not be possible.

In the main the recommendations as described in the bill which you have proposed, are those which we are supporting today. There will be opportunity, we understand, for other portions of the Commission report to be considered later.

Specifically we are recommending in cancer the creation or expansion of 20 cancer regional centers as part of medical complexes or associated with either medical schools, universities, specialized cancer institutions, or research hospitals all brought together, pooling their energies, their knowledge, their resources to do something which we have never been able to do before. Implicit in this recommendation is also the creation of 200 stations for cancer which will be connected with these regional centers.

The purpose of all of this is very clear. What we want to do is, first of all, make available all of the knowledge concerning cancer which is available in those institutions which are carrying on the greatest amount of research and which are giving to patients everything that research can bring at the present time. This is not today the case for all patients. The figure of 300,000 Americans who will die of cancer this year is well known to you. This represents a figure which would be very much greater if not for the great advances in medicine and in surgery and laboratory sciences of the last 20 to 25 years, but the figure is still too high because we are saving only one out of three patients with cancer. Thirty years ago we were saving one out of five. So, we are doing much better.

I would give a conservative estimate which represents the thinking of our panel on cancer, that if these regional centers were operating today, we would be able to save 100,000 Americans who are going to die of cancer this year. This figure is based upon the certainty that such a Regional Cancer Center network throughout the country would make possible far earlier diagnosis, more effective utilization of the methods of proved value available today, and the application of new knowledge from the research laboratories without delay. I want to emphasize that this is not possible today because of the lack of resources to make this Regional Cancer Center network possible.

The purpose of these Regional Cancer Centers is to bring this knowledge in diagnosis, treatment, and research to the assistance of every

doctor in the country who has a patient with cancer. This program is created to assist the doctor in the care of his patient by bringing resources and manpower and equipment and in knowledge which are not presently available in usable form to every doctor in the country.

These Regional Cancer Centers will have all of the specialists who are necessary to give the finest care to every patient with cancer. They will be centers of both clinical and basic research. In addition, these centers will act as training grounds for young men and women in the various specialties of cancer care and treatment and various aspects of medicine, surgery, and laboratory science necessary for both for patient care as well as progress leading to the discovery of the causes of cancer and new methods of diagnosis and treatment.

And finally, these centers will set up a communication system through stations which will be situated in university hospitals or community hospitals of 300 beds or so in strategic parts of the country. Through these hospital stations the doctor will be in constant touch with the centers.

Senator Hill will recall for a number of years, when I have had the privilege of appearing before his Appropriations Committee, I have made this recommendation of setting up of institutions which would have the same kind of organizational pattern and power as that in the splendid National Cancer Institute in Bethesda but in independent institutions throughout the country.

I think that, Mr. Chairman, I shall not carry this any further at this time.

The total cost for over a 5-year period is put in our Commission booklet for the stations as some $600 million for the centers and for the stations $225 million. This would be a gradual buildup as the resources of the country can be mobilized for this purpose, as institutions are prepared to take the challenge of this great opportunity. After these are established and well established, I think that we can look forward to what we may regard in very conservative language as the beginning of a new era, of a new era in the treatment of human beings with cancer in this country.

With the chairman's permission I take this opportunity to define the terms used in more detail.

1. The Regional Cancer Center can be a part of a medical complex, or it can be an independent institution associated with a medical school, a university, or an already existing cancer institute or hospital-research institute cancer complex. Close association with existing medical resources in all other fields of medicine is desirable. This can be through a university, or through a medical school, or by association with a number of institutions concerned with research, teaching and training, demonstration and care of the patient. Experience both abroad and in this country has demonstrated how effectively the many disciplines and approaches to the cancer problem can be brought together in a cancer institute, or in a cancer hospital and research institute combination. Such organizations bring together in one location all the skills, knowledge, and techniques of medicine, surgery, and the laboratory sciences required for the solution of the many problems of cancer. Such resources make possible the optimal care of the patient with cancer.

The Regional Cancer Center would be an expansion of this cancer institute development, such as is seen in the M. D. Anderson Hospital and Cancer Research Institute in Houston, the Memorial Sloan-Kettering Cancer Hospital and Institute in New York, the Roswell Park Cancer Hospital and Institute in Buffalo. These are the largest in the country. There are more than 15 others which may be described in terms of varying degrees of completeness as cancer institutes, including the Children's Cancer Research Foundation in Boston, which is devoted primarily to research and care in the field of leukemia and other forms of cancer in children.

The Regional Cancer Center would represent an expansion of this type of hospital-research institute by strengthening the basic research, the preclinical research, and the clinical investigation already present to a strong degree in a few cancer institutes in the country, and by providing both more adequate facilities and more stable support for the care of patients who are under clinical investigation while receiving optimal treatment and who make possible the training of scientists and cancer specialists and demonstrations of the optimal forms of treatment. The expansion which the center would provide will include, in addition, provisions for consultation with the 200 cancer stations, and through them the community hospitals, and through them the doctor in practice. New methods of communication will be possible by special support in such centers. The centers will assume the obligation of being available to any doctor in the country at any hour of the day or night for consultation, diagnosis, and treatment. Such cancer research centers accept as their goal and function the mobilization of total resources of science and medicine for the benefit of patients with cancer now alive and for the eradication of the many problems of cancer.

These cancer research centers may be in parts of the country where there is no intimate connection with universities or medical schools, following patterns already established in the relationship of medical institutions to one another. Special arrangements can be made to utilize the existing strength of universities, medical schools, and specialized cancer institutions for the staffing of these centers, for the training of students, scientists, and doctors in the many fields of science and medicine applied to cancer, and for the pooling of knowledge.

In the case of cancer, the existing Cancer Institutes have already proved the certain of success of an expansion into Regional Cancer Centers with even more meaningful connections and associations with universities, medical schools, and other medical institutions.

2. The diagnostic and treatment cancer stations will be located either in university hospitals, or in community hospitals with 300 beds or more, which either have or will develop cancer registries. Wherever there is a community need not yet met, special consideration should be given to the development of stations so that patients will not have to travel too far from their own communities. The stations will be provided with additional staff required to provide the best in diagnostic services available today, and also to provide the expert care of the patient with cancer. Doctors who are expert in radiology, radiotherapy, chemotherapy, special diagnostic techniques, and the various branches of surgery which bear on cancer will be available. The cancer stations will be in constant contact with the Regional Cancer Centers

and will, in turn, be in communication with community hospitals and with the doctors in practice. The stations, therefore, will serve as part of a network of facilities available for the programs of clinical investigation carried out with other Regional Cancer Centers.

The special knowledge of biostatisticians and epidemiologists in the centers, and the availability of computer facilities in such centers will make possible the creation of experimental designs for clinical investigation as well as the storage, retrieval, and analysis of data for the entire network system.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you.

Dr. DEBAKEY. Thank you, Dr. Farber.

Senator Hill, I would now like to ask Mr. Folsom if he would make his remarks now because I understand he has another appointment a little later.

As I indicated earlier, Mr. Folsom brought to the Commission a great deal of wisdom and experience in dealing with these matters and he was of tremendous value and support to the Commission's deliberations.

STATEMENT OF MARION B. FOLSOM, DIRECTOR, EASTMAN KODAK CO.

Mr. FOLSOM. Thank you. Mr. Chairman, it is a great pleasure for me to appear before your subcommittee again. I recall the cordial relations which I had with you, Senator, while I was Secretary, and also with your committee.

It is my privilege to serve on the President's Commission and also on its Manpower Subcommittee. I have a prepared statement which I will file but I would like to make my remarks orally.

The CHAIRMAN. All right.

Mr. Secretary, we will have your prepared statement appear in full in the record at this point and you may make any further statement you see fit, sir.

(The prepared statement of Mr. Folsom follows:)

STATEMENT OF MARION B. FOLSOM, DIRECTOR, EASTMAN KODAK CO., FORMERLY SECRETARY OF HEALTH, EDUCATION, AND WELFARE—1955–58

It is a great pleasure for me to appear before your committee again and to discuss this bill designed to carry out some of the recommendations of the President's Commission on Heart Disease, Cancer, and Stroke. It was my privilege to serve on this Commission and on its Manpower Subcommittee.

The two recommendations relating to this bill read as follows:

"The Commission recommends that a broad and flexible program of grant support be undertaken to stimulate the formation of medical complexes whereby university medical schools, hospitals, and other health care and research agencies and institutions work in concert.

"The Commission recommends a special program of incentive grants to communities to stimulate the development of a system for the planning and coordination of health activities."

The following excerpt from the Commission's report indicates the need for better planning and coordination of health facilities and services in local communities—

"Manpower and facilities for the delivery of top-quality health care are in short supply in virtually every community. Therefore, the efficient use of existing resources is imperative. Yet in many communities the reverse is actually the case. Instead of coordination, there is duplication of services and facilities in some areas, while serious gaps exist in others.

"There may be several large general hospitals, furnishing more beds for acute care than can possibly be utilized by the community, while serious shortages exist in beds for long-term care and programs for the those patients who can best be cared for in their own homes. Several hospitals may possess costly equipment—such as cobalt devices for cancer care, or heart-lung machines—each being used only once or twice a week. Teams of highly skilled people required to work with this equipment are also standing idle.

"A beginning response to these problems can be seen in a few of the Nation's more progressive and active communities.

"Such endeavors are of the utmost importance if we are to realize our aspirations for programs that will have maximum impacts on heart disease, cancer, and stroke. Independent and often competing activities of hospitals, health departments, and medical practitioners—each working in isolation and often at cross purposes—are not in the best interest of the consumers of health services, the health profession, or the Nation."

I gained the impression from my 3 years association with the Public Health Service that one of the greatest needs in the whole health field today is for sound community planning of hospitals and other health facilities. This impression has been reinforced by my experience since leaving Government service. I have been spending a good part of my time, both before and after my retirement, in this health and hospital field. For several years I have served as chairman of the Patient Care Planning Council of Rochester and Monroe County, and also as chairman of the planning committee for the 11-county Rochester Regional Hospital Council. Thus, I have had practical experience in trying to put plans into operation. For some time I have been serving on the Federal Hospital Council. For the past 2 years I have been Chairman of the National Commission on Community Health Services, which—with grants from foundations and the Public Health Service—is engaged in a 4-year program to stimulate the organization of community health planning agencies.

Last year I was appointed by Governor Rockefeller chairman of a small committee with the difficult assignment to make recommendations for a better control of hospital costs.

So, you see, I have had an opportunity to study, as a layman, general hospital and health-care problems from several different angles and have visited quite a few cities and talked to many experienced persons in connection with these activities.

In my opinion, we have a long way to go in meeting the broad objective of providing the best of medical care, including preventive care, to the population, regardless of income. Due to the progress of medical research and medical science, we have learned much in recent years, but our problem now is to apply widely the information we already have. To meet this objective, we probbaly will have to spend a higher percentage of our gross national product on health and medical care than we have in the past. It is now 6 percent, compared with about 4 percent 20 years ago. The trained health manpower will be limited for some years, although the potential manpower will be adequate. Hence, it is necessary for all those engaged in this health field to make every effort to conserve resources and the scarce manpower, and to get the most effective use from both through the elimination of waste, unnecessary duplication, and to adopt the most progressive management methods.

People are naturally greatly concerned over the sharply rising costs of hospitalization—in New York State daily hospital charges have risen at an average of 8½ percent per year during the last 4 years. A high percentage of this increase in cost has been due to uncontrollable items, such as hospital wages and salaries catching up with those in other fields, more expensive treatment, services, and equipment, brought on by the great advances in science and medicine in recent years, all of which require more highly trained personnel. Due to the rise in incomes and the widespread use of prepaid insurance, a larger percentage of the population are using hospitals.

One important factor in the increased cost has been the lack of planning in facilities and services which are needed to provide the various levels of care. In a typical city you will find that there is an excess of acute beds and general overutilization of the acute general hospital which, of course, is the most expensive facility; and a shortage of long-term care, extended care, and self-care facilities, which can be constructed and operated at a considerably lower cost and often better suited to the needs of the patient. The acute beds can also be relieved by greater use of ambulatory and out-patient services and organized home care.

Another cause of increased cost is the competition and lack of cooperation between hospitals, resulting in unnecessary duplication of expensive facilities and services, and scarce manpower. In many of these hospitals, with small use of the facilities, the quality of care is apt to be below that of other hospitals. In many cases, management methods of hospitals have not kept up with the great progress in business management in the field of training, development, and utilization of personnel, data processing, statistical controls, communications, etc.

To meet the situation and provide high-quality comprehensive health care, there is real need for better communitywide planning of all health facilities and services. The planning agency should be established to coordinate existing health facilities—both governmental and voluntary. It should study the actual needs in order to prevent duplication. It should study future needs in order to fill any gaps. And it should obtain community agreement on the facilities that are needed. It could minimize costly duplication of partly used personnel and see that scarce skilled manpower is used in the most effective way.

A number of examples could be cited of effective programs of coordinated community health planning, several having been financed in part by grants from the Public Health Service under the Community Facilities Act. But perhaps I should give you some practical examples from our Rochester experience.

In 1961 we organized the Patient Care Planning Council, initially to determine the allocations of funds from a joint capital campaign for the seven hospitals, and then to serve as a health planning and coordinating council for the county. With the assistance of the local medical society, we arranged for 28 physicians to make a scientific survey of the patients in about half of the beds in the hospitals, in order to determine the type of facilities they needed. We found that a substantial number of the patients did not, for medical reasons, need to be in an acute general hospital but could have been taken care of in out-patient departments, extended-care, long-term, or self-care units, doctors' offices, or at home. As the result of this study, we reduced considerably the number of acute general beds the hospitals had requested. Instead, three hospitals will construct so-called extended-care units for the convalescence and rehabilitation of patients who do not need all the services given in the acute beds—the units to be constructed and operated at a much lower cost. As the result of these changes, we were able to devote a much larger part of our funds for modernization, replacing several old buildings with modern wings and equipment.

After the successful capital campaign, we continued our efforts to coordinate the health facilities to provide better health care with less duplication and work. Much had previously been accomplished in obtaining cooperation of the hospitals by the regional hospital council and of the health agencies by the council of social agencies.

With the combined efforts of the councils, the hospitals, physicians, and health agencies, the following has been accomplished in recent years:

The hospitals have participated in joint purchasing for a number of years;

The hospitals agreed upon the most urgent needs for two capital funds after thorough study;

The county medical society encouraged hospitals to organize utilization committees;

Five hospitals are constructing a centralized laundry, with borrowed funds to be amortized from charges, rather than use funds from the community capital drive;

The council worked out a program for transfer of the municipal hospital to the University of Rochester Medical Center, with savings to the city;

The council obtained agreement to abandon County Tuberculosis Hospital with transfer of patients to nearby State hospital with available beds, with considerable savings to the county;

The council is now working out an agreement between the county and the medical center for medical care of patients in the county infirmary;

An organized home-care program has been developed for patients transferred from hospital;

A mental health council has been organized to coordinate the activities of agencies in the mental health field, including the integration of the State hospital;

The council arranged for one general hospital to add in-patient psychiatric unit and to combine with three agencies to set up and operate an out-patient clinic;

Based on a bed survey which indicated that 30 percent of its medical and surgical patients could be taken care of in a self-care unit, one hospital is converting part of its facility for such a unit. It is estimated that the operating cost per bed will be reduced by 38 percent.

The council is now endeavering to develop a program for coordinating use of special laboratory equipment;

The community college has established a preclinic nursing course for the first year of the hospital's diploma school program and a 2-year associate degree course. One hospital abandoned plans to construct a new nurses dormitory and its diploma school program.

The council is now developing a long-range plan for health facilities in the community.

We still have much to do.

It is difficult to measure the improvement in health or the dollar savings resulting from these activities to obtain better control of hospital construction, facilities, and utilization, and closer cooperation of various health agencies. I have, however, made three comparisons between Rochester and three other New York cities—Buffalo, Syracuse, and Albany. The Blue Cross agency in the Rochester area covers 73 percent of the population compared with 40 percent in the three other cities. The in-patient-days per thousand Blue Cross members in 1963 for the three other cities were considerably above Rochester. The combined Blue Cross and Blue Shield premium in these three cities was also considerably above that of Rochester.

From my experience, I am very optimistic over the possible accomplishments by community health planning councils. We are hoping that the findings of the National Commission and the experiences of the few communities which are doing a good job will stimulate many communities to set up such councils.

The "medical complexes" proposed by the President's Commission would become a valuable part of a community health planning and coordinating council. For example, the University of Rochester Medical Center has been very helpful in our planning efforts and already has an affiliation with three community teaching hospitals. Only recently, the Center completed arrangements with one of the hospitals under which one of the faculty members will be the full-time chief of medicine at the hospital, with reimbursement for his salary to the Center. This will enable the hospital to attract interns and residents who can be rotated to the medical center, and be helpful to both institutions in their training and research activities. If similar arrangements could be made for several staff officers in all the teaching hospitals, and if the other plans contemplated in the "medical complex" proposal were adopted, there would be great opportunity for improvement of medical care in the community. There would be closer cooperation between the hospitals and less likelihood of unnecessary duplication of expensive special facilitieis, which could be concentrated in the Center where better care could be provided. There would be better opportunity for the staff in the other hospitals to keep in touch with new knowledge and practices, and for attracting more physicians to the seminars and special classes and lectures at the Center.

I therefore see how a "medical complex" would be of great value to us in the Rochester community. It would also be helpful in the 11-county area, where we are now conducting a demonstration project for areawide planning, under a grant from the Public Health Service.

I would, therefore, heartily endorse Senate bill 596, which would authorize grants to communities for setting up such "medical complexes." For communities which are not as far along as we are in Rochester, funds would be provided to develop a plan and to set up the planning council.

I have a few comments on the provisions. It would seem to me that there should be specific provision that the local health department be included in the local council supervising the program. I assume they would be, anyhow. Should not the State health department be brought into the picture, also, at least on a consulting basis?

As far as expenditures for construction are concerned, should it not be specified that they be coordinated with the Hill-Burton and other Federal-State plans?

As these complexes are intended to be demonstration projects with the presumption being that Federal grants will be made only for a limited period, should it not be indicated that 10 percent specified for local contribution is intended as a minimum and that greater local contribution is contemplated in most cases? If substantial contributions are not obtained, it may be difficult to continue the project when the Federal grants close.

Thus it is important that the provisions be kept broad, as they are, particularly in the provisions of other major diseases, and that the medical schools be given all possible freedom to develop their own programs of education, patient care, and research, and that flexibility be permitted for communities.

A sound growth of medical complexes would, of course, require many more highly trained doctors, who are already in short supply. It is thus very important that Congress consider the several measures advocated by the Commission to increase trained medical manpower, such as expansion of the Health Profession Education Act of 1963 and the Nurse Training Act of 1964, provision for a program of Federal scholarships for talented medical and dental students in need, as originally included in the health education bill, and increase in the career programs of the community colleges for training medical and dental technicians.

I would also suggest that action be taken on the Commission's recommendation that there be an additional program of "grants to communities to stimulate the development of a system for the planning and coordination of health activities."

Mr. FOLSOM. I would like to read an excerpt from the Commission's report.

The CHAIRMAN. All right, sir.

Mr. FOLSOM. About the better planning and coordination of health facilities in local communities; it reads:

Manpower and facilities for the delivery of top-quality health care are in short supply in virtually every community. Therefore, the efficient use of existing resources is imperative. Yet in many communities the reverse is actually the case. Instead of coordination, there is duplication of services and facilities in some areas, while serious gaps exist in others.

There may be several large general hospitals furnishing, more beds for acute care than can possibly be utilized by the community, while serious shortages exist in beds for long-term care and programs for those patients who can best be cared for in their own homes. Several hospitals may possess costly equipment—such as cobalt devices for cancer care, or heart-lung machines—each being used only once or twice a week. Teams of highly skilled people required to work with this equipment are also standing idle.

A beginning response to these problems can be seen in a few of the Nation's more progressive and active communities.

Such endeavors are of the utmost importance if we are to realize our aspirations for programs that will have maximum impacts on heart disease, cancer, and stroke. Independent and often competing activities of hospitals, health departments, and medical practitioners—each working in isolation and often at cross purposes—are not in the best interest of the consumers of health services, the health profession, or the Nation.

I gained the impression when I was down here with my 3-year association with the Public Health Service that one of our greatest needs in the whole health field was sound community planning of hospitals and other health facilities.

This impression has been reinforced by my experience since leaving Government service. I have been spending a good part of my time recently in the health and hospital field.

For several years I have served as chairman of the patient care planning council in Rochester and also chairman of the planning committee for the Rochester 11 county regional hospital council. So, I have had practical experience in trying to put these plans in operation.

I find a number of cities have nice plans but very little has been done about putting them into operation. I have also been serving on the Federal Hospital Council here which makes grants under the Community Facilities Act to communities to assist in its planning efforts.

For the past 2 years I have been chairman of the National Commission on Community Health Services which, with grants from foundations and from the Public Health Service, is engaged in a 4-year program to stimulate the organization of community health planning agencies.

Only last year I was appointed by Governor Rockefeller as chairman of a small committee with a difficult assignment to make recommendations for better control of hospital costs. So you see I have had an opportunity to study as a layman these general hospital and health care problems from several different angles.

I have visited quite a few cities and talked to quite a number of experienced people in this field.

In my opinion we have a pretty long way to go yet in meeting the broad objective of providing the best of medical care including preventive care to the population. Due to the great progress we have made in medical research and medical science we have learned very much in recent years but our problem now is to apply widely the information we already have.

The trained health manpower, which our manpower committee studied, will be limited for some years. It is going to take some time to train enough people to do an ample job. Hence, we have got to do what we can to conserve our scarce manpower and also conserve our resources, which means we ought to get rid of as much waste as we can, unnecessary duplication, and adopt the most progressive management methods for the hospitals.

HOSPITALIZATION COSTS

People are very greatly concerned now about the sharply rising costs of hospitalization. In New York State we find that the daily hospital charges are rising at the rate of 8½ percent a year. That is the average of the last 4 years. A high percentage of this has been due to uncontrollable items because we must catch up in wages and salaries with other fields. We have had to use much more expensive equipment. We have much more highly trained manpower in order to take advantage of all the advances which have been made. Also, many more people are using hospitals than before because of the increasing standard of living and the widespread use of prepaid insurance.

On the other hand, one important factor in this increased cost has been the lack of planning of facilities and services which are needed to provide the various levels of care. As the Commission pointed out in this extract I just read, in a typical city you will find an excess of acute beds, the most expensive type of facility, and general overutilization because of the lack of other types of facilities such as long-term care, self-care facilities. These other facilities could be operated at considerably lower cost and also constructed at a lower cost. In many cases they are better suited to the need of the patient.

Also the ambulatory and outpatient services can be used more, also greater use can be made of organized home care.

Another cause of increased costs is the competition and the lack of cooperation between hospitals resulting in unnecessary duplication of expensive facilities, and also duplication of scarce manpower.

Now, in many of these hospitals with a small use of these facilities, the quality of care is probably below that of the other hospitals.

We also find that in many cases management methods of hospitals have not kept up with the great progress of business management such as in the field of training and development and utilization of manpower, data processing, statistical controls, communications, and so forth.

COMMUNITY HEALTH PLANNING

To meet this situation and provide a high quality of comprehensive health care, there is a real need for better communitywide planning of all health facilities and services in the community.

Now, a planning agency should be established to coordinate the existing health facilities, both governmental and voluntary. They should study the needs of the communities and try to make plans for future needs to try to fill in the gaps and should minimize costly duplication of partly used personnel and see that scarce skilled manpower is used in the most effective way.

A number of examples could be cited but I thought you might be interested in what we have been able to do in Rochester as a practical application in the last few years. We have had in Rochester for a number of years a regional hospital council which was financed a number of years ago by one of the foundations. We have had the experience of cooperation between the hospitals which has not existed in other communities.

In 1961 I was asked to be chairman of an allocation committee to allocate the funds which we were going to raise for a capital drive for the hospitals. I found that the request was going to be several times more than I knew we could raise. As chairman of the allocations committee, I felt I would have to make most of the decisions; as the other members of the committee were representatives of the hospitals. We organized a patient care planning council with the top people in the community, the president of the medical society, the head of the Community Chest, and the Council of Social Welfare Agencies, etc., as members of the committee.

The first thing we did was to make a survey of a thousand beds, selected on a scientific basis, to be studied by a group of 28 doctors brought together by the medical society to study the patients, the needs of the patients in those beds, and to see what type of facilities they needed.

We found that as far as the medical patients were concerned 23 percent of the patients occupying these acute general beds shouldn't have been there. They should have been in other types of facilities or at home. As a result of that we decided we didn't have to expand the acute beds of the city as much as the hospitals had recommended. We cut down their request considerably.

Instead of that, three hospitals are putting in what we call extended care units, for people needing rehabilitation, convalescent services, people not quite ready to go home—but who do not need the services of an acute hospital. We think the units can be built at half the cost. We used a motel-type construction and operated at half the cost of acute beds.

As a result of that we were able to use a good part of our money for modernization. We tore down five or six old buildings and are putting up new buildings with modern equipment and getting more for our

money. This is a joint hospital drive, by the way, that all the hospitals got together on.

In most cities each hospital is on its own. As a result they are apt to duplicate facilities and add the type of beds not needed rather than modernize existing facilities.

Now, I thought you might be interested in the other things we have been able to accomplish; so I am going to read a list of what we have been able to do in the last few years with the help of the medical societies, the medical school, the regional hospital council, and the Council of Social Agencies.

The hospitals have participated in joint purchasing for a number of years. The hospitals agreed upon the most urgent needs for the two capital funds drives we have had in the last 10 years. The county medical care for the patients in a county infirmary where we find that committees. Five hospitals are constructing a centralized laundry with borrowed funds to be amortized from charges rather than use funds from the community capital drive. The council worked out a program for transfer of the municipal hospital to the University of Rochester medical center with savings to the city. The council obtained agreement to abandon the county TB hospital and transfer the patients to a nearby State hospital that had plenty of beds available thus effecting a large savings to the county. We are now working on an agreement between the county and the medical center to provide medical care for the patients in the county infirmary. We find that the quality of medical care is very low in the infirmary and this will greatly improve it.

Organized home care has been developed for patients transferred from hospitals. We found half of these didn't need to go in the hospitals and we can provide that care at $10 a day compared to $40 a day in the hospital.

A mental health council has been organized to coordinate the activities of agencies in the mental health field, including integration of the State hospital in the community with 3,000 beds.

The council arranged for one general hospital to add an inpatient psychiatric unit and to combine with three agencies to set up and operate an outpatient clinic.

Based on a bed survey which indicated that 30 percent of medical and surgical patients could be taken care of in a self-care unit, one of the hospitals is converting part of its facilities for such a unit. We can operate that at about a reduction of 38 percent over the acute beds.

We are now endeavoring to develop a coordinated program for the use of special laboratory equipment.

Our community college established a preclinic nursing course for first year of the hospital's diploma school program and 2-year associate degree course. The results of that were that one hospital abandoned plans to construct a million-and-a-half-dollar nursing home dormitory and its diploma school program.

We also are now developing a long-range plan for health facilities of the community. We still have quite a little to go but we are getting fine cooperation in bringing about these various improvements in the health care and cutting out duplication.

It is difficult to measure the value of this and the dollar savings but because of the better control we have had of hospital utilization

and closer cooperation I made a comparison with Rochester and the three upstate New York cities who haven't done much in this field—Buffalo, Syracuse, and Albany. I find that the Blue Cross agency in Rochester covers 73 percent of our population as contrasted with these other cities where only 40 percent are covered.

The inpatient days per thousand of Blue Cross members shows the utilization of the hospitals in these three other cities is considerably above that in Rochester. The combined Blue Cross and Blue Shield premium in these three other cities is over 40-percent higher than that of Rochester.

From my experience I am very optimistic, therefore, of the possible accomplishments from these community health planning councils. We hope to get the findings of the National Commission and experiences in a number of communities will stimulate many other communities throughout the country to set up these councils.

Now, in getting down to this legislation, these medical complexes proposed by the President's Commission will become a very valuable part of a community health planning and coordinating council.

For instance, in the Rocester area, the University of Rochester Medical Center has been very helpful in our planning efforts. Only recently the Center completed arrangements with one of the hospitals under which one of the faculty members will be the full-time chief of medicine in this hospital with reimbursement for his salary to the center. This will enable the hospital to attract internes and residents who can be rotated to the medical center.

SOLVING STAFF PROBLEMS

One of the difficulties of many hospitals now is they can't attract internes, but by a tie-in with the medical center it will be much easier. This is also going to help both institutions in training and research activities.

If a similar arrangement could be made as we contemplated in these medical complexes so there will be several staff officers in these community hospitals furnished by the medical center, and with the other plans, there would be better medical care in the community. There would be closer cooperation between the hospitals and less likelihood of unnecessary duplication of expensive equipment which would not be used very much in these other hospitals.

There would be a much better opportunity for the staff in other hospitals to keep in close touch with new knowledge that a medical center would have. You could have also more physicians interested in continuing courses given by the medical center. So I can see where a medical center would be of great value to us not only in Rochester but in the whole Rochester area, in the 11-county regional hospital area which we are engaged in planning for.

I would, therefore, heartily endorse this Senate bill 596 which would authorize grants to communities for setting up medical complexes and these coordinating and planning committees.

SUGGESTED AMENDMENTS

I have only a few comments to make on the provisions of the bill. It would seem to me that there ought to be specific provision that the

local health department be included in the local council super the program. It probably would be included but I think it ou be specified.

Also there is no reference at all to the State health departmen seems to me they at least ought to be brought in on a consulting so they could advise the authorities where these complexes sl be located and help bring about the community health coordin committees.

Also, I think it ought to be specified that these expenditure construction should be coordinated with the Hill-Burton and Research Facilities Acts and other Federal-State plans. In o words, there ought to be a pretty close coordination so you won't unnecessary duplication. I think it ought to be specified in the that this should be brought about.

As these complexes are intended to be a demonstration project m or less for a limited period, I wonder whether we shouldn't ask more than 10-percent contribution from the local communities. specify here it should be at least 10 percent but I think we ought indicate that that should be the minimum and we ought to try to more, otherwise when the demonstration is over there might not any funds available in the local communities. I think we can rea that on a gradual basis.

I agree that it is wise to have these provisions quite broad as th are in the bill because much should be left to the medical schools. Th ought to have all sorts of freedom to develop their own programs c education, patient care research. Also, we ought to allow much flex bility for the different communities.

We are finding in the work of this National Commission of ours tha the organizations vary quite widely in different communities, depend ing on the size of the communities and how they are organized an how different groups get together so I would certainly endorse keeping this as flexible as possible.

NEED TO EXPAND MEDICAL MANPOWER

Now, of course, this means, if you have a wide growth of these medical complexes, you are going to have to have more highly trained doctors and already they are in short supply. So I think it is important that Congress consider the several other measures advocated by the commission to increase the trained medical manpower such as the expansion of your Health Profession Education Act of 1963 and the Nurse Training Act of 1964.

Now, our manpower committee also thought, and I certainly agree, that we ought to provide Federal scholarships for talented medical and dental students in need. That was in the original provisions of the health education bill but it was dropped out. It is badly needed because we find that a large percentage of the students in medical schools come from families with income of over $10,000. A lot of good potential material is in the other groups we are not tapping now. I would think these scholarships would be very, very helpful in that area.

Also I think we should expand our program for grants to communities to stimulate the development of these planning and coordinating committees.

Thank you very much, Mr. Chairman.

The CHAIRMAN. Thank you, Mr. Folsom, for your most interesting and informative statement. We appreciate it very, very much.

Dr. DeBakey?

Dr. DEBAKEY. I also want to express my thanks to Mr. Folsom for his testimony here.

Next, I would like to ask——

The CHAIRMAN. Senator Kennedy?

Senator KENNEDY of New York. I understand Mr. Folsom has to leave. Could I ask him just one question? I thought your statement was very helpful and interesting. I was just wondering based on your experience and the efforts that you made in this field, could you just tell us what you think the relationship between the centers and the stations to NIH and the Public Health Service should be?

RELATIONSHIP WITH NIH

Mr. FOLSOM. Well, I have been thinking lately about how the tieup ought to be here. The NIH now deals with the medical schools all the time on research, and the Bureau of State Services is dealing with medical schools also, I understand, under the Research Facilities Act. It also makes grants to hospitals and communities for planning and demonstration projects under the Community Facilities Act.

There ought to be pretty close tie-in to the agency that now is concerned with making grants for community planning and coordination of health facilities. The local group should be slanted more toward bringing research knowledge to the other hospitals and the physicians rather than be concerned so much with research.

So, I would think it might be better tied in with the State service organizations, in the Public Health Service, rather than NIH, although there should be a close relationship.

Senator KENNEDY of New York. The emphasis really should be then on making sure that the information that is uncovered and which was mentioned earlier brought to the attention of the local doctors and to the local communities so that they can utilize it, is that the thrust of this legislation?

Mr. FOLSOM. Yes; that is the main purpose of it. We have a lot of information and knowledge that is not being generally used. It is pointed out that if we can only use the knowledge we have a lot of lives could be saved. This is a mechanism, a suggestion, of the best way of getting that knowledge out to the communities.

From my experience, I think it could be done. It would be very helpful and could be done fairly rapidly, too, in communities already set up to do it. But there are so many communities that haven't made much effort in planning so a good part of this money the first year will go for planning to getting agencies set up and instructed on how to go about it.

Then they could actually set the stations up and most of the stations would be located, of course, in existing community hospitals. The university medical center would serve as the base and as a regional center. I think that is what we contemplated.

Senator KENNEDY of New York. Thank you very much.

The CHAIRMAN. Senator Yarborough?

Dr. Farber, do you want to make some comment on that?

Dr. FARBER. With your permission, Mr. Chairman, I understand what Mr. Folsom has in mind, and I agree with him certainly as Senator Robert Kennedy has mentioned that the uncovering of knowledge and getting it to the doctors is of tremendous importance here. But I would like to make a point here that I did not make clearly before, and that is that these centers will make possible the kind of medical research in clinical investigation which is not possible today on the scale that is required, not only in the field of cancer but in heart disease and in stroke, and in many other diseases, too. Research on it will be an extremely important part of this, and it is this research as well as the training which I associate with the National Institutes of Health, with the aid of any other governmental agencies or any other parts of the Public Health Service that are required, but the research must be emphasized greatly.

Mr. FOLSOM. I might say I think it is wise to leave the decision in its relationship within the Public Health Service here entirely to the Surgeon General to work out because there must be very close coordination between these two elements.

The CHAIRMAN. Senator Yarborough, do you have some questions?

Senator YARBOROUGH. Mr. Folsom, I want to comment on this recommendation for an expansion of the Health Professions Education Act and the Nurse Training Act and also your additional recommendation that career programs be stimulated in community colleges. I might add junior colleges for training medical and dental technicians to help the higher trained medical doctors and the dentists.

In the hearings on this Health Professions Education Act the testimony indicated that it took about $25,000 to educate a young doctor, and that less than 5 percent of the families of the United States were financially able to finance that education. As you pointed out, that is just automatically excluding from medical education the overwhelming majority of the people of the country unless they have outside aid.

I have a question or two back when you were explaining the coordinated action in Rochester and how much it saved there, I know two of those actions were that the council got the University of Rochester Medical Center to take over the municipal hospital, the city hospital, and you were successful in getting the State to take over the county hospital.

Apparently you did not lessen the medical treatment but the city and county there were able to shift this off to other governmental agencies.

SAVINGS REALIZED

Mr. FOLSOM. In the case of the medical center we had always had a close tie-in there. But the city was incurring quite a deficit. We were able to get the deficit wiped out before the university would take it over mainly because we got the welfare department to pay what it should have been paying all along for the welfare patients.

Senator YARBOROUGH. Now, if you get the county TB hospital taken over by the State, is this really a true figure that you saved that much?

Mr. FOLSOM. No. What we did there was——

Senator YARBOROUGH. Somebody pays for it.

Mr. FOLSOM. Thirty miles away there was a State hospital with plenty of beds available for these patients. We had been operating this

county hospital with the patient load going down steadily with no reduction in staff, in fact, an increase in staff. So the patient could be cared for at a much lower cost at the State hospital and the county really saved about a million dollars.

The State has not increased its cost anything like that much.

Senator YARBOROUGH. In other words, you are not giving this as an illustration of how one governmental unit shifts from one to another but a savings by coordinated action.

Mr. FOLSOM. Yes. This had been considered for several years but nobody had been able to do it. With the top leadership in our council we convinced the authorities what an overall savings there would be. We think we are giving better care at a much lower cost.

Senator YARBOROUGH. Thank you, Mr. Folsom; thank you, Mr. Chairman.

Mr. FOLSOM. I might say the reason I have to leave I have to testify before Congressman Celler's committee.

The CHAIRMAN. We certainly appreciate your presence, Mr. Folsom, and I want to thank you very much.

Mr. FOLSOM. I am very glad to be here.

The CHAIRMAN. Thank you, sir.

Dr. DEBAKEY. Senator Hill, before asking Dr. Wright to continue at this point, I would like to amplify just a bit some aspects of the legislation and its purpose at least as we conceive it since I think the question has been raised—Senator Kennedy raised the question a moment ago—as to what takes the major thrust of the legislation, I think it is important to recognize, first, that this legislation provides an opportunity to extend an effort and a direction of development that is already in operation, Senator Kennedy.

While it is true in a sense that this constitutes the most innovative aspects of the recommendations of the President's Commission in establishing this concept of a regional network, it is new only in that sense. It is not unrelated to programs, on-going programs. It is, I think, in fact, so closely related that it is an outgrowth of the going programs. It is the natural extension to a great degree of the developments and the fruits that have come out of the National Institutes of Health research and training activities, and the concepts of the centers which are already in operation supported by the National Institutes of Health largely thrust upon the medical community through that means.

So, this type of legislation is new only in respect to providing a further extension of this total concept. I think actually it is derived from this background of activity, and the long experience that has now developed over this period of time beginning with the establishment of the National Institutes of Health and particularly the categorical institutes in combining the research, training, and now patient care, so intimately interwoven in most centers that have been in operation that it is difficult to disassociate one from the other. The reason one can provide the highest degree of skill and knowledge in patient care in such centers is because research and training are an integral part in it.

So, I think it is important to understand this concept, that this is not just an extension of patient care and making available the best knowledge. It is not just an extension of research, clinical research, and it is not just a means of providing training. It is the best mechanism of

combining all three. Anyone who has had experience in a medic center, such as most of us, and, of course, many others whom we co sulted, has recognized the importance of this particular objective an that this is the best means of achieving this goal.

It is the best means of providing the best in research and particularl in clinical research, the best means by which it is possible to bring th knowledge gained from basic medical sciences to the bedside and t translate that knowledge into diagnosis and patient care. It is also th best means for providing training for the practitioners who will ult mately provide this care, and it is the best means of expanding the bas sciences in these general areas.

So, I think it is important to recognize that this is not just the thrus of medical care.

Senator KENNEDY of New York. Thank you. That is very helpfu I just gathered from the earlier testimony and looking into this legis lation to some extent and the background that there had beem som deficiencies in the being able to get the information which has bee developed by all of you to the bedside and to the local doctor and gather that in the field of cancer from your own testimony and I kne there had to be some emphasis on that. I didn't mean to imply thought research should be less or we hadn't been doing a great dea in any or all of these fields but I just thought we should really focu some attention on that point so it is quite understood. It is ver important.

Dr. DEBAKEY. It is very important and I am glad you did bring i out. But I just wanted to emphasize this concept underlying th centers and its relationship to the experience we have gained in thi regard.

Senator KENNEDY of New York. Thank you very much.

Dr. DEBAKEY. May I now ask Dr. Wright to present his testimony Mr. Chairman?

The CHAIRMAN. Dr. Wright.

STATEMENT OF DR. IRVING WRIGHT, CHAIRMAN, SUBCOMMITTE ON HEALTH

Dr. WRIGHT. Senator Hill, and members of the committee, it is real pleasure to be before you again. I have had the experience i previous years and I hope have made a minor contribution to you efforts in the field of health.

The Subcommittee on Heart Disease was made up of Dr. Samue Bellet, professor of cardiology at the University of Pennsylvania; D J. Willis Hurst, professor of medicine at Emory University; Dr. Pau Sanger, distinguished surgeon from Charlotte, N.C.; Dr. Taussig Johns Hopkins, with whom you are all very familiar, I am sure, fo her distinguished work on congenital heart disease; and the sta member, Dr. John Turner, who contributed markedly to the work o this Committee.

My own experience has been in practice, in the teaching of medicine and research mostly on a clinical level at Cornell University. I hav also been president of the American Heart Association and a member o the National Advisory Committee for Heart Disease for one term an for part of another term.

I mention this to indicate that I have had a rather broad experience and have been interested in these problems, not just since the inception of this Committee but during my entire professional life of more than a quarter of a century.

The Subcommittee on Heart Disease has presented to you its report. In essence this is my statement, based on the efforts of the entire Committee. I should like to summarize it and perhaps make comments on certain aspects of this report in order to conserve your time. It is all available for your perusal.

The CHAIRMAN. We will have it appear in full in the record, Doctor, in its appendix.

Dr. WRIGHT. This report has already been submitted. It is entitled "The Report of the Subcommittee on Heart Disease." This will appear in the second volume of the report of the Commission.

We are strongly in favor of general principles outlined in the bill as it has been drawn up and submitted to us. There are certain points, however, that appear to be worth while discussing.

The concept of the regional complex and the center working as a nucleus with radiated stations throughout a geographic area is involved. We hope all areas in the country would eventually be covered. This concept is a very valid one, but it is a long-term project. It is important to get it underway now because it won't be very long before we have 50 million more people to take care of in this country. We are not in our present status even in the business of preparing to take care of the total future population unless we enter into a long-term project right now. It will take planning, it will require development of manpower at every level. Physicians, of course, are the key personnel, but we must have more nurses, and more laboratory technicians. Electronics technicians are now being declared essential to medical progress, a field that medicine hasn't really done very much about developing at all. Yet the future of medicine is going to be tied into this new discipline. We need physical therapists, occupational therapists, and rehabilitationists.

We need many more trained workers in the social sciences who are sincerely interested in sick people, not in abstract theories. The plan is a broad one, and it is a long-term one. But in order to get off the ground, this type of bill must be implemented soon.

The Heart Disease Subcommittee has recommended that a total of 25 centers be established during the next 5 years. The total amount of money involved in this will be approximately $166.2 million.

This is a very conservative estimate. It has been felt by some that we were being too conservative in terms of the cost per center, but we tried to be honest in our estimations. Once a center is established, individual investigators within that center may, if they wish, apply for special research and other grants which would supplement the basic grant once the center organization is ready to use extra funds to advantage.

The Heart Disease Subcommittee felt there was a need for 160 new heart stations. The concept of the station as adopted by the entire Commission really came from the development of heart stations in many hospitals during the past 15 or 20 years.

So, this is not an idle dream. Stations are, in fact, in operation in many centers, including Cornell. They have served as a nucleus for

stimulation and interest, much better care of the patient, and continuing education to the doctors on the staff who are not heart specialists. They come to the station to see the electrocardiograms, to discuss the problems of the patient with the specialists working in the station. This is a most important form of continuing physician education and is vitally important.

In terms of the question that Senator Kennedy addressed to Mr. Folsom, it is my belief that the centers and the regional complexes would best be related directly to the NIH, because they are going to be vitally concerned with research projects, and the NIH organization is experienced in this.

The CHAIRMAN. Doctor, if I might interrupt, isn't what you are proposing in a sense an addition to the programs we have conducted through NIH?

Dr. WRIGHT. This is correct.

The CHAIRMAN. Building on and enlarging them?

Dr. WRIGHT. This is correct.

This implies a need for NIH to be reoriented so that there will be more interest and more support for care of patients and for the training of local physicians into this program. Otherwise, the NIH program has been superbly administered in the past. This new concept should be developed to a greater degree.

The stations that are located in major centers should probably be under NIH, but stations out in the rural and small community areas may be, for practical purposes, oriented to the Bureau of State Services of the heart disease control program. Here there will be an absolute need for a cooperative effort working with the volunteer agencies such as the American Heart Association to coordinate the facilities in the area and devleop stations of the highest possible standards.

This Committe has also recommended development of laboratories at a State level for the standardization of certain types of laboratory tests, such as the culturing of streptococci in the rheumatic fever programs (not available generally but terribly important) or the standardization of prothrombin tests to aid in the control of anticoagulant therapy. This bill should be broadened to include these laboratories for standardization. They should frequently be closely coordinated with stations at local levels.

The stations we contemplated, 160 in number, would start with 30 the first year at a cost of $11¼ million. The total over 5 years would be estimated to cost $117,500,000. That is a 5-year project, and it is contained in the report of the Commission.

It is vitally important, that the practicing physician be made to feel important in this program. He should be graded up, not graded down, and his continuing education and participation is essential to the success of any program of this nature. If we do not succeed in fostering his education, if we do not keep it constantly up to modern scientific ideas, he will soon become obsolete, even though he goes through the motion of practicing. This we must avoid in any such program, therefore, grants to the community hospitals to continue live, active educational programs are essential to the fulfillment of this program. We are trying to get modern care to the patients. How do we achieve this? It must be through the local physicians. This is important. It should be emphasized and it should never be forgotten for one moment.

The CHAIRMAN. Doctor, Senator Javits advises me he has another meeting that he must attend, and he is going to have to leave us, and he has a question or so he would like to ask you.

Dr. WRIGHT. Yes, sir.

Senator JAVITS. Doctor, may I apologize, but the immigration subcommittee on which I sit is having its opening hearings on immigration right now with the Attorney General. I would like to join my colleague, Senator Kennedy, in welcoming the New York members of the panel. I understand he did that when he introduced you to the subcommittee, which I greatly appreciate and ask you just these two questions.

One, it seems to me that the bill does not go as far as the report, and in terms of the facilities which are to be created.

Nonetheless, is the panel favoring the bill as being the best in this imperfect world, or does the panel feel, if any of us are so minded, that we should insist on bringing the bill up to the report?

Dr. WRIGHT. In answer to that question, I believe that there are certain aspects which—some of which, I have already mentioned—which should be included in the bill, and which are part of the recommendation of the Commission. I think that we must strengthen it in some aspects. For example, we need more finances for training. If we don't train people we will not have the manpower to man this program. They run parallel. Mr. Folsom also made one or two suggestions which I thought were worthy of considerations by the committee.

Senator JAVITS. We will go over the testimony and take very seriously the areas in which you feel the bill needs to be upgraded. I certainly will and I am sure others will.

Dr. DEBAKEY. Senator Javits, may I simply state after 9 months of study by this Commission, and these are all members of this Commission, of course it is perfectly natural for us to feel that the bill is deficient in the areas in which it did not meet the Commission's recommendations, and I would say very definitely to you in answer to your question that we would like to see the bill conform more closely to the recommendations of the President's Commission.

Senator JAVITS. May I make a suggestion, gentlemen. After reading your testimony if you find that you have not sufficiently, in your judgment, pinpointed exactly the items with reference specifically to the bill that you feel ought to be amended, it is requested that you put in writing a memorandum specifically pinpointed to the sections of the bill as to what you believe should be done. I ask unanimous consent, Mr. Chairman, that this memorandum may be made part of the testimony.

The CHAIRMAN. Without objection that memorandum will appear in the record, including your testimony this morning.

Senator JAVITS. I have just one other question.

I am very deeply interested as others of us in the question of narcotics addiction. Did the Commission give any consideration to how any work in narcotics could be tied into their efforts?

For example, was such consideration given either as to research or as to any combination of research and clinical training or any combination of research and outpatient training? One of the appalling things about narcotics addiction is that mighty little is being done about the

basic question of either cause or cure, and I just wondered whether you gentlemen gave that any consideration.

Dr. WRIGHT. I don't think anyone with any knowledge of medicine or knowledge of what is going on in the world today could say anything but be in complete agreement with your statement of the importance of narcotic addiction.

The Commission did not consider this as one of its items because the Commission as given to us by President Johnson was specifically for heart disease, cancer, and stroke.

It is true that people with cancer and people with some types of vascular diseases have so much pain that addiction is something that we have to guard against at all levels, and I think most physicians do. But there is not the real essence of the problem of narcotics, and I think this should be a matter of a separate bill and a separate study of major importance, if I may say so.

Senator JAVITS. Thank you very much. Thank you, Mr. Chairman. I deeply appreciate your courtesy.

The CHAIRMAN. All right, Doctor.

Dr. WRIGHT. I was discussing the relationship of training to research problems. I would like to mention here, if I may, just one section of our report. This is on page 14 and thereafter, in which it points out that the NIH budget has only been increasing at the rate of 4—or a little more—percent per year. The National Heart Institute budget was decreased by $15 million last year.

I would like to place in the record that an increase of 4 to 6 percent in the budget per year for the development of a really aggressive research program is completely unrealistic. This is what it costs to keep what you have going. Once you are embarked in a research project as I have been, and Dr. DeBakey and others in this group, you find out that the cost of equipment is going up, and the cost of salaries goes up—more than this; annually you fight to have well-trained people. They have to be paid more as years go by just like everyone else in industry or professional life. Therefore, 4 to 6 percent is a totally inadequate addition. The estimates of the Advisory Heart Council, a most authoritative body, runs considerably higher, closer to 20 percent. That is required at this point when we are trying to develop a national program of this magnitude.

The fact that the National Heart Institute has been budgeted in such a way that training programs have been markedly curtailed instead of being increased is a matter which should be completely revised. A marked increase in training grants should immediately be authorized.

The trainee programs and research fellowship programs of the NIH have been confined primarily or almost completely to those who are training for basic type research. Now we are going to need a very large number of physicians who are trained for clinical or applied research and the care of patients in the special areas of heart disease, cancer and stroke. Therefore, we should emphasize the importance of establishing funds for clinical traineeship so that we develop thoroughly well trained teachers and practitioners in these areas to take position of leadership in stations and in centers

The CHAIRMAN. Doctor, I think you will find that the National Institute on Mental Health has carried on this very training you speak of.

Dr. WRIGHT. Yes, sir; they have.

The CHAIRMAN. But they have not done it in the Heart Institute; is that correct?

Dr. WRIGHT. That is correct. The Heart Institute, the Cancer Institute, and the National Institute of Neurological Diseases and Blindness ought to really move in on this and take steps to produce some topflight personnel.

The Commission also recognized the need for developing scholarships for young men who want to go into medicine. I want to second that heartily. The development of the doctors of the future should not be on the basis of family finances, it should be on the basis of the capability of the individual. This, however, should not be on the basis of grades alone but should also include consideration of evidence of character suitable for the exacting standards of this profession.

When they succeed in getting through the medical school they also face the need for specialized training to be leaders in these major fields that cause more than 70 percent of the deaths in this country. We have to provide manpower if we propose to develop great facilities. This is vital.

The CHAIRMAN. I would certainly agree with you, Doctor, and I think for the record I should say that in the last several years the Congress has appropriated more money for NIH—for the Institutes, and the NIH—has invested, shall I say, more money than has been used—they have had surpluses; the cause of those surpluses I am not prepared to go into at this moment but we have given them more money than they have used in the last several years.

Dr. WRIGHT. Yes, sir. This is true in a sense but the Bureau of the Budget gets into the act.

The CHAIRMAN. Undoubtedly; yes, sir.

Dr. WRIGHT. And the NIH does not actually have as much money to use as Congress appropriates and intends to be used for this purpose.

The CHAIRMAN. You speak of a very important factor when you speak of the Bureau of the Budget, Doctor.

Dr. WRIGHT. Yes, sir.

The CHAIRMAN. Very important.

I just want to make the record clear, though, that Congress had appropriated these funds that had not been expended.

Dr. WRIGHT. Yes, sir.

The CHAIRMAN. I like the word invested. You would agree with me?

Dr. WRIGHT. That is a very good word.

The CHAIRMAN. Invested.

Dr. WRIGHT. May I make two further points and then conclude my statement, sir?

The CHAIRMAN. Yes.

Dr. WRIGHT. One is that I do believe that we must at this time implement in every way the development of programs in communication. The medical profession is literally overwhelmed by the thousands and thousands of medical articles that appear monthly in this country and abroad. Some of them aren't worth reading but many of them are and to particular individuals they are the lifeblood of intellectual progress.

Therefore, we must develop a way to resolve this problem into a crystallized form so that the physician or medical scientist at every level can get the meat out of the total mass of material that is published.

And lastly, I speak particularly for Dr. Helen Taussig in this but I am in complete agreement, more interest must be shown in the development of animal research facilities.

In the past animal research has too often consisted of housing the animals in a shed or a barn under very poor conditions. They develop all kinds of diseases. Frequently nobody knows what the diseases are except they kill off a lot of experimental animals often ruining great research programs. Some of the diseases are known, many are not understood. It is high time that in our program development we must allow funds for modern animal care. If we are going to carry on research with animals it is no good if half the control animals die off because they get infected, in unsterile quarters.

I now conclude by pointing out that what is learned elsewhere in the world in medical research can be applied to American citizens. Therefore, international research and international relations in the field of medical sciences is absolutely essential for us to get out of the world's total information the maximum benefit that can be applied to the American public.

Thank you very much.

The CHAIRMAN. Thank you.

Dr. DEBAKEY. Thank you, Dr. Wright.

I would like to now call on Dr. Rusk to testify next.

STATEMENT OF HOWARD A. RUSK, CHAIRMAN, SUBCOMMITTEE ON REHABILITATION, PRESIDENT'S COMMISSION ON HEART DISEASE, CANCER, AND STROKE

Dr. RUSK. Senator Hill and gentlemen, I, too, am grateful for the privilege of testifying before your subcommittee. I was Chairman of the Rehabilitation Subcommittee and on my Committee were Mr. Folsom, and Mrs. Harry S. Truman.

We met with every other subcommittee in addition to many hearings with specialists from all over this country.

We were told by President Johnson that this Commission should investigate the problems of heart disease, cancer, and stroke in three areas: research, training, and service. My particular interests and that to which rehabilitation is dedicated is service to the patient—somebody who has been too late for research as far as he is concerned. Our program is designed to train him to live the best life he can with what he has left. As you well know, in this modern concept, this program started in 1943 with the amendment to the old Vocational Rehabilitation Act, and has grown very rapidly during the past decade because of the great understanding and support of the Congress in this program.

The most heartening thing to me personally that came out of this Commission report was the fact that every subcommittee unanimously said that any complex or station has to be underpinned by a comprehensive rehabilitation service for the benefit of the patients who have

reached maximum improvement and for whom prevention has not been possible.

In order to provide this, the Subcommittee addressed themselves to this broad problem—to a review of what we have and what we would need—to provide these services over the next 5 years.

I would like to give three short illustrations. Rehabilitation in cancer has been sadly neglected in the past. The numbers rehabilitated under the Federal-State vocational rehabilitation programs have been infinitestimal because we have been so concentrated on the needs in orthopedic and neurological problems.

One evidence of the great need of rehabilitation for the cancer patient is that the colostomized patients formed an organization called Colostomies Anonymous in order to share with each other the knowledge they had gained the hard way.

We had this brought to us very vividly within the last 4 weeks in our own institute when two patients were referred to us by Memorial Hospital. They were said to be the second and third patients in medical history to have survived an operation known as hemicolectomy. These individuals had cancer of the bladder that had spread into the pelvis and they were given one of two alternatives—3 months to live in pain, or an operation that, if the disease had not spread to the upper glands, then half of the body would be amputated just above the pelvis.

The first man, a presser and tailor, chose to be operated and half of his body was amputated. He survived and he came to us about 4 weeks ago. He is now sitting up in a special plexiglass shell. He works in the gymnasium 2 or 3 hours a day. My prosthetic colleagues tell me that they feel that legs can be made for him so that he can ambulate, drive a car, and the head of his union has already promised him a job.

The second came to us 2 weeks ago, a 42-year-old schoolteacher with the same condition, who also survived and who we think can be rehabilitated back into life again.

In rehabilitation of stroke cases we have had considerable experience. We can't rehabilitate an individual with such brain damage he can't remember today what he was taught yesterday, or those with such severe heart damage that they can't take on the added exertion, or those with uncontrollable malignant hypertension. But take the rest, and the answer is "Yes." A recent analysis of 3,000 patients has shown that 87 percent can be taught to meet the needs of daily living, and 35 percent can do some kind of gainful work and the average age of this group was 63.

We are very heartened by what can be done for these patients and the same is true of the patients with heart disease.

Our program comes on after the stitches are out and the fever is down, when the patient recovers from his coronary and has to go back to a new job. We feel that we can be a halfway house to find out what he can do within the limits of his cardiac capacity so that he can't harm himself but become a productive citizen.

I think in the past it has been demonstrated many times that rehabilitation, which we now talk about as the third phase of medicine is not only good medical and social practice but it also is sound economically because we have been able to show over and over again

that for every dollar invested $5 come back in Federal income tax alone in the first 5 years after the individual was rehabilitated. W have been able to show the same thing in hospital costs which we fundamental to Mr. Folsom's presentation—that a large number these individuals can be gotten out of acute hospital beds, moved other facilities or taken home, taken care of at home with a fracti of the cost.

In order to provide these services, the commission made seve proposals, divided into two sections. One group will require n legislation, including a new program of project grants to pay part the costs of projects to expand vocational rehabilitation programs wi the objective of increasing the number of handicapped persons v cationally rehabilitated.

Now, President Johnson in his health message pointed out that la year we broke the record and rehabilitated 120,000 disabled perso That is great. It was 40,000 in 1945. "My 1966 budget will propo increased funds to rehabilitate an additional 25,000." That is wo derful, too, but when you realize there is a backlog of more than 2 m lion and when we get 250,000 new cases a year you can see that are not making great progress very rapidly, and this is primarily d to the fact we don't have the people and we don't have the faciliti

The other points requiring new legislation I will summarize: T first would allow us to take patients 6 months or longer to try determine their rehabilitation potential. You can't examine peo and in 3 days or 30 days tell who can and who can't. This is a re tively simple thing which would, I think, get a great many peo back into productive life again.

Then grants for construction of rehabilitation facilities and wo shops, and last an authorization for Federal financial participation activities which are financied by local public funds as well as St public funds, which we feel would broaden the base of this progr tremendously.

The price tag on the program recommended under present law, expand programs to reach more heart disease, cancer, and stro victims, would come to $12½ million a year, or, around a $78 milli total with gradually increasing increments over a 5-year period. U der the new legislation I have outlined, it would require $10 million t first year, and $15 million for 4 successive years or a total of $1 million approximately to do this total job.

I think one of the most important things in this bill that I wou like to reemphasize, that my colleagues have all spoken of, is provi a nucleus for continuing education of the physician which is fund mental if the level and quality of medical care is not only to be ma tained but improved.

As far as the bill S. 596 specifically is concerned, I think it is u fortunate there is no mention of rehabilitation in the bill. The rep has shown the action of the subcommittees and our recommendatio the necessity for underpinning all of these various programs by comprehensive rehabilitation service and I think this should be stated.

I think also in the recommendations for the Advisory Council t bill should include someone skilled in, and dedicated in, the field rehabilitation.

The CHAIRMAN. Doctor, may I interrupt you there?

Dr. RUSK. Yes.

The CHAIRMAN. We are supposed to have another bill on this whole matter of rehabilitation and I hope we can have that bill from the administration. I can assure you if we don't get an administration bill, we still will have a bill.

Dr. RUSK. Thank you, sir.

I would just like to conclude by saying that we have to have more people in this field. We are shorter, I think than any other field in medicine. We feel that we are a service to the other specialties in medicine. We are excited about this opportunity for service because it broadens the present regional rehabilitation center program which you and your committee established some 6 years ago and which has been eminently successful in exactly the same way in rehabilitation that these complexes are designed to go forward in heart disease, cancer, and stroke.

Thank you very much.

The CHAIRMAN. Thank you.

(The prepared statement of Dr. Rusk follows:)

STATEMENT OF HOWARD A. RUSK, M.D.

Mr. Chairman, thank you for the privilege of appearing before the committee as a member of this panel today. I am happy to offer the following statement for the record in connection with these hearings.

For anyone deeply concerned with improving diagnostic, curative, and rehabilitative care for the American people, the bill before the committee is of tremendous importance. I know that the committee has before it a complete citation of the statistics surrounding these three diseases and the tragic inroads they are making into the health, well being, and productivity of the American people.

I should like to highlight the opportunities we now have to create expanded and modern rehabilitation programs to deal with disabilities resulting from heart disease, cancer, and stroke.

At present several Government agencies are doing valuable work to assist practitioners, hospitals, local, and State agencies to provide more and better rehabilitation for the disabled people they serve. Among these are the Vocational Rehabilitation Administration, the Public Health Service, the Children's Bureau, and others. I believe this bill, if enacted, will fortify all of the work being done by these agencies.

The proposal to establish a series of regional medical complexes for research, teaching, and patient care for heart disease, cancer, and stroke patients can have far-reaching effects in our efforts to secure new knowledge, elevate the quality of care, and greatly augment our supply of well-trained experts in these fields. I urge the committee to support this proposal.

While the bill does not make any specific provision for incorporation of rehabilitation into these complexes, I hope the committee will make clear the importance of doing this. It would be a tragedy if thousands of young physicians and other paramedical personnel were to receive training in these special institutions and go away without an opportunity to understand what adequate rehabilitation services can mean to the patients they will be caring for during the rest of their professional lives.

In relation to these proposed complexes, the Commission also recommended that the special rehabilitation research and training centers now in operation in several places in the country be expanded to permit them to operate at their full potential. I presume this proposal is being considered—and I hope favorably—by the Department of Health, Education, and Welfare with a view to requesting the additional funds that would be required for the Vocational Rehabilitation Administration to carry out this recommendation.

It is particularly important that the diagnostic and treatment stations in these complexes have adequate provision for well-developed rehabilitation serv-

ices. This should be an essential part of complete diagnostic and treatment service; it also becomes the vehicle by which these patients, upon discharge, can be regularly integrated into the community rehabilitation programs, including the Nation's network of State vocational rehabilitation agencies. This post-hospital care is a critical need for large numbers of heart disease, cancer, and stroke patients. We must have better provision for this kind of aftercare in the community, both for those who will be capable of employment later and for those whose objective is a satisfactory functional and social life.

The bill also provides for a National Advisory Council on Medical Complexes. I urge the committee to make specific provision in the bill for at least one of the members to be a person who is outstanding in the rehabilitation of heart disease, cancer, or stroke patients.

Again I thank the committee for promptly considering this important legislation which is certain to be an outstanding contribution to the improvement of the health and well-being of the American people.

The CHAIRMAN. Dr. DeBakey.

Dr. DEBAKEY. Our next witness is Dr. Meyer.

Senator HILL. I would like to say that he is not only one of the distinguished and pioneering men in this field, but I might say that his subcommittee brought out beautifully the striking example of the gap that exists today in the knowledge available, for example, in this field of stroke, and the application of this knowledge or the lack of application of this knowledge to a large segment of patients suffering from this disease.

STATEMENT OF DR. JOHN STIRLING MEYER, CHAIRMAN, SUBCOMMITTEE ON STROKE, PRESIDENT'S COMMISSION ON HEART DISEASE, CANCER, AND STROKE

The CHAIRMAN. Dr. Meyer.

Dr. MEYER. Senator Hill, it is a great honor to appear before your subcommittee.

I would like to testify in strong support of this bill, S. 596, in general, and particularly as it applies to the program of stroke.

The Stroke Subcommittee included Dr. Howard Rusk, who is presently here today, and we had appear before us representatives of all those people in the United States who are considered to be expert in the stroke field. These included Dr. Houston Merritt, of New York; Dr. Denny-Brown and Dr. Charles Kane, of Boston, Mass.; Dr. Champ Lyons, of Alabama; and, of course, Dr. DeBakey himself, because not only is he expert in the field of vascular surgery elsewhere in the body, but also in the treatment of strokes.

Our Stroke Committee report is submitted here as part of the testimony, and it is the part from volume II which is fairly extensive.

The summary of what I would like to bring in testimony today, sir, is that stroke is a neglected field. I do not think there is a more neglected area in modern medicine.

A lot of people do not know what a stroke is. A stroke is an interruption of the blood supply to the brain. It may be due either to hardening of the arteries with a thrombosis or blood clot with occlusion, or it may be due actually to a rupture, with a hemorrhage into the brain. It is very common.

Now, I will give you some idea of the magnitude of the stroke problem in a minute, but the important message I want to get across today is that this is a preventable and a treatable disease, and it is only in

the past decade that we have come to realize that this is not only a preventable and a remediable disease, but it is also a diagnosable disease in the warning state before you have a catastrophic occlusion.

In my opinion, one of the greatest clinical discoveries in modern medicine in the past 10 years has been the recognition of the warning stages of strokes. It is probably as revolutionary as the recognition of angina as the warning of a heart attack, and we realize now how terribly common these little warning strokes are, and that something can be done about it.

This includes medical as well as surgical treatment, and with the modern advances of arteriography, which are the outlining of the blood vessels to the brain by dye, and taking X-ray pictures we can confirm the diagnosis with extreme accuracy, and it turns out that about two-thirds of the cases have lesions or trouble in the blood vessels in the neck which the surgeon can get at very easily. This came as a big surprise to all of us, even though we had been working in this area for many years, we did not realize how common this was.

We are also coming to recognize, by the application in a small way of pilot programs such as are recommended in this bill, how frequent is the association of hypertension, a treatable condition, with stroke.

Eighty percent of cases with stroke have hypertension and this, of course, is a treatable condition, and will prevent strokes.

Diabetes is another commonly associated disease with stroke. We also know now of drugs which will increase blood flow to the brain in patients with stroke, and in the past decade we have come to recognize the value of surgery in the treatment of this condition for the first time.

A word about the magnitude of the problem. This is an immense public health problem: the field of stroke. There are over 400,000 new cases of stroke each year in the United States, and this is a gross underestimate.

Of these, at least 200,000 die. There are at least—and this again is a gross underestimate—in my opinion, 2 million cases of stroke in the United States who are disabled at the present time.

Now, the cost to our Nation is enormous for the care of this type of disability as well as the loss of work capability in people often in the most productive period of their lives.

What are our plans in this bill to do something about this problem? We want to provide a national network of centers and stations that are expert in the diagnosis, treatment, and prevention of strokes.

First of all, the centers: We want to provide by this bill 15 regional centers located primarily in university or medical centers which will be established over a 5-year period at a cost of $85.5 million, approximately. This is not a lot of money when you think of what it can do.

We also propose 100 community stations at a cost of about $77.75 million over a 5-year period.

These stations can often be combined with the heart stations that were mentioned by Dr. Wright in order to share facilities and save money. It is this type of organization, an aspect that can be provided by our experts in the Public Health Service of the Federal Government, to conserve money, facilities, and manpower that Mr. Folsom alluded to earlier.

Now, I want to make clear the difference between a center and a station. A center is primarily concerned with research, determining new causes of diseases, and improving our knowledge of prevention, diagnosis, and treatment.

The stations are primarily concerned with development of community resources to provide the best possible medical care and application of knowledge which Senator Kennedy stressed as being so important.

Now, you can well ask will these work? Well, I can tell you they will work. We have got three centers for stroke in the United States today. I am fortunate in having one of them in Detroit at Wayne State University.

Dr. Irving Wright, on my left, has another one at Cornell, and there is another one in Minnesota, under Dr. A. B. Baker.

Now, there is no question that these stroke centers are working extremely well. They are supported by the U.S. Public Health Service, and we have learned a great deal.

We have a collaborative study in the surgical treatment of stroke that has been chaired both by Dr. DeBakey and Dr. Champ Lyons. (I am the secretary) and we know now on the basis of 3,000 to 4,000 cases what to expect from various types of treatment of stroke, and I myself in my own institution now have data on 150 cases of randomized, surgically treated cases compared to medically treated cases.

We can now show data which is getting to the level of statistical significance where certain forms of surgery can be proven to be valuable in this disease. Furthermore, we have another randomized, controlled study of medical treatment which shows the vasodilator compounds may be valuable in the treatment of acute stroke on the basis of purest scientific statistical data, which is the best type of data one can possibly have. This is what these centers will make available.

Now, a word about organization: I submit to you that these centers related to research and investigation are best organized and under the supervision of the National Institutes of Health, using an extension of the existing double review principle of an advisory council and study review committees or scientific committees.

I would submit, sir, in my opinion that the stations, the stroke stations, should be related jointly to a committee of the National Institutes of Health and the Bureau of State Services working cooperatively.

The point is this is not a competition for power or control. It is a united effort to improve the health of our country and it is a great responsibility.

I wonder if I might just mention one word about manpower and then, sir, I will be finished.

Naturally, we are all concerned about manpower because we are all short of experts in medicine. The whole of medicine is understaffed, we know that, we want to improve the men available in medicine, and that is being discussed today.

Dr. Rusk has pointed out the shortage of personnel in rehabilitation. This is true in neurology, which happens to be my specialty; we are short of neurologists.

But I do not believe this program in this bill is going to create any manpower shortage. What it will do in the stroke field is that the

stroke program will aid the local physicians in improving and extending their care of strokes, which they are already doing.

These patients are already being taken care of by the physicians, and it will not alter the present pattern of medical care in the United States, but make it more efficient.

Thank you, Mr. Chairman.

The CHAIRMAN. Talking about the manpower question, Doctor, if I may ask you, did you have the opportunity or did you give consideration to the question of salaries for your Federal staffs? I am thinking particularly in terms of NIH now. We have lost so many good men, as you know, at NIH, and due, I think, in large measure to the inadequacy of the salaries. Did you consider that?

Dr. MEYER. Dr. DeBakey will answer that.

The CHAIRMAN. All right, Doctor.

Dr. DEBAKEY. Senator Hill, I can speak about that. I have spoken about this matter before your committee previously.

The CHAIRMAN. That is right.

Dr. DEBAKEY. You will find in the Commission's recommendation a strong proposal in regard to this matter, strongly recommending that this need be met.

There could be no question about the fact that there is urgent need in the opinion of the Commission members, because they made a very strong appeal in their report to the President that this need be met.

I think it is extremely important that an effort be made to provide adequate salaries at sufficient levels to compete with ongoing salaries for these people. This, I think, constitutes an important element of the total program because, without these people to help administer and develop this program, it will have great difficulty in being implemented property. I think it is an extremely important point.

The CHAIRMAN. Thank you. And you gave emphasis to this in your report, did you?

Dr. DEBAKEY. We gave great emphasis to this in our report, and I have in previous testimony before your committee.

The CHAIRMAN. Yes; I know that.

Dr. DEBAKEY. In that testimony I have pointed this out on a number of occasions. I think this is an urgent problem.

The CHAIRMAN. I quite agree with you. I am glad you used that word "urgent." It certainly is urgent. We are losing more and more people all the time due to this inadequacy of the salary level; is that not true?

Dr. DEBAKEY. That is exactly correct.

The CHAIRMAN. Doctor, let me ask you this: Could you give us some estimates of the cost of operating a regional medical complex; what would be the first-, second-, third-, fourth-, or fifth-year course for the 32 regional medical complexes recommended by your Commission?

Dr. DEBAKEY. Senator Hill, in our Commission's recommendations we proposed a total of 19 regional centers in heart disease, cancer, and stroke during the first year at a cost of $87.5 million.

Now, we projected our program over a 5-year period indicating that we hoped there would be developed 60 such centers over the 5-year period.

This is because we recognize that this type of program in the magnitude envisaged would require time to develop. You could not get all of this entire regional network covering the entire country of regional complexes, centers, and stations developed in 1 year or 2 years, but over a 5-year period we would hope to have the numbers that we stated. That was the best estimate that we could come to from the studies we gained.

So that over a 5-year period we would hope to develop some 60 regional centers, and 550 total stations at a cost of—we are including the medical complexes at a cost of—$1.6 billion over the 5-year period.

The CHAIRMAN. Over the 5-year period?

Dr. DEBAKEY. That is right. Now, in this respect we would hope that this bill would lead to that development. I want to say very clearly, Mr. Chairman, that we are strongly in support of this bill as it is written here. There are a few, perhaps, modifications in wording, as has been indicated, that might be made to strengthen it, but we would like to see this bill endorsed and approved by Congress because it does provide the basic need to get this program started.

And while, in the opinion of the Commission members here, it may not meet the full need, it does begin the program, and we would hope to see it started, certainly in the manner in which it is indicated here.

We have indicated in our Commission report to the President what we estimated would be the total need over a 5-year period, including what we estimated to be the cost.

It is obvious, too, that the average cost of one of these centers may be developed from the figures we gave, but this would vary because of the local needs. One place might cost maybe $1 million to get a center started and operated, whereas in another place it might cost as much as $3 or $4 million, but the average total cost is indicated in the budgets we have proposed as estimates of needs.

The CHAIRMAN. What were the two modifications you addressed yourself to, Doctor?

Dr. DEBAKEY. Well, one of the modifications I would hope that we indicated is that we believe, as we indicated in the Commission's recommendations, that in the National Advisory Council on Medical Complexes be established. In this bill, S. 596, this is indicated in permissive language, but we would like to see it definitely established. We would like to see this done because we believe that the experience of the National Institutes of Health in this program—and I think it is important to recognize that this experience has been extremely helpful in bringing us to this point—it has really brought us to this point, at which it is possible now to develop this program. Were it not for the work of the National Institutes of Health in establishing the support of medical institutions in this country, both for research and training and in establishing clinical research centers as well as special research centers of other types, we would not be in the position today to mount a program of this kind.

I think it is important to recognize this program is not unrelated to well developed and highly successful ongoing programs, as is indicated by the report of the President's Commission. There are other specific recommendations that are made to support these ongoing programs and to expand them and develop them further, and I would hope, Mr. Chairman, that this bill will not be recognized as completely unrelated to other activities.

I think it is important to recognize that there are other supporting mechanisms that will need additional funds as we have indicated.

I just cite as an illustration, Mr. Chairman, the recommendation we make about the library. Here, for example, is one important aspect of the underpinning of effort that is necessary to mount this program, and to keep it going and to develop further knowledge which, of course, will be applied at a later date.

The CHAIRMAN. Some of your recommendations can be carried out under existing law, is not that true?

Dr. DEBAKEY. Absolutely; and I think this is very important to recognize, and indeed in the report to the President's Commission we bring this out. There is no need for legislation for many of the programs that are already in operation. They simply need to be expanded, to be emphasized further, to be developed further.

There is need for legislation, and there is need for this specific bill, and it is extremely important that we recognize that his bill will make it possible to develop this regional network. Without this bill I doubt seriously that we could ever mount this program.

The CHAIRMAN. Do you have something to add, Dr. Farber?

Dr. FARBER. I am in hearty agreement with Dr. DeBakey. He stated this very clearly.

What is new about this that we cannot do without this bill is this regional network which starts a totally new kind of activity which is directed toward the expansion and extension of what we have been doing through the National Institutes of Health until now. But this network has a very specific goal, a purpose, which is not implicit in anything else that is now presently supported from other sources.

The CHAIRMAN. Well, now——

Dr. DEBAKEY. Mr. Chairman, I would like to take advantage of this opportunity which you have offered us to present a supplement——

The CHAIRMAN. To do what, sir?

Dr. DEBAKEY. To present a supplemental statement should you like for it to appear in the record later.

The CHAIRMAN. Good. We would be happy to have you do that.

Dr. Wright, you had something?

Dr. WRIGHT. Lest there be some apprehension in some quarters regarding this development of the regional complex, I would like to reemphasize the point made by the committee repeatedly that, for the most part, these complexes are to be built within the structure or closely associated with the structure of the leading medical centers and schools of the country and not as a separate institute.

The CHAIRMAN. Yes. Well, you are going to take advantage of and use to the maximum, I take it, what we now have?

Dr. WRIGHT. That is right.

The CHAIRMAN. We have a lot of good programs, do we not?

Dr. DEBAKEY. Absolutely.

The CHAIRMAN. We had a former king come all the way from Europe over here to a medical center. I have seen the time—no, I have not seen the time, but I have read about the time when he would have gone to Berlin or Vienna, or maybe Paris or London or even, perhaps, Edinborough; is that right?

Dr. DEBAKEY. Yes.

The CHAIRMAN. Have you seen the time, Doctor? [Laughter.]

I withdraw that. Now Doctor, as I foresee this program here, the two big questions we are going to have in the consideration of this legislation, I am not thinking entirely of this committee, but I mean on the floor of the Senate, and as it progresses through the House of Representatives and the committee over there, and everything, one is going to be this matter of what is it going to cost? That is a very easy question to ask, and a very pertinent question, too, and the other is going to be how is it going to be administered?

What are you going to do? You heard former Secretary Folsom's testimony this morning. It would seem to me that certainly most of this administration should be and ought to be in connection with the NIH, is not that true? Would that be your thought as the Chairman of this Committee?

Dr. DEBAKEY. Well, I would say this in that regard, Senator Hill. The NIH has had an extraordinary experience in dealing with the medical scientific community of this country. It has been an extremely successful experience.

It has promoted the level of medical care as well as the level of medical science in this country to its present position of eminence.

Indeed as a consequence of these developments in medicine greater advances have taken place during this period than in all previous recorded history. This has been largely due to the support and the activities and the kind of organizational development that has taken place in the National Institutes of Health.

For this reason and because this program is so intimately related to the ongoing programs of the National Institutes of Health, with the exceptions that you pointed out, I would think it ought to be extremely closely integrated with that program, if not immediately and directly under that program.

The CHAIRMAN. Just as in the matter of physical rehabilitation, we know what has been done by the Office of Vocational Rehabilitation——

Dr. DEBAKEY. Yes.

The CHAIRMAN (continuing). Under the leadership of Dr. Rusk, Miss Mary Switzer, of course, and you would want to make maximum use of the knowledge and experience you gain there by working right with the Office of Vocational Rehabilitation; is that correct?

Dr. DEBAKEY. Exactly.

The CHAIRMAN. Do you gentlemen have any further thoughts to suggest on this matter on the administration of these programs?

Dr. DEBAKEY. Well, we can—we have already indicated, I think, for the most part, what our feelings are in this regard. We show in the President's Commission in general our regard for this. If you would like, we can present to you a supplemental statement in this regard.

The CHAIRMAN. I wish you would do that, Doctor, because, as I say, the two questions that are going to be asked as this legislation proceeds, are the question of administration and the question of the cost.

Dr. DEBAKEY. We can specifically point to those two questions in our supplemental statement.

The CHAIRMAN. Good.

(The supplemental statement referred to follows:)

SUPPLEMENTAL STATEMENT SUBMITTED BY DR. MICHAEL E. DEBAKEY

Hon. LISTER HILL,
U.S. Senate, Washington, D.C.

DEAR SENATOR HILL: As Chairman of the President's Commission on Heart Disease, Cancer, and Stroke, I appreciate the opportunity to further clarify several questions which were raised during the hearings on February 10 on S. 596, the bill you introduced to implement the President's proposals in the fields of cancer, heart disease, and stroke.

We regard these proposals, embodied in S. 596, as an excellent beginning toward the ultimate goal which President Johnson clearly enunciated in his historic health message of January 7, 1965, to the Congress. In that message, President Johnson said:

"Today we are challenged to meet and master the 3 killers which alone account for 7 out of 10 deaths in the United States each year—heart disease, cancer, and stroke. The Commission on Heart Disease, Cancer, and Stroke has pointed the way for us toward that goal."

Thus, in giving our strong support for the passage of this bill, we can repeat the statement we made to the President in submitting our Commission report to him that it is our "deep conviction that its immediate implemenation will not only narrow appreciably the spectrum of our ignorance, but will contribute to the saving of thousands upon thousands of American lives now needlessly sacrificed to those three deadly enemies of mankind."

Early in the deliberations of the Commission, its 28 members resolved that we would make no major recommendations unless they were accompanied by specific price tags. We realized the difficulties involved in that decision and the burden it would place upon our technical staff, but we strongly felt that it would be irresponsible to present to the President and to the Congress major recommendations in these areas without indicating our best estimates of what they would cost.

We also made a considered decision, after much deliberation at several Commission hearings, that it would be equally irresponsible to present just a 1-year estimate of the costs of our proposals. As we stated a number of times in the Commission report, the fight against these three major killers of mankind will not be won overnight. We therefore voted to present 5-year cost estimates wherever possible, realizing that to go much beyond the fifth year would involve us in more speculation than precision.

On pages 78 to 83 of the first volume of the Commission report, there are specific cost estimates of every one of the major recommendations we adopted at the final Commission meeting last fall. (See app. B, p. 295.)

On page 79 of the report there is a specific breakdown of the 5-year costs of establishing a network of regional medical complexes. The 5-year cost is estimated at $1.6 billion. This overall estimate is further broken down into the specific yearly costs of the complexes and their component parts—the regional centers and the diagnostic and treatment stations.

We do not regard these cost estimates as absolutely rigid or immutable. They are the best estimates we could come up with after making several national surveys of prototype centers. The estimates are, however, the Commission's best judgment after 9 months of study and 7,500 pages of testimony garnered from close to 200 witnesses representing all segments of the medical and scientific community.

We realize that the executive and legislative branches of our National Government must make their own independent evaluations of the importance and validity of these recommendations. We fully understand that there are many other worthy programs competing for support out of our total Federal tax revenues but we maintain, as we pointed out on page 27 of the report, that the $42 billion which these diseases cost our economy each year mandate a sizable offensive to cut down these losses. We had the valuable assistance of the President's Council of Economic Advisers and of many of the Nation's most distinguished economists in developing these estimates. A good deal of this economic material will appear in volume 2 of the Commission report.

A second major question raised at the hearings concerned the structure for the administration of the regional medical complex program.

The 28-member Commission gave this matter a great deal of thought, and its conclusions are outlined in several sections of volume 1 of the report.

The overwhelming majority of the Commission members felt that the regional medical complex program should be tied closely to the ongoing activities of the National Institutes of Health. For example, on page 29 of the report, the Commission recommends an Advisory Committee on Regional Centers and it further suggests that the recommendations forthcoming from this Committee be transmitted to the appropriate NIH Advisory Councils to aid these Councils in making recommendations to the Surgeon General regarding applications for regional centers. The intent here is quite clear. The Advisory Committee on Regional Centers should be closely tied into, and call upon, the vast knowledge and experience of the existing NIH Advisory Councils in the fields of heart disease, cancer, and neurological diseases.

On page 31 of the report, there is a very clear statement that "the proposal for categorical research centers for heart disease, cancer, and stroke represents an outgrowth and extension of an already successful program of the National Institutes of Health. The NIH Clinical Center program, now in its sixth year, has demonstrated on a modest scale the great potential of clinical research units in various parts of the Nation."

The present NIH Clinical Research Center program, while relatively small in scope, is a prototype of the major innovative thrust of the Commission's report "to fuse the worlds of scientific research, medical education, and medical care." The present categorical centers are concerned with much more than research—their major functions also include the training of clinicians in the various disease entities, and the delivery of the best possible care to patients. Our proposals, in essence, would greatly extend the scope of this existing program with the ultimate goal of closing the gap between new research discoveries and their practical application to thousands upon thousands of additional patients.

The contention that the National Institutes of Health is purely a research organization, and therefore does not possess the experience needed to administer the regional medical complex program, flies in the face of existing budgetary facts. In President Johnson's budget request for fiscal 1966, the Congress is asked to appropriate $193 million for NIH training activities, the great bulk of which fall into the clinical area. Furthermore, the President has recommended $54 million for NIH fellowship programs.

Many of the members of the Commission have served, or are now serving, on various NIH advisory councils. In drawing up the final Commission report, they were deeply aware of the unparalleled experience of the National Institutes of Health in working with universities, medical schools, independent research institutions, and hospitals in the fields of research, training, and the delivery of a high quality of patient care.

The consensus of the vast majority of the Commission—that the National Institutes of Health be given the major responsibility for the administration of the regional medical complex program—was endorsed at the Senate hearings by the American Heart Association, the American Cancer Society, and the Association of American Medical Colleges.

The American Heart Association, which is composed of 35,000 physicians who are interested in heart disease, in addition to 40,000 public-spirited laymen, was represented at the hearings by its president, Dr. Carleton B. Chapman. Speaking to the issue of the best administrative structure for the regional medical complex program, Dr. Chapman told your committee:

"The Institutes collectively represent a splendidly constructed system, which has been built up over more than a decade and which seems ideally suited for the implementation of the regional complexes proposal. This, after all, rests very critically and predominantly as has been pointed out, on the continuing recruitment and training of highest level clinical personnel. At the Federal level, the National Institutes of Health can rightly claim expert knowledge of this particular function and we believe this attribute can be turned to splendid account in the administration of the regional complexes proposal. In addition, the established traditions of the Advisory Councils of the National Institutes of Health have been widely accepted and universally respected in the Nation. And just as important, the categorical nature of the National Institutes of Health still further qualifies them, in our considered opinion, for administering the regional complexes proposal, an important segment of which is also categorical."

Speaking for the 28 members of the President's Commission on Heart Disease, Cancer, and Stroke may I express to you, and to the members of the Senate Labor and Public Welfare Committee, our deepest appreciation for the op-

portunity to appear before you and to explain our detailed proposals for a major offensive against the three diseases which remain as the major threats to the health and well-being of Americans of all ages.

If you need any additional material I, or my fellow members of the Commission, would feel privileged to supply it.

Sincerely yours,

MICHAEL E. DEBAKEY, M.D.

The CHAIRMAN. Senator Yarborough.

Senator YARBOROUGH. Mr. Chairman, I have several questions. In view of the time, I would like, instead of asking one witness several questions, just to range these questions up and down the panel here.

Dr. DeBakey, and you gentlemen on the panel, I want to express my appreciation for your action in coming here. I cannot visualize all the demands upon your time that you have left but, knowing the few experts there are in these fields, I know of the tremendous demand upon your time—day and night, at every hour, at every minute. You have to allocate and do a certain percentage of what is requested of you.

I realize—pulling you out away from this practice and from these supervisory duties and all the many tasks you have—what it means for you.

We appreciate it very much and I wish 20 Senators were listening here. It is our task, as this small group on this subcommittee, to try to carry through to the full committee some feeling of this urgency that you have given us about the need for this. I think what we have, of course, is just a token in the bill. I am thinking of pages 78 through 83 of your report here and what you recommend is needed. I am thinking, in that context, we ought to do that. We are appropriating, in this Government, $50 billion a year for defense—$47 to $50 billion. This year it is about $6 billion for space. I have heard a good many complaints that the space sciences are bleeding scientists from other fields and I think that even what you recommend here sounds large to many Members of the Congress. But, when we consider all of the billions we are pouring into space and defense, it is a modest amount. I would like to see all of it appropriated and we will do what we can.

Now, you, I know, with your great demands on your time, might be limited but the organizations and associations to which you belong—of which you have become presidents—I want to make a suggestion or two about their efforts.

Difficult as our problem is in the Senate, it is much easier than the problem in the House of Representatives or with the Bureau of the Budget.

Under the leadership of this great and distinguished chairman, who has been on this committee for more than a quarter of a century, I have been on the Subcommittees on Education and on Health, for just 7 years. I have seen the great progress that has been made in those 7 years under his leadership, and not merely in health but in education, because the two fields overlap, as has been pointed out here in so many instances.

For example, when we got the Health Professions Act through, that relieved some of the burden on the National Defense Education Act loans because the loans are larger to a medical student than a student under the National Defense Education Act.

So there is overlap in the two subcommittees.

We get bills out of this subcommittee and, under the leadership of this distinguished chairman, through the full committee and through the Senate and it is generally trimmed down there. That is nothing compared to what we strike when we hit the House of Representatives. That is the real meat ax and they chop down. I have sat on these conference committees year after year where the Senate fights. I have seen the time when every Member of the Senate was fighting in the field of education, both Democrats and Republicans, for more liberal appropriations and more liberal authorizations and, right across the table from us, every Member of the House, both Democrat and Republican, was voting to cut it down.

So we ask for help at the other end of the Capitol. Our jurisdiction stops at a line right through the center of that dome.

In the east front extension there is one room down on the floor below the main rotunda where the conference committees meet and the line, right through the center of that table, is through the east and west—through the center of the Capitol—and half of it is on the House side of the Capitol and half is on the Senate side.

Now, after we get this authorization, we have great frustrations from the Bureau of the Budget. We get messages year after year from all administrations asking for glowing things.

Then the Bureau of the Budget comes along and cuts the life out of them. They say they cannot cut our appropriations but they turn around to the department and say, "You can't spend what is appropriated," so it is further whittled down. You will get more reasonable treatment in the Senate than you do in the House and the Bureau of the Budget so, despite all your sacrifices and time to come here, we ask for your help in these two other branches of the Government.

Dr. Farber, your statistics state that of 300,000 who die of cancer each year, 100,000 might have been saved Are those 100,000 the ones who might have been saved with medical knowledge now known if you could get this medical knowledge into the hands of every practitioner and every small hospital, every clinic, all over the land?

Dr. Farber. Senator Yarborough, yes; that is what I meant.

This would include earlier, far earlier diagnosis than is now the case so the surgeon has a better opportunity; greater application of radiotherapy of the most modern kind and the use of chemical agents in combination with radiotherapy and with surgery.

If we could combine early diagnosis with these new modalities of treatment, I feel certain that the reduction would be of the order of magnitude that I have mentioned. This is a considered statement.

Senator Yarborough. What percentage of the radiotherapy being administered today, in your opinion, is by technicians who are adequately trained in radiotherapy for cancer application?

Dr. Farber. I cannot give you an exact percentage, but I can say this: There is a great shortage of highly skilled men in the field of radiotherapy. This has been recognized by the National Cancer Institute and the National Institutes of Health in the creation of a program to train many more radiotherapists and radiobiologists.

This is one of the great shortage areas so that, first, there are not enough trained men to do all of the radiotherapy which we would like in the finest manner. There are not enough institutions with the

proper therapeutic weapons in radiotherapy to carry this on. This is one of the areas which we hope would be remedied by the creation of these 20 centers and the 200 cancer stations.

Senator YARBOROUGH. Due to the fact of the lack of coordination, is it not true, out over the Nation, there are centers where there are no properly trained people in the treatment of radiotherapy for cancer and a man, who just generally handled X-ray machines, applies the X-ray to the spot?

Dr. FARBER. That, indeed, is correct, Senator. I agree with you.

Senator YARBOROUGH. I could pursue that further but I will not. I think we all know what we have in mind on that point and I think it pinpoints the necessity—one of the many necessities—for this program not only for the modest amount we put in this bill, in an effort to try to get something passed, but in the broader aspects of your report.

I have a question. I want to commend you for getting this report and the staff in getting this report in a readable format. Will the others be similar?

Dr. DEBAKEY. Yes.

Senator YARBOROUGH. Let me recommend that it be in readable format. The wider the dissemination we have of this information, then the better the prospects for speedier enactment of this program and the speedier use of it.

Dr. DEBAKEY. Thank you, Senator. I think you would be interested to know that we attempted to give wide dissemination of this report and I have been tremendously heartened, as every member of this Commission, by the very favorable response that we have received about this report, both from the lay and the medical scientific communities of this country. It is perfectly obvious that the recommendations of this report are recognized as being needed, and urgently needed, and strongly supported.

There is hardly a day goes by that I do not receive a telephone call or a letter from institutions wanting to know what they could do about applying for a center.

Senator YARBOROUGH. Thank you, Dr. DeBakey.

The CHAIRMAN. Can I ask a question right there?

Senator YARBOROUGH. Yes.

The CHAIRMAN. Doctor, would not you like to have the reports of these subcommittees printed as a part of this hearing?

Dr. DEBAKEY. Yes, we would like very much to have that.

The CHAIRMAN. You do that. Be sure we have copies.

Dr. DEBAKEY. I will see that you get copies.

The CHAIRMAN. Reports of each one of your subcommittees, so we can have them printed as a part of this hearing.

(The documents referred to appear as appendix A on p. 171.)

Dr. DEBAKEY. I think the information and data available in the subcommittee reports, as I have indicated previously, some of which have never been available before, that have been compiled here, is of tremendous value, and many aspects of the planning stage that will be necessary later.

Senator YARBOROUGH. These committee reports that we print have tremendously valuable information in them. Sometimes it is not recognized at the time. The members or ex-members throw their reports

away. The office is so cluttered they cannot keep them and they be come scarce. I looked at a report last night, a report by Presider Roosevelt when he had a Commission on American Architecture, an the report was printed as one of our green-backed documents. The were lost or thrown away, and now it costs $5.25 to get a copy of tha

Architects recognize that many farsighted men had recommenda tions and they use the report. So while we will print this as a docu ment, I hope you gentlemen will print it in a form that the publi will read and we will read ourselves out of this fine print. I like th attractive way in which this is gotten up.

Since all of you are engaged in education as well as in your specia ties you know the problem you have in getting people to look at ir formation.

Dr. Wright, you said one big problem is getting the cooperation c individual practitioners, to get away from their fear that these center are going to have Government medicine of some kind, and I think tha is a very important thing. Do you not think it is important also i we are to get this early diagnosis that Dr. Farber has talked abou we have to have the cooperation of the medical profession, the ind vidual practitioner, who is out practicing alone?

Dr. WRIGHT. This is terribly important, Senator, and it makes possible to apply already known knowledge with real tangible result

As Senator Hill and perhaps other members of the committee knov we have been interested in the treatment of coronary attacks with ant coagulants for a good many years.

Just as a tangible result of this, I would like to mention the figure that have just appeared substantiating our findings. These wer figures obtained by a 3-year study conducted by the British Medica Research Council.

Among the men who were in the study under 55 years of age, th death rate was 14 percent in those receiving anticoagulants, as com pared to 26 percent for those not receiving anticoagulants.

Repeated heart attacks in those under 55 years of age, occurred i those treated with anticoagulants in 15 percent. In the untreated case the same 3-year period, 62 percent developed additional heart attack It is an increase of four times.

If we consider this in terms of hundreds of thousands of patient the difference between 15 as against 60 percent, can really produc an impressive impact on the problem. In patients over 55, the di ferences were not so great. There was a difference between 17 an 33 percent. These are the latest available figures based on a ver careful study conducted in the British Isles.

This is just an example. If we have such information, and th physician in practice can apply it, and he has laboratories that h can depend upon, checking with the standardized laboratories I men tioned, the whole pattern of this type of treatment in a communit can be changed. The community may be a small or a large one.

Senator YARBOROUGH. Dr. Wright, your statement earlier about th international aspects and the need for getting this information tran mitted between nations was brought home forcefully to me some year ago as a practicing attorney.

I had a sunstroke case and in trying to find information, a medica doctor was advising me, who was doing research, that the only plac

he could find information where research had been done or collected and printed was in a British medical journal of statistics they kept in the Euphrates area in Mesopotamia during World War I, when they were losing so many men to sunstroke, they began to collect it and studied the figures.

That was printed, and it was the only place where it was printed. It was not updated. It was in the late 1940's, and I found it in a British medical journal.

Dr. WRIGHT. This is a common experience. Any effort that is made to curtail the application of funds and resources for studies elsewhere in the world is shortsighted.

We should emphasize international studies and communication and increase them because, what is developed elsewhere is applicable to the American public. We ought to take advantage of this. There are excellent and highly productive research people all over the world.

If we have good contacts with them, we get their results years before we might otherwise.

Senator YARBOROUGH. Dr. Wright, on page 33 of your report where your recommendations for expenditures are stated, I am referring to the sixth, seventh, and eighth columns on undergraduate training, National Institutes of Health, for graduate training grants, and in the third, clinical fellowships and investigatorships. You would spend more money there than on any of the other categories, I noticed.

Dr. WRIGHT. The others are essentially in operation.

Senator YARBOROUGH. This is the big gap then?

Dr. WRIGHT. But the clinical fellowships have never been developed at all, so we would be starting from scratch here and, therefore, we need more funds to get started in these areas.

Senator YARBOROUGH. In the panel yesterday some people mentioned moonlighting, some people doing this work often having to do work on a night job in order to earn a living. I assume this is more acute in this area because of lack of programs.

Dr. WRIGHT. It certainly is important. I think they ought to be doing their moonlighting learning more medicine rather than driving buses or something like that.

Senator YARBOROUGH. I agree with you.

Dr. WRIGHT. Buses are important for public transportation but for a person who is a highly trained individual preparing for a professional career, this is not the kind of moonlighting he ought to be doing.

Senator YARBOROUGH. Absolutely. Let me ask you, Does not this take more years of training than most of the space sciences? Our scientists working in space?

Dr. WRIGHT. If you include the total education, actually today when a man starts in undergraduate arts college he really has to be beginning to prepare himself for a medical career. If he is going to be efficient about it, he must take mathematics and chemistry and physics, biology, and allied subjects to prepare himself. There are 4 years.

If he has 4 years of medicine, there are 8 years. If he has a residency, there are at least 3 years more. There are 11 years.

Then if he should go into training to become a specialist in his field the total is 13 or 14 years. We must have funds to pay these people enough. By that time they have families and other responsibilities, and they should lead a normal life.

Senator YARBOROUGH. I am hopeful that our committee——

Dr. WRIGHT. I hope we will develop this plan and get it operati

Senator YARBOROUGH. I hope our committee will in the bill befo it is finally through bring out all you have requested in those fiel We will see what success we have. At least we will never pass it unl we bring it out of our committee and make a fight for it on the floor the Senate.

Dr. WRIGHT. Thank you, Senator.

Senator YARBOROUGH. You have my help on this, Mr. Chairman.

You mention that experimental models of hearts have already be tried in man. That has been temporary while an operation was process or have you actually implanted a whole experimental model a heart in a man?

Dr. WRIGHT. I would like to ask Dr. DeBakey to speak on this this point, since it is more in his field than in mine.

Senator YARBOROUGH. Dr. DeBakey.

Dr. DEBAKEY. Specifically I can speak about this authoritative since that refers specifically to a clinical case which I had. This not an artificial heart to replace the heart but rather to suppleme the heart. There are programs now being supported by the Nation Heart Institute, and we, among others, are involved in this resear program, and I can tell you from the experience that we have had th this is a feasible objective. An artificial heart both to replace the fur tion of the heart in terms of its pumping mechanism and to suppleme that function, i.e., to support it temporarily, constitute a feasible o jective which we are intensively investigating; and there are a numb of us who believe that if we can promote this program as intensive as we would like, bringing all the skills and knowledge from the oth physical sciences, particularly engineering, electronics and the like, th we can perfect a model that can be used and applied to human being Actually we are now able to apply them in experimental animals, n on a permanent basis, but we can put them in experimental animals a replace the function of the heart quite effectively for a short peri of time.

We would hope to have this within the next 5 years, but it w require a far greater expansion of effort than we are putting into it the present time.

Senator YARBOROUGH. Or it will require more research money well as manpower.

Dr. DEBAKEY. Exactly. To be able to bring the skills and know edge of other sciences into this program, which we are unable to now as we would like.

Senator YARBOROUGH. A corollary question: You state, Dr. Wrigl that kidneys, livers, lungs, and recently lungs, have been transplant into man from primates or from man to replace diseased orga Have you transplanted entire hearts into a man?

Dr. DEBAKEY. Well, there has been one done, one case that know about. We personally, I personally, have not, and we have n in our institution, but there has been one that has been done which w only successful for a short period of time.

Senator YARBOROUGH. An entire heart from a primate?

Dr. DEBAKEY. Yes.

Dr. WRIGHT. Wasn't the problem in part due at least to the fact that the size of the heart of the primate was not adequate for man? That was one of the things.

Dr. DEBAKEY. Of course, the more fundamental problem still exists. There is the problem of the rejection phenomenon. This is a fundamental problem which has not been completely solved. We can suppress this in certain areas. We have patients of our own, as well as others, with transplanted kidneys now going well over a year, and these people are leading a reasonably normal life, and working and are rehabilitated.

How long we can keep this going we do not know, but there are more hopeful signs about this all the time. This is why, in a sense, research must undergird this whole effort.

Senator YARBOROUGH. Dr. Meyer, while you were testifying you said 400,000 new stroke cases a year. Is this percentage in relation to the entire population increasing each year, declining, or is it stationary, the percentage of people with strokes a year? What is happening there?

Dr. MEYER. If you analyze the data as an overall trend in the U.S. population, stroke is increasing. However, if you take certain segments of the population there is some promising news. Males, for example, around the age of 65 in the past decade who have been receiving control of their blood pressure, the incidence of stroke in this particular treated group is decreased.

Now, that is my interpretation of the statistics. I could tell you that the answer to your question is that the overall incidence is going up of strokes, but there is a certain group in which it is going down, and there is some argument about why, and I think it is because of control of blood pressure.

Senator YARBOROUGH. Of course, with increasing longevity of people you will have more strokes.

Dr. MEYER. That is true.

Senator YARBOROUGH. If we limited this to people under 75 or under 70, is the percentage of strokes increasing in that group?

Dr. MEYER. Yes, but in the younger age group, there is some evidence, sir——

Senator YARBOROUGH. Say 75?

Dr. MEYER. In this particular, if you don't mind, if I take it down a decade below that, below 65——

Senator YARBOROUGH. Sixty-five.

Dr. MEYER. With the management of hypertension in the young group the incidence is decreasing, I think, not increasing.

Senator YARBOROUGH. Dr. Rusk, the $148 million that you mention, is that for rehabilitation clinics alone for 1 year or the full 5 years.

Dr. RUSK. That is the full 5 years on the two programs, the legislative one and, the increased appropriations for ongoing programs, in training primarily.

Senator YARBOROUGH. That was not in this report.

Dr. RUSK. No. It is in the backup document in detail.

Senator YARBOROUGH. That will be in the record.

Dr. RUSK. It includes the support of these four new facets of the legislation that, hopefully, will come in a special bill.

One point that has not really been mentioned in the testimony is that in the report the recommendations for certain bioengineering activi-

ties, some specifically in the field of rehabilitation and others in the general field of instrumentation, I think all of us realize every day that there needs to be closer cooperation and understanding and research between the biologist, physician, and the engineer, and we find this especially true in our field in the development of new devices and material and so forth.

We have patients now totally paralyzed, arms and legs, who, because of the artificial muscle and by eletronic or carbon dioxide motivation are carrying on full-time jobs where their brain is needed and their hands are not.

I think that this is one very great area of the future so far as research and development is concerned.

Senator YARBOROUGH. Thank you, Dr. Rusk.

Gentlemen, I want to mention one point which has been discussed some, not publicly like this, but I think that we might as well bring it out, about this bill.

There have been some fears expressed by people connected with some of the great clinics of the country that this bill as now written rather straitjackets them, that the medical schools will have a grip on them, and some people connected with these great clinics point out in the earlier stages of cancer research that medical schools would do little about it, would hardly take patience, especially if it was thought to be incurable. They would not give them a bed. These great research institutes over the country have added a great deal, and of course, you know better than I what they have done.

I won't take time to try to recite any of that, but I just mention this point because this is being talked about, and I would like to ask for your recommendations, not immediately but in the solution of this before we come to consider this bill, to be certain that there are such safeguards that you will have their full cooperation in the passage of the bill.

Dr. DEBAKEY. Well, Senator Yarborough, I think if one carefully reads the bill there is no limitation in this regard.

Senator YARBOROUGH. Pardon me.

Dr. DEBAKEY. I say if one carefully reads this bill it does not restrict the centers to these institutions. It names a number of different kinds of institutions, and I would think the most important element in developing a regional center is the potentiality and, particularly in terms of personnel available that are in that center for that purpose.

Senator YARBOROUGH. I think, perhaps, that was accentuated by some of the charts exhibited during the hearings showings that medical schools and other things had no place for these institutes, which they list as a factor in this complex.

Dr. Rusk, in this rehabilitation you mentioned the work on rehabilitation earlier, people who have had cancer cures, cured by amputations of considerable portions of their body. Is there a saving of money with this, when you take the amount of money to rehabilitate these people? Have you saved money for the economy? This is a pretty hard, coldblooded question. You have saved a man, you rehabilitated him for his life but we have had that question asked us. Are you actually saving money for the economy when you do this? It is not my question but people have asked us this question.

Dr. RUSK. We have had figures from last year that 19 percent of those rehabilitated were on public assistance or in public institutions before they were rehabilitated and returned to work. After the average cost of rehabilitation was less than a year's welfare payment, which was a continuing thing that went on year after year.

These two gentlemen that I spoke of, which is the most radical example I could have given you, are in their early forties. I think both of them will go back to work. It is going to cost not too much to rehabilitate them except in the development of the new type of prosthesis, but I will give you an example of this.

Eight years ago we had a boy brought up from Bolivia with no arms and legs. We developed legs for this child and taught him to walk. He is now in junior college in California.

But because we invested the money, because these legs were developed, when the thalidimide babies came—5,000 of them in Germany, and thank God we had only a handful here—we had legs that could be the pattern for the fitting of these children. So it is not just what you invest in these two patients, it is what you invest in all the patients coming on for the future. I think you have to say, too, what is the price tag on human life.

Senator YARBOROUGH. Well, I was asking this question which has been asked about taxes. Actually taking these people off relief rolls, would not there be a saving of money from the standpoint of the public tax roll?

Dr. RUSK. A terrific saving. As I pointed out, for every dollar spent, $5 come back in Federal income tax alone in the first 5 years of rehabilitation.

Senator YARBOROUGH. Money comes back by taking these people off relief and making them viable portions of the whole community life.

Dr. RUSK. That is correct.

Senator YARBOROUGH. Dr. Wright, there is one more thing—time has run out—you touched on this more than anybody. In enlisting the efforts of the practicing physicians, how would these arrangements work between the diagnostic stations and the medical complexes? I do not want to prolong this, but if you would just tell us briefly.

Dr. WRIGHT. Yes. It seems to me that the station is the key area to bring this about. The station should provide one to five people who are really knowledgeable in an speciality. They should act as a focal point of education, continuing education in the community service area.

But there attitude makes a big difference. If they adopt the attitude that the doctors, the practitioners cannot continue to follow and care for their cases, this sets up a very bad relationship, and could do more harm than good.

If they take the attitude that "we are providing you with a service, Doctor, and we will help you with your patients in any way that we can do so, you bring the patient in, we will do the electrocardiogram, we will help you with fluoroscopy, we will help you to interpret, we will help you with the basic treatment. If your patient should have to go to a hospital for open heart surgery, we will help you, and when the patient comes back, he is your patient," the impact of the program is entirely different and implemented then with a good spirit.

At every level we should bring this spirit about. Otherwise, the whole program can really get fouled up in a small community.

The Commission has rightly taken the attitude that we must help the practitioner apply modern medical science to the care of patients.

Dr. DEBAKEY. Senator Yarborough, may I just add, in respect to the role of the private practitioner, that we consider him to be an active participant in this program. We believe that this program provides one of the best educational mechanisms for keeping him up to date with what is going on in medicine, and keeping him up to date with the most recent up-to-date knowledge in these special fields. He will then have a better opportunity to maintain his continuing education.

Senator YARBOROUGH. Dr. Wright pointed out earlier the danger of that individual practitioner becoming obsolete in his own profession if he did not keep up.

Dr. DEBAKEY. That is right.

Dr. WRIGHT. I think one of the biggest challenges to medical educators today is the prevention of early obsolescence of their graduates and this means that at medical school level and from then on the students and the graduate doctors must be inculcated with the concept that their education never stops, it cannot stop. They must be tied into a continuing educational process in order to avoid this, in order to provide them with the tools, the intellectual as well as technical tools, to equip them to give the best service.

Senator YARBOROUGH. Dr. Farber.

Dr. FARBER. May I add one word here to another aspect of the relationship of the doctor in practice to all of this? If you scratch a doctor you find a frustrated research man, and this will afford an opportunity for the doctor in practice to help in the gathering of vitally needed information concerning the action of drugs and chemicals, for example, working as part of an experimental design created by the regional center and the medical complex in association with all of the other regional centers and medical complexes in the country, and the NIH, let us say, through the station to the community hospital, to the doctor in practice, and that doctor in his way will not only have a chance to have a continuing education by giving his patients the benefit of something which is new which he otherwise could not give them, but he has an opportunity also have the satisfaction of contributing to the acquisition of new information.

Senator YARBOROUGH. Thank you.

Dr. Rusk indicated he had something to say.

Dr. RUSK. I just wanted to mention that the second volume, the backup document of the Subcommittee on Communications, has gone into this in great detail, including a program of the new transitorized type of apparatus which plays back 8 millimeter films and some of which have already been developed, so this is a postgraduate course for doctors that can be made available to them right in their office, which is also a part of the thinking and the planning and the recommendations. That is detailed in volume II.

Senator YARBOROUGH. That will enable that doctor to be as modern as the most modern hospital.

Dr. RUSK. Carry on right in his own office a continuing postgraduate program.

Senator YARBOROUGH. I congratulate you, gentlemen, on the achievement, your leadership, and for your taking those achievements and trying to broaden that which you know so it would benefit the whole people, and as Dr. Wright said, humanity.

Thank you very much for the time you have taken to educate us here. We hope we can transmit some of this to the Seante.

The CHAIRMAN. I think they demonstrated this morning they are mighty good educators.

Senator YARBOROUGH. I think so, too.

Dr. DEBAKEY. Senator Hill, may I say as a final word to express on behalf of all of us here and on behalf of the medical scientific community in this country that we should like to express our grateful appreciation to you, Senator Yarborough, and to other members of your committee for the yeoman work that you have done in providing the leadership and the strong support for these humanitarian goals. We deeply appreciate it.

The CHAIRMAN. Dr. DeBakey, Dr. Farber, Dr. Meyer, Dr. Wright, and Dr. Rusk, we certainly feel deeply grateful to you for the magnificent work, dedicated work, that you all have done on this Commission.

As Senator Yarborough has said, it is not only service to our people here in America, but it is a service to all of mankind, and surely we want to thank you and express our deep appreciation for the very fine, most informative and most challenging and inspiring testimony that you have brought us here this morning. We are deeply grateful to you. Thank you very, very much. Thank you.

At this point in the record I will place a list of the members of the President's Commission on Heart Disease, Cancer, and Stroke. Following that exhibit will appear a number of communications and statements that have been received to date.

(The exhibits referred to follow:)

MEMBERS OF THE PRESIDENT'S COMMISSION ON HEART DISEASE, CANCER, AND STROKE

CHAIRMAN

Dr. Michael E. DeBakey, professor and chairman, Department of Surgery, Baylor University College of Medicine, Houston, Tex.

MEMBERS

Dr. Samuel Bellet, professor of clinical cardiology, Graduate School of Medicine, University of Pennsylvania, Philadelphia, Pa.

Mr. Barry Bingham, editor and publisher, Louisville Courier-Journal, Louisville, Ky.

Mr. John M. Carter, editor, McCall's magazine, New York, N.Y.

Dr. R. Lee Clark, director and surgeon in chief, the University of Texas M. D. Anderson Hospital & Tumor Institute, Houston, Tex.

Dr. Edward W. Dempsey, former dean, School of Medicine, Washington University, St. Louis, Mo. Resigned on September 28, 1964, to become special assistant to the Secretary (health and medical affairs), U.S. Department of Health, Education, and Welfare, Washington, D.C.

Dr. Sidney Farber, director of research, Children's Cancer Research Foundation and professor, Harvard Medical School, Boston, Mass.

Dr. Marion S. Fay, former president and dean, the Women's Medical College of Pennsylvania, Philadelphia, Pa.

Mr. Marion B. Folsom, director, Eastman Kodak Co., Rochester, N.Y., and former Secretary of the U.S. Department of Health, Education, and Welfare, Washington, D.C.

Mr. Emerson Foote, former chairman of the board, McCann-Erickson, Inc., Ne York, N.Y.
Gen. Alfred M. Gruenther, immediate past president, American National R Cross, Washington, D.C.
Dr. Philip Handler, professor and chairman, Department of Biochemistry, Dul University Medical Center, Durham, N.C.
Mr. Arthur O. Hanisch, president, Stuart Co., Pasadena, Calif.
Dr. Frank Horsfall, Jr., president and director, Sloan-Kettering Institute f Cancer Research, New York, N.Y.
Dr. J. Willis Hurst, professor and chairman, Department of Internal Medicin Emory University School of Medicine, Atlanta, Ga.
Dr. Hugh H. Hussey, director, Division of Scientific Activities, American Me ical Association, Chicago, Ill. Resigned as of September 5, 1964, to becon special consultant to the Commission.
Mrs. Florence Mahoney, cochairman, National Committee Against Mental Illnes Washington, D.C.
Dr. Charles W. Mayo, emeritus staff surgeon, Mayo Clinic, Rochester, Minn.
Dr. John S. Meyer, professor and chairman, Department of Neurology, Way State University College of Medicine, Detroit, Mich.
Mr. James F. Oates, chairman of the board, Equitable Life Assurance Societ New York, N.Y.
Dr. E. M. Papper, professor and chairman, Department of Anesthesiology, Co lege of Physicians and Surgeons, Columbia University, New York, N.Y.
Dr. Howard A. Rusk, professor and chairman, Department of Physical Medici and Rehabilitation, New York University Medical Center, New York, N.
Dr. Paul W. Sanger, surgeon, Charlotte, N.C.
Gen. David Sarnoff, chairman of the board, Radio Corp. of America, New Yor N.Y.
Dr. Helen B. Taussig, emeritus professor of pediatrics, Johns Hopkins Ur versity, Baltimore, Md.
Mrs. Harry S. Truman, Independence, Mo.
Dr. Irving S. Wright, professor of clinical medicine, Cornell University, Med cal College, New York, N.Y.
Dr. Jane C. Wright, adjunct associate professor of research surgery, New Yo University School of Medicine, New York, N.Y.

U.S. SENATE,
February 12, 1965.

Hon. LISTER HILL,
Chairman, Subcommittee on Health,
Committee on Labor and Public Welfare,
U.S. Senate, Washington, D.C.

DEAR LISTER: I am very much interested in the hearings you are now conduc ing on S. 596, to establish a realistic plan to combat heart disease, cancer, strok and other major diseases. I am familiar with the report of the President Commission on which the present legislation is based, and I commend you f introducing S. 596, and for so promptly holding hearings on it.

The American people, I am confident, will strongly support and apprecia any practical program to help reduce the toll these diseases now take. Hea disease, cancer, and strokes are responsible for over 70 percent of the deat in this country. Because of them close to $30 billion is lost each year in pr ductivity and in taxes due to premature disability and death. Their contr and eventual elimination, will be one of the greatest boons which could come mankind.

We must continue to open up every possible line of research which will d velop new scientific knowledge to combat these diseases, and to make availab to all people in all parts of the country the new and existing lifesaving knowled we possess. We must do this without interfering with present medical patter or professional practices, or with the administration of existing hospitals. S. 5 has been drafted skillfully to meet all of these criteria.

I am particularly enthusiastic about the provisions of the bill to establis 32 multipurpose regional medical complexes throughout the country. Such co plexes would bring the latest methods of prevention, diagnosis, treatment, a cure of major diseases within the reach of millions who do not now have the benefits.

It is my understanding that these new complexes will be associated with medical schools, teaching hospitals, medical centers and other already established public or nonprofit institutions. I would like to make known, therefore, in these first congressional hearings on the multiple-purpose regional medical complexes, the interest of the University of Utah Medical School, with its new teaching hospital, in being selected as the site of one of the complexes. The qualifications of the school for such a selection are unquestioned.

The College of Medicine of the University of Utah is the only functioning medical school between Denver and the Pacific coast, and between the Canadian and Mexican borders. It has established an enviable reputation for excellence in all three major phases of medical school activities; namely, education, research, and patient care. It is already participating in a considerable degree in regional aspects of medical education and care, especially through its postgraduate medical education division and through participation of its faculty in meetings to evaluate the standards of care. It is a logical, natural site for a medical complex of the type contemplated in this bill. The location of such a complex at the University of Utah Medical School would simply be expanding and making more effective the work already being done there, and make it possible to reach more people not only in all of Utah but in several surrounding States.

I have been in touch a number of times about this proposal with Dr. Kenneth B. Castleton, dean of the Utah Medical School, and he has assured me of the great interest of the school in the proposal, and in having a possible role in it. He feels, as I do, that through it the schools could render an even greater service to the people of the area.

In closing, let me stress again my support of S. 596, and to offer my assistance in getting action on it in the U.S. Senate at the earliest possible date.

Sincerely,

FRANK E. MOSS.

AMERICAN HOSPITAL ASSOCIATION,
Washington, D.C., February 16, 1965.

Hon. LISTER HILL,
Chairman, Committee on Labor and Public Welfare,
U.S. Senate, Washington, D.C.

DEAR SENATOR HILL: This statement expresses the views of the American Hospital Association and its recommendations in respect to S. 596, Heart Disease, Cancer, and Stroke Amendments of 1965. This bill amends the Public Health Service Act so as to add a new title IX for the purpose of establishing regional medical complexes for research and treatment in heart disease, cancer, stroke, and other major diseases.

The American Hospital Association applauds the overall purpose of this bill and the intent of the Federal Government to support further major efforts in an overall attack on these major killer diseases. The hospitals of America are, of course, acutely aware of the effects of these diseases upon individuals, their families, and the Nation. The entire health field, along with the Federal Government and the public, has been making substantial efforts in the alleviation of suffering caused by these diseases. We see this bill as a means of focusing national attention in a coordinated manner upon heart disease, cancer, and stroke, and we support the purpose of this legislation.

Before commenting in particular on sections of the bill, we wish to project the image we have as to the detailed means of implementing the purposes of the legislation. We believe it is essential that such an overall view be clearly understood by everyone at the outset. A group of prominent and widely experienced health administrators met and assembled all information available and discussed the bill in detail and the implications which the bill seems to have for both immediate and long-range health care in the United States. As we have summed up the primary function of this legislation, it is to establish a bridge between the science of medicine and its full application to the care and treatment of patients.

ORGANIZATION

Appropriate organization essential to carrying out the purposes of the bill is paramount. Three levels of health facilities are to be included in each individual overall demonstration. In combination these facilities and services are seen as

comprising a "regional medical complex." The medical school and the medical teaching hospitals affiliated with the school form a "medical center," which is the nucleus. This nucleus is seen as assuming primary responsibility in the advancement of the program's intent throughout the entire regional medical complex. There are at present 80 medical schools in the country, and there are approximately 200 hospitals affiliated with these medical schools.

The second level in the regional complex, referred to as a "categorical research center," we interpret as comprising the nonaffiliated approved teaching hospitals, of which there are approximately 600. These hospitals are teaching centers with medical intern and residency programs. They are the major source for the education of professional nurses and the primary sources for the teaching of many other of the health disciplines.

The third level in the regional complex is referred to as the "diagnostic and treatment station." In large measure these stations would be the smaller hospitals spread throughout the Nation. They provide a focal point for medical care and treatment in smaller communities and make possible the concentration of services and facilities in behalf of the community in the most economic fashion. There are approximately 6,000 of these smaller hospitals.

The above combination of facilities comprises the potential for the program in large measure. The complex would provide a means for funneling the program out into the largest number of health facilities and through them to the public as a whole.

We believe it is well at the outset to start with a limited number of carefully nurtured total regional medical complexes and in keeping with what we believe to be the purpose of the bill to limit the program to only carefully selected cases in the disease entities to be included. Emphasis would be only upon those cases which would be benefited by the various newer and promising types of treatment. Thus, the present program would make available the very latest advances and would bring the fruits of medical research to a limited number of patients at the outset.

We believe, however, it would be a mistake not to appreciate the enormous public pressure that will grow for the broadening of the program. In this regard, we see the intent of the bill to go far beyond the present limited categorical research program of the National Institutes of Health. At the start, the program would be directed toward demonstration of patient care related to training and research. The point we would emphasize is that the public's expectation for expansion of the program to much more complete patient care demonstrations should be kept in mind.

At the time the Federal Hospital Survey and Construction Act was started in 1946, a coordinated hospital system was visualized. The organization and coordinating aspects of that system were in some ways very much like the program which is now being considered in S. 596. The coordinated hospital system, as visualized under the Hospital Survey and Construction Act, failed to materialize. Major reasons for this failure were a lack of any primary disease focus which would tend to stimulate coordinated efforts, a lack of financing directed toward coordination, and various aspects of human factors involved in such a coordinated program. We believe, therefore, that the provisions of this bill will go far to remove various problems encountered in the past.

The Federal Government is at the present time providing financing and stimulation to regional planning of health facilities. Such endeavors are being organized rapidly throughout the country. These planning groups could well be helpful in accomplishing the purposes of the regional medical complexes proposed in this bill.

ADVISORY GROUPS

The bill proposes that advisory groups will be established for each regional medical complex. We have tried to visualize the most effective organization of such groups so as to accomplish the desired purposes of the bill. To be effective, the advisory group should be representative of each of the component levels of the regional medical complex. This will provide importantly for joint effort and cooperation of the medical school hospital group, the large teaching nonaffiliated hospital group, in the smaller hospitals in outlying areas. Most importantly, it will avoid the possibility of total domination by the medical schools in the complex which could well frustrate the total purpose of the program.

We believe the function of the advisory group is most important to the success of the whole idea, and we have therefore given particular thought to the

organization and function of the group. The advisory group could be established in a variety of ways and with varying functional authority. It could be one of three types of groups. In the first, the advisory group would serve in a simple advisory role. The second approach might provide for advisory functions and limited authority with perhaps veto power. In the third approach, the advisory group might be established so as to have statutory authority to approve and disapprove specific projects and programs. The bill, we believe, provides only for an advisory group.

MANPOWER

Very likely the chief limiting factor in carrying out the purposes of the legislation will be the lack of the essential medical manpower. It is most fortunate that the Congress enacted Public Law 88-129 (Health Professions Educational Assistance Act) which will assist materially in meeting shortages of physicians particularly. The American Hospital Association strongly urged the passage of this legislation. It appears to us, however, that this program is moving very slowly and the total amount of funds appropriated by the Congress thus far will limit the potential accomplishments. We note that legislation has been introduced to assist in the financing and operation of medical schools.

Adequate numbers of well-trained professional nurses are also of fundamental importance to the successful accomplishment of the program. The Nurse Training Act of 1964, which Congress passed last year, should be helpful in relieving the professional nurse shortage.

The Federal Government has for several years been assisting materially in the training of qualified practical nurses and this group is also of great importance.

In respect to the broad spectrum of paramedical personnel, efforts have been very slow. At present we do not know the national number of various categories of paramedical personnel available. We do not have information on which to properly evaluate their preparation. Little is known as to the total numbers needed and little is known as to the sources of the education and quality of the training. We hope that efforts can proceed without further delay in obtaining information that is needed so that proper projections and planninfl may follow.

We would urge that a careful review be made of what is now being done in the overall health manpower picture; and if additional efforts and expenditures on the part of the Federal Government will assist in moving ahead more rapidly, we would hope that support will be forthcoming. It should be possible to increase substantially the effectiveness of already existing medical manpower through intensification of refresher training and of specialized training for selected physicians. We hope this will be given particular emphasis in this program as it develops under S. 596.

FINANCING

In the experience of the hospital field, the financing of the patient care aspects involved in research and demonstration projects is often neglected. There seems to be far too little appreciation of the heavy financial burdens placed on specialized departments of hospitals.

The disease entities visualized for care under this bill involve the most costly procedures carried on in hospitals today. They cannot, therefore, be considered in terms of the usual or average costs of providing patient care. We wish to emphasize very strongly, therefore, that for all of those cases which are accepted for research training and care in the various units of the regional medical complex that the Federal Government commit itself to paying fully for all the services required by this group of patients. Too often the experience with Government research programs has developed problems because of widely divergent opinions as to which costs are training costs, which costs are research costs, and which costs are patient care costs. We feel that all three costs must be considered in total in insuring the success of this program.

SPECIFIC COMMENTS AND RECOMMENDATIONS ON S. 596

Section 900. Purposes

We are pleased that this section would provide for "other major diseases" in addition to heart disease, cancer, and stroke with appropriate controls provided

elsewhere in the bill. There are various concurrent diseases which may affect patients' treatment, and it is well to have this provision in the bill.

Section 901. Authorization of appropriations

On page 3, line 1, we urge that the word "hospitals" be inserted immediately following the words "research institutions". Though it no doubt is intended that hospitals will be included in the broad language, inasmuch as it is in hospitals where the program is in the main to be carried on, it is important to name them specifically in the bill.

In subsection (b), page 3, line 10, we believe the word "or" appearing between the words "planning" and "other activities" should be changed to "and". This is necessary, we believe, to make perfectly clear that both planning and other activities in connection therewith will be included under the grant.

In subsection (c), page 3, line 16, we strongly urge that this paragraph be rewritten as follows:

"Funds appropriated pursuant to this title shall be available to reimburse fully the cost of hospital, medical, or other care of patients (as determined in accordance with regulations) incident to research, training, and demonstration activities."

This rewording conforms to the suggestion we have already made that the entire cost of the services to patients accepted under this program be paid for.

Section 902. Definitions

In subsection (d), page 5, as we have previously discussed, we would urge that to the fullest extent possible the smaller hospitals in the country be utilized as "diagnostic and treatment stations." It is at this level that, in large part, the disease entities to be included in the program will be detected. We recommend, therefore, that paragraph (d), page 5, line 2, be amended by inserting the phrase "the hospital or unit thereof" instead of the phrase "of a hospital".

Section 903. Grants for planning and development

In subsection (a), page 5, line 24, following the words "research institutions" we urge the insertion of the word "hospitals". We believe this is essential in order to avoid unnecessary construction. In several areas of the country, medical schools do not own and operate their own hospitals; and to accomplish their purposes, they make arrangements with one or more existing hospitals in the area. We believe it would be unwise to force medical schools under these circumstances to construct their own hospitals. As previously mentioned, we believe the bill expects hospitals to be a primary entity in carrying out the program and it is essential, therefore, that they be named specifically.

Subsection (b) (2), (3), and (4), page 6 refers to "the applicant." The bill contains no definition of an applicant. It is not clear whether an applicant must be the medical center or whether it may be a clinical research center or a diagnostic and treatment station or whether it could be an entirely separate corporate entity. There are examples in the country of such entirely separate corporate entities functioning at the present time.

We would urge that provision be made for an "applicant" to be any one of the three components of the complex provided so long as all the requirements in respect to forming the complex and establishing the necessary advisory committee are met.

Section 904. Grants for establishing and operation of regional medical complexes

In subsection (a), page 7, line 11, immediately following the words "research institutions", insert "hospitals". Again we believe this is essential in order to give recognition to their primary function in the proposal.

Section 905. National Advisory Council on Medical Complexes

In subsection (a), page 9, line 5, we urge that "may" be deleted and the word "shall" be inserted. It is essential, we believe, that there be no doubt whatever as to the requirement for the appointment of the National Advisory Council.

In subsection (a), page 9, line 11, following the words "the medical sciences", insert "hospital administration". Since most of the program will be carried out in hospitals, there should be assurance that an appropriate authority in hospital administration be included; and for the same reason, we believe that in line 15 at the end of the sentence there should be added: "and one shall be outstanding in hospital administration." At the present time, the bill provides

no assurance whatever that an individual who is thoroughly knowledgeable and authoritative in the administration of health facilities will be included.

We appreciate the opportunity of expressing the views and recommendations of this association on S. 596. We shall be pleased to be of all possible assistance to your committee in its development of the legislation. We request that this statement be made a part of the record of the hearings on the bill.

Sincerely,

KENNETH WILLIAMSON,
Associate Director, American Hospital Association.

STATEMENT OF THE AMERICAN DENTAL ASSOCIATION

The American Dental Association is pleased to have this opportunity to offer comment on S. 596, which would amend the Public Health Service Act to assist in combating heart disease, cancer, and stroke.

Certainly, the statistics relating to the incidence and mortality rates of these diseases are sobering. A combined total of more than one million people die annually because of them. Many additional millions suffer more or less permanent harm to their health as a result of heart disease, cancer, or stroke. The cost of these diseases is in the billions. Any commitment to the total health of our people that the Nation makes must unquestionably include devoting a substantial amount of money and manpower to caring for and curing the victims of these diseases while at the same time working as rapidly as possible to discover even better methods to contain, moderate, and even prevent their ravages.

The dental profession's interest in this legislation is not solely because of its commitment to the total well-being of the American people. In relation to the research and treatment centers concerning heart disease, the dentist has a vital professional concern for some forms of this disease, particularly that known as bacterial endocarditis. This type, involving damage to the valves of the heart, sometimes occurs because of infection in the mouth. Cooperative efforts in educating the medical and dental professions as to preferred methods of management of it have been going on for some time between the American Dental Association and the American Heart Association.

The dental profession's concern with and responsibility for cancer is much broader in scope. It is especially important that when the treatment and research centers devoted to cancer are planned that appropriate emphasis be given to oral cancer.

The incidence of oral cancer in the United States is approximately 30,000 new cases per year. As of 1965, it is estimated by the American Cancer Society that 9,000 persons are dying each year from this manifestation of cancer. In studies made as to the site of cancer, only the breast, lung, and uterus were found to have a higher incidence rate than does the mouth.

What is even more serious is that the 5-year survival rate of oral cancer is worse than that for cancer in any other part of the body except the lungs and stomach. After 5 years, only 29 percent of those afflicted with oral cancer survive.

Further, many of those few who do survive, live on at great cost. Deformities, if any, and other undesirable changes resulting from the treatment for cancer of the breast, lung, uterus, stomach, and prostate can be successfully handled so that society in general is unaware of the physical changes in the individual. With oral cancer, this is often not possible. In many instances, deformities cannot be corrected or masked to assure the patient of an acceptable appearance. There is great difficulty in eating or speaking when the tongue or the floor of the mouth has been necessarily removed. There is a sudden and shocking loss of dignity and sense of stability for such people and severe psychiatric problems frequently develop as a result. In many instances, these people are institutionalized for the rest of their lives not because of the cancer so much as from the impact of its consequences.

Considerable research is being conducted today in an effort to find the primary cause of cancer and the secondary factors relating to lung, breast, and uterine cancer as well as better methods for early detection and improved treatment in the form of radiation, surgery, and chemotherapeutic agents. Once again, oral cancer is something of an exception. Comparatively little research has been conducted on cancer of the mouth. The work to be done in the research centers

envisoned in S. 596 could and should be charged with substantial responsibility in this field. Most men conversant with oral cancer have great hope that the tragically low survival rate could be dramatically and swiftly raised through more widespread application of early detection and improved treatment methods. At the same time, the disfigurement that now so frequently accompanies treatment can, in some way, be minimized or even eliminated.

The American Dental Association, then, is deeply sympathetic to the goals of S. 596. But we would at the same time like to urge in the strongest possible manner that the establishments authorized in S. 596 be planned in such a way that they serve our people's total health and that the considerations raised in this brief statement not only be given careful consideration but be acted upon.

THE AMERICAN PUBLIC HEALTH ASSOCIATION, INC.,
Washington, D.C., February 10, 1965.

Hon. LISTER HILL,
Chairman, Senate Committee on Labor and Public Welfare,
New Senate Office Building, Washington, D.C.

DEAR MR. CHAIRMAN: The American Public Health Association along with you has been pointing out for several years the serious facts recently highlighted in the report of the President's Commission on Heart Disease, Cancer, and Stroke. We applaud the recommended dramatic crash approach to these major causes of death, and we are grateful to see that universities and medical schools are to be involved in the fight in a direct way. They have much to offer, and we in public health have long wished for their greater participation in community health much as universities have for decades participated in agricultural programs.

We have some misgivings about the mechanisms of application of services to communities as proposed in the legislation since apparently the network of public health agencies (both official and voluntary), which have long been repressed by low budgets and most recently by fragmented and sporadic support, appears to have been overlooked.

I am convening a small group of individuals experienced and especially competent in the delivery of health services to review this question of methods of providing services. This review will be done quickly but thoroughly, and hopefully I will be able to forward to you suggestions to further improve this highly desirable legislation before it is finally enacted.

Respectfully yours,

BERWYN F. MATTISON, M.D.,
Executive Director.

AMERICAN MEDICAL ASSOCIATION,
Chicago, Ill., February 18, 1965.

Hon. LISTER HILL,
Chairman, Committee on Labor and Public Welfare,
U.S. Senate, Washington, D.C.

DEAR SENATOR HILL: The American Medical Association wishes to express its appreciation to the Senate Committee on Labor and Public Welfare for making available to it an opportunity to appear on February 9, 1965, at the hearings on S. 596, the "Heart Disease, Cancer, and Stroke Amendments of 1965." We regret that we found it necessary to inform you that we could not present the association's views at that time. Because of the short notice given of the hearings, it was not possible to accord this important legislation the proper measure of consideration which it warrants.

We are sure that this committee must appreciate the tremendous significance of the legislation before it. The purposes of it, namely to assist in combating heart disease, cancer and stroke, and other major diseases, are most laudatory. The eradication or control of such diseases, as well as of all other medical afflictions of man, has been, and continues to be, an active concern and goal of medicine.

We deem it imperative that S. 596 be given consideration commensurate with the significant impact which it could have upon the course of medicine and upon the health needs of our citizens.

The association has initiated steps within its organization to give to S. 596 a most careful analysis of its intent and the manner in which it is sought to be implemented and achieved. We cannot urge too strongly to this committee that this legislation raises considerations with far-reaching ramifications and with a potential of far-reaching effects upon the Nation's health needs. The course to be charted must represent the most judicious employment of the Nation's medical resources.

Sincerely,

F. J. L. BLASINGAME, M.D.

GELVIN-HAUGHEY CLINIC,
Concordia, Kans., January 14, 1965.

Hon. FRANK CARLSON,
U.S. Senate, Washington, D.C.

DEAR FRANK: In reviewing the many comments from newspaper articles and television speeches of future plans of the Johnson administration in establishing funds for clinical research in cancer and arteriosclerotic diseases, it is the desire of our group to establish such a research program.

Dr. Haughey and I established the Gelvin-Haughey Clinic in 1951. Our long-range planning and thinking was to provide patients, as nearly as possible, a complete diagnostic medical center. This has been accomplished in part by the addition of 11 doctors, most of whom are board certified in the following specialties: Thoracic and urological surgery, obstetrics and gynecology, internal medicine, gastroenterology, and pediatrics.

On November 1, 1957, the Gelvin-Haughey Clinic was accepted as a full member of the American Association of Medical Clinics and has been a member in good standing since that time with several doctors acting on the national credentials and membership committees.

Reports from the Kansas State Hospital Association show that the St. Joseph Hospital, Concordia, Kans., has been among the five leading hospitals in the State of Kansas in the number of cancer cases diagnosed and treated in the past 5 years. From these reports you can readily see we are ideally located geographically for a research center.

I wish to make this information available to you for future reference. If appropriations are made available for clinical research, this information will be in your files and will be available to the interested committees with your usual good support. Any further information which you feel would be desirable or advantageous, I will be more than happy to furnish.

Most sincerely yours,

E. R. GELVIN, M.D.

UNIVERSITY OF MINNESOTA MEDICAL SCHOOL,
DEPARTMENT OF PHYSICAL MEDICINE AND REHABILITATION,
Minneapolis, Minn., February 9, 1965.

Senator LISTER HILL,
U.S. Senate, Washington, D.C.

DEAR SENATOR HILL: As your committee begins considering legislation for diagnosis and treatment of heart disease, cancer, and stroke, I would like to bring to your attention one of the most serious problems we face in trying to build better rehabilitation services for the disabled people of this country.

Our medical schools across the country, with only rare exceptions, are continuing to turn out thousands of young physicians who have gained no real comprehension of modern rehabilitation services and what they can mean to all of the disabled and chronically ill patients they will be caring for during their professional lives as physicians. Even our most highly rated medical schools provide little or no teaching of medical rehabilitation in the 4 years of medical school. The almost total emphasis on pathology and diagnosis of acute disease leaves the graduating medical student unprepared to care for the millions of cases of chronic diseases which can be improved by rehabilitation. It is only the few physicians who decide to go into physical medicine and rehabilitation as a specialty who have an opportunity, as part of their formal medical education, to learn about medical management and continuity of medical care. Unless something is done aggressively to overcome this deficiency at this crucial stage in the development of physicians generally, we are going to continue to face

almost insurmountable (and largely unnecessary) obstacles in coping successfully with the problems of severe disability among the American people.

I have inquired of the Vocational Rehabilitation Administration about their current efforts in support of undergraduate medical training in rehabilitation. Some time ago they undertook an extremely modest program to secure at least token attention to the indoctrination of medical students in rehabilitation concepts. At present they are making annual grants for this purpose to some 65 medical schools and of this number over 75 percent of these grants are less than $30,000. In a few other schools their support goes as high as $100,000 a year, which brings this vital teaching to a level which is a little closer to the practical requirements for this important undergraduate teaching. You may recall that 2 years ago I and Dr. Frank H. Krusen recommended to your committee that teaching grants of $200,000 per year be made to selected schools and that the number of grants be increased over the years as medical schools reorganized the curriculum so that they would be able to provide adequate teaching of medical rehabilitation.

I know that you are quite familiar with the President's Commission's proposal to establish 32 regional centers for teaching, research, and services for heart, cancer, and stroke patients. Certainly this represents a laudable effort to advance diagnostic and curative medicine which will benefit untold thousands of patients. However, unless these centers encompass the teaching, research, and services for comprehensive management, including rehabilitation, they will fall far short of meeting the goals proposed by the Commission, and medical care will still remain inadequate for millions of disabled patients. In these three diseases we have an outstanding example of how it is possible to so focus our interest on diagnostic medicine that we completely fail to grasp the dimensions of these diseases in terms of the disability they produce.

In particular, these proposed regional centers should be located at medical schools and should be focal points for teaching medical students the principles and techniques of rehabilitation while they are learning the other phases of diagnosis and care of heart disease, cancer, and stroke patients. This is an opportunity we should not miss. I should like to recommend that the bill which you and your committee report should include specific provisions for the Vocational Rehabilitation Administration to support an expanded program of undergraduate medical education in rehabilitation and to start immediately toward building this support on a level of $100,000 annually for all of the medical schools with whom the Vocational Rehabilitation Administration presently has such a grant relationship. In doing this we should give priority to those medical schools which have or will have a direct affiliation as one of the proposed 32 regional centers for heart disease, cancer, and stroke. Our objective should be to give this kind of support to every medical school as fast as they are able to organize and carry out the proper undergraduate teaching curriculum in rehabilitation.

Furthermore the support to each of the established regional rehabilitation research and training centers should be increased to $1,500,000 annually so that they may expand their training of faculty members needed in other medical schools, provide leadership in the development of a comprehensive rehabilitation program, and in the aggregate represents a research effort in rehabilitation and chronic disease comparable to that of the named Institutes of the National Institutes of Health at Bethesda.

The amount of funds involved here is not great in comparison with the size of the investments we are making in other aspects of health research and teaching. It can, however, have a major and continuing impact on the ability of our Nation's physicians to do a much better job for their patients who become disabled from injury or the many chronically disabling diseases.

I deeply appreciate the many wonderful things you already have done to advance medical care in this country, and I hope you will find it possible to take this important forward step.

With all good wishes, I am,

Sincerely yours,

FREDERIC J. KOTTKE, M.D.,

Professor and Head, Department of Physical Medicine and Rehabilitation.

AMERICAN PHYSICAL THERAPY ASSOCIATION,
New York, N.Y., February 9, 1965.

Senator LISTER HILL,
Chairman, Senate Committee on Labor and Public Welfare,
U.S. Senate, Washington, D.C.

DEAR SENATOR HILL: The American Physical Therapy Association, as the singular national professional organization for the more than 12,000 physical therapists in these United States, has basic concern with the health and well-being of our citizens. In this context we have vital interest in the Heart Disease, Cancer, and Stroke Amendments of 1965 (S. 596) and request that this letter be read into the record of the hearings on this bill currently being held by Senate Committee on Labor and Public Welfare.

The American Physical Therapy Association supports and endorses the provisions of S. 596 as essential to meeting the needs for rehabilitation of the millions of our citizens afflicted by heart disease, cancer, and stroke, as well as other major diseases.

This association through its constituent members has for more than 44 years provided specialized high quality treatment services, for both inpatients and outpatients, afflicted with crippling diseases, and has been the predominant allied medical profession involved with the rehabilitation of persons with strokes.

Physical therapists have contributed through basic and clinical research to the body of knowledge concerning the evaluation and treatment of the stroke victim. Furthermore, they have extensive experience in conducting and participating in training and demonstration activities in this area.

For the aforestated reasons the American Physical Therapy Association makes the following recommendations concerning S. 596:

1. That the regional medical complexes be established in areas in which approved schools of physical therapy exist. If no such school exists in a region, that consideration be given to the development of a physical therapy school in association with the medical school.
2. That consideration be given to the requirement that physical therapy be represented in the designation of regional advisory groups.
3. That the provisions for construction of facilities as defined in section 902(f) include the physical therapy service departments and physical therapy training facilities.
4. In view of the fact that participation and cooperation of physical therapists is essential to the success of the proposals contained in S. 596 and inasmuch as physical therapy is one of the leading medical sciences involved in the treatment of heart disease, cancer, and strokes, we recommend that the Surgeon General be advised to appoint a member of the American Physical Therapy Association to the National Advisory Council on Medical Complexes.

We hope that these recommendations will receive the serious consideration of your committee.

Sincerely,

MARY ELIZABETH KOLB, *President.*

LIST OF SCIENTIFIC PAPERS PUBLISHED BY DR. HENRY G. HADLEY, AND ON FILE IN THE COMMITTEE FOR THE USE OF ITS MEMBERS IN CONSIDERING S. 596

1. The Reason for the Failure of Cancer Research.
2. The Krebiozen Episode and Cancer Research.
3. Environment and Micro-Organisms in Neoplastic Disease.
4. Micro-Organisms, Cellular Immunity, and Neoplastic Disease.
5. Serological Reactions and Neoplastic Disease.
6. Bacterial Immunity and Neoplastic Disease.
7. Evolutionary Theory and the Etiology of Cancer.
8. Cancer and Plant Tumors.
9. Cybernetics, Micro-Organisms, and Neoplastic Disease.
10. The Correlation of Bacterial Immunity With Neoplastic Disease.

AMERICAN HEART ASSOCIATION, INC.,
New York, N.Y., February 24, 1965.

Senator LISTER HILL,
Charman, Committee on Labor and Pubic Welfare,
Senate Office Building, Washington, D.C.

DEAR SENATOR HILL: The American Heart Association recently offered testimony before the Subcommitee on Health on S. 596 (regional medical complexes)

and was grateful for the opportunity of placing its views on record. We hope you will advise us if there is any other action we can appropriately take.

Meanwhile, I am taking this opportunity of acquainting you with the composition of the study commission I appointed for the purpose of examining the bill (S. 596) and establishing the main points of our testimony. It consisted of the following members:

Dr. Robert Glaser, chairman, Affiliated Hospitals Center, Inc., Boston.
Dr. Robert Wilkins, professor of medicine, Boston University Medical School, Boston.
Dr. James V. Warren, chairman, Department of Medicine, Ohio State University, Columbus.
Dr. A. McGehee Harvey, professor of medicine, Johns Hopkins University, Baltimore.
Dr. Sherman M. Mellinkoff, dean, UCLA Medical School, Los Angeles.
Dr. John R. Hogness, dean, University of Washington Medical School, Seattle.
Mr. Jesse R. Fillman, Choate, Hall & Stewart, Boston.
Dr. Houston Merritt, vice president for medical affairs and dean, Columbia College of Physicians and Surgeons, New York.
Mr. Philip P. Ardery, Kentucky Home Life Building, Kentucky.
Dr. Lindsay E. Beaton, Tucson.
Dr. Francis L. Chamberlain, clinical professor, University of California School of Medicine, San Francisco.
Dr. Carl V. Moore, professor of medicine, Washington University, St. Louis.
Mr. Quigg Newton, Commonwealth Fund, New York.
Dr. Elvis J. Stahr, Jr., president, Indiana University, Bloomington.
Dr. Carleton B. Chapman, professor of internal medicine, Southwestern Medical School, University of Texas, Dallas.
Mr. Rome A. Betts, executive director, American Heart Association, New York.

The group convened in Boston on February 6, each member having studied the bill and other relevant material thoroughly beforehand. The main lines of the testimony were evolved after a session lasting about 6 hours. I should add that each member dropped everything and came to Boston on little more than 24 hours notice. After the meeting in Boston, we obtained the approval of our legislative advisory committee by telephone. The testimony we offered on Tuesday, February 9, was thus based on very competent advice and careful study. I doubt that a more knowledgeable and highly motivated group of men could have been found in the Nation for the purpose.

Please be assured of our continuing interest in the legislation (S. 596 and S. 597), and of our appreciation for the courtesy the subcommittee showed us.

Yours sincerely,

CARLETON B. CHAPMAN, M.D., *President.*

CANCER CARE OF THE NATIONAL CANCER FOUNDATION,
New York, N.Y., February 15, 1965.

Senator ROBERT F. KENNEDY,
U.S. Senate,
Washington, D.C.

DEAR SENATOR KENNEDY: Thank you for your letter of February 8 concerning the work of Cancer Care in relation to the proposed amendment to the Public Health Service Act.

At your suggestion, I have reviewed the report of the President's Commission on Heart Disease, Cancer, and Stroke and S. 596 and found that these documents deal thoroughly with the goal of curing and rehabilitating the cancer patient by means of research, training personnel, diagnosis, and treatment. No consideration is given, however, to meeting the needs of those who will die of cancer each year. This omission is understandable is view of the fact that the program of Cancer Care is unique and, regrettably, was not represented on the Commission.

During the several months or years that a patient with advanced cancer may live, his family can be destroyed by financial and emotional strain. This is particularly true is the middle-income group, where a previously productive family can be reduced to public welfare status. In the 20 years of its existence, Cancer Care has gained the experience that enables us to help these families retain their integrity, dignity, and productivity.

Cancer Care was called on to serve 10,555 persons last year in the metropolitan area of New York City, which included 3,671 patients and 6,884 family members. Financial grants amounting to $535,079 were given to provide necessary services in the home. These services include medical homemakers, housekeepers (for the care of children), nurses, bedside equipment, transportation for medical treatment, and the cost of prescribed medications. When care at home was not feasible, some of these grants were used to supplement nursing home costs.

An additional $235,752 was spent for counseling and guidance.

Funds must be provided for research directed toward the cure of cancer. We must face the fact, however, although it is painful to do so, that a cure is many years off.

More than 300,000 people in the United States will die of cancer this year. Without assistance, many of the families of these patients will lose their independence and become an economic liability.

I find nothing in the terms of S. 596, or in the report of the Commission, to indicate that the needs of the advanced cancer patient and his family have been considered.

I would, therefore, strongly recommend that provision be made for the millions of American families who must face this disease in the years to come.

I appreciate your interest and your awareness of this problem.

Sincerely yours,

HENRY J. HEIMLICH, M.D., *President*.

NEW ROCHELLE, N.Y.

PREPARED STATEMENT OF WARREN ZEPH LANE, M.D.

To amend the Public Health Service Act to assist in combating heart disease, cancer and stroke, and other major diseases.

Senator Hill, distinguished members of the subcommittee and members of the staff: I am Dr. Warren Zeph Lane, chief, department of thoracic and cardio vascular surgery and a member of the Research and Clinical Study Committee of the Norwalk Hospital of Norwalk, Conn. I am also vice president of the Norwalk Area Cancer Society and chairman of the Protocol Subcommittee on Thermography of the American Cancer Society.

My purposes in appearing before the committee is to place in perspective the aspirations of the non-profit community hospital. Since World War II the augmentation and educational upgrading of the staff of the community hospital; the expenditures by trustees for capital development; the enlargement of endowment funds; and the progressive planning and construction in collaboration with the Hill-Burton Act has produced a progressive program of local and regional hospital improvement.

When the Commission's report is carefully read, recommendations are made which seem to fit the qualifications of many community hospitals. But, the community hospitals, in order to shorten the timelag between conceptual and development work for medications and procedures and instrumentation need further support. The ultimate consumer, the patient, wants to know and needs to know that his family physician, specialist, and local hospital are up to date and not lagging a decade behind the university centers in the application of scientific medicine.

In order to accomplish this reduction in the time lag the current income for acute short-term patient care cannot be expended on research and development. There are many reasons for this, but the overriding factor is that the rapid increase in per capita per day costs cannot be negotiated with Blue-Shield, Blue-Cross Plans when it is applied to clinical research and development. Secondly, the national voluntary agencies rarely grant funds for community hospital research. Thirdly, the NIH programs find few community hospitals eligible for their funds because full-time medical investigators tend to congregate in the university and teaching hospital complexes. These points are not criticism, they are used to demonstrate the plight of the community hospitals that may be trying to encourage staff activities for medical investigation and postgraduate education.

The program that we have attempted to implement at the Norwalk Hospital may serve as a grassroots example:

(1) A 20-year flexible plan for orderly development based on population growth and public communications was established in 1951.

(2) The annual giving plan with a full-time director and staff, charged with the development of fund procurement, was accomplished. This staff prevents the necessity of expensive fund drives. In 13 years it has produced $9 million at a cost of 6.5 percent of gross income from over 30,000 individual gifts. More than 165 other community hospitals have adopted the annual giving plan developed by the Norwalk Hospital.

(3) Professional staff requirements for certification and education were enlarged and defined.

(4) A research laboratory was established. Since opening for work in October 1963 it has—

(a) Been responsible for coordinating basic research in infrared themography for 18 institutions over the United States.

(b) Been responsible for the original work in developing an instrument which may have application in the surgical treatment of coronary artery and peripheral vascular arteriosclerotic disease.

(c) Performed more than 2,000 infrared thermograph examinations which may lead to a method for localization of cancer.

(d) Accomplished the isolation of a dialyzable substance in the blood serum of patients with rheumatoid arthritis.

These are outstanding examples of programs which are related to clinical medicine.

In international programs:

(1) Since 1953 we have trained interns and residents from 26 nations. Many have gone on to university centers for board certification in various specialties.

(2) We have participated with various applied science firms in the negotiation of a total ecological development program for Kenya. This latter program includes a "reversed flow" medical training program for physicians, nurses, and technicians which will train Kenyans in the principles of American medicine. When fully funded and implemented we expect to make this program a model for underdeveloped nations everywhere.

I am sure that the same types of work can be claimed by many other hospitals, but my purpose is to demonstrate what is feasible with our present support. Therefore, I would like to make the following recommendations to the committee for consideration when amending the law:

(1) Provide for a category of funds which are to be reserved for grants to community hospitals for research and development and postgraduate medical education. This should include capital funds and discretionary funds for personnel, supplies, and equipment. Certain prerequisites for safeguarding application should be specified such as (a) minimum space requirements, (b) program definition, (c) house-staff participation, (d) science-fair winners participation, and (e) review by a committee of the hospital and staff and trustees. In this way we may be able to generate a great deal more interest from the premedical and high school students in a mutual learning process.

(2) Provide for travel and housing for qualified physicians, nurses, and technicians from underdeveloped nations for a minimum of 2 years. During this time they could be exposed to the grassroots of American medicine. On return to their countries, this should be followed up by the cross-fertilization of the "reverse flow" process in which American personnel will spend 1 year in that country seeing to it that the new-found knowledge does not become diluted or forgotten. In the process, the problems of the underdeveloped country will be learned at firsthand. It is my belief that family allowances should be included for both categories.

(3) Provide subsidies for accredited foreign medical schools provided they will accept American students who qualify. In this way we may encourage the "reverse flow" to start with the original educational process. Also, the expense may be somewhat less than enlarging our present medical education program too rapidly with loss of excellence in the process.

Finally, I should like to say that if the public sector provides some support for programs such as this the private funds will increase locally when the ultimate consumers begin to realize the benefits. Thank you for your consideration.

U.S. SENATE,
COMMITTEE ON PUBLIC WORKS,
February 24, 1965.

Hon. LISTER HILL,
Chairman, Committee On Labor and Public Welfare,
New Senate Office Building, Washington, D.C.

DEAR SENATOR HILL: Attached please find a letter addressed to me from Dr. William L. Simpson, scientific director, Detroit Institute of Cancer Research.

In this letter Dr. Simpson expresses his views on S. 596. If at all possible I would appreciate the inclusion of Dr. Simpson's letter in the record of public hearings in S. 596 so that his views may receive consideration when the Subcommittee on Health prepares to "markup" the bill.

With all good wishes.

Sincerely,

PAT MCNAMARA, *U.S. Senator.*

DETROIT INSTITUTE OF CANCER RESEARCH,
Detroit Mich., February 20, 1965.

Hon. PATRICK V. MCNAMARA,
Senator from Michigan,
Old Senate Office Building,
Washington, D.C.

DEAR MR. MCNAMARA: It is a source of much regret that I have learned so recently that public testimony was being taken on Senate Bill 596, which was introduced by Senator Lister Hill to implement recommendations of the President's Commission on Heart Disease, Cancer, and Stroke.

As the scientific director of the Detroit Institute of Cancer Research, one of less than a score of categorical institutions devoted to basic and clinical research in the field of cancer in the United States, I find that the wording of this bill departs significantly from the recommendations of the President's Commission on Heart Disease, Cancer, and Stroke in several important and undesirable ways.

In the first place, the primary emphasis on development of huge "medical complexes" built around medical schools is unrealistic for most sections of the country and will block the possibilities for immediate progress based on the knowledge developed in existing categorical institutes to deal with the specific diseases named. The inclusion of "other major diseases" in addition to heart disease, cancer, and stroke, makes the program so diffuse that gains against the three named diseases would surely be delayed through dissipation of the total effort. There is no careful study to justify this broadening of the bill beyond the diseases so carefully documented by the distinguished group of scientists and citizens who made up the President's Commission.

I urge that the committee, of which you are a member, seriously consider amending the bill so as to take full advantage of the opportunity to push ahead quickly with the fight on cancer by recognizing the leading roll that can be played by institutions already committed to basic and clinical studies on that disease. I urge that you recognize the broad experience of the several National Institutes of Health in administering research funds and place administrative responsibility for implementation of the President's program within the National Institutes of Health.

If there is any way in which I can be of assistance to you or to the committee in evaluating the potential effects of this legislation, especially on the people of the city of Detroit and the State of Michigan, I shall be at your service upon call.

Sincerely yours,

WILLIAM L. SIMPSON, M.D.,
Scientific Director.

WAYNE STATE UNIVERSITY,
Detroit, Mich., February 16, 1965.

Hon. LISTER HILL,
Chairman, Labor and Public Welfare Committee,
Senate Office Building, Washington, D.C.

DEAR SENATOR HILL: We have read with interest the report of the President's Commission on Heart Disease, Cancer, and Stroke (vol. 1, December 1964). We understand that Senate bill 596 introduced in the 1st session of the 89th Congress seeks to implement certain of the recommendations of the Commission.

The establishment of regional medical complexes for research and treatment in heart disease, cancer, stroke, and other major diseases is of particular interest to us in that we are all concerned with the development of a teaching, research, and service medical center in Detroit. Wayne State University has begun the building of a teaching and research center designed to accommodate entering classes of 200 medical students. This has been made possible by collaboration of the midtown Detroit hospitals; Harper, Grace, Woman's, Children's, and the Rehabilitation Institute with the university. The purposes of the center clearly fit into the patterns outlined by the provisions of S. 595, S. 596, and S. 597. The Housing Commission, the Planning Commission, the Health Commission of the City of Detroit, the five voluntary hospitals and the university have worked together for many years to bring the medical center to its present state. Our objectives are excellence in the areas outlined by S. 596, as well as in all other fields which relate to our several teaching, research, and service functions.

The bills now under consideration hold much promise for the development of an important public health and educational resource in Detroit. The undersigned represent some of the organizations vitally interested in the medical center and what it may bring to almost 4 million people in our immediate area. We invite your special attention to these bills and to our interest in them as sound methods by which the recommendations of the President's Commission may be implemented. We also assure you of our willingness to testify before your committees if you think this is desirable.

JEROME CAVANAGH,
Mayor, City of Detroit.
JOHN J. HANLON,
Health Commissioner, Detroit and Wayne County.
RAY EPPERT,
Chairman, Citizens Committee, Detroit Medical Center.
LEONARD WOODCOCK,
Chairman, Board of Governors, Wayne State University.
CLARENCE HILBERRY,
President, Wayne State University.
ERNEST GARDNER,
Dean, School of Medicine, Wayne State University.

ANN ARBOR, MICH., *February 17, 1965.*

Senator PHILIP A. HART,
Washington, D.C.:

The University of Michigan respectfully urges your support of Senate bills 595, 596, and 597 which can help us to improve and expand our already distinguished programs in medical education. The proposed support and assistance to students, faculty, libraries, and schools are necessary to meet the demands of the people for improved health, and to our ability to do our share.

President HARLAN HATCHER,
The University of Michigan.

The CHAIRMAN. The subcommittee will now stand in recess.

(Whereupon, at 12:55 p.m. the subcommittee recessed subject to the call of the Chair.)

APPENDIX A

SUBCOMMITTEE REPORTS OF THE PRESIDENT'S COMMISSION ON HEART DISEASE, CANCER, AND STROKE

REPORT OF THE SUBCOMMITTEE ON HEART DISEASE

(Dr. Irving S. Wright, Chairman, Dr. Samuel Bellett, Dr. J. Willis Hurst, Dr. Paul Sanger, and Dr. Helen Taussig; staff, Dr. John D. Turner)

INTRODUCTION

Heart disease is the No. 1 cause of death in the United States. In 1963, over 993,000 Americans died of heart and blood vessel diseases; this toll represented 54 percent of all deaths in the United States. And yet, in fiscal year 1963, only 11 percent of all medical research expenditures (Government and private) were used for research in cardiovascular diseases. In addition to those killed by cardiovascular diseases in 1963, it is estimated that 14,600,000 survivors were afflicted with definite heart disease and almost 13 million with suspected heart disease. The deaths, illness, disability, and economic loss to family and to Nation caused by diseases of the heart and blood vessels clearly place them as the No. 1 health problem in America today.

Tremendous strides have been made during the last 15 years toward the prevention or cure of some of these diseases. In large part, such gains have been fostered by the wise and intelligent interest and awareness of the U.S. Congressmen who have appropriated increasing amounts of moneys for medical research since the end of World War II. These funds have made it possible for investigators in the biomedical sciences to bring their talents and efforts to bear, in a way never before possible in the history of mankind, on this most important challenge to health.

Medical research has yielded a high return on the public investment. Analysis of the health statistics over the last decade shows a definite decrease in the deaths associated with a number of these diseases. For example, research in high blood pressure has resulted in the development of drugs that effectively lower elevated levels. Large numbers of Americans with high blood pressure have been treated successfully with these drugs over the last decade. Over this same interval, the number of deaths attributed to high blood pressure has decreased. Though the drugs are not the sole reason for this fall, they are a most important one. In addition these drugs have made it possible for a large percentage of people with high blood pressure to return to work and a normal life. There is no question that such salutary results are a product of medical research.

One form of blood vessel disease—atherosclerosis, especially of the coronary arteries—has not shown the decline reported for other forms of cardiovascular disease, according to the death rates. In spite of intense research efforts, coronary heart disease remains the No. 1 cause of death in adult males and females in the United States. This is not to say, however, that medical research has not made great strides in this field. As a matter of fact, the results of research in atherosclerosis have been perhaps even more spectacular than in many other fields.

Examples are numerous. Atherosclerosis of the major arteries of the body has been attacked surgically with gratifying results. With the development of artificial arteries, it is now possible to replace or bypass many diseased segments of arteries and restore normal blood flow to vital organs. An increasing number of Americans are now leading normal lives as a result of such advances in vascular surgery.

Electrical devices, cardiac pacemakers, have been developed that can restore to normal a diseased heart's abnormally slow rate. Some of these pacemakers

can be implanted to maintain a normal heart rate for years. Indeed, more than 5,000 adults living with implanted pacemakers might be dead but for this advance in technology.

The dreaded complications of an acute heart attack—thrombosis and embolism—have been greatly reduced in frequency by the use of anticoagulant drugs. Preliminary work with clot-dissolving drugs, or fibrinolytic agents, in treating thrombotic episodes shows considerable potential; more work in this area could result in significant contributions.

Research efforts are underway at the present time to develop an artificial heart to replace a diseased heart. Experimental models have already been tried in man. These models are being modified; and, with the aid of industry, it is hoped that an effective model may become available for widespread use by 1970 or even earlier.

Another development which has become possible due to increasing research into the immune responses of men has been in the field of organ transplantation. Kidneys, livers, lungs, and recently hearts have been transplanted into man from primates or from man to replace diseased organs. Though the results leave much to be desired, early work in this complicated field has shown sufficient promise to justify intensification of such research.

The advances in cardiovascular disease over the last two decades were not considered possible 50 years ago. Funds, in increasing amounts appropriated by Congress for facilities, training, and research, together with funds from voluntary agencies and private sources, have made these advances possible. Thanks to these historymaking developments, physicians today know more than ever before about heart and blood vessel diseases and can do something about them.

Still there is a long way to go. It is imperative that these advances be capitalized upon and the research effort intensified and accelerated if these diseases are to be brought under control.

In addition to the development of new knowledge through research, a pressing need is the application of the fruits of research so that the American people can receive the full benefit of what medical research has accomplished. At present, they are denied much that medical knowledge has to offer. In part this is because of shortages of professional health workers and medical facilities. It is also partly related to the public's lack of awareness of recent developments and techniques of prevention and treatment. The patient with heart disease should receive the best that modern medicine has to offer, not only to save his life but also to restore him to his family as a productive and useful citizen. Such treatment can only be accomplished by a coordinated national program to overcome shortages where they exist, by stronger educational efforts directed toward the professional and general public concerning the prevention and treatment for cardiovascular diseases, and by the development of properly distributed community resources sufficient to provide excellent medical care from the onset of symptoms of heart disease to the patient's return to community life.

In evaluating the research, training, and control needs in cardiovascular diseast, it is worthwhile reviewing the wise and thoughtful provisions of the National Heart Act:

"The purpose of this act is to improve the health of the people of the United States through the conduct of researches, investigations, experiments, and demonstrations relating to the cause, prevention, and methods of diagnosis and treatment of diseases of the heart and circulation; assist and foster such researches and other activities by public and private agencies and promote the coordination of all such researches and activities and the useful application of their results; provide training in matters relating to heart diseases, including refresher courses for physcians; and develop and assist the States and other agencies in the use of the most effective methods of prevention, diagnosis and treatment of heart diseases."

Unfortunately, many of these important provisions have not been carried out to the extent possible. The Subcommittee on Heart Disease of the President's Commission on Heart Disease, Cancer, and Stroke has developed a series of recommendations to permit the fullest possible implementation of these provisions and to meet the charge given to the Commission by President Johnson "* * * to recommend steps to reduce the incidence of these diseases through new knowledge and more complete utilization of the medical knowledge we already have."

Most of part 1 of this report emphasizes conclusions and recommendations. With some redundancy, part 2 deals mainly with the background for these conclusions.

REGIONAL HEART DISEASE CENTERS FOR CLINICAL INVESTIGATION, TEACHING, AND PATIENT CARE

It is recommended that at least 25 heart disease centers be established on a regional basis in selected universities and medical research institutions throughout the country.

A heart disease center is defined as an organizational unit, including indivduals from various disciplines in medicine, the broad purpose of which is to conduct research and traning aimed at the prevention, alleviation, and cure of heart and blood vessel disease. Such an organizational unit should be administratively and physically part of a large medical complex which is already engaged in medical research and training.

The center must have space appropriate to the program to be mounted, permitting reasonable expansion. Nonmatching support dollars should be available for the construction of new space or the renovation of existing space.

The research program should include clinical investigations, utilizing hospitalized patients, outpatents in certain instances, and a variety of modern laboratory facilities. Research support should include funding for all aspects of inpatient and outpatient observation, construction, or renovation of space, salaries of all categories of personnel, purchase of equipment and supplies, including laboratory animals, and so forth.

It is mandatory that the personnel of each center be large enough in number and represent enough disciplines to facilitate investigation in depth, utilizing a broad range of scientific methods. Such a center might include internists; cardiopulmonary physiologists; cardiologists oriented toward electrocardiographic interpretation and electrical termination of abnormal rhythms; peripheral vascular specialists; cardiac and vascular surgeons; lipid, coagulation, and general biochemists; statisticians; epidemiologists; radiologists with appropriate training; and, in some cases, geneticists. Computers may be employed for full exploitation of data developed in these centers.

Such centers would be strongly oriented toward clinical investigation but at the same time would provide high-quality patient care, including rehabilitation, and would also be concerned with teaching and the training of personnel concerned with heart disease.

The teaching function should include the training and support for physicians, surgeons, radiologists, nurses, and professional personnel in other pertinent disciplines. Also included should be training programs for personnel staffing the heart stations. The center should also serve a teaching function for the medical community of the region.

Since the research and training activities demand patients, the centers will necessarily also be concerned with patient care. It is visualized that each center will require up to 30 hospital beds—medical, surgical, and rehabilitation, in addition to the beds already available in that hospital facility—as well as an outpatient care facility.

It should be emphasizd that it will be necessary to develop regional centers where none exist. During the first 3 to 5 years of the program, investments will have to be made in potential regional sites.

A total of $166.2 million over a 5-year period should be provided to establish and maintain these 25 centers. Authority should be given to provide up to 100 percent for construction and renovation costs. The proposed 5-year budget for this program is as follows:

Projected outlay for 5 years

[Dollars in millions]

Year	1	2	3	4	5
Number of new centers	10	3	4	4	4
Construction and renovation	$25	$7.5	$10.0	$10.0	$10.0
Operating expenses		17.0	22.1	28.9	35.7
Total	25	24.5	32.1	38.9	45.7

The present program of matching grants for the construction of health research facilities needs to be augmented with authority for the Public Health Service to construct, on a nonmatching basis, research facilities for regional or national purposes. The Public Health Service has the responsibility for meeting national research objectives. In pursuing these objectives, the Public Health Service must have available a full range of mechanisms which are not dependent on the availability of matching funds or the existence of institutional interest in specific research programs. The additon of this nonmatching construction authority would enable the Public Health Service to be more responsive to specific research objectives established by the executive or legislative branches of the Government. It is urgently recommended.

SPECIALIZED HEART DISEASE RESEARCH CENTERS

To permit the development of certain specific areas which require more concentrated effort in a particular field of research in cardiovascular disease, it is recommended that at least 10 specialized heart disease research centers be established in various health and medical research facilities throughout the country. These centers would be organizational units with personnel and in-depth research and training objectives limited to a special facet of cardiovascular, e.g., epidemiology, genetics, study of blood coagulation parameters and anticoagulant and fibrinolytic agents, pharmacology (especially of natural products) or coronary prevention evaluation. These centers are to be distinguished from the regional heart disease centers mentioned above in that they will not be concerned with the total problem of cardiovascular disease. For example, there is need for a minimum of three special epidemiological research centers in the field of cardiovascular disease. Centers of this type require personnel from a variety of disciplines, e.g., epidemiologists, biostatisticians, mathematical statisticians, sociologists, nutritionists, pathologists, and others. Such a center would develop and support epdemiological research projects in the broad field of cardiovascular disease in suitable population groups in the United States and, where unique research opportunities exits, in foreign countries. Specialized centers in other specific research areas could be organized similarly in a manner appropriate to the nature of the task. There is definite need for this flexible approach to the establishment of specialized centers for in-depth research and training.

It is estimated that $300,000 per year is needed for each specialized center. It is recommended that $600,000 be appropriated during the first year with annual increments of $600,000 up through the fifth year; a total of $9 million for the first 5 years of this program.

DEVELOPMENT OF THE CENTERS

The planning, review, and early stages of the development of these centers will be a major undertaking. The total effort will be of a magnitude for which the present administrative structures at the National Institutes of Health are not properly geared. It will be impractical to have the many detained ramifications of each plan subject to separate consideration by the several committees which presently report to the Advisory Councils. For example, under the present system, each one of these centers would involve disciplines requiring the action of numerous study sections. The many committees concerned will not be able to consider the material in parallel from the viewpoint of time. In the present administrative structure, applications would have to be reviewed by committees dealing with (*a*) construction and renovation, (*b*) program project, (*c*) appropriate study section activity, and (*d*) training grants.

In order to activate and develop this major program with essential flexibility, it is recommended that an Advisory Committee on Regional Centers be established by the Public Health Service. The function of this committee will be the organization, development, coordination and review of all plans and projects dealing with the development of heart disease centers and the presentation in mature form of comprehensive proposals to the National Advisory Heart Council for its consideration. This committee should also be concerned with positive program planning as well as the development of a basic "core" of support which would enable each center to become established, coordinate its essential function, and get underway.

During this period the center committee should utilize fully the talents of the presently existing committees, especially those dealing with construction

and renovation. One way to achieve this would be to have representation from each on the Advisory Committee on Regional Centers.

The experience gained during the early period could be applied in the development of subsequent centers. This would obviously have great advantages. After the first 3 years, requests for additional support from these centers should be submitted in each case through the usual channels and subject to competitive review.

It is believed that this approach will avoid the overloading of the present committees, sections, and staff during this development period. Furthermore, it will coordinate this effort in a sound manner and will greatly enhance the quality of the supporting data presented for consideration to the National Advisory Heart Council. Such staff work will, in turn, lessen the burden of this large program on the Council.

CARDIOVASCULAR RESEARCH FUNDS

Estimated total expenditures, for research in the cardiovascular diseases, amounted to $122.4 million in fiscal year 1963. The major source of support was the Federal Government, providing 88 percent of the total in fiscal year 1963. The National Institutes of Health currently provide the bulk of the funds, although many other Government agencies are supporting some such research. In the private sector, the American Heart Association is the major source of support for cardiovascular research; in addition, it plays an important role in professional and public education in this field. The list of voluntary agencies and foundations, currently financing such research, is long and diversified—a total of 37.

Expenditures for research in the cardiovascular diseases comprised only 11.8 percent of all medical research expenditures in the United States in fiscal year 1962, as noted above. Although cardiovascular research expenditures, in dollars, increased 8.7 percent in fiscal year 1963, the proportion to total medical research expenditures decreased to 11 percent, indicating that research in cardiovascular diseases is not keeping pace with the annual expansion in total medical research. This neglect has occurred in spite of the fact that over 50 percent of all deaths in the United States are due to diseases of the heart and blood vessels.

Closer examination shows that the total budget for the National Institutes of Health (NIH) increased from fiscal year 1963 to fiscal year 1964 by only 4 percent while the budget for the National Heart Institute decreased by almost $15 million. Furthermore, although conservative NIH estimates show that a 19-percent budget increase can be justified on current program needs, it is understood that the bureau will be held down to a 4- to 8-percent increase for the next several years; barely sufficient to continue support of ongoing programs but not sufficient to allow development and support of new programs. This approach is hardly realistic. Budgetary increases should be based on the need for a productive program of research on rigid adherence to a predetermined percentage increase.

In order to facilitate intensified and expanded support of research in cardiovascular disease, it is recommended that $40 million be appropriated to the National Heart Institute in a 3-year period over and above current appropriations for research project grants.

SPECIAL STUDIES

The National Heart Institute has given, and should continue to give, special emphasis to epidemiological studies and controlled clinical trials of drugs, diet, use of tobacco, and surgical procedures. Broad clinical field trials of this nature are expensive and require the collaboration of many institutions. This should not act as a deterrent to the support of meritorious projects of this type. In order to facilitate the planning and implementation of special-purpose programs, the National Institutes of Health should be given authority to use a mechanism whereby funds appropriated for these programs would not lapse if unspent at the end of the fiscal year.

Considerable work is being devoted by many investigators at the present time to the development of an artificial heart. To mount a large-scale attack on this problem, considerable research and development by university and research institution members, but, more particularly, by industry will be required. The same is true for other technical developments. The present Public Health Service Act, as amended, does not provide direct authority to contract for

research and development purposes. The authority being utilized for this purpose is obtained by delegation from the General Services Administration through the Secretary of Health, Education, and Welfare. This delegated authority is general in nature and does not contain certain features which appear essential to contracting for research and development purposes. In addition, any contract let by the National Heart Institute, in excess of $25,000, must be approved by the Secretary of Health, Education, and Welfare—a delaying and cumbersome procedure.

It is therefore recommended that the Public Health Service's authority to contract for research be broadened to allow the Surgeon General or his delegated agent—

(*a*) To make advance payments on contracts in order to assist contractors in initiating new and complex technical operations;

(*b*) To pay for the cost of construction involved in and essential to the successful accomplishment of the terms and purposes of a contract; and

(*c*) To commit contractural support for advance periods upward to 5 years to enable contractors to make substantial investment in facilities and staff, as required for major contract operations, with confidence in substantial recovery of costs and reasonably stable operations.

Further, it is recommended that the procedure of letting contracts be made less cumbersome so that rapid strides can be made in the research and development area without being impeded by unnecessary administrative and fiscal restrictions.

It is also recommended that the National Heart Institute be appropriated $10 million in the first year; $15 million in the second year; and $20 million in the third year for research and development operations as a needed adjunct to its current research program.

It is also recommended that there be a greater expansion of the international research program in order to capitalize on unique research opportunities abroad.

A need exists, both nationally and internationally, for the development, dissemination, adoption, and use of standardized nomenclature, criteria, and methods (clinical and laboratory) utilized in cardiovascular (and other) research so that the results and reports of investigators from different parts of the world can be interpreted, reproduced and, when applicable, applied for the benefit of the American people. The beginnings made in this direction have proved most fruitful. An example is the International Committee on Blood Clotting Factors which has been supported in large measure by funds from the National Heart Institute. Efforts of this type are needed and should be encouraged and supported.

An intensification and acceleration of the present research effort will require staff with the numbers and competence to administer these programs. It is recommended that there be a relaxation of the current limitations on positions in order to support the development and implementation of new programs.

TRAINING PROGRAMS

Research training can be supported and is supported by the National Institutes of Health and the National Heart Institute. Although a careful 1962 projection of manpower needs recommended a doubling of medical and scientific manpower by 1970, there has been no substantial increase in training funds in the NHI budget for the past 4 years except for minor increases to meet the needs for increased stipends and educational allowances.

This is an unrealistic response to a vital need. A much larger corps of well-trained research scientists and physicians is essential to an intensified and accelerated program of research in cardiovascular diseases. This need must be met.

The National Advisory Heart Council prepared a proposed budget for fiscal year 1965. This budget was presented to the subcommittee of the Committee on Appropriations of the House of Representatives in March 1964. The Council—the senior advisory group to the National Heart Institute—in evaluating the program needs for the institute recommended a 20-percent increase in fellowship funds and an 11-percent increase in training grant funds. The appropriations to the NHI for fiscal year 1965 in the fellowship and training grant areas do not come near these recommended figures. There was no increase at all.

It is recommended that the National Heart Insitute receive an annual increase in appropriations up to 20 percent in training grant and fellowship funds over the next 5 years so that a start can be made to meet, at least in part, the re-

search manpower shortage. Further, it is recommended that undergraduate training grants be increased to $40,000 per eligible 4-year school and to $25,000 per eligible 2-year school.

The Commission is aware of the efforts on the part of other official and voluntary health agencies in the field of cardiovascular diseases. For example, the 168 hospitals in the Veterans' Administration, providing almost 125,000 beds, many of which are physically near medical schools, constitute an excellent total facility for bringing excellent medical care to a sizable segment of the population and, in addition, can provide an ever-expanding resource for clinical and basic investigations.

Much wider use should be made of the Veterans' Administration facilities for research and teaching in collaboration with other major research and teaching facilities. The Veterans' Administration has potential for large-scale and long-term clinical studies. It is specifically recommended that the Veterans' Administration be given the charge and the funds to carry out an expanded program of research and teaching, in addition to patient care.

The valuable contributions to the research and community service effort made by the American Heart Association and its affiliates are recognized.

ADVANCED CLINICAL TRAINING

The needs in manpower described above apply not only to research scientists but also to practicing physicians in the heart disease field as well as in other categories. These men and women are ultimately responsible for carrying the fruits of research to the majority of the American people. And yet, under current policy guidelines, the National Heart Institute can only support training that is research oriented.

Greater emphasis must be placed on the training of superior clinical physicians. There is a great need for a larger corps of clinicians who are capable of precise diagnosis and providing appropriate treatment, clinicians with minds capable of recognizing and applying new discoveries and clinical observations.

To meet this need, it is recommended that the authority be granted and the funds appropriated for:

(*a*) The establishment of clinical fellowships in the cardiovascular field; and

(*b*) The establishment of full-time clinical investigators in the cardiovascular field.

In a medical school, education and research go hand in hand. This should be recognized by the Public Health Service. Administrative and policy attitudes regarding research grants should be less restrictive even when such education involves clinical medicine and service.

APPLICATION OF RESEARCH

The need for more effective and more widespread application of the products of research is as great as the need for new knowledge through research. And yet, financial support for this type of activity has lagged far behind research support; in 1964, for example, the total budget for the heart disease control program was one-tenth of the total budget for the National Heart Institute.

The Subcommittee on Heart Disease has explored in depth the current state of knowledge in the field of cardiovascular diseases and has evaluated and outlined the current and future research training and control needs (see pt. 2, below).

In almost every disease category in the cardiovascular diseases, the need exists in each State for a coordinated statewide program of heart disease control. In rheumatic fever control, for example, as in most other heart disease categories, there is a variety of Federal, State, and voluntary programs. There is little overall coordination of the ongoing programs and the agency responsible for a given program varies from State to State. This situation is not helped by the disagreement among health workers in the field as to whether rheumatic fever prevention (and control efforts in heart disease in general) should be an official or voluntary agency responsibility or both.

On the national level, greater efforts should be made to coordinate the activities of the U.S. Public Health Service, the Office of Education, the Children's Bureau, the Vocational Rehabilitation Administration, the American Heart Association, and other agencies involved in community services in cardiovascular disease. These agencies should pull together existing information so that an assessment can be made of the heart disease control programs in each State, the extent of

these programs, the responsible agencies within each State (at the State, county, and city levels), and the obstacles within each State which prevent implementation of a coordinated statewide program. This type of information is badly needed.

A comprehensive coordinating effort should be made by the heart disease control program, in cooperation with the agencies referred to above. This could be facilitated by the appointment of a committee of scientists and health workers in this field to advise the heart disease control program. Such a committee might undertake the establishment of uniform criteria so that reports received from each State could be pooled to give meaningful and accurate national data. It might also recommend pilot projects in heart disease control; successful projects might ultimately serve as models for more large-scale operations.

Coordination within States

It is suggested that each State develop its own heart disease control program (with operating sections for congenital heart disease, rheumatic fever and rheumatic heart disease, hypertension, coronary heart disease, cardiopulmonary disease, peripheral vascular disease, congestive heart failure) with financial assistance from the heart disease control program (with specially earmarked funds for each of the operating sections).

It seems reasonable to recommend that each State choose the agency responsible for the implementation and administration of a coordinated statewide program since it appears that a single national recommendation might not be suitable (or acceptable) to all areas. The type of program adopted would depend on the local conditions.

Irrespective of which agency is ultimately responsible for administering the program in any given State, there should be representation from all other agencies, public and private (voluntary), involved in heart disease control activities on a planning committee, or advisory council or other appropriate body. Critical to the success of such a program would be an excellent relationship between the administering agency and the practicing physicians within that State; this point cannot be emphasized too strongly.

The role of the heart disease control program of the U.S. Public Health Service is to assist the States to develop and implement heart disease control programs.

The Public Health Service has been seriously hampered from fulfilling its mission in heart disease control by lack of sufficient authority and funds. The refinement of techniques, pilot testing, and similar developmental work have been all but neglected because of lack of project grant authority and funds to mount such programs.

Some control techniques are available which cannot be demonstrated on a widespread basis because they do not lend themselves to existing funding mechanisms. The contract method of funding is difficult to use when projects provide services and no clearcut product (such as a research result) for the Public Health Service. A demonstration is most appropriately and feasibly funded by a project grant which requires no extensive reports containing fresh data. The contract mechanism, available to the heart disease control program through its direct operations funds, is limited (less than $700,000 in 1964) and is appropriately used for those projects which pursue official goals. This does not allow support of many projects which, although they are not part of a section chief's immediate plan, are nonetheless well conceived and of real worth to the community or to the future of heart disease control. In one year (1962) these unsolicited but meritorious projects which had to be rejected represented a total need of more than $2 million.

AUTHORITY REQUIRED

After full consideration of the need for developing sound and effective community service programs aimed at reducing the burden of cardiovascular diseases in the United States, the following actions are specifically recommended:

The heart disease control program of the Public Health Service should be given the authority to make project grants to public and other nonprofit organizations for studies, experiments, feasibility trials, demonstrations, and training in order to provide incentive and encouragement for the development and improvement of methods for application of the results of research to patients in the community.

Specifically, it is recommended that a new subsection 314(n) be added to the Public Health Service Act, which would provide that funds appropriated pursuant to subsection 314(e) would also be available for the Surgeon General to

make project grants, on such terms and conditions as he finds necessary, to States and other public and nonprofit organizations for studies, demonstrations, and the training of personnel.

It is also recommended that $1.5 million be appropriated to the heart disease control program to initiate this project grant program with annual increases until $7.5 million is reached in 5 years.

HEART STATIONS

The Public Health Service should be given the authority and necessary funds to award grants to establish and maintain a network of approximately 150 heart stations in the United States. Approximately half of these stations should be established in medical centers and in clinical facilities of the medical schools, usually not those designated as regional centers; the other half should be in community general hospitals, including Veterans' Administration hospitals, not necessarily connected with medical schools. This network would serve as a pilot program for the demonstration of methods providing high-quality patient care. The stations would have the following principal objectives:

1. Immediate and emergency care for patients with acute cardiovascular emergencies.
2. Provision of cardiovascular diagnostic facilities for the screening of patients to determine whether they will require the more highly technical facilities available at the larger medical centers.
3. Stimulation of interest of medical students and practitioners.
4. Training of physicians in the community.
5. Education of the general public concerning prevention and treatment of heart disease.

The stations will include intensive care units for the emergency care of patients with heart disease. In addition, each station should be equipped to diagnose and treat patients with peripheral vascular disease. They should be established so that they may share certain facilities and personnel with stroke stations. Therefore, it is desirable for the heart stations to be in the same area of the hospital as the stroke stations and to work closely with them, avoiding unnecessary duplication but supporting each other.

The stations will provide limited laboratory facilities, an outpatient clinic, electrocardiographic and radiologic services. Patients requiring advanced treatment would be referred to the regional center equipped to perform it.

In order to establish these stations, funds are necessary for the renovation of existing facilities. It is estimated that renovation and equipment will cost an average of $200,000 for each. An additional amount of $175,000 a year may be required for the efficient operation of each station.

It is recommended that a total of $118.5 million be appropriated for a 5-year period for the development of this program, according to the following table:

Costs of heart stations

[Dollars in millions]

Years	1	2	3	4	5
Number of new stations	30	35	40	45	
Renovation costs	$6.0	$7.0	$8.0	$9.0	
Operation expenses	5.25	11.375	18.375	26.25	$26.25
Total	11.25	18.375	26.375	35.25	26.25

It should be pointed out that a recent (1961) survey of cardiac catheterization, angiocardiography, and closed and open heart surgery facilities in the United States showed that 60 percent of hospitals equipped with cardiac catheterization facilities performed fewer than 50 catheterizations per year; 79 percent of those with angiocardiographic facilities did fewer than 50 angiocardiograms per year; and, 77 percent of all hospitals equipped for open heart surgery performed fewer than 50 open heart operations per year. Many such hospitals did not use their facilities at all.

Preliminary data from another recent survey show that cardiopulmonary laboratories and cardiac surgical facilities with the highest frequency of com-

plications are those with the least experience. These data add credence to the belief that first-class teams must be kept reasonably busy, i.e., between 100 and 200 procedures per year or 2 to 4 cases per week. In addition to the need for an adequate caseload, highly technical diagnostic procedures such as angiography should be carried out at the institution where surgery, if indicated, is to be performed, in order to avoid repetition of precedures.

Although many hospitals are anxious to be fully equipped and have cardiac catheterization and angiocardiographic apparatus for study of congenital and acquired heart disease and to be able to perform open and closed heart surgery, certainly the 800 which currently exist are not necessary, especially in view of the fact that 270 of them reported no such operations at all in 1961. It would seem far wiser to limit the number to 200 and 250 well-equipped centers with well-trained teams and a sufficient caseload, and reserve the others for emergency cardiac surgical work.

Consequently, it is recommended that highly technical cardiac diagnostic procedures and cardiac operations should be performed only in institutions where facilities for cardiac catheterization, angiocardiography (and aortography), closed and open heart surgery are all available, and where the caseload is sufficient. Patients found by heart stations, other health installations, and practicing physicians to require such specialized diagnostic evaluation should be referred to such institutions for definitive diagnosis and treatment.

STATEWIDE LABORATORY FACILITIES FOR HEART DISEASE CONTROL

There is need in every State for coordinated statewide laboratory facilities to perform laboratory services related to heart disease control. These laboratories should form a part of a coordinated statewide program of heart disease control, headed by a specific unit within the State health department. Such a program to be successful, must coordinate the efforts of the numerouus public and voluntary agencies whose work infringes on heart disease control and must also collaborate closely with the private physicians of the State.

The objectives of this statewide laboratory network should be:

(1) The grouping of beta-hemolytic streptococci. Rheumatic fever is potentially preventable through prompt identification and immediate treatment with an appropriate antimicrobial agent of patients suffering from beta-hemolytic streptococcal infections. Each State should have coordinated laboratory facilities to identify the group A beta-hemolytic streptococcus organism. Where such facilities exist, they have proved a tremendous boon to practicing physicians and have facilitated rheumatic fever control programs in that State.

(2) The provision of services for the laboratory control of patients receiving anticoagulant agents. Over half a million patients in the United States are receiving anticoagulant drugs each year; it is probable that the number will grow in the future. The dosage of these drugs must be tailored to each patient individually and the dosage regulated by carrying out appropriate blood tests at frequent intervals. In many areas of the country, this service is carried out by hospital and private laboratories. These laboratories need a central unit for standardization of their tests at frequent intervals. In other areas, however, patients cannot receive this type of medication because this service is not available. A statewide laboratory network could help to provide this service in areas where it is needed.

(3) In conjunction with the heart disease control program (HDCP) laboratory at the Communicable Disease Center (CDC), to provide the service of standardization of other chemical laboratory tests to hospital and private laboratories in the country. The HDCP laboratory at CDC is performing this service for laboratories all over the United States and abroad at the present time. This statewide network of laboratories could serve as local agents for this valuable program. As such, these local laboratories could also perform chemical determinations and participate in large local and national epidemiologic studies in cardiovascular disease; in this sense, these laboratories would act as a valuable resource for certain research programs of national interest.

It must be stressed that the development of such a laboratory network to perform the above services would make it possible to achieve an immediate, specific,

and measurable impact in reducing death and disability. Each State should assess its own needs. The heart disease control program of the Public Health Service should have the authority and specifically earmarked funds to assist the States in setting up and operating the needed facilities.

Therefore, it is recommended that the Public Health Service be given authority and funds to establish and maintain coordinated statewide laboratory facilities necessary for heart disease control programs. A total appropriation of $8.5 million over a 3-year period is recommended for this purpose—$2.5 million for each of the first 2 years and $3.5 million for the third.

COMMUNITY HOSPITAL PROGRAMS

In addition to the need for a coordinated national program of heart disease control, the need for a coordinated heart disease control program within each State, and the need for a network of heart stations throughout the United States, there is need for strengthening community facilities, services, and programs in the field of cardiovascular diseases. A continuing program designed to maintain a high standard of professional competence of physicians, nurses and paramedical personnel and to educate the general public is needed to achieve the common objective of improving the care of the sick.

The community hospital should serve as the center of this program, in cooperation with government and private agencies.

In order to organize and keep such a program of continuing education in clinical cardiology in operation, suitable personnel should be appointed to staff the program in a given hospital. The staff should include a full-time director of medical education with such help as he needs for the organization of meetings, consultations, regularly scheduled staff and grandrounds, and clinical pathological conferences. Members of the attending staff of the hospital should be encouraged to attend courses and take longer additional training whenever possible.

Though ideally all community hospitals with 300 or more beds should ultimately mount such a program, it is recommended that such units be established and supported in 100 of these hospitals throughout the United States as a pilot demonstration. It is estimated that about $75,000 per year would be needed to carry out a program of this type in each hospital of this size. A total of $7.5 million annually would be needed for expenses.

CONCLUSIONS

An all-out national effort is needed now in research, development, and training, and in the application of present knowledge in the field of cardiovascular disease. Only in this way will it be possible to reduce the burden and incidence of heart and blood vessel diseases, the No. 1 cause of death in this country.

The following table summarizes the appropriations recommended to implement the national program outlined in this report. These figures are at the current dollar value; should this value shift in the future, these figures should be adjusted appropriately.

Year	1	2	3	4	5
Regional centers	[1] $25.0	$24.5	$32.1	$38.9	$45.7
Specialized centers	.6	1.2	1.8	2.4	3.0
Research grants—NHI	8.0	12.0	20.0		
Contracts (R&D)—NHI	10.0	15.0	20.0		
Undergraduate training grants—NHI	1.55	1.55	1.55	1.55	1.55
Graduate training grants and fellowships—NHI	4.3	5.2	6.3	7.5	8.75
Clinical fellowships and investigatorships	5.0	7.0	9.0	12.5	15.0
Heart disease control project grants	1.5	3.0	4.5	6.0	7.5
Heart stations	11.25	18.375	26.375	35.25	26.25
Laboratory facilities	2.5	2.5	3.5		
Community hospital programs	7.5	7.5	7.5	7.5	7.5
Total	77.20	97.825	132.625	111.60	115.25

[1] Figures in millions of dollars over and above current appropriations.

Report of the Cancer Panel

(Dr. Sidney Farber, Chairman, Dr. R. Lee Clark, Dr. Frank Horsfall, Dr. Charles Mayo, General David Sarnoff, and Dr. Jane Wright. Staff: Dr. David Schottenfeld, Dr. Maureen Henderson, Dr. Abraham Lilienfeld, Mr. Louis M. Carrese; consultant, Dr. Morton L. Levin)

Cancer is a term applied to a group if diseases having in common the transformation of normal body cells into abnormally growing partsitic cells. Because of the fundamental nature of this biological change and the fact that it can occur in any organ of the body, cancer is one of the most complex and difficult medical challenges, both from the standpoint of treatment and research. Although the group of diseases known as cancer have certain biologic features in common, they differ widely with respect to clinical course, curability, known etiology and diagnostic and treatment methods. The basis of the illness—cancer—is the cancer cell. The known causes or agents which can transform normal cells into cancer cells are numerous, but as yet no single agent or cause has been discovered which has been found to be common to all forms of cancer. Also, the causes of many forms of cancer are as yet unknown.

Research into the mechanism by which normal cells become cancer cells and by which certain chemicals, viruses, and physical agents such as ionizing radiation contribute to this change may involve any of the biological, chemical, and physical sciences. This is evident in the report of the Subcommittee on Research which contains a review of the present status of knowledge on the basic aspects of cancer. All of the presently known environmental factors in cancer in man have been discovered primarily by the direct study of the disease in humans. Hence, there is growing recognition of the need for epidemiological study of all forms of cancer in man, utilizing the most advanced methods and adding objective biochemical and physical observations to the data obtained by interview and history.

MAGNITUDE OF CANCER

The magnitude of a disease problem is usually measured by: incidence or number of new cases per year; mortality or number of deaths per year; and prevalence or number of cases under treatment or care at one point in time during a given year. With data on incidence and mortality from all causes, it is possible also to estimate what proportion of the population may be expected to develop the disease during life or at any specified age.

The number of new cases of cancer per year contineus to increase in part as a result of increases in population and the increasing percentage of older persons. Allowing for both these factors, the data from the cancer morbidity reporting system in operation in upstate New York since 1940 indicates that from the period 1941–43 to 1958–60 the number of new male patients per 100,000 population increased 31 percent. For females the rise was 5 percent. In 1941–43, the total cancer incidence rate was higher in females than in males. In 1958–60, this situation was reversed; the male rate (261.3) exceeded the female (244.7). This change was due almost wholly to the marked rise in lung cancer, which has increased more rapidly among males. If we exclude lung cancer from the 1958–60 figures, the female rate (239.9) continues to exceed the male (232.7). Although lung cancer has increased in both sexes, the increase among males has been more than twice that among females.

The most common forms of cancer in males are cancer of the skin, lung, prostate, large intestine, stomach, rectum, and bladder. Among females, the most common forms in the order of incidence are cancer of the breast, skin, cervix uteri, large intestine, corpus uteri, ovary, rectum, and stomach.

Under present conditions, some form of cancer will affect 24 percent of men and 27 percent of women now living. Cancer is the second most common cause of death in the United States; in 1963 it accounted for 285,362 deaths, or 15.7 percent of all deaths. At present rates, one in every four Americans now living may be expected to develop cancer eventually, unless new preventive measures can be developed and unless known causative factors can be more effectively controlled.

It has been estimated that approximately 830,000 persons are under treatment for cancer during the year, that the annual manpower loss from cancer morbidity is 221,000 man-years and that the annual hospitalization cost is over $666 million. More than 40 percent of deaths from cancer occur during the productive years of 25 to 64 years.

The care of the cancer patient often requires major surgery, prolonged hospitalization or nursing home care and costly medication. Hence, cancer is often economically catastrophic to the family of the patient. The total economic burden of cancer is about $11.2 billion per year in the United States.

PREVENTION OF CANCER

The prevention of cancer at present involves avoidance or removal of known environmental causes of cancer. This includes (1) avoidance of unnecessary and avoidable exposure to ionizing radiation and excessive exposure to ultraviolet radiation, (2) hygienic measures in occupation involving exposure to known cancer-producing chemicals and dusts, and (3) avoidance of exposure to tobacco, particularly cigarette smoke, which has been proven to play an important role in the causation of cancer of the lip ,mouth, larynx, and lung. In addition, the identification of the earliest detectable probable precursors of cancer—as in the so-called carcinoma in situ of the uterine cervix—has now reached the stage of practicability so that widespread utilization of uterine cytological tests to identify these lesions could result in prevention of most of the 15,000 deaths from carcinoma of the uterine cervix each year.

The Subcommittee heard repeated testimony on the importance of community services to provide the maximum application of existing knowledge regarding the prevention of cancer. Of particular importance are programs for public, school, and professional education regarding the health hazards of smoking and services to increase the utilization of cervical cytology to detect early in situ cancer of the uterus.

CURABILITY OF CANCER

The average cure rate for cancer, as measured by the 5-year survival rate, is estimated as approximately 33 percent. The most recent relative 5-year survival rate, reported to the National Cancer Institute from a number of large hospitals, indicates that in these hospitals the average cure rate is now 43 percent. It is a reasonable assumption that improvement in early diagnosis and more widespread utilization of existing knowledge regarding treatment would result in an increased average cure rate of 50 percent or higher. To achieve this will require increased specialized facilities for cancer diagnosis and treatment throughout the United States.

The Subcommittee heard testimony repeatedly indicating that there exists a national need to expand our facilities of research in order to gain the new knowledge necessary for the conquest of cancer and to provide the patient with cancer the best diagnostic and treatment service that modern medicine has to offer. It is with these objectives that the Subcommittee on Cancer makes the following recommendations.

RECOMMENDATIONS

I. National network of facilities for patient care, research, and teaching in cancer

The Subcommittee envisions systematic patient care, research, and teaching as the most effective means for providing multidisciplinary services for the cancer patient and for developing a multidisciplinary research program. To accomplish this, the Subcommittee on Cancer recommends the establishment and development of a three-level echelon-structured, national network, so designed in structure and function as to provide the maximum interchange in all phases among all three levels.

Regional cancer centers would be the main nodes of this network. These would be tied to selected medical school affiliated and community hospitals of 200 or more beds, with demonstrated interest in cancer, to be identified as clinical cancer stations. The echelon in the network would consist of those small community hospitals having approved cancer registers and/or tumor clinics which would develop a relationship to a clinical cancer station in geographic proximity.

The planning, design, and review of this program should be oriented to the provision of a continuing flow of information and services through all these facilities. To insure the coordination of these multiple functions and to maintain continued collaborative development of this program, the Subcommittee recommends the establishment of a special committee to review plans and projects; the recommendations from this special committee are to be transmitted to the National Advisory Cancer Council to aid the Council in making its recommendations regarding applications for the development of these facilities.

A. Regional cancer centers

Experience has shown that one of the most effective ways of providing the necessary multidisciplinary and multifaceted approach to cancer is in a center which brings together, in one location, all the clinical, scientific, and developmental skills necessary. In such a center, investigators from a broad spectrum of scientific disciplines focus on general and specific, basic, and clinical research problems which relate to the prevention, diagnosis, and treatment of cancer. Such centers can vary in size; in specific focus of interest; in representation of disciplines; and in administrative affiliation and organization. Basic, medical, behavioral, applied, and developmental scientists can all contribute to productive research whether in a university, a hospital, or a community hospital-based center.

In a cancer research center, eradication of cancer is the accepted institutional goal. The translation of basic research findings, into successful clinical practice, makes clinical facilities and patient care an essential and integral part of a research center. New methods of diagnosis and treatment, developed within the cancer research centers, become prototypes of diagnostic and treatment patterns for use in the general community.

Although they are mainly occupied with research, cancer research centers have assumed major responsibilities in the training of research workers in many disciplines as well as in the training and postgraduate education of physicians in the care and management of patients with cancer.

At present, there are in this country only four fairly comprehensive cancer research centers, which have broadly based and extensive clinical and basic research programs, with representation from the many disciplines and specialties necessary for a large-scale research effort. In addition, there are 10 other cancer research centers which for lack of resources, have not been able to mount more comprehensive programs. With appropriate support, many of these could develop comprehensive programs.

The distribution of the existing cancer research centers is geographically uneven. Most are located in the northeastern part of the country. A few scattered centers are in the north-central section. There are scarcely any cancer research centers in the Southeast and only one west of Colorado. In 25 States with a population of approximately 5.5 million, there is not 1 center. California, with a population of about 16 million, has only 1 center and Texas has 1 center for a population of about 9.5 million.

Recommendation.—In order to mount a national research program of the necessary breadth and depth, the subcommittee recommends the eventual development of a total of 20 comprehensive cancer research centers. This number is based on a minimum of 1 center for each 10 million population.

Although there is an urgent need for new centers in the Midwestern, Western, and Southern States, the subcommittee estimates that it will take 5 to 10 years to plan, design, construct, and staff the new institutions. It is therefore recommemded that the order of development of this program be determined by the rapidity with which centers can fulfill requirements. Priority should be given to those centers which already have plans for expansion into comprehensive institutions.

It is understood that three or four existing institutions are in a position to apply immediately for developmental support over a 5-year period and that the second 5-year period will see the progressive completion of four to six new centers strategically located in relation to centers of population.

The estimated construction requirements will vary from the construction of a complete new physical plant to the renovation of existing space. Funds for new construction and renovation should be made available by the Federal Government on a nonmatching basis.

There should be no restriction on the discipline eligible for staff appointments. Scientific personnel needed include physicists, biologists, chemists, surgeons, gynecologists, physicians, genticists, statisticians, physologists, embryologists, anthropologists, radiologists, epidemiologists, and sociologists.

Operating budgets must include all costs of: both inpatient and outpatient care and observation; convalescent rehabilitation and terminal care for patients participating in investigative programs; round-the-clock consultation service to all area physicians; statistical and electronic processing services.

The regional cancer centers should set up an intercenter council to effect liaison in programing, information exchange, joint research and clinical trials, exchange in staff and students, coordination and evaluation of total program, and advice to the National Cancer Institute concerning program requirements.

The estimated construction, equipment, and operating costs to initiate this program for a 5-year period are:

	Year				
	1	2	3	4	5
Number of new centers	4	4	4	4	4
Funds required [1]	50	90	150	150	160

[1] Figures in millions of dollars.

It is recommended that these funds be appropriated to the National Cancer Institute to develop this program.

Administration for development of cancer research centers.—The National Institutes of Health does not have a mechanism for the rapid review and consideration of large-scale multidisciplinary undertakings. In the present system, plans for a multidisciplinary research center would require action by numerous study sections. For example, an application for development of a cancer research center would be reviewed by committees dealing with construction and renovation, program project grants, training grants, and by appropriate study sections.

To expedite the development of these research centers and to avoid an undue burden on present grant administration mechanisms, the subcommittee recommends for the National Advisory Cancer Council the appointment of an Advisory Commitee on Cancer Research Centers. This Committee would be charged with: The definition of criteria for comprehensive cancer research centers; the organization of a progressive program of center development; review of plans and proposals submitted for developmental support. This Committee would also be responsible for the coordination and evaluation of the total cancer research program and for advice to the National Cancer Institute about further requirements when the present recommendations are fulfilled.

B. Cancer stations

To meet the urgent national need for a wider distribution of specialized facilities, techniques, and skills required to provide high-quality diagnostic and treatment services to the patient with cancer, the subcommittee makes the following recommendations:

Funds should be appropriated to te National Cancer Institute of the Public Health Service to provide grants to 200 hospitals and medical centers for the development of cancer diagnostic, treatment, and consultation stations on a demonstration basis. Of these units, 100 should be located in teaching hospitals and 100 in community hospitals with 300 or more beds and accredited residency training programs. Population and geographic needs should be taken into consideration in the development of this program.

In the face of an outstanding community need, a smaller nonaccredited hospital or a group of hospitals should be provided with the resources to develop comprehensive cancer services. In such an event, facilities for the treatment of differing types of cancers can be located in different institutions.

These units will have the staff necessary to provide specialized care to the patient with cancer. There will be specialists in radiotherapy, radiology, chemotherapy, and special diagnostic techniques. These specialists should be in close contact with the cancer research centers in order to obtain directly from these research centers information and training in newer method sof diagnosis and treatment. The diagnostic and treatment units will in turn convey information to other community hospitals and physicians.

The units should also serve as a part of a network of facilities available for collaborative clinical research programs carried out by the large cancer research centers. Epidemiologists and biostatisticians within the research centers would be responsible for the design and the analysis of clinical research carried out within the network of research centers and diagnostic treatment units.

To fulfill its graduate educational function within its own community each diagnostic and treatment unit must have resources o provide a 24-hour, 7-day-a-week specialist consultation service without charge. This information service would also have access to the information services provided by the research centers.

Support for the initial construction, renovation, and provision of equipment and development of laboratory facilities should be made avialable on a nonmatching basis.

Laboratory facilities should include those necessary for chemotherapeutic treatment.

Each center must have facilities to provide services for physical, social, and vocational rehabilitation.

The operational budget for the diagnostic and treatment units should be from several sources and should not include the cost of patient care.

It is assumed that these centers will gradually become self-supporting or will require minimal subsidies within 10 to 15 years.

Emphasis should be placed on local resources for the provision of care for medically indigent patients in a diagnostic and treatment unit. Patients other than the indigent and medically indigent should pay for services.

Each diagnostic and treatment unit should be required to maintain a tumor registry to insure proper patient followup and aftercare and should serve as a tumor clinic center for other local hospitals and physicians.

The subcommittee reemphasizes the importance of the link between the cancer research centers and the cancer stations and all other community medical facilities. Only in this way will there be speedy, universal, and effective application of new knowledge resulting from research.

Besides providing and demonstrating high-quality patient care the stations will serve as a focal center for the training and continuing education of general practitioners in the provision of high-quality care.

It is recommended that the following appropriations be made to the appropriate units in the Public Health Service to initiate this program for a 5-year period.

[Dollars in millions]

	Year				
	1	2	3	4	5
Number of new stations	40	40	40	40	40
Costs of construction and renovation	$8	$16	$24	$32	$40
Operational support	7	14	21	28	35
Total	15	30	45	60	75

C. Other community hospitals

The Subcommittee on Cancer recommends that community hospitals with approved cancer registries be brought into the national clinical cancer research program. There are currently 1,000 hospitals with cancer registries approved by the American College of Surgeons. Conceivably, if 200 of these were used to serve as community stations, there still remains 800 hospitals as an immediate resource complement for the program. Since, understandably, these community hospitals would be general hospitals with an interest in cancer being one of many interests, their contribution to the national program would be strictly through clinical activities, teaching, maintenance of proper record registries, and followup.

They would be physically adjacent to stations through which they would "feed" clinical information and results and from which they would obtain direction. Thus, for example, comprehensive epidemiological studies, conducted at the center level, could be carried out, reflecting information from all participating levels of the program.

The Subcommittee emphasizes the importance of the active linkage of the centers, of the centers with the stations, and of the stations with community hospitals and all other community medical facilities. Only in this way will there be speedy, universal, and effective application of knowledge resulting from research.

The Subcommittee further emphasizes that the principle of team care—providing collaborative multidisciplinary knowledge and skills to the cancer patient—should be carried out throughout all echelon levels of the program.

II. Additional support of cancer research

The national network will serve as a principal research resource. But the existence of such a network does not preclude the development of additional means of stimulating research nor the expansion of mechanisms already in existence. The research needs require a wide variety of organizational means.

A. Specialized cancer research centers and task forces

The Subcommittee heard a great deal of testimony in favor of the use of special cancer research units and task forces to concentrate research effort in particular areas so as to hasten the solution of specific research problems.

It is recommended that support of this type be made available for 10 specialized cancer research centers during the next 5 years. These will be organizational units with specialized personnel and with research and training objectives in depth, limited to a particular facet of the cancer problem, with emphasis on flexibility. They can be organized and established in various health and medical research facilities. The Subcommittee recommends that at least one research unit be established for each of the following areas:

1. An epidemiological unit for human population studies;
2. A virology unit;
3. A carcinogenesis unit;
4. A cytopathology unit for the development of a cytopathology reference and diagnostic laboratory;
5. A radiation and radiobiology unit;
6. An occupational and environmental carcinogenesis unit;
7. A clinicopharmacology unit for study of teratological and carcinogenic effects of drugs;
8. A clinical-pathology diagnostic research unit and reference laboratory;
9. A surgical treatment research laboratory;
10. A center for study of the incidence and epidemiology of cancer in animals.

A second type of task force approach would consist of the collaboration of investigators from several relevant disciplines concentrating on a particular form of cancer; for example, a hematologist, epidemiologist, cytogeneticist, and virologist could form a multidisciplinary team to develop a program of research in leukemia. Or a surgeon, clinical endocrinologist, epidemiologist, and biochemist could develop a research program in breast cancer.

Such multidisciplinary teams already exist in the major cancer research institutes. There are, however, other institutions with the necessary resources and facilities which are interested in such programs. These institutions should be encouraged to develop such specialized programs.

It is recommended that 10 such units be established.

It is estimated that for the two types of specialized units, $300,000 per year is needed for core support of each. It is recommended that the following appropriations be made available to the National Cancer Institute for progressive development of this program over a 5-year period.

Appropriations for specialized cancer research units and teams

Year of program	Number of new units	Dollars in millions
1	2	$0.6
2	2	1.2
3	2	1.8
4	2	2.4
5	2	3.0

B. Research project grants

The Subcommittee endorses the existing system of review of research project grants by study sections and advisory councils at the National Institutes of Health and recommends expanded support of cancer research. Specifically it recommends that an additional $40 million be appropriated in a 3-year period, over and above the current appropriations, to the National Cancer Institute for research project grants.

C. International research

Cancer does not recognize any national boundaries. It is a major cause of death in all parts of the world. People everywhere are interested in the conquest of this dread disease. It has been pointed out repeatedly that there are differences in the frequency of cancer in different countries. Study of the reasons for these differences undoubtedly will contribute to the final solution of the cancer problem. Therefore, the Subcommittee concurs with the recommendation of the Subcommittee on Research on the need for an expanded support of international medical research.

III. Application of medical knowledge in the community

It is estimated that one-third of all patients with cancer are cured or survive at least 5 years after treatment at the present time. One-half of all cancer patients could be cured if knowledge already accumulated through research could be fully applied to all people in the Nation. Substantial reductions in disability resulting from cancer could also be made. Reduction of mortality could result from preventive measures against some cancers, earlier diagnosis and utilization of improved methods of treatment for others.

Financial support from Federal funds for national programs of this type has lagged far behind the support of research. In 1964, for example, the total budget for the cancer control program of the Public Health Service was 7.2 percent of the total budget of the National Cancer Institute.

The Subcommittee has made a number of specific recommendations representing a beginning effort to extend the application of knowledge to the American people. In doing so, the Subcommittee fully recognizes the limited nature of some of these recommendations and the need for a more concentrated national and international effort to use every present means available to reduce cancer mortality and limit cancer disability.

A. Prevention of cancer: Cigarette smoking and health

During the past decade, evidence has increasingly indicated a definite relationship between smoking and the occurrence of a variety of diseases. In particular, the association of cigarette smoking with increased liability to develop lung cancer has been essentially demonstrated. The work in this area of smoking and disease occurrence was summarized and evaluated in the Report on Smoking and Health, by the Advisory Committee of the Surgeon General in 1964. In addition to confirming previous reviews, the report stated that smoking was a serious hazard to health and indicated the need for more aggressive programs of education and prevention.

The subject of smoking and health received attention from many witnesses who appeared before the Subcommittee and a wide variety of recommendations for action were suggested. It clearly appears that the reduction of cigarette smoking offers large possibilities for the prevention of illness, disability, and premature death in this country.

Therefore, the Subcommittee makes the following recommendations:

1. The Subcommittee endorses the conclusions and recommendations of the Surgeon General's Report on Smoking and Health.

2. The Subcommittee recommends that steps be taken to decrease this health hazard through educational programs. It recommends that $10 million be appropriated to the cancer control program, Public Health Service, over a 3-year period for a comprehensive national program of education and public information regarding the hazards of cigarette smoking.

The program should be aimed at the education of children, adults, physicians, and educators with the assistance of State and local community agencies. A network of smoking control clinics should be provided to assist those who desire to give up smoking. New and more effective educational material should be developed.

B. The early detection of cancer

More than 20 years ago, the Papanicolaou vaginal cytology test was shown to be an effective screening procedure for the early detection of uterine cancer. Data reported from the tumor registries of California and Connecticut have shown that current modes of therapy have increased survivorship of women

with this disease and that over 90 percent of women treated when the disease is at the earliest detectable stage are cured by the standard of the relative 5-year survival ratio.

Cytological examination for early diagnosis is becoming more frequent, but studies have shown that its increased use is largely concentrated among women of the higher socioeconomic groups, who have the lowest risk of cervical cancer. For example, a recent report from California indicated that 63 percent of women in the upper social classes had had a Papanicolaou test as compared to 36 percent of women in the lowest social class.

The Subcommittee fully approves the Public Health Service supported projects demonstrating the "14 step" control program for carcinoma of the cervix and urges the cancer control program of the Public Health Service to increase the number of projects and the number of communities in which such projects are being conducted. However, the Subcommittee feels that there can be no valid reason for delay in developing a national effort to prevent 14,000 unecessary deaths from cancer of the cervix each year. Therefore, it recommends the development of a national program for the early detection of cervical cancer, consisting of two major components:

(*a*) A national educational program for the general public so that all women are aware of the availability of this test. This should be conducted by the cancer control program, Public Health Service, in cooperation with State and local health departments, the medical profession, and the voluntary health agencies such as the American Cancer Society.

(*b*) A cervical cancer detection program directed at the approximately 8 million women over 25 years of age who are admitted to hospitals in the United States each year.

The Subcommittee feels that such a hospital-centered screening program will be most economical, will reach the high-risk, low-socio-economic group, and offers the greatest potential for rapid public and professional education.

In 1961 a New York State Department of Health program reported the detection among hospital admissions of 7 new cases of uterine cancer per 1,000 women examined. Smears from 5,500 women were examined at a cost of $2 to $3 per patient. Other studies have shown a higher frequency of new disease detection when cells from both a cervical smear and vaginal aspiration are examined. With this type of examination 10 per 1,000 unsuspected new cases have been reported in general populations and 18 to 30 per thousand in indigent populations. Cells from both cervical and aspiration smears can be examined on a single slide so that the most productive screening procedures can be implemented within a ceiling of $3 per patient examined.

It is recommended that $5 million be appropriated to the cancer control program in the first year and that this be increased by $2.5 million each year for a period of 3 years, to provide grants to hospitals participating in this program. At the end of 2 years a committee should be appointed to review progress and plan for the future development of the program.

Total support for cytological examinations should be given to hospitals providing care for medically indigent patients, and partial support to hospitals providing care to patients who do not have health insurance or other resources to cover cytological examinations. All other hospitals should include this examination as part of the routine physical examination, and the cost of cytology should be included with the cost of other laboratory investigations.

In providing these grants, consideration should be given first to hospitals providing care for the indigent and the medically indigent.

C. Community cancer control programs

Community demonstration projects in the detection of carcinoma of the cervix, of the oral cavity, and of the breast have been developed during the past 7 years. Methods and instruments for the early detection of cancer of the colon, rectum, and breast are being developed.

The Subcommittee recommends an increase in community demonstration programs for the early detection of uterine, oral, and breast cancer and the organization of complementary and supplementary programs to demonstrate early detection of cancer of all accessible body sites.

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It recommends that the following funds be appropriated to the cancer control program of the Public Health Service for this purpose.

	Year				
	1	2	3	4	5
Dollars (millions)	1.5	3	4.5	6	7.5

At the end of 4 years, the demonstration programs for which funds have been specifically allocated should be reviewed and evaluated and plans for future programs developed.

IV. Education and training

Every witness who appeared before the Subcommittee testified to a shortage of trained scientists, clinicians, teachers, and technicians in every aspect of cancer research and control. The Subcommittee is aware of the increase in trained manpower necessary to implement the recommendations for expansion of the cancer research effort and the application of knowledge. It fully endorses the recommendations of the Subcommittee on Manpower and adds the following recommendations with regard to the specific requirements in cancer.

A. Undergraduate training

1. *Medical schools.*—Each medical school now receives $25,000 from the National Cancer Institute in support of undergraduate cancer education. The Subcommittee recommends that these grants be continued.

However, there still exists a need for broadening the training of medical undergraduates in the various aspects of the prevention, diagnosis, and treatment of cancer, including the development of demonstration teaching programs in cancer detection and in the care of the cancer patient.

There is also a need to provide organized cancer teaching and training opportunities for general interns and for residents now specifically concerned with cancer diagnosis and treatment. Therefore, the Subcommittee recommends that necessary funds as indicated below be appropriated to the National Cancer Institute to provide additional grants of $25,000 to those medical schools which develop specific educational programs in these aspects of cancer control.

Year:	*Dollars (millions)*
1	1.0
2	1.5
3	2.0
4	2.5
5	2.5

This program should be reviewed at the end of 4 years to determine future needs and development.

2. *Dental schools.*—In view of the important role played by the dentist in the early detection of oral cancer and the need for the education of dental students with regard to cancer control, the Subcommittee recommends an increase of $10,000 in the annual undergraduate training grant presently awarded to dental schools by the National Cancer Institute. This will require an additional annual appropriation of $500,000 to the National Cancer Institute.

B. Clinical training

1. *Residency training.*—To recruit medical graduates into cancer specialties in which there is a marked shortage of personnel, the Subcommittee recommends that $500,000 per year be appropriated to the cancer control program in support of residency training in a limited number of specialties. The designated specialties shall be those that are essential for progress in cancer control and which have the greatest personnel shortage, for example, radiology, radiotherapy, physical medicine, preventive medicine, and epidemiology, pathology, anesthesiology.

A supported resident should be required to spend at least 1 year of this training period in work directly related to cancer, and the details of his training program should be specified at the time the grant is requested. The program should be

developed on a trial basis for a 5-year period and be thoroughly reviewed after 4 years to determine future development.

2. *Training of specialists.*—Since 1963, cancer training for specialists in the form of senior-clinical traineeships has been available through the cancer control program of the Public Health Service. Individual physicians who have completed residency training leading to American Board certification in one of the clinical specialties are eligible to receive an additional year of supervised experience in their specialty with major emphasis on the management of cancer. Every application for a traineeship must include a plan developed by the prospective trainee in collaboration with the clinician whom he has selected as training director, and the plan must be endorsed by an academic official of the training institution.

Official announcement of the program and distribution of application materials begun in late July 1963 resulted in 141 applications by the November 15 deadline.

Panels representing the five basic clinical specialties (surgery, gynecology, pathologoy, radiology, and internal medicine) review the applications and assign priorities according to scientific and educational merit. Final selection is by staff. There were at first 108 awards, but after 9 withdrew, 99 actually began the training program in July 1963. The total of grant funds obligated was $868,000.

The Subcommittee recommends that $3.5 million be appropriated to the cancer control program of the Public Health Service to increase the number of senior clinical traineeships to 300. It is further recommended that priority should be given to those specialties which have the greatest personnel needs: radiology, radiotherapy, physical medicine, preventive medicine, and epidemiology, pathology, and anesthesiology.

C. Training of technicians

In 1964, the cancer control program of the Public Health Service expended $1.5 million in the training of medical technicians. Enrolled in supported programs were 350 cytotechnologists, as well as radiographers and radiotherapy technicians. In view of the urgent needs for such personnel, the Subcommittee recommends that the appropriations be increased by the following amounts to the cancer control program of the Public Health Service for expansion of this program.

Year:	*Millions*	Year:	*Millions*
1	$1	4	4
2	2	5	5
3	3		

D. Continuing professional education

The Subcommittee emphasizes the importance of continuing education of physicians and dentists as a basic responsibility of regional cancer centers and cancer stations. It recommends that each center and station have a full-time director of postgraduate education.

This position should be fully supported within the operating funds of all regional cancer centers. When necessary, partial or total support for this purpose should be included within the Federal grants to the cancer stations.

E. Training for research

In view of the pressing needs for research manpower in cancer, the Subcommittee recommends that the program of research training grants and fellowships administered by the National Cancer Institute be expanded. Specifically, it recommends that the following annual appropriations, over and above the current level, be made to the National Cancer Institute to support such an expanded program.

[In millions of dollars]

	Year				
	1	2	3	4	5
Additional funds	4.3	5.2	6.3	7.5	8.75

F. Stabilization of academic positions

The Subcommittee repeatedly heard evidence of the critical need for stable support for investigators and teachers in our research and educational institutions. It wishes to record its regret that the research career award program has been discontinued by the National Institutes of Health.

In view of the pressing need for the development of stable academic positions, the Subcommittee recommends that a broad program of academic career awards be established by the National Institutes of Health to provide the needed stability to academic careers. This program should be designed after review and consideration of the best features of the career investigation awards of the American Heart Association and the American Cancer Society and the Markle scholarships. It should be developed on a more flexible basis than the research career award program of the NIH so as to provide for a greater degree of participation of the investigator or teacher in other institutional responsibilities at different phases of his career. Provision should be made on a negotiated basis also for proportional support of the awardee by his institution.

There should be two components of this program: (1) research career awards and (2) teaching career awards. The Subcommittee recommends that, to provide career research and career training awards, $8 million be appropriated during the first year of the program, $16 million the second year, $18 million the third year, $20 million the fourth year, and $24 million for the fifth year. The Panel further recommends that no fixed ratio between career research and career teaching awards be established.

G. Public education

The Subcommittee recommends that the present appropriation of the cancer control program of approximately half a million dollars for general cancer education of the public through health agencies and professional societies be increased to $1 million and by increments of one-half million dollars to $2 million in 3 years. At the end of 2 years, there should be a complete review of all supported programs to determine future development.

V. Cancer morbidity reporting

For much of our knowledge of the occurrence of cancer and of time trends we have been dependent on mortality records. These are often less accurate than the information gathered during the patient's life and available as cancer reports or in physicians' pathological laboratories and hospital records. Also, differences in survival and case fatality of various forms of cancer make mortality data of unequal and often unknown estimates of incidence.

Information on cancer incidence in the United States is based on the data gathered by the continuous reporting systems of upstate New York, Connecticut, and California and on single-year morbidity surveys made by the National Cancer Institute in 10 selected cities for the years 1937 and 1947 and in Iowa for 1950. The data gathered in this way have already provided valuable knowledge of the occurrence of different forms and sites of cancer, time trends in incidence, case fatality and survival rates, differences in cancer incidence in ethnic, socioeconomic, and other population groups, and have served as a basis for conducting epidemiological and other population studies of the dimensions and scope of cancer as a community health problem.

There is need for comparable, continuously gathered data for all sections of the United States. Also, every State and community needs continuous morbidity data on cancer to provide information regarding the magnitude of cancer as a public health and medical care problem.

Therefore, the Commission recommends cancer be made a reportable disease and that information on the incidence of cancer be gathered continuously throughout the United States or in representative States and regions.

In selected States, cancer should be made reportable by law to avoid difficulties otherwise arising out of possible violation of the confidentiality of medical records. Such a system of cancer reporting has been in operation successfully in upstate New York since 1940. Reports should be required of physicians, pathologists, clinics and hospitals upon first making a diagnosis of cancer; and a copy of all death certificates should be sent routinely to the cancer reporting unit for recording and for comparison with previous reports.

The Commission recommends that the sum of $1 million per year be made available to the National Cancer Institute to be used in assisting States in

initiating cancer reporting systems. Assistance should be provided in organizing the reporting system, providing consultation service, purchasing equipment and providing temporary clerical or other service, in an amount not to exceed $50,000 for any State during the first year and not to extend beyond 3 years.

Priority in establishing cancer reporting system should be given to States representative of the various regions in the United States in which morbidity data have not been gathered previously or gathered only periodically. States in which there are established cancer research institutes should also be given priority because of the opportunity for utilizing cancer morbidity records in conducting or supplementing epidemiological studies undertaken by these institutes. The National Cancer Institute should consider the establishment of a national cancer morbidity register, utilizing copies of State registry reports or of abstracted data from such reports.

Report of the Stroke Subcommittee

Dr. John S. Meyer, Chairman, and Dr. Howard Rusk; Staff, Dr. Nemat O. Borhani

BACKGROUND

The brain demands more than one-fifth of all the blood pumped from the heart. The condition known as stroke is evidence that parts of the brain are not receiving their essential supply. In dramatic forms, stroke exhibits disastrous impairment of intellectual and motor function, such as paralysis of the arm or loss of speech. Although stroke is associated with various diseases of the blood vessels of the brain, various types of arteriosclerosis are the most common contributory factor.

In general, stroke may be divided into three main types:

(1) occlusion due to thrombosis or clotting of the cerebral vessel;

(2) occlusion due to embolism, a fragment of a clot which becomes dislodged from the heart or vessels of the neck and plugs the cerebral vessel; and

(3) rupture of a cerebral vessel by high blood pressure or a flaw in the vessel wall resulting in an aneurysm, a sac pressing on the brain and threatening a brain hemorrhage.

Thrombosis and embolism account for the vast majority of strokes.

In contrast with their concern with many less common diseases, the public and the professions have shown slight interest in the prevention, treatment, and recognition of basic problems of the victims of stroke. One indication of this apathy is that accurate information regarding the frequency of stroke is not available, though estimates state that at least 2 million people living in the United States show clinical evidence of this illness.

The human and financial cost of disability resulting from stroke weighs heavily on the patient, as well as the family, the community, and the taxpayer. Even after the initial episode of illness is past, the majority of stroke patients who do not receive comprehensive treatment become dependent upon their families and the community for the rest of their lives. In this condition, they may survive for years.

Effective methods of prevention and treatment of various types of stroke, including some recently developed, are available. For example, three of every four patients with occlusive cerebral vascular diseases have symptoms that warn of a disabling attack. About three of every four patients with symptoms of stroke experience a discernible narrowing of the blood vessels supplying the brain, a condition which is frequently amenable to surgical correction, although the indications for surgical and medical treatment still need to be better defined. Typical warning episodes of stroke are brief attacks of loss of speech, weakness of the limbs, staggering, or loss of consciousness.

There are promising new areas for research in stroke prevention and treatment, including epidemiological studies, alteration of blood-clotting mechanisms, control of fat metabolism and hypertension, hyperbaric oxygenation (high pressure oxygen chambers), blood vessel surgery, and new drugs to improve circulation to the brain and to prevent arteriosclerosis (hardening) of cerebral arteries.

With modern medicine, many patients anticipating stroke can be treated effectively to avert catastrophe; and, among those who have suffered severe stroke, treatment can reduce or prevent chronic disability. To achieve such results, it is necessary (*a*) for the stroke patient to have a high quality of medical care,

not only to save his life but also to restore him to his family as a productive and useful citizen, and (*b*) to educate the professional and general public concerning the prevention and treatment of stroke.

The problem of stroke must, therefore, be approached from two aspects:

(1) the development of a national and coordinated research program aimed at determining the causes of the disease, developing techniques of prevention, and improving methods of diagnosis and treatment; and

(2) the development of community resources to provide the best possible medical care from the onset of warning symptoms of stroke to the patient's return to community life.

Many aspects of circulation of blood to the brain urgently need study. Many fundamental problems of physiology, pathology, neurology, neuropathology, circulatory dynamics, and blood clotting need to be studied with respect to development of strokes.

One of the obstacles to successful research planning, in the past, has been the assumption that stroke and coronary artery disease were the same, as shown by the oft-quoted statement that cerebrovascular disease is a "later life edition of coronary artery disease." Evidence from pathological studies in man and animal studies indicates that naturally occurring and experimentally produced atherosclerosis does not occur in all arteries of the body at all locations in a similar manner. This evidence suggests that studies oriented specifically to the cerebral arterial system would contribute to understanding of the cause and prevention of strokes.

Recent epidemiologic studies also suggest differences between stroke and arteriosclerotic heart disease. In a comparative review of mortality from stroke and heart disease in Norway, Ustvedt noted that heart disease rates declined in Norway and in Scotland during the war years and decreased thereafter, whereas death rates from stroke remained rather stable during the war and showed only a slight decrease after the war.

Ethnic differences in mortality from atherosclerotic heart disease and stroke lend further support to the possibility that the two diseases may be different.

In addition, autopsy studies of diseased cerebral vessels in cases of stroke have shown pathological changes of a nature different from those seen in coronary vessels in arteriosclerotic heart disease. Furthermore, in physiology, anatomy, and pharmacology, the cerebral collateral circulation differs from that of coronary vessels.

Because (1) the suggested scientific evidence indicates that cerebral thrombosis and hemorrhage may represent a different disease process than atherosclerosis and hypertension elsewhere in the body; (2) the care of the stroke patient requires cooperation among such medical specialties as neurology, cardiology, surgery, physical medicine, and rehabilitation; and (3) there have been great advances in knowledge in this area which until recently was thought to be hopeless, the Subcommittee therefore recommends that a national stroke program be developed to deal with the two major aspects of the problem: (*a*) Research and training, and (*b*) patient care.

RESEARCH AND TRAINING

To develop the research needed, it is recommended that a national stroke research training program be established within the Public Health Service. The administrative facility for the development of the various research and training aspects of this program should be housed within the appropriate unit of the Public Health Service. Henceforth, this administrative unit may be termed the "National Stroke Program Unit." This Unit should have a full-time permanent staff, with responsibility for the development of this program. This program should be developed with the advice of the Joint Council Subcommittee for Cerebrovascular Diseases of the National Advisory Heart Council and the National Advisory Neurological Diseases and Blindness Council.

The activities of this Unit would include support of a system of stroke centers, separate research and training grants, and certain direct operations.

STROKE CENTERS

Regional stroke centers

It is recommended that at least 15 stroke centers be established on a regional basis in selected medical schools and medical research institutions throughout the country. Each would be an organizational unit, including individuals from vari-

ous disciplines, the broad purpose of which is to conduct research and training aimed at the prevention, alleviation, and cure of the cerebrovascular diseases. Such a unit should be administratively and physically part of a large medical complex which is already engaged in medical research and training. The cerebrovascular center must have space appropriate to the program to be mounted, permitting reasonable expansion.

Nonmatching support dollars should be available for the construction of new space or the renovation of existing space.

The broad design should include clinical investigations, utilizing hospitalized patients, outpatients in certain instances, and a variety of modern laboratory facilities.

Research support should include funding for all aspects of inpatient and outpatient observation, construction or renovation of space, salaries of all categories of personnel, purchase of equipment and supplies, including laboratory animals, and so forth.

Since these organizational units will be expected to provide intellectual leadership in cerebrovascular disease, it is essential that the personnel of each center be large enough in number and represent enough disciplines to facilitate investigation in depth, utilizing a broad array of scientific methods. This means that each center will have leadership provided by physicians or surgeons expert in vascular disorders of the nervous system in the neurological or surgical or cardiovascular areas.

The program must have research potential in several of the following disciplines: neurology, therapeutics, angiography, rehabilitation, neuro-ophthalmology, pathology and neuropathology, epidemiology, electrophysiologic techniques, rheology, neurophysiology, psychology, methods of study of cerebal blood flow, vascular physiology, psychiatry, lipid chemistry, mechanisms of coagulation and lysis, and computer methodology.

Such a center would be strongly research-oriented but at the same time would provide patients with care of high quality, including rehabilitation, and would also be concerned with teaching and the training of personnel in the management of stroke.

Examples of the type of research that should be conducted in these centers are studies of:

(*a*) Collateral circulation of the vessels of the brain.

(*b*) The neurological manifestation of strokes.

(*c*) Safe screening tests for cerebral vasomotor reactivity and cerebrovascular disease.

(*d*) New methods of medical and surgical treatment and prevention of strokes.

(*e*) Pathology of stroke.

(*f*) Rehabilitation methods.

The teaching function should include the training and support of physicians, surgeons, radiologists, nurses, speech pathologists, physiatrists, and other professional personnel in pertinent disciplines.

Since the research and training activities will serve patients, it is visualized that each center will require up to 30 hospital beds—medical, surgical, and rehabilitation—as well as an outpatient care facility.

It should be emphasized that, during the first 3 to 4 years of the program, it will be necessary to make investments in institutions where the complete resources are not yet available but which have potential for development.

A total of $85.5 million over a 5-year period should be provided to establish and maintain these 15 centers. Authority should be given to provide up to 100 percent for construction and renovation costs. The proposed 5-year budget for this program is as follows:

[In millions of dollars]

	Number of years				
	1	2	3	4	5
Construction and renovation	10.0	4	4	6	6
Operating expenses	2.5	8	12	14	19
Total	12.5	12	16	20	25

Specialized stroke research centers

To allow flexibility for the development of a particular field of research, it is recommended that at least 10 specialized stroke research centers be established in various health and medical research facilities throughout the country. These centers will be organizational units with personnel and in-depth research and training objectives limited to a special facet of stroke, such as epidemiology, instrumentation for cerebral blood flow and diagnostic tests, or experimental cerebrovascular surgery in primates known to develop cerebral atherosclerosis.

These centers should be distinguished from the regional stroke centers, mentioned above, in that they will not be concerned with all aspects for cerebrovascular disease. For example, an epidemiologist may desire to establish such a specialized center to develop a program of study of the epidemiology of stroke in certain population groups. Such a program will permit the development and provide for the support of such a study in areas of the country that are particularly suitable for such research and which are not necessarily related to the regional stroke centers described earlier.

It is estimated that a total $300,000 per year is needed for each one of these specialized centers. It is recommended that $600,000 be appropriated during the first year, $1.2 million during the second year, $1.8 million during the third, $2.4 million during the fourth and $3 million during the fifth year.

Administrative mechanism for stroke centers

The planning and development of both types of centers will be a major undertaking. The total effort will be of a magnitude which may require modifications of procedures presently used my the Public Health Service for review of grant applications. It would be impractical to have the many detailed ramfications of each plan subject to separate considerations by the several committees which presently report to the advisory councils. For example, under the present system, each one of these centers would employ disciplines requiring the action of numerous study sections. The several committees involved would not be able to consider the material simultaneously; in the present administrative structure, applications would have to be reviewed separately by committees dealing with (*a*) construction and renovation, (*b*) program project, (*c*) appropriate study section activity, and (*d*) training grants.

In order to activate and develop this major program with flexibility, it is recommended that an Advisory Committee on Stroke Centers be established. The function of this committee will be the organization, development, coordination and review of all plans and projects dealing with the development of stroke centers and the presentation in mature form of the comprehensive proposal to the appropriate advisory council for its consideration. This committee should also be concerned with positive program planning as well as the development of a basic "core" of support which would enable each center to become established, coordinate its essential function, and, and get underway.

During this period, the center committee should utilize fully the talents of the presently existing committees, especially those dealing with construction and renovation. One way to achieve this would be to have representation from each of these committees. The experience gained during the early period could be applied in the development of subsequent centers. This would obviously have great advantages.

After the first 3 years, requests for additional support for these centers should be submitted through the usual channels and be subject to competitive review.

It is believed that this approach will prevent the overloading of the present committees, sections, and staff during this development period. Furthermore, it will coordinate this effort in a sound manner and will greatly enhance the quality of the supporting data to be presented for consideration by the appropriate Advisory Council. This will in turn lessen the burden of this large program on the Council.

RESEARCH PROJECT GRANT PROGRAM

During the fiscal year of 1963, the total expenditures, both Federal and non-Federal, for grants directly earmarked for the support of research on stroke amounted to $5.5 million, which represented 0.45 percent of expenditures for medical research and 7.7 percent of total expenditures for research in cardiovascular diseases. Of this $5.5 million, $5 million represented Federal expenditures. Clearly such a small allocation of funds for the support of research on stroke does not reflect the importance of a disease that causes at least 12 percent of all deaths in this country.

Therefore, it is recommended that funds be appropriated to the National Institute of Neurological Diseases and Blindness for increased support of research projects in the field of stroke, so that the present level of Federal support for research grants may be increased to at least $8 million a year for the next 3 years. This represents an increased appropriation of $10 million for a 3-year period. These funds are to be used for grants or contracts in specific projects. Special emphasis should be given to epidemiological studies of stroke, an area of research that, up to now, has been almost totally neglected.

TRAINING PROGRAM

Research training

There is a need for developing a training grant program to prepare individuals for a career of leadership in research in stroke. The complex nature of brain function and the various cerebrovascular diseases suggest that optimum training for such a career would include extensive experience in neurology, cardiovascular medicine, angiography, neuroophthalmology, neuropathology, lipid chemistry, electroneurophysiologic techniques, blood flow methods of various types, clot lysis mechanisms, and epidemiology.

Education in depth for any one individual in all these fields is not practical. The objective of the program will be training in depth in a laboratory area or two and practical experience with additional laboratory methods as well as basic understanding of the clinical nature of cerebrovascular disease. Emphasis will be placed on the specific educational needs of the individual trainee, related to his previous residency experience and his ultimate career goal, rather than on the exact duration of the training.

Therefore, it is recommended that $1 million a year be provided through the National Institute of Neurological Diseases and Blindness to develop a training grant program in the field of stroke. Such grants would be given to educational institutions for the development and operation of training programs, including support of faculty, facilities, and the provision of stipends for trainees.

Undergraduate training

One of the means for increasing professional interest in stroke and for recruiting physicians into careers in stroke research is to provide a focal point for the teaching of stroke in medical schools. The development of such a focus of interest would serve as a stimulus to interdepartmental cooperation in other research and teaching, including the development of joint projects, seminars, and indoctrination in special problems of the patient with stroke.

One of the best mechanisms for providing for such a development is an undergraduate training grant which will provide funds for hiring additional faculty with a special interest in stroke, for fellowships for medical students, and associated purposes. Therefore, it is recommended that $2 million be appropriated annually to the National Institute of Neurological Diseases and Blindness so that undergraduate training grants of $25,000 a year can be made available to medical schools.

Clinical training

In addition to shortages in research manpower, there are also shortages of practicing physicians in the stroke field. There is a great need for a greater number of clinicians who are trained in precise methods of diagnosis and who are capable of providing the best of treatment.

To meet this need, it is recommended that the authority be granted and the funds appropriated to the National Institute of Neurological Diseases and Blindness for the establishment of clinical fellowships and full-time clinical investigatorships in the stroke field. More specifically, an appropriation of $1 million annually is estimated as necessary to develop this training program.

DIRECT OPERATIONS

In addition to developing the grant program discussed above, it is recommended that a National Stroke Program Unit of the National Institute of Neurological Diseases and Blindness of the Public Health Service be responsible for the following:

(*a*) development and maintenance of a National Center for Stroke Information Exchange (including issuance of a cerebrovascular bibliography, an index of current research activities, and statistics relating to stroke);

(*b*) development and maintenance of a National Center for Collaborative Field Studies including epidemiology, evaluation of therapy, etc.; and

(*c*) the provision of central laboratory and statistical facilities, including computers and necessary electronic equipment for conduct of such studies.

The Commission is aware of the efforts on the part of other official and voluntary health agencies in the field of stroke. For example, the 168 hospitals in the Veterans' Administration, providing almost 125,000 beds, many of which are physically near medical schools, constitute an excellent total facility for bringing the best in medical care to a sizable segment of population and, in addition, can provide an ever-expanding resource for clinical and basic investigation. Already signficant contributions to our knowledge concerning stroke have come from studies conducted in the Veterans' Administration hospitals.

Every effort should be made to continue and amplify clinical studies of stroke. The possibilities for research concerning the methods of rehabilitation currently in use, as well as research concerning basic phenomena in recovery from damage to the nervous system, are attractive and should be exploited. To this end, plans should be directed toward maintaining a liaison between the National Stroke Program Unit, Public Health Service, and the Veterans' Administration, Vocational Rehabilitation Administration, and voluntary health agencies such as American Heart Association.

This unit should be provided with an outstanding professional and administrative staff. It is recommended that the sum of $7 million be appropriated for a 5-year period to support its activities.

Patient care

The Neurological and Sensory Disease Service program, Division of Chronic Diseases of the Public Health Service, should be given authority to make project grants to public and other nonprofit organizations for studies, experiments, feasibility trials, demonstrations, and training designed to provide incentive and encouragement for the development and improvement of methods for the application of the results of research to patients in the community. Specifically, it is recommended that a new subsection be added to the Public Health Service Act which would adjust the ceiling and provide that funds appropriated pursuant to subsection 316(a) would also be available for the Surgeon General to make project grants in the neurological and sensory disease program area, on such terms and conditions as he finds necessary, to States and other public and nonprofit organizations for studies, demonstrations, and the training of personnel.

Stroke stations

An appropriate unit in the Public Health Service should be given the authority and necessary funds to award grants to establish and maintain a network of approximately 100 stroke stations in the United States. Approximately 50 of these stations should be established either in medical centers or existing clinical facilities of the medical schools, but not usually in those schools designated as "regional stroke centers"; and the other 50 in community general hospitals, including Veterans' Administration hospitals and mental hospitals, not necessarily connected with medical schools. These stations would serve as a pilot program for the demonstration of methods providing high quality patient care. They would have the following principal objectives:

(1) Immediate and emergency care for patients with acute stroke.

(2) Stimulation of interest of medical students and practitioners.

(3) Training of physicians in the community in management of stroke.

(4) Identification of the stroke-prone individual and encouragement of treatment to prevent catastrophic manifestations of stroke.

(5) Education of the public concerning prevention and treatment of stroke.

These stations will include intensive care units for the emergency care of patients with stroke. They should be located that they may share certain facilities and personnel with heart disease stations. Therefore, it is desirable for the stroke stations to be in the same area of the hospital as the heart stations and to work closely with them, avoiding unnecessary duplication but supporting each other.

These stations will include laboratory facilities, physical medicine, and rehabilitation facilities, outpatient clinic and hosiptal beds, and provisions for electroencephalographic, electrocardiographic, neurological, and emergency surgical services.

In order to establish these stations, funds are necessary for the renovation of existing facilities. It is estimated that renovation and equipment will cost an

average of $200,000 for each station. An additional amount of $175,000 a year will be required for the efficient operation of each station.

The Stroke Subcommittee recommends that a total of $77.75 million be appropriated for a 5-year period for the development of this program, according to the following table:

Cost of stroke stations

[Dollars in millions]

	Year				
	1st	2d	3d	4th	5th
New stations	20	20	30	30	
Renovation costs	$4.0	$4	$6.0	$6.0	
Operation expenses	3.5	7	12.25	17.5	$17.5
Total annual costs	7.5	11	18.25	23.5	17.5

Local community programs

Many of the victims of stroke require services at home, in hospital outpatient departments, in clinics operated by public health departments, etc. In order to expand and make more effective such services at a local community level, it is recommended that the appropriate unit in the Public Health Service be given the authority and funds for developing a program of project grants to community agencies such as hospitals, public health departments, voluntary health agencies for studies, experiment, feasibility trials, and demonstrations, and training. Over a 5-year period, $22.5 million should be appropriated for this purpose, with $1.5 million in the first year, with gradual increases until $7.5 million is reached in the fifth year.

Report of the Subcommittee on Rehabilitation

INTRODUCTION

Rehabilitation has frequently been called the third phase of medicine, following preventive medicine and curative medicine and surgery. It is the period when the fever is down and the stitches are out. In contrast to convalescence, in which the patient is left alone to rest through the period when time and nature take their course, medical rehabilitation is a dynamic concept in which the skills of a professional team are integrated as a single force to assist the patient in reaching the maximum of his physical, emotional, social, and vocational potentials.

The first objective of rehabilitation is to eliminate the physical disability, if possible; second, to reduce or alleviate the disability to the greatest possible extent; and, third, to retrain the person with a residual physical disability to live and to work within the limits of his disability but to the hilt of his capabilities.

The complexities of the physical, social, emotional, and vocational problems of patients with heart disease, cancer, or stroke require the teamwork and skills of many disciplines: Physicians, physical therapists, occupational therapists, speech therapists, rehabilitation nurses, psychologists, rehabilitation counselors, orthotists, social workers, and therapeutic recreation specialists. It is essential, therefore, that patients with heart disease, cancer, or stroke in need of rehabilitation services be referred at the earliest feasible time to facilities where such specialized personnel are available.

In the general or specialized hospital, the rehabilitation unit is a service unit to the entire institution, as is the X-ray unit and pathology laboratory. Medical responsiiblity during the period of definitive care rests with the initial or admitting service. During this period, the rehabilitation unit serves in a consulting role.

For example, if a patient with cancer of the larynx is to undergo laryngectomy, the speech pathologist from the rehabilitation unit may see the patient preoperatively to explain the principles of esophageal speech or the use of the artificial

larynx. He helps allay the fear of loss of speech and makes retraining following surgery more effective.

When the patient with heart disease, cancer, or stroke has completed the definitive phase of care and is in need of rehabilitation, he may be transferred to the rehabilitation service where the total effort of the rehabilitation team can be concentrated on his care and where he will be in a milieu conducive to hope, tempered with realistic goals.

The Subcommittee on Rehabilitation heard testimony from individuals and representatives of organizations who are experts in rehabilitation services for persons with heart disease, cancer, and stroke to the effect that the complexities of the physical, emotional, social, and vocational problems of patients with heart disease, cancer, and stroke require a teamwork approach among many disciplines, e.g., physicians, physical therapists, occupational therapists, speech pathologists, rehabilitation nurses, psychologists, rehabilitation counselors, orthosists and prosthetists, social workers, rehabilitation administrators, and others. It was repeatedly emphasized that because of its very nature, rehabilitation is a service program which is an essential and integral part of the total medical care and medical and social responsibility for persons with heart disease, cancer, or stroke.

Heart Disease.—The Subcommittee on Rehabilitation heard those testifying repeatedly assert that the rehabilitation services we are providing for our fellow citizens with heart disease are far from optimal. Cardiovascular diseases are not only the leading cause of death in our Nation but they also lead the causes of disability. It is estimated that at least 20 million persons are handicapped to some degree by heart disease. In the bringing of rehabilitation concepts and methods to these persons, we should be concerned not only with the problems of overt heart disease but the premorbid stages as well.

A major need is for continuing education of physicians, paramedical personnel concerned with rehabilitation, and the public as to the potentials and methods of rehabilitation. Despite efforts by public, professional, and voluntary agencies, the potentials of rehabilitation, its concepts and its methods, are not well understood. It was emphasized that the most important single contribution to the more effective utilization of rehabilitation concepts and methods in services for the patient with heart disease is continuing education for physicians.

The importance of and the potential contribution of properly staffed work classification units was repeatedly emphasized. Much needs to be learned about energy costs and psychological problems of cardiac workers. There is need for education of both labor and industry and the placement and compensation of cardiac patient.

Cancer.—It was repeatedly brought out that too often the surgeon feels only the primary responsibility for the surgery, per se. Often, he does not have the time or the interest to detail the possibilities of postsurgical rehabilitation. The surgeon must realize that rehabilitation exists as a service program for him and his patients. To help meet the responsibility of his disabled patients after the surgery is completed, a program designed to meet the retraining needs of the patient after the fever is down and the stitches are out must be set up. There needs to be a new era of understanding as to the service role of rehabilitation.

This can only be accomplished by improving our total communications program; e.g., the American Cancer Society has provided certain literature but organizations like the American College of Surgeons and other learned surgical societies should be asked to sponsor training and demonstration programs in rehabilitation for their membership. This could best be done by the inclusion of papers presented at their regular meetings, films, film strips, teaching TV material, and appropriate literature. Rehabilitation must be an integral part of the total treatment of cancer patients.

Breast cancer.—Surgeons who operate on patients with breast cancer must be familiar not only with the philosophy and principles of rehabilitation but with the practical means of incorporating this needed service into their therapeutic regimen. Lymphedema, for example, often a complicating factor following mastectomy, can be materially reduced with proper physiotherapeutic and rehabilitation procedures. There should be available, in a hospital treating patients with breast cancer, a rehabilitation team who can provide the needed service to such patients. The service should be provided in the early stages and continued as long as indicated. The problems of fitting a prosthetic brassiere, the psychological problem in adjusting to a mutilating procedure, and many other conditions created as a result of radical mastectomy, should be managed like any other medical and psychological rehabilitation problems. It is the responsibility

of the surgeon to see to it that his patient receives not only a comprehensive and good quality surgical care, but also is provided rehabilitation if indicated.

Cancer of the larynx.—A specialized team to retrain patients with laryngeal cancer physically and reorient them psychologically is an absolute necessity.

There are 3,000 to 6,000 new cases of cancer of larynx in the United States annually; there are an estimated 23,000 to 25,000 laryngectomized individuals in this country. Speech therapy, using esophageal speech or electronic devices, and rehabilitation of these patients is fundamental in their care.

A rehabilitation team can be invaluable to the cancer surgeon in meeting problems following maxillofacial and other types of radical surgery. In addition to plastic surgery, much can be done physically by prosthetic devices, at which time the orthotist and the dentist are invaluable members of the rehabilitation team. Psychological support, also fundamental for these patients, is best provided in a setting serving all types of disability.

Amputation.—Cancer is responsible for 5 percent of all amputations. A third of the cancer amputees are children. The proper fitting with prosthetic devices and training in their use is basic. Even though the life expectancy of these patients may be limited, it is important for them to live the best lives possible. This requires a total rehabilitation effort if the physical, emotional, psychological, and vocational need of these patients are to be met.

Cancer of colon.—Colostomy offers another important opportunity for rehabilitation for cancer patients. Too often, the colostomized patient is left on his own after surgery, not only to work out the technical details of managing the colostomy but also to struggle through the depression that is usual after this type of surgery. Here is real need for all types of patient support and education. The American Cancer Society has provided certain literature and recently the Division of Chronic Diseases in the Public Health Service has produced an instructional film for both professional personnel and patients. There is urgent need for enlargement of such a program: unless it is developed, many patients will be lost by default, even though their surgery is successful.

Stroke.—In the past the patient with stroke has too often been considered a hopeless candidate for the nursing home, the back bedroom, and the chronic wards of the hospital. It was pointed out in the testimony that strokes occurred at all ages and that, regardless of age, the patient was entitled to rehabilitation opportunities. It was further indicated that the individual with such severe brain damage that he is unable to retain knowledge, the patient with cardiac failure that made further energy demands impossible, and those with uncontrollable malignant hypertension were obviously not suitable candidates for rehabilitation. It was emphatically brought out that every stroke center or station must have services of a comprehensive rehabilitation program, not only physical but vocational.

There was special discussion on the most difficult problem in stroke: aphasia. Actually this disabling condition should be considered a total problem of communication rather than aphasia alone. There is a tremendous need not only for more services in this field but for more research. This should not only be done by the Vocational Rehabilitation Administration alone. Basic research should be supported also by the National Institute of Neurological Diseases and Blindness, the National Heart Institute, and any other agencies with either primary or tangential interest.

The person who has suffered residual disability following a stroke should not be considered a specific clinical entity but, rather, an individual with a functional deficit. The localization and extent of the anatomic and physiologic defect produced by stroke results in variations in the hemiplegic pattern. No standard program for the rehabilitation of the person with stroke is therefore possible. Individual prescription and therapeutic measures must be based on analysis and evaluation of the functional deficit.

The stroke patient in our society is at our mercy. He is not uncommonly aged; usually he is financially dependent; he does not know what he needs or where to find help; and he is certainly incapable of coordinating his own health services. There is great need, therefore, to find methods of intra-agency and interagency coordination within the purview of health, education, and welfare at local, State, and National levels.

It is apparent that the U.S. Public Health Service through the State health departments could serve an important function in continuing education in rehabilitation of stroke victims as well as casefinding.

Rehabilitation is not a subdivision of medicine but is actually in some respects broader than medicine, for it involves a wedding of the behavioral and social sciences with biological sciences. This principle has not been adequately applied in the case of stroke patients but should be encouraged.

Rehabilitation is an integral part of the medical care of patients with heart disease, cancer, and stroke. It is essential, therefore, that any and all specialized facilities for the care of patients with heart disease, cancer, and stroke have comprehensive rehabilitation service. The type of rehabilitation service and the staffing patterns of such services will vary with the basic mission of such specialized facilities. All persons testifying at the hearings of the Subcommittee on Rehabilitation strongly recommended that persons needing rehabilitation services because of heart disease, cancer, or stroke could best be served in a general multidisability rehabilitation program.

Disability centers.—Subcommittees on Heart Disease, Cancer, and Stroke have recommended the establishment of diagnostic and treatment stations throughout the country. These stations, which will be in community general hospitals and medical centers affiliated with universities, will be responsible for providing high-quality care for patients suffering from heart disease, cancer, or stroke. Since it is recognized that each of these stations should be associated with a rehabilitation unit capable of providing needed services, it is recommended, therefore, that where none exist, a rehabilitation unit be established in each and every one of the hospitals where heart disease, cancer, or stroke stations are built.

Program services and staffing will vary in such units. However, a typical rehabilitation unit will include at least a 20-bed ward for rehabilitation services. The units should offer multidisability rehabilitation programs, but especially oriented to meet the needs of heart disease, cancer, and stroke stations.

In order to establish such units, funds must be provided for the renovation of existing facilities and for the construction of new ones. It is estimated basic renovation will cost approximately at least $150,000 for each 20-bed unit. An additional $150,000 a year will be required to meet half of the operating costs of each unit. The remaining half can be met through fees for service and local participation.

The Rehabilitation Subcommittee recommends that funds be appropriated by Congress for a 5-year period for the development of this program. These funds should be allocated by the Public Health Service so that this program can be administered in coordination with heart disease, cancer, and stroke stations. This program should be developed in collaboration with the Vocational Rehabilitation Administration. The following table summarizes the annual budget necessary for the development of this program on the basis of 100 rehabilitation units. Total budget will vary, depending upon total number of units.

Costs of rehabilitation stations

[Dollars in millions]

	Year				
	1	2	3	4	5
Number of new units to be established	10	20	30	40	
Renovation or construction	$1.5	$3.0	$6.0	$7.5	
Operating expenses	1.5	4.5	10.5	12.0	$15
Total	3.0	7.5	16.5	19.5	15

Demonstration projects.—It is further recommended that all hospitals and public health agencies serving persons with heart disease, cancer, and stroke should be encouraged and assisted to make rehabilitation services an integral part of their program. The Public Health Service should be given the authority and necessary funds to make project grants to hospitals and public health agencies for the development of demonstration projects in rehabilitation in the community. Such community rehabilitation programs should be integrated with other services provided by hospitals and public health agencies to patients with heart disease, cancer, or stroke. It is estimated that the sum needed to initiate this program is $1.5 million the first year, to be increased in stages to $7.5 million during the fifth year.

THE VOCATIONAL REHABILITATION PROGRAM

The major responsibility for rehabilitation services for the adult civilian population of the United States is vested in the Vocational Rehabilitation Administration, Department of Health, Education, and Welfare, and its counterpart agencies in all 50 of the States, the District of Columbia, Puerto Rico, Guam, and the Virgin Islands.

The principal programs conducted are (1) the basic program of vocational rehabilitation services for disabled people, carried out cooperatively between the States and the Federal Government, (2) research and demonstration, (3) training programs to produce more professional personnel, and (4) an international rehabilitation research program.

State-Federal rehabilitation services.—Disabled persons apply to, or are referred to, the State vocational rehabilitation agency to receive whatever combination of services may be needed to achieve rehabilitation. The services available include medical, surgical, hospital, psychological, vocational, and other education and training; job placement; followup in employment; and several other related services. The key staff member in this program is the rehabilitation counselor who works with the patient, the physician, the family, hospitals, schools, employers, and others in laying out an individual plan of services and in helping to carry it out. While some services (beyond counseling) may be provided directly by the State agency, most services are secured by purchase from physicians, hospitals, rehabilitation centers, clinics, schools, sheltered workshops, and other sources.

Some highlights.—In fiscal year 1964, almost 120,000 disabled clients were rehabilitated by the Federal-State vocational program. This was the eighth consecutive year that a new high was established in the number of persons rehabilitated. Over the past 5 years, the number of rehabilitants has increased 36 percent.

A total of 400,000 disabled clients were served during the year by the State vocational rehabilitation agencies, an increase of a little more than a third over the last half decade.

During the same 5 years, the national rehabilitation rate increased from 49 per 100,000 population to 63 per 100,000.

More than a quarter of the rehabilitants were 45 years of age or over: 1 in 5 rehabilitants was less than 20 years old.

Of every 10 rehabilitants, 6 were male; 8 of every 10 rehabilitants for whom race was reported were white.

Nearly half the rehabilitants had dependents.

The three largest sources of referral were private physicians (16 percent), and hospitals and sanatoriums (13 percent), and educational institutions (13 percent).

Before receiving rehabilitation services, more than half the rehabilitants were dependent on family and friends for their primary source of support.

At acceptance for service, to judge from past trends, about 21,000 rehabilitants were being supported by public funds. Of these clients, some 16,000 were receiving public assistance payments at an aggregate annual amount of over $18 million. The other 5,000 were maintained by public institutions and other public programs. At closure, about 6,300 clients were receiving public assistance of less than $6 million annually, a net reduction of about 60 percent in the number of public assistance recipients, and an estimated savings of nearly $13 million in public support funds.

Nearly three-quarters of the rehabilitants were not working before rehabilitation. The remaining clients were either employed, self-employed, unpaid family workers, or homemakers. After rehabilitation, 83 percent of the clients were earning wages. The average wage for the group was a little over $40 per week; nearly 30 percent were earning over $60 per week. The aggregate annual earning of all rehabilitants was $250 million.

The number of clients rehabilitated who had been applicants for old-age and survivors' disability insurance benefits was about 9,600.

Of the rehabilitants closed into paid employment, more than 10 percent were placed in professional and semiprofessional types of occupations and nearly 30 percent became skilled and semiskilled workers.

More than 90 percent of the rehabilitants required some type of purchased service at cost to the agency. The services needed most frequently by all rehabilitants were diagnostic procedures, 96 percent; training and materials, 36 percent; and surgery and treatment, 35 percent.

On the average, clients completed the rehabilitation process in approximately 13 months. The median time from referral to acceptance for service was about 2 months; from acceptance to closure, 11 months.

Services for heart patients.—From its inception, the State-Federal program of vocational rehabilitation has served persons disabled by disease or disorders of the heart. Since 1943, when legislation authorized the provision of services to reduce or eliminate the handicapping residuals of disability, the program has also provided medical restorative services for the cardiac with a potential for work. State agencies have varied in the depth and scope of the services they have made available to the cardiac case. Some have pioneered by arranging for their clients to have surgery of the heart, including open-heart surgery, surgery to insert "cardiac pacemakers," to transplant arteries or veins, or to substitute various synthetic materials for damaged arteries. In other States, arrangements to provide these highly technical procedures have been made through other public or private agencies, with the State rehabilitation agency coordinating these other resources in order to develop the integrated pattern of services essential to the rehabilitation of the cardiac.

Emphasis has always been given to the following: comprehensive diagnostic and evaluative services, physical restoration services, professional counseling, prevocational and vocational training, and job placement and followup. All clients of a State rehabilitation agency receive a general medical examination at the time they apply for services. The family physician's intimate knowledge of the client and his circumstances is utilized fully, since he may direct attention to secondary medical problems, or to emotional and social problems which must also be resolved if the person handicapped by a cardiac condition is to be successfully rehabilitated. Usually the agency will refer the client to a cardiologist who thoroughly evaluates the cardiovascular and related systems. In addition to providing such relatively routine tests as an EKG, X-ray, and fluoroscopy of the chest, he may recommend further special studies which are arranged for by the agency. The client may be referred to a work classification center, where a team of medical and vocational specialists determine his physical capacity for work. Or he may be referred to the cardiac team of a medical center where cardiac catheterization, angiocardiography, and blood chemistries under standardized conditions of work are completed.

Once the evaluation of pertinent medical, psychosocial, and vocational factors has been completed, the agency counselor, in consultation with his medical consultant, will develop a rehabilitation plan cooperatively with the client and his family. This plan may include provision for necessary surgical procedures. Arrangments may be made for the client to go to a rehabilitation center where tolerance for work may be developed under medical supervision, where training in "work simplification" can be received, as well as such additional services as prevocational training, psychological testing, and personal adjustment counseling. Sheltered workshops may be utilized to afford the client exposure to work experience in order to develop confidence in his ability to return to the labor market; or the plan may include his attendance at a vocational school to develop job skills.

The client and the counselor consider together all possibilities for remunerative employment which are within the client's residual physical capacity, his particular aptitudes and interests and for which there are placement opportunities available. These may include employment in the competitive labor market, self-employment, a return to the job held prior to the onset of disability, sheltered workshop activity, or homebound industry. Other community services, such as homemaker services, may be incorporated in the work plan so that the client may expend his energies at work more suited to his abilities.

In carrying out rehabilitation plans for cardiac patients, it is logical that State agencies should uncover gaps in the services needed by their clients. In cooperation with other community agencies, and with the support of the Vocational Rehabilitation Administration, State agencies have stimulated the development of many valuable resources for the rehabilitation of the cardiac. Among these are cardiac evaluation centers at medical centers, work classification units, homebound industries, rehabilitation centers, and sheltered workshops.

Equally important, State agencies have given essential support to these resources by finding appropriate candidates for the services they provide and by paying for the care received by clients. The State agency may assign vocational counselors to such facilities in order to increase their effectiveness, an

activity frequently undertaken as an extension and improvement project with the support of 75 percent funding through the Vocational Rehabilitation Administration. Cooperative arrangements have been developed between Federal and State agencies and the American Heart Association.

Rehabilitation for cancer patients.—As is true with heart disease and stroke, the practices of State agencies vary in their efforts to meet the rehabilitation needs of cancer cases. Generally, the comprehensive evaluation and continuum of services appropriate to the individual needs of the cancer client are similar to those described earlier.

Because of the difference in State agency practices and the pressure of many of these agencies to provide cancer surgery when the eligibility for vocational rehabilitation services was uncertain, the Vocational Rehabilitation Administration has encouraged State rehabilitation agencies to include cancer patients in their caseloads where eligibility requirements are met and has issued guidelines for provision of vocational rehabilitation services to indivduals with cancer.

The agencies generally arrange for biopsies to be carried out when they are required as part of the diagnostic workup and are approved by the agency's medical consultant. It is also general policy to provide necessary surgery when the client is unable to pay for this service himself or when arrangements cannot be made for surgery through other resources in the community. Sometimes when an individual is accepted for service, a malignancy is discovered or suspected, and the subsequent biopsy may indicate the necessity for surgery as a lifesaving measure. In such cases, the State agency may provide for the necessary surgery. If a client is known to have cancer at the time he is accepted for rehabilitation service and the rehabilitation plan includes physical restoration services to remove or alleviate the malignant condition, radiation therapy and drugs may be provided as part of the physical restoration program.

Agencies have been cautioned against becoming involved in diagnostic surgery in cancer cases with a grave prognosis. Thus, under current practices, a major consideration for State agencies in accepting cancer cases for vocational rehabilitation services is reasonable expectation that the individual will be able to engage in a remunerative occupation.

The public program of vocational rehabilitation could expand its services to meet the needs of a greater number of cancer cases through the following measures:

State rehabilitation agencies should be encouraged to liberalize their policies in accepting cancer cases for service, including cases where (1) the disease process is considered arrested, and (2) where the cancerous progress may be medically described as slow. This liberalization could be accompanied by a broad program of interpretation of this new policy to physicians, community referral sources, and the general public.

State agencies should broaden their service concepts for individuals with cancer. In the case of laryngectomized individuals, physical restoration with reconstructive surgery can often be beneficial. There is need, too, for the provision of training in esophageal speech and in cases where such speech cannot be acquired to provide electronic devices to facilitate communication.

The Vocational Rehabilitation Administration should develop cooperative agreements and programs with the medical profession and appropriate voluntary agencies. For example, discussion should be initiated with representatives of the American Cancer Society leading to cooperative programs in the rehabilitation of cancer patients, as has been done with the American Heart Association for cardiac cases. This should lead to improved coordination in providing services at the State level.

Rehabilitation for stroke patients.—Often, for the patient, the return to a useful and productive life following a stroke is a long and discouraging process, but frequently much can be accomplished if vocational rehabilitation services can be provided early and continued for the necessary time.

Patients with stroke are being served through State agency programs, although unfortunately not in large numbers. The services provided are essentially the same as those for heart and cancer cases. In some cases physical restoration services will include surgery for removal of clots, tendon transplants, tendon lengthening, or release of spastic muscles.

Early referral is particularly important in stroke cases. Educating physicians to early referral is a constant preoccupation of the Vocational Rehabilitation Administration. It could be strengthened through coordinated action with State and local medical associations as well as with State and local heart associations.

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Provision should be made for State agencies to support stroke cases for specified periods in nursing homes which have appropriate rehabilitation and therapeutic services. Along this same line, needed therapy should be provided in the home as a homemaker service.

In rural areas, State agencies should be enabled through special funding to provide mobile diagnostic and therapy teams to evaluate stroke cases, determine their degree of disability, and prescribe treatment. There is also a need for the training of nurses and family members in order to provide needed therapy under the direction of the patient's physician and with the resources of the local hospital.

States should be enabled to encourage by grants and other forms of support the initiation of local programs of physical and speech therapy for stroke patients, utilizing fully the community hospital and other relevant community-based health programs.

Services for heart, cancer, and stroke patients.—In the year ending June 30, 1964, nearly 120,000 disabled Americans were rehabilitated into public employment under the State-Federal vocational rehabilitation program. This was a 9-percent increase over the preceding 12 months and the 11th consecutive year in which a new high was established. Despite these advances, it is estimated that there are 2 million Americans who are eligible for and who could benefit from vocational rehabilitation services if facilities, personnel, and funds were available. The number newly disabled each year is 350,000.

Even present services under the State-Federal rehabilitation program are not used to full effect for patients with heart disease, cancer, and stroke.

Of 110,136 persons rehabilitated into employment by State vocational rehabilitation agencies in fiscal year 1963, only 5,138 (4.7 percent) had heart disease, 539 persons (0.5 percent) had cancer, and 502 (0.5 percent) had strokes. As the total number of persons rehabilitated annually into employment increased steadily from 80,739 in 1959 to 110,136, the percentage of the total with heart disease, cancer, and stroke remained constant.

By 1968 the Vocational Rehabilitation Administration projects a total of 161,900 persons rehabilitated into employment. If the percentage of the total with heart disease, cancer, or stroke remains constant, vocational rehabilitation services during fiscal year 1968 will be provided to only 7,500 persons with heart disease, 750 persons with cancer, and 800 persons with strokes.

Legislation.—Legislation currently pending before the Congress would allow State vocational rehabilitation agencies to serve clients for a period of at least 18 months before all criteria of eligibility are met. If this legislation is adopted, patients with heart disease, cancer, or stroke may receive intensive evaluation services before it is definitely determined that there is a reasonable expectation of ability to work for pay.

Further services could be provided for patients with heart disease, cancer, or stroke if State legislatures appropriate more money for Federal matching, so that State agencies may increase staff, expand services, and serve more clients.

State agencies can also be encouraged to develop more extension and improvement projects (which are supported with 75 percent Federal funds) for persons with heart disease, cancer, or stroke.

Services available for cardiac, cancer, and stroke patients through State rehabilitation agencies could be considerably enhanced and expanded by clear-cut authority to provide self-help devices such as mechanical stairs or other structural alterations in the home. These facilities might be interpreted as being in the nature of prostheses, but their primary function would be to serve as aids to independent living rather than as devices designed to meet a vocational need. Quite possibly, adidtional legislation would be necessary before State agencies could have the authority to expend funds for the purchase of such equipment, but this seems an area deserving careful analysis.

Vocational rehabilitation services should be extended to many more young people with heart abnormalities in their early teens, since they require early guidance by counselors for proper vocational planning. Young people with organic heart disease, whatever their functional or therapeutic classification, should be considered handicapped and eligible for vocational rehabilitation services. Many of these young people with a history of rheumatic fever are often classified 1–A and are, therefore, not acceptable to State vocational rehabilitation agencies. More education is needed in the correct use by physicians and correct interpretation by counselors of the functional therapeutic classification.

The Vocational Rehabilitation Administration should be directed to launch a

special 2-year development program to provide a vastly expanded pattern of operation in cooperative work with the States and communities in rehabilitating the victims of heart disease, cancer, or stroke.

Specifically, the new programing should include:

1. New system of project grants, primarily to State vocational rehabilitation agencies, financed entirely with Federal funds for a 2-year developmental period, to provide complete and modern vocational rehabilitation services to persons with disabilities resulting from heart disease, cancer, or stroke; $1.5 million a year is recommended.

2. The construction of vocational rehabilitation centers and sheltered workshops with special emphasis on those which will be fully capable of providing the most advanced evaluation and services for persons disabled by heart disease, cancer, or stroke, as well as other disabilities including mental retardation.

To provide a strong incentive to cooperating agencies and groups, at least three-fourths of the construction costs of these projects should be borne by the Federal Government. This Federal support should also apply to necessary equipment and the costs of staffing for the first few years.

Because many persons are so severely disabled they cannot reasonably be expected to even enter competitive jobs, yet are able to work productively in sheltered workshops, the Federal Government, through the Vocational Rehabilitation Administration and the cooperating State agencies, should provide continuing Federal grants to help support sheltered workshops.

There are at present about 400 rehabilitation centers, varying in type, size, service, and disability interest. Of these, probably about 75 are vocationally oriented centers, including those with beds or dormitories and those functioning on an outpatient basis. According to a recent estimate, at least 200 more vocationally oriented centers are needed. Sheltered workshops currently number about 650, with great variations. At least 1,000 more sheltered workshops should be established.

For an aggressive and yet realistic approach, it is recommended that during the next 5 years a minimum of 100 vocational rehabilitation centers and 500 sheltered workshops be established throughout the country.

The average cost per unit is estimated to be $700,000 for each center and $120,000 for each sheltered workshop. The Federal Government's share of this amount should be at least 75 percent of such costs. The Vocational Rehabilitation Administration should be given the authority and appropriation to undertake this program. The following tables summarize the cost of initiating this program for the first 2 years.

Annual cost of new vocational rehabilitation centers

[Dollars in millions]

	1st year	2d year
Number of new centers	5	15
Total actual cost	$3.5	$10.5
Federal share	2.5	7.0

Annual cost of new sheltered workshops

[Dollars in millions]

	1st year	2d year
Number of sheltered workshops	50	50
Total actual cost	$6.0	$6.0
Federal share	4.5	4.5

3. Legislative authority to permit the use of Federal funds by the Vocational Rehabilitation Administration to match funds appropriated by city or county governments which are used within the general framework of the presently established State vocational rehabilitation program. This new authority will encourage city and county governments to participate directly in the vocational rehabilitation of their citizens suffering from heart disease, cancer, or stroke.

It is estimated that $2.5 million is necessary for a 2-year period to initiate this program.

4. New legislative authority to enable the Vocational Rehabilitation Administration to relax its present requirements in the acceptance of disabled persons for services in the State-Federal program.

Under present law, a disabled person must be found potentially employable before rehabilitation services can be undertaken. In a large number of patients recovering from heart disease, cancer, or stroke, employability cannot be prognosticated until restorative measures have been administered for a variant period of time. For the Federal-State program to play an aggressive role in reducing needless disability, the agencies should be authorized and encouraged to provide services for a preliminary period of time (which will vary but often runs from a year to a year and a half) before deciding whether or not the individual patient is likely to be employable.

The extent of the additional outlay of funds will depend largely on the ability of individual States to appropriate increased funds for matching purposes. It is estimated that a sum of $1 million will be needed for the first year. Expenditures for subsequent years will be incorporated in the growth of the vocation rehabilitation program.

RESEARCH IN REHABILITATION

Since 1954, the Vocational Rehabilitation Administration has conducted a program of research and demonstration grants and research fellowships and since 1961, with the use of "counterpart" funds owed the United States, this program has been international. Some funds for research and demonstration projects in rehabilitation are also available from the Public Health Service through the National Institutes of Health and the Division of Chronic Diseases, Bureau of State Services; the Children's Bureau, Welfare Administration, Department of Health, Education, and Welfare; and the Veterans' Administration. The research appropriation for VRA in the fiscal year 1965 was $22,685,000.

The public program of vocational rehabilitation today sights two goals: employment of disabled persons according to their abilities, their preference, and their hopes for a secure future; and the reduction of dependency among disabled persons who cannot always undertake work for pay.

Some of the ways to achieve these goals have been clarified by Vocational Rehabilitation Administration research and demonstration activities since 1955.

More than 850 projects supported by VRA were completed, in progress, or approved for initiation at the end of June 1964. In that year, more than $15 million in Federal money was available for research projects, to support initiation of new projects or continuance of prior awards. Research grants to State rehabilitation agencies or private, nonprofit groups require a prospect of new information or new techniques of benefit to the general program or certain areas of rehabilitation endeavors.

The projects study virtually every field of rehabilitation: cardiovascular disorders, mental retardation, mental illness, orthopedic disorders, speech and hearing, visual disorders, aging and chronic illness, and other conditions that are handicaps to employment and independent living. Not only is there research per se, but demonstrations of the validity of new knowledge or ideas, administrative and program studies, and many projects on the periphery of the program but valuable to its operation and progress.

The philosophic concepts of rehabilitation of the person with heart disease have gained increasing recognition over the past two decades. This has resulted from a sharper scientific delineation of rehabilitation as a concept coupled with increased physiologic and biochemical knowledge of congestive heart failure and better understanding of the meaning of cardiac functional classification in terms of ergometry and ergonomics.

Projects in heart disease

With the aid of research and demonstration grants, the Vocational Rehabilitation Administration has supported a number of cardiac work evaluation units which have yielded valuable information on the capacity of heart patients to engage in physical activity. The treatment and advice given to cardiovascular patients as well as the vocational rehabilitation procedures have changed considerably as a result of such findings.

To restrict the patient to a level of activity far below his reasonable capacity defeats the purpose of rehabilitation. To neglect to protect the patient against dangerous stresses at home, yet to overprotect the patient during employment,

is poor management, expensive both to the patient and the community. Reasonable regulation of the patient's activities so that he may resume an enjoyable and productive life should be the goal.

The University of Minnesota, the University of Pittsburgh, and Columbia University have each sponsored projects in work classification for heart patients. The Minnesota unit studied the parameters of cardiac output and cardiac work during vocational rehabilitation. The Pittsburgh unit conducted two projects: One was to evaluate the effect of employment on cardiacs whose work tolerance had been prescribed by the unit and the other was an effort to develop standards for work recommendations by analyzing compliance with work prescriptions and mortality. The Columbia University unit analyzed and correlated data on the vocational adjustment and personal characteristics of persons seen by the unit.

The New York Medical College has studied the electrophysiological characteristics of nerve and muscle to determine if changes occur in these characteristics in the course of chronic occlusive arterial disease.

At Baylor University, the department of rehabilitation has installed an electronic data procesing system to study rehabilitation in severe neuromuscular respiratory and circulatory disabilities. This is based on the idea of linear programing used in industry to chart a complex flow of production. The rehabilitation process is examined through study of data recorded in a case history over the period of hospitalization. This study should identify activity patterns in specific categories of disability, including stroke and heart disease, during hospitalization.

Northwestern University Medical School is studying the course of rehabilitation of cardiac patients who have undergone corrective cardiac surgery in an attempt to determine predictive indicators for recovery and long-term adjustment. Psychological, psychiatric, neurological, social service, and cardiac diagnostic procedures are being employed in this 5-year study of patients who have been operated on by means of closed- and open-type of cardiac operations. The project will provide data basic to the understanding of the complexities of rehabilitation of cardiac patients in a comprehensive manner.

A study of the effects of training and other factors on cardiac patients before, during, and after a program of rehabilitation is being conducted at Montefiore Hospital in New York. Baseline data on a cardiac patient group have been developed. This group will be followed and studied according to criteria of work physiology not usually applied to those with heart disease.

A home-care program for cardiac patients was carried out by the University of Maryland Medical Center. An administrative unit was organized and home-care services were provided for an experimental group of patients with serious cardiac handicaps. Considerable differences in the rate of readmission to the hospital were found between experimental and control groups. Not only was the initial hospitalization much shorter for the experimental group, because of the availability of the home-care program, but the rate of readmission was much less for the experimental group. Differences in mortality rates of the two groups were not significant.

A study of factors relating to unsuccessful vocational adjustment of cardiac patients was made by the Heart Association of Southeastern Pennsylvania. It showed that social and emotional factors were closely related to unsuccessful adjustment rather than organic heart disease or vocational factors. Failure to come to emotional terms with the illness, overconcern, anxiety, and bitterness characterize this group. Failure to return to work is accompanied by family and personal disorganization; family problems grow; problems are perceived unrealistically.

The Human Resources Foundation on Long Island is conducting research with far-reaching implications for heart disease and stroke victims. Through the use of recently developed methods of telemetry, and in conjunction with new psychometrics, the physical and psychosocial aspects of work are being studied while the worker is on the job. It is expected that the project will develop important knowledge bearing on the physical reaction of disabled persons to the physical and emotional strains of the job and on the relation of such reactions to the individual's work adjustment.

Needs.—There is now available a considerable body of information regarding the metabolic and cardiovascular requirements for short bouts of exercise by hemiplegic patients. It is urged that studies be initiated on the effects of prolonged exercise on subjects with motor impairment, since information on this question is sparse.

A project is needed to study means of early detection of cardiac cases as well as the development of better evaluation procedures for the cardiac patient.

A study is needed of the work-potential indicators for cardiac patients, especially following cardiac surgery.

There is need for revision of physical standards for the cardiac in industry. This revision should invite the participation of industrial medical directors.

A project to study psychosocial adjustment of the cardiac through the use of group therapy and recreational facilities is indicated by recent findings. Also, study of the premorbid and postmorbid personality of the cardiac will provide guides to counselors and other rehabilitation personnel.

Further study is indicated for the causes of various vascular diseases; such as arteriosclerosis and atherosclerosis and peripheral vascular conditions. Also, investigation of respiratory sequelae, as a rehabilitation problem in cardiac disease, needs support.

In order to provide a continuity of service for youths disabled by heart disease, a program to insure a progression from school to work is needed. This program would establish demonstration projects which coordinate services between the school's secondary program and a work-adjustment program. There is considerable experience with the mentally retarded which needs to be transferred and modified to fit the needs of the youth disabled by heart disease. After testing in 4 or 5 experimental projects, 10 selected demonstrations should be established in various regions to promote the use of the procedures and methods developed from the experimental studies. These activities should logically be integrated with cardiac centers and service units.

Projects in cancer

Victims of cancer, who are successfully treated, frequently are able to return to their former occupations with little or no handicap. However, certain residuals of cancer surgery require rehabilitation measures. For example, amputations are not uncommon and prosthetic appliances are fitted to replace the amputated limb. Another result of cancer surgery, in some cases, is facial disfigurement. Two projects studying the problems of facial disfigurement have been completed under the auspices of the Vocational Rehabilitation Administration.

Facially disfigured.—New York University Medical Center has completed a study of the teamwork approach to rehabilitation of the facially disfigured. This approach recognizes the extreme importance of the psychological and social factors in this kind of disability, along with medical factors. This project concentrated on patients requiring physical restoration by surgery. Of course, facial disfigurement results from causes other than cancer but malignant growths are a frequent cause for facial surgery with the consequent need for physical restoration. The significance of the New York University study was in the contribution of the psychosocial members of the team and in its analysis of the kinds of patients who are more likely to be rehabilitated.

At Duke University, a related study concerned cosmetic prosthetic restoration. Experiments were conducted to develop materials best suited for molds and for the prosthesis itself. The study developed a satisfactory prosthetic nose and established a cosmetic prostheses center.

Laryngectomy.—Laryngectomized cancer patients, having lost their voices, are taught a method of speaking called esophageal speech. They must learn to impound air in the esophagus and to eructate at will. Articulation is carried on as before.

Two studies of esophageal speech have been conducted at the University of Kansas Medical Center. The first was to determine the relationships between attitudes toward speech and the intelligibility of the esophageal speech of laryngectomized persons. It was found that acceptance of esophageal speech was closely related to intelligibility and the absence of swallowing noises, breathing noises, low pitch, and so forth. The subjects whose speech measured as more intelligible were making the healthiest adjustment to speaking situations and usually they were verbal people in the preoperative period.

The second study by means of cinefluorography investigated physiological movements in esophageal speech. Significant findings were obtained for teaching esophageal speech. It was also suggested that the variables of personality, motivation, drive, family environment, and aspiration level, which were not evaluated in this study, are probably more important for the speech learning process than are the physical variables.

A project sponsored by the Junior League Speech & Hearing Center of Columbia, S.C., studied the social and vocational acceptability of esophageal speakers. In a carefully designed study, comparison of normal and laryngectomized speakers indicated that the laryngectomees were significantly less acceptable than the normals regardless of whether acceptability is based upon closeness of social contact permissible, the prestige levels of the jobs for which the speakers are considered adequate, the number of jobs for which the speakers are considered adequate, or the degree of public contact entailed in jobs for which the speakers are considered adequate. Moreover, the laryngectomees were judged to be significantly less acceptable than the normals whether the comparisons were based only on speech, only on appearance, or on the simultaneous speech and appearance of the speakers, regardless of the presence or absence of information.

The primary purpose of a University of Pittsburgh project was to study factors which might be related to the learning of speech in laryngectomized patients. Specifically a number of biographical, medical, personality, social, communication, and speech training factors were studied as correlates to speech proficency. Descriptions of specific speech training procedures were also obtained and correlated to measures of speech proficiency. In addition, a population of esophageal speakers was compared with a population of artificial appliance users on several measures of speech proficiency, as well as on factors associated with speech proficiency.

In general, the results obtained favored esophageal speech over the use of artificial appliances. Also, certain factors such as age and the nature of residual musculature were important in prognosis, while early training, personality, and social variables were shown to be closely related to proficiency in speech.

At Washington University, St. Louis, a project is being conducted to study the neurophysiologic factors necessary in the reestablishment of normal swallowing and voice in laryngectomized animals with mechanical prostheses and patients with partial laryngectomies.

Needs.—Among the needs for research in rehabilitation of cancer victims are:

Further development of prostheses to replace deformities caused by cancer, including lost appendages, at various stages of the disease, especially newer techniques in prosthetics following disarticulation, and evaluation of various materials in the manufacture of prosthetic devices.

A study of the rehabilitation needs of individuals with cancer of the bones and joints.

Further studies of rehabilitation procedures in breast cancer. These should include methods of minimizing disability, reducing edema, and improving prosthetic devices.

A study of the psychosocial relationships of the cancer patient and his family during rehabilitation is indicated by recent findings, especially with respect to breast and gastrointestinal cancer.

Separate but closely related studies of rehabilitation of individuals with cancer of the lungs, genitourinary system, gastrointestinal system, or the larynx.

A study of the rehabilitation needs of patients with cancer or tumors of the brain and neurological system.

Establisments of more centers for research and training, as well as services, in the field of cosmetic prosthesis and surgical repair of facial disfigurement.

Studies of the effectiveness of preoperative and postoperative exercises and other procedures of physical medicine in alleviating or reducing deformities due to mastectomy.

Studies of preoperative and postoperative counseling in cases such as mastectomy to achieve the best possible adjustment to the disability and to improve vocational rehabilitation potential.

Experimental work in using identifiable signs to differentiate satisfied and unsatisfied patients in the courses of undergoing repair for facial disfigurement, and using these signs to measure need for psychotherapy prior to surgery.

In order to provide intensified research and treatment for laryngectomized patients who require training in esophageal speech, it is recommended that a university medical center already well equipped in this area be encouraged to step up its program by a grant for 3 to 5 years of intensive study of the coordination of surgical, psychiatric, psychosocial, and speech therapy facilities in improving esophageal speech. From this experience, selected demonstrations can be developed.

A study should be made of the attitudes of the professional personnel working with individuals who are disabled by cancer and are in the process of rehabilitation.

Stroke projects

There is no disability affecting larger numbers of Americans in which rehabilitation can play a more important role than stroke.

Energy expenditure—It is generally conceded that easy fatigability is a major factor hampering the rehabilitation of patients with hemiplegia due to cerebral vascular accidents. The Vocational Rehabilitation Administration has supported studies at the University of California and New York University directed toward analyzing this problem.

The California studies involved the measurement of energy expenditure in normal persons and in hemiplegics. The investigators found higher energy expenditures among hemiplegics than in normals doing equivalent exercise. However, it was demonstrated that hemiplegics with assistive devices could be brought within the normal range at reasonable levels of speed of exercise. A new method of measuring energy expenditure was described and its effectiveness demonstrated. These studies indicated a need for further studies of energy expenditures in common activities of everyday life.

A second project at California had two primary objectives: (1) to obtain quantitative data on the physiological demands of certain types of activity, and (2) to assess, wherever possible, the therapeutic results of certain exercise regimens. On the basis of data obtained in these studies, there appears to be no reason why hemiplegic patients, under adequate medical supervision, should not be able to play a useful and productive role in society. However, if the hemiplegic patient is to engage in physical activity, care must be taken that inordinate demands are not made on the afflicted regions of the body.

New York University Medical Center is conducting a study of the significance of respiratory impairments in hemiplegics, scheduled for termination in February 1966.

Aphasia.—There has been rather wide-ranging study of speech and language rehabilitation for aphasics, not all of which was directed at stroke victims, but much of it applicable to this group. The diagnosis, treatment, or therapy of aphasia, the prognosis for recovery, and the vocational rehabilitation potential are tightly interwoven subjects for research. It should be noted, also, that aphasia can be viewed as a closely related group of disabilities with a variety of causes and manifestations. Thus, patients present varying degrees and combinations of expressive and receptive language impairment.

Improving differential diagnosis of aphasics is a basic step toward the improvement of the selection of treatment methods and rehabilitation planning. Toward this end, a project was carried out to develop a test for aphasia. The result is the language modalities test. It is an instrument to assess the impaired language of the adult aphasic which permits a ready classification of the patient's communication problem and, at the same time, leads to the design of the therapeutic process.

A study of the stimulus-response relationships in the retained language of aphasic adults revealed six factors: (1) Visual to oral transmission, (2) aural to oral transmission, (3) visual to graphic transmission, (4) aural to graphic transmission, (5) the ability to comprehend language symbols, and (6) the ability to perform simple arithmetic operations. The test analyzes the patient's impairment according to these factors. Then the patient can be approached directly with the type of language he needs along the pathway most evidently available. The test also gives a scoring value based upon the patient's recognition of his own errors and his tendency to correct them. This test may be one of the most critical sources of information concerning the aphasic and his amenability to therapy.

The purpose of an investigation at the Jewish Chronic Disease Hospital was to study the value of psychotropic drugs as an adjunct to speech therapy for aphasic patients. Only right hemiplegics were studied. Statistical analysis indicated that the drugs had no significant effect on speech therapy or perception. However, analysis of the qualitative data from daily clinical records indicated improvement in the patient's emotional tone and alleviation of the usual depressive reaction. It is not determined whether this improvement was due to speech therapy, group therapy, the effects of the medication, or a combination of factors.

Improvement in speech therapy and in performance on tests of perceptual organization occurred in patients who had sustained their cerebral vascular accidents less than 6 months prior to evaluation and treatment. This improvement was significantly greater than in those who were evaluated and treated after the first 6-month period following their cerebral vascular accident.

Two currently active projects are using automated and programed presentation of language and perceptual learning tasks with immediate feedback as to adequacy of response. These studies are seeking to develop the kinds of stimulus inputs effective in increasing learning in hemiplegics. Results should help lead to clarification of teaching techniques with specific forms of intellectual deficit, as these relate to patient learning in rehabilitation. One of these projects is coordinated with a similar project in Milan, Italy, to enable cross-cultural comparison of the effectiveness of training procedures in different languages.

A project recently initiated is studying paired-associate learning, verbal conditioning, aging, and brain damage. Comparisons will be made between subjects more than 60 years old, and subjects 25 to 45 years old. They will be studied with respect to their ability to perform paired-associate learning tasks and the effect of verbal conditioning procedures. Questions of learning ability and general adaptability to new conditions are crucial for a variety of professional disciplines working in psychiatry, physical medicine and rehabilitation, and related fields with brain-damaged patients. An investigation of verbal behavior in relation to aging and brain damage will add significant information concerning the strengths and deficits encountered in these groups.

A study of the visual-space perception of the hemiplegic is being conducted at Baylor University in order to elucidate a relatively unexplored impairment which may affect the patient's potential for rehabilitation. Particular emphasis is being placed upon changes in perceptual capacities in the course of rehabilitation and the relationship of these capacities to functional motor performance, neurological status and intellectual functioning.

The task of determining the ability of brain-damaged individuals to profit from training is the subject of study at the New York Medical College. Its purpose is to test a method of predicting their response to special training, to determine if they can indeed respond to such education, and to attempt to identify and map the salient variables in their response both to training and to the diagnostic method, with regard for similarity and continuity of response and ability.

Other medical studies.—A basic study at Kenny Rehabilitation Institute found a significant relation between atherosclerosis in the peripheral blood vessels of the extremities and in the cerebral blood vessels. A related project in California (the Rancho Los Amigos Hospital, Inc.) seeks (1) to determine the frequency, severity, and the types of cardiovascular problems present in hemiplegic patients undergoing rehabilitation, (2) to develop practical physiological methods and to obtain objective data for evaluation of these cardiovascular problems, and (3) to correlate objective data, so obtained, with the ability of patients to undergo rehabilitation.

Investigators at the Kenny Rehabilitation Institute in Minneapolis have sought to evolve a practical tool or technique that would have significane in predicting functional ability of the hemiplegic patient and the likelihood of his eventual employment. A feasible technique would make it possible to direct patient treatment according to residual capacities and establish realistic rehabilitation goals. To this end, data were compiled from detailed physical examinations, aphasia tests, and EEG readings of a series of hemiplegic patients. The data will be analyzed statistically to establish the interrelationships of perceptual, verbal, sensory, and motor function with the location of the lesion and the degree of rehabilitation achieved.

A study is being conducted at Baylor University to develop quantitative methods for evaluating spasticity.

An important means of overcoming physical limitations of hemiplegics is provided by orthotic and prosthetic devices developed mainly through research since World War II. These devices provide synthetic muscles consisting of gas-operated or hydraulically operated braces and other types of devices to overcome weakness, paralysis, or absence of extremities. As has been demonstrated in other research projects, orthotic and prosthetic devices reduce the energy expenditure of hemiplegics in performing physical tasks, and they considerably increase the range of physical activity and thus the employability of the hemiplegic.

Psychosocial-vocational adjustment.—Harvard University has completed a study of the natural course of recovery from cerebrovascular accidents after the acute stage and the influence of rehabilitation. The study also includes a preliminary investigation of the problems of the patient and his family in the first year after discharge from the hospital. One purpose was to determine which patients with cerebrovascular accidents do better with rehabilitation training than they would be expected to do merely as a result of encouragement to

activity and prevention of stiffness and pain in joints. Patients were assigned at random to treatment and control groups and their performance was assessed before and after treatment. Improvement was observed in both groups. There was no statistically significant difference between the gains of the two groups in any of the tests of strength, performance, or aphasia. Interim reports indicate that improvement after discharge was dependent upon the strength of family relationships and the individual's perception of himself as a functioning or as an immobilized person.

The University of Minnesota investigators are seeking to determine the effect of intensive rehabilitation upon maintenance of the capacity of self-care and independence by patients with hemiplegia resulting from cerebrovascular accidents. They will determine the general health needs, the physical capabilities, the extent to which social, vocational, and economic needs have been met, and what community resources have provided assistance or guidance to the patient and his family. Attitudes of the patient and family toward rehabilitative status will be investigated as well as the extent to which the public health nurse has contributed to continuing the care plan instituted in the hospital.

A demonstration project at Long Beach, Calif., completed in 1960, was directed at the vocational rehabilitation of the physically rehabilitated hemiplegic in a workshop setting. The subjects were considered "nonserviceable" by the State vocational rehabilitation agency and therefore presented little prospect of vocational adjustment. The purpose was to determine to what extent this "nonfeasible after evaluation" group could become acceptable for competitive employment with the help of assistive devices, mechanical modifications, situational work adjustment techniques, and training in a transitional workshop. The cooperation of the State rehabilitation agency and community industries was active and contributed considerably to the success of the project. Factors that worked against successful rehabilitation were (1) the presence of concomitant disorders, particularly seizures, cardiac conditions, visual disorders, diabetes, and other liabilities, and (2) emotional or personality disorders. The project demonstrated (1) that workshop evaluation and training can have a marked effect on the employability of hemiplegics, (2) that intensive placement activities are necessary to educate employers and sell the hemiplegic's abilities, (3) other people's attitudes, including rehabilitation personnel, must be changed regarding the potentials of hemiplegics, (4) all possible techniques of rehabilitation, including adaptive devices, selective tests and measures, job survey, and further research must be utilized to the fullest extent to provide successful rehabilitation for hemiplegics.

Needs.—Research in rehabilitation of persons with stroke is particularly difficult due to many practical considerations in the clinical situation which handicap research. Some of these are:

1. Inaccurate determination of extent of pathology.

2. Loss of research population due to deterioration or death of patient or his strong motivation to return to his community and family upon improving.

As a result, research populations are too small for meaningful statistical evaluation or include too wide a range of ages, e.g., 20 to 70.

If one attempted to adhere to the ideal of experimental design, probably no clinical research would be conducted other than case studies.

To facilitate clinical research, an organized and standardized approach to data collecting must be instituted. Major neurological and rehabilitation centers should coordinate their activities. With electronic data processing, reports from any investigators can be centralized. Uniformity is the prime need in terminology and in recording autopsy, neurologic, psychologic, speech, and social background data. Data built up in a central pool can then be analyzed with statistical confidence beyond the reach of an individual clinical research study. Unless some centralization and organization of data is achieved, clinical research in rehabilitation will continue to be loose and inconclusive, if not productive of contradictory results.

Further research to determine the bases of selection, types of training, and placement opportunities should be instituted in representative areas of the country, since some sections are more likely than others to offer job opportunities to hemiplegics. As the general conclusion that the work habits, reliability, work-life prognosis, and amenability to training are more important than the exact job skills in this research may not hold up in all circumstances, workshop training must be adjusted accordingly. In some instances, it might well be implied that specific mockups of particular industrial jobs would be the only way to determine the competence or potential of hemiplegics to fill such jobs.

Ten selected demonstrations, based on the prototype established in Long Beach, Calif., should be established in conjunction with good multidisability facilities in different regions.

There is a need for further study of spasticity to determine causes and methods of treatment, including special devices and drugs.

A study of the rehabilitation of hemiplegics who are victims of disease as compared with victims of trauma, should include special attention to brain damage as it relates to problems of the dominant lesion versus the nondominant.

A study of the use of assistive devices and their efficacy in the rehabilitation of hemiplegics should give special attention to ambulation activities.

Further studies in the psychosocial and emotional problems of the hemiplegic warrant special attention to the family unit.

A study of maximum hospitalization necessary for hemiplegics is needed to pay special attention to effects on vocational rehabilitation.

A recent study shows that the use of a mobile rehabilitation team to evaluate patients in rural areas is practical. This technique should be applied to determine effectiveness of early and complete diagnosis and treatment of hemiplegic stroke patients in rural areas.

International research

Foreign countries which are conducting most of the research financed with counterpart funds are India, Pakistan, Israel, Egypt, Yugoslavia, and Poland. The projects range from the field of orthopedics and prosthetics to the area of social problems. The handicaps range in scope from cerebral palsy to blindness and include cancer, heart disease, and stroke.

A study at the Hadassah University Hospital in Jerusalem consists of a survey of hemiplegics in Israel and their rehabilitation. The objectives are: to appraise incidence and prevalence of hemiplegics in Israel; to provide data concerning the psychological and psychosocial response to hemiplegia on behalf of the patient himself and his surroundings, with special attention to the sociologic and ethnologic structure of the patient's community; to investigate special involvements and resulting mental and emotional conditions; and to evaluate special therapy and total assessment and planning of rehabilitation for the future based on the assembled data.

Another project in Israel concerning the hemiplegic is a study by the Ministry of Health of the causes and costs of the nonrehabilitation of patients hospitalized because of cerebrovascular accidents or valvular disease of the heart. This study will inquire into the professional and administrative factors, during hospitalization and after discharge, which may be responsible for the failure to restore patients to employment or self-care, and to estimate the costs which such failure imposes on the economy.

Cancer patients have not received great attention in the international research program primarily because of a lack of personnel and facilities. The Tata department of plastic surgery of the J. J. group of hospitals in Bombay is studying the use and acceptability of facial and facio-maxillary prostheses for persons with facial defects caused by congenital lesions, trauma, cancer, burns, and other causes. The investigators are fabricating prostheses and developing new fabricating and fitting methods which may be suitable to local conditions while they study the psychological reaction of the patient to such prosthetic restorations. They also plan to develop a facial prosthetic center for the purpose of training other personnel.

There is an increasing interest in many countries in research in the field of cardiac disease. Counterpart funds are supporting a project at the cardiology unit of Memorial Hospital in Bombay to study methods for the rehabilitation of cardiac patients, including studies of their medical, social, psychological, and vocational needs. The hospital will establish a cardiac work evaluation unit to determine the psychological and socioeconomic factors affecting a patient's recovery and set up guides for the establishment of cardiac rehabilitation units in other institutions in India.

In Israel, one of the projects being supported is at the Government hospital, Donolo, in Jaffa. This project will investigate the influence of body activity on the physical and vocational rehabilitation of coronary patients. They will carry out both a retrospective and a prospective study. In the latter, they will set up gradual physical training programs for 100 coronary patients, and biochemical and electrophoretic methods will be used to investigate the connection

of cholesterol and other lipids to the incidence of myocardial infarction in middle-aged patients.

Another project at the Heart Institute of the Tel-Hashomer Hospital in Israel deals with a research and demonstration project for training of the handicapped, mainly cardiac patients, in agriculture, specifically nursery vegetable growing, bulb and flower cultivation, and beekeeping.

In Pakistan, a project at the Jinnah Central Hospital in Karachi is carrying out an epidemiologic study of cardiovascular disease. As a consequence, a National Heart Institute of Pakistan is being developed.

Still another project in heart disease is at the Cairo Rehabilitation Center in Egypt, which is investigating methods for the rehabilitation of youth disabled by heart impairment by providing comprehensive rehabilitation services to selected heart patients.

Research needs abroad for rehabilitation are similar to those in this country. However, since the service needs are so great in these countries, and the personnel available is limited, it is felt that most of the emphasis should be in the field of applied research in which the provision of needed services is an essential part. It is important that certain basic research programs be carried on in these countries, but the greater emphasis should be on applied research and provision of services, including rehabilitation services. As these service needs are met to a greater degree, efforts may be made to establish centers in these countries where basic research can be pursued.

There should be a coordinated effort in promoting research within these countries in view of the shortage of qualified personnel and funds. It is also important that the benefits derived from research elsewhere should be applied in those countries receiving American support. The research supported through this international program has benefited greatly those countries and this country as well. The program has created a growing cooperation and reciprocity among these nations. Most are incorporating the results of research into their rehabilitation activities by enlarging their resources and facilities and by sharing their experiences and knowledge with other countries. They continue the work of these projects even after the support is terminated. The United States benefits from the projects, since a number of them have been carried out in circumstances unavailable in the United States, in peculiar ethnic and cultural situations and dealing with victims of Hansen's disease, a rarity in the United States.

A cooperative project in "Advanced Epidemiology of Cardiovascular Disease" to be conducted by New York University, now under consideration, would use counterpart funds in India, Pakistan, Egypt, Israel, and Poland and Yugoslavia to study various selected population groups in an effort to determine the universality of genetic factors in coronary heart disease and stroke. The proposal is based upon the thesis that genetic influences play a major role in the incidence of arterial degenerative disease. The influence of diet, tension, work, cigarettes, alcohol, and other environmental factors may operate through a malfunctioning or inadequate genetic makeup. Collaborators in the foreign countries would provide U.S. investigators with samples of venous blood of persons who had experienced myocardial infarction or cerebrovascular accident and simular samples from the patient's parents, siblings, uncles, aunts, and grandparents. Blood serum would be frozen and transported by air to New York for lipid and enzyme studies.

Ways should be sought to increase the number of such cooperative research internationally with the hope of obtaining knowledge which cannot come from domestic projects but which would be of value in the rehabilitation of persons in the United States with heart disease, cancer, or stroke.

Efforts should also be made to broaden the number of nations in which the Vocational Rehabilitation Administration can conduct research in rehabilitation under Public Law 480, which authorizes the use of counterpart funds.

General research needs

There is a need, growing in intensity, for means of collecting, cataloging, indexing, storing, and retrieving the proliferating published and unpublished studies in each of these disease groups. At the same time, there is a need to apply numerous specific findings in a combined pattern of service to victims of these diseases. And, finally, there is the need to foster the dissemination and use of the new knowledge, techniques, and patterns of service.

There are a number of means to be considered or tried experimentally. One might be establishment of specialized medical, psychosocial, and rehabilitation

teams with special research units attached in various parts of the country. Another would be to establish major rehabilitation research and training centers for each of these disease groups, modeled after the Vocational Rehabilitation Administration's currently successful regional research and training centers. An alternate method is to divide these needs into smaller components to be conducted under individual grants.

It appears that the need to provide some cohesiveness and comprehensiveness to the research and demonstrations in each of these disease groups requires some device, some organizational approach, which will perform these functions. In addition, for reasons of economy, in order to buy the most research mileage with limited resources, organization of these programs becomes vitally important.

It would also seem appropriate to take advantage of the existing research groups already advanced in certain lines of investigation regarding rehabilitation in heart disease, cancer, and stroke, and to utilize the experience of these groups, the already developed facilities, and the established reputation which knowledgeable professional persons throughout the country recognize.

The recommendations which follow are intended to indicate specific types of support that could be given to recognized research groups in these disease entities. No attempt is made to identify "recognized research groups" at this point.

A series of research seminars should be conducted in several regions of the country. Their purpose would be to encourage the dissemination of new research information and encourage the exchange of ideas among those working in the field of vocational rehabilitation with intensive interest in heart disease, cancer, or stroke. These seminars should be staffed with good editing and writing personnel in order that reports will be well written and thorough.

There are strong movements afoot in several fields to improve the dissemination of knowledge by intensive efforts to catalog and index published and unpublished studies and reports. The use of computers has speeded up search procedures, but the laborious job of finding, cataloging, and indexing is not much improved. The National Library of Medicine has demonstrated the use of a computer and tapes to produce an index and bibliographies, but the recapture and selection and evaluation of information is not yet automated.

It is important to the field of vocational rehabilitation that a cataloging and indexing program be initiated in the areas of heart disease, cancer, and stroke. It is recommended that three closely related research projects be developed to perform this function and establish its continuation as a part of a larger overall plan for cataloging and indexing all vocational rehabilitation studies and reports.

It is expected that each of the five research and training centers would receive $200,000 a year for the purpose of expanding research activities in these disease groups.

Also, in the first year, $500,000 would be allocated to a collaborative epidemiological study in which one center would act as the data collection and analysis center. This amount would gradually increase to the rate of $1 million by 1970.

Recent studies have indicated the extreme importance of the psychosocial aspects of the disabled person's life in the success or failure of vocational rehabilitation. In the next 5 years much emphasis will be placed on studies of (1) pre- and post-morbid personality; (2) the effects of counseling and psychotherapy at crucial points in the rehabilitation; (3) the influence of the family on success of rehabilitation; and (4) family counseling. In heart disease, cancer, and stroke studies there is need to push research further along these lines and to disseminate the findings through demonstrations.

Another area that needs development is the use of real work situations in industry to increase job readiness and placement prospects of the disabled person. Projects should be established to work with stroke, heart disease, and cancer patients in close cooperation with specific industries found suitable and willing to cooperate. Graduated work levels need to be defined in relation to the specific disability and procedures experimentally tested to determine the most effective use of the work situation. Five experimental projects should be launched as soon as good planning procedures allow. When experience has been gained in this area, selected demonstrations should be established in 15 to 20 different settings in order to promote the widespread use of these procedures in vocational rehabilitation.

The subcommittee heard testimony as to the need for continuing research in methodology, instrumentation, development of self-helf devices and the evaluation of rehabilitation techniques in the care of patients with heart disease, cancer, or stroke. It is recommended, therefore, that the National Heart In-

stitute, National Institute of Neurological Diseases and Blindness, and Division of Chronic Diseases of the Public Health Service increase their support of research programs in the rehabilitation of heart disease, cancer, and stroke patients.

In addition, it is recommended that a sum of $10 million be appropriated for the Vocational Rehabilitation Administration for the first year, with annual increases, until $15 million is reached in the fifth year for research in the rehabilitation of persons with heart disease, cancer, and stroke; and that this amount be in addition to the regular budget for research and demonstration projects. These funds would be utilized by the Vocational Rehabilitation Administration for support of research in rehabilitation, for the development of possible collaborative research among the existing centers, and for community research and demonstration programs.

Research and training centers

Under authority from the Congress, the Vocational Rehabilitation Administration provides grants to a limited number of universities to support rehabilitation research and training centers. Such centers must be distinct organizational and physical entities providing a continuing framework for clinical research and training in rehabilitation, with the medical and other services considered essential in carrying out a comprehensive program of patient care and rehabilitation, including the provision of specific beds assigned to rehabilitation.

The research conducted by these centers may encompass any aspect of the rehabilitation process, from onset to retraining and placement of the disabled. It may be broadly directed to a wide range of medical or other fields of rehabilitation, or specifically concerned with rehabilitation as it applies to specific diseases or a group of related diseases.

The training program of these centers may provide training of all types, long term as well as short term, professional, technical, and for any or all categories of students, graduate or undergraduate, working in any of the medical or medically allied and other professions engaged in rehabilitation. Programs also provide training in such areas as the principles of rehabilitation, special problems of rehabilitation, as related to specific disabilities or groups of disabilities, and the interrelationship of medical and other disciplines in the practice of rehabilitation. In all instances, training must be based upon a defined, organized program of instruction designed for undergraduate medical students, interns, residents, and undergraduates and graduates in the allied professions working in the field of rehabilitation.

In June 1963, there were four special research and training centers in operation, all of a type designated as medical centers, at New York University, University of Minnesota, University of Washington, and Baylor University in Texas. An additional medical center, Western Reserve University-Highland View Hospital, Ohio, opened in 1964 and one prospective center is to be given a developmental grant. The amount of $2,600,000 appropriated for 1964 will be used to continue the present five regular medical centers, and provide funds for developing the prospective center. The 1965 cost of continuing these six centers is estimated to be $3 million. The $3,385,000 requested for 1965 will permit financing of two more centers specializing in mental retardation, at an initial cost of $385,000 in 1965. The programs in the centers and the need for them are discussed below.

The program of the rehabilitation research and training centers is entering its third year. The New York University Medical Center and the University of Minnesota Center have been in operation since November of 1961. They are doing research on many basic problems intimately related to the correction of disability, the preparation of the individual for a place in his community, for self-maintenance and vocational attainment in keeping with potential ability. Each of these programs has been successful in attracting skilled researchers and effective training personnel on a full-time basis. Medical and nonmedical students at the undergraduate and graduate levels at the centers have been recipients of extended intensive training in rehabilitation and have had increased opportunity to participate in research on certain disease processes and the rehabilitation of persons handicapped by them, on impairment of physiological function resulting from disabilities, and on the clinical management of patients with long-term illness and impairment.

There has been a gradual growth of research and training activities in these centers since their inception. The training activities have been strengthened through the introduction of new courses such as "Speech Rehabilitation of the Brain Injured"; the development of teaching aids and manuals, e.g., in the field of orthotics; expansion of electro-physiology research; biochemical studies in cardiovascular disease; and use of new approaches to pulmonary studies. Such expanded programs will lead ultimately to solutions of some of the more trying problems of the seriously disabled, chronically ill patient. Furthermore, up to 40 percent of the increased funds will be utilized for bringing in additional patients for research who will at the same time be the recipients of the most modern comprehensive care.

The two more recently established projects at the University of Washington and Baylor College of Medicine are moving along steadily and with evidence of significant progress though they have been in operation but a year and a half. The University of Washington has added to its staff in rehabilitation medicine an orthopedic surgeon, a psychiatrist, and rheumatologist. It has added a psychometrist to assist in prevocational evaluattive procedures; a mechanical and an electrical engineer each of whom serve not only as teachers of the engineering aspects of rehabilitation medicine but also carry medical orientation to student engineers who are seeking a career in this new and relatively pioneer area of service. Also, there has been the development of a new brace and phosthetic shop to serve the training, research, and patient care needs of the program.

Included in the new research are studies on: hemiplegia and its effects on learning, being carried out to determine in particular what happens when the right or left side of the brain has been damaged; the rehabilitation potential of the patient undergoing treatment and convalescence in the home; evaluative investigations on upper extremity bracing; and reconstructive surgery in quadriplegic hands—to cite but a few of the more recent developed studies.

At Baylor Medical Center, research is moving at a steadily increasing pace. A research committee, consisting of 11 full-time faculty members with consultants, reviews, evaluates, and approves research projects carried out under the existing center grant. It provides periodic reevaluation of research progress, consultation in preparation and execution of research, and a forum for exchange of ideas and techniques among clinical programs, physiology, biochemistry, and pharmacology.

A major recent effort has been undertaken to define research problems in rehabilitation medicine. This effort is based on a detailed analysis of the patient population (Texas Institute of Rehabilitation and Research), their characteristics by age, sex, and color; diagnostic groups; and specific patient problems encountered and presently coded. These facts were then analyzed to form the basis for justifying research priorities. Studies in the human capacity for physical work, cardiovascular responses to exercise, studies on the urinary bladder in spinal cord injury, electromyographic differential diagnostic tests in muscle fiber lesions, and many others are currently moving ahead.

Similarly, the training program has provided a teaching staff and an exemplary care program to develop medical student elective courses; student nurse rotation (eight senior students every 8 weeks) in comprehensive nursing and postgraduate courses in collaboration with the Texas Woman's University; medical social service rotation with the University of Texas at Austin; and the extensive enlarging of clinical psychology training programs with the University of Houston.

As a result of its expanded activities in research and training resulting from this program, New York University recently decided to build a new nine-story research building adjacent to its institute of physical medicine and rehabilitation. It has added more than 20 full-time research workers at the M.D. or P.H.D. level as a result of the grant and a number of these experienced investigators are working in the fields of heart disease and stroke. Emphasis is given to the problems of heart disease, cancer, and stroke not only in undergraduate medical training but also in postgraduate residency training which serves 55 to 60 physicians each year.

The Western Reserve University-Highland View Hospital project, recently activated, enjoys an excellent research and training environment and offers great promise for the future. Excellent treatment facilities are available.

The prospective center in the South Atlantic region is at a stage of development that will not warrant funding on a full scale. Rather, it is intended to select

an institution which justifies the judgment that a year or two of support will aid it in developing a program of research, training, and patient care comparable to centers now operating at the high level described above. This type of grant is looked upon as developmental in nature but is to be made only to universities with medical schools of the highest caliber in the region to be served, with a record of growth, academic standards, breadth of program, and commitment to research and training that gives assurance that the awarding of a developmental grant will result in attainment of complete status as a successful rehabilitation research and training center in 1 to 3 years.

A few of the research projects in the cardiovascular field being conducted at these centers are as follows:

1. In the Rehabilitation Research and Training Center at Baylor University several projects are directed at measuring cardiac response to work tests and the circulatory fitness of atherosclerotic patients during the performance of physical activities.

2. In the Rehabilitation Research and Training Center at the University of Minnesota studies are continuing on (1) evaluation of cardiac output, cardiac work, and metabolic rate during hydrotherapy and exercise, (2) cardiac output determinations by the measurement of the electrical impedance of the thorax, and (3) on peripheral circulation.

3. The New York University Research and Rehabilitation Center is conducting a group of studies of congestive heart failure and cardiac arrhythmias based on the techniques of producing congestive heart failure in guinea pigs and surgical procedures on dogs for the atrial fibrillation study. It is hoped that this approach to the study of congestive heart failure will yield basic understanding along the lines of enzyme deficiencies. As a consequence, perhaps a better rationale of treatment may result which may improve the longevity of patients who are experiencing congestive heart failure. It is hoped that clearer and basic understanding of atrial arrhythmias, and perhaps ventricular arrhythmias will then lead to a more fundamental approach to treatment. In addition, epidemiological studies on coronary heart disease will be undertaken in two areas: the human or clinical area, and the basic science or biochemical area. Also studies on heart transplant are being carried out.

Further research regarding the relation between myocardial energy requirements and common activities should be supported. It is suggested that regional centers—

(*a*) Continue the studies of the requirements for cardiac work in relation to muscular work throughout the range of vocational activities;

(*b*) Extend the studies of cardiac work to situations requiring ambulation;

(*c*) Extend the studies of cardiac work to situations producing emotional stress;

(*d*) Extend the studies of cardiac work to vocational activities carried on under adverse environmental conditions; and

(*e*) Support the development of methods to measure cardiac output and cardiac work more precisely and over shorter intervals of time so that phasic changes of cardiac performance can be studied.

Such studies can be pursued in a regional research and training center with previous work in the field. Regional centers can be encouraged to step up programs which have been started in these research areas.

In order to increase the research and training activities of these centers in heart disease, cancer, and stroke, it is recommended that—

(*a*) The number of such centers be increased to 10 during the next 5 years; and

(*b*) The funding of such centers be increased per center per year as the need and program justifies.

TRAINING IN REHABILITATION

A shortage of trained personnel has remained the greatest single deterrent to the more rapid increase in rehabilitation service since the inception of modern rehabilitation services for civilians after World War II. In its report of January 25, 1952, to the Chairman, Manpower Policy Committee, Office of Defense Mobilization, the Task Force on the Handicapped stated: "The field of rehabilitation, as a growing force in our national life, faces certain serious

personnel difficulties which place limitations on the present ability of our country to bring more disabled persons into activity and productivity."

In a report issued February 10, 1956, the Health Resources Advisory Committee, Office of Defense Mobilization stated: "A nationwide shortage of trained workers is preventing the benefits of modern rehabilitation reaching vast numbers of the Nation's disabled." It further stated: "Although the number of such personnel has increased substantially in recent years, the number today is still not sufficient to meet present national needs or expected future needs." Despite the substantial national increase in rehabilitation personnel as a result of the training program of the Vocational Rehabilitation Administration which was started in 1955, the statement of the Health Resources Advisory Committee, Office of Defense Mobilization, is as valid today as it was when made in February 1956.

A training program to increase the number of qualified persons for the disciplines allied with rehabilitation also was initiated by the Vocational Rehabilitation Administration in 1955. The pattern of rehabilitation services was becoming infinitely more complex, and there were critical personnel shortages existing or expected for the expanded program in prospect.

The early training program began with an appropriation of $900,000, for the 1955 support of 77 teaching programs in various subjects in several colleges and universities, 201 traineeships for students selected by schools to receive stipends, and 16 short-term courses for various objectives.

In 1963, training grants totaled slightly more than $13 million. This amount was used to support 439 long-term grants for 2,812 traineeships and for scores of short-term courses. Many of the grants were for rehabilitation medicine. In fiscal year 1965, there were 68 medical schools conducting courses with the aid of VRA funds, reaching 250 undergraduates, 250 residents in training, and 8 academic careerists.

Another field of great emphasis is rehabilitation counseling for State agencies and rehabilitation facilities. There are close to 40 educational institutions receiving support for curriculums in this subject, reaching somewhere around 900 trainees. In 1955 there were only 53 such traineeships.

Almost every field touching upon rehabilitation is helped by the training program. In addition to the fields named above, there is training support for physical therapy, occupational therapy, speech and hearing, social work, psychology, prosthetics and orthotics, and nursing.

There are also short-term courses in an increasing number. In 1963–64, 148 such courses were supported to refresh and reeducate rehabilitation personnel, to keep them abreast of current developments and techniques. These courses served 6,086 trainees.

Long-term training

Physicians.—Physicians required for diagnosis, treatment, and rehabilitation of individuals with cancer or cardiovascular disease may belong to almost any branch of medicine. Of greatest relevance, however, are physicians in internal medicine, surgery, cardiology, and physical medicine and rehabilitation who function in rehabilitation centers, hospital rehabilitation units, cardiac work classification units, or other facilities primarily concerned with restorative services for patients with heart disease, stroke, or cancer. While no quantitative estimates are available for the number needed to enter the field each year, it is estimated that special, intensive refresher courses in rehabilitation of patients with cancer or cardiovascular diseases should reach about 500 physicians each year. Of this number, about one-third should be those in residency training so that they may practice their specialty with up-to-day knowledge of contemporary rehabilitation methods and techniques.

Of major importance in rehabilitating stroke and cancer patients are the physicians who specialize in physical medicine and rehabilitation. There are an estimated 550 physiatrists in the United States. This figure includes 418 physicians certified by the American Board of Physical Medicine and Rehabilitation, according to the 1963 directory of medical specialists. An additional 300 physiatrists could probably be used immediately in hospitals and rehabilitation centers; the total estimated need may be as much as 3,000. As in any field of medicine, the supply falls short of meeting the needs.

About 385 residents have been approved by the American Board of Physical Medicine and Rehabilitation. The percentage of residencies that are unfilled is much higher than in the older and better established medical specialities—

about 50 percent. About 90 percent of the residents in training in this specialty are receiving VRA traineeships. On June 30, 1964, 149 residents were enrolled for full-time training in physical medicine and rehabilitation. About 130 annually complete the board requirements for admission to examination and about 50 take the examination each year.

An experimental teaching program is also in effect in one university hospital which provides for the rotation of the intern staff through the rehabilitation service. This experiment will be closely watched for possible establishment of similar teaching programs in other centers.

Two pilot programs, initiated in 1962 for the purpose of providing fully trained residents in physical medicine and rehabilitaton wth advanced preparation for an academic career, were continued in 1963. In 1964, 20 academic career trainees were expected.

Other than the 149 physicians enrolled in postgraduate training in rehabilitation medicine under VRA fellowships, there are enrolled in such training 15 to 20 physicians who are permanent residents of the United States and about 40 foreign physicians who will leave the United States at the conclusion of their training but who make a contribution to the clinical care of patients. Although the Veterans' Administration provides residency training in physical medicine and rehabilitation, the majority of their residents are career men who join the Veterans' Administration.

Nurses.—Grants have been made to 10 of the 33 graduate schools of nursing with the objective of producing instructors of rehabilitation nursing. In the United States, there are 636 approved schools of nursing. Of this number, 521 are hospital schools, 35 are junior college associate degree programs, and 80 are university programs offering a baccalaureate degree. Faculty who are qualified to incorporate teaching of rehabilitation are needed in nearly all of these schools.

Currently, the national supply of rehabilitation nurses with training under the Vocational Rehabilitation Adminstration or equvalent formal training or experience is around 500. Approximately 6,000 others have limited preparation through short-term training.

Currently there is a national need for at least 1,400 nurses with graduate training in rehabilitation. Of these, 176 are needed to provide at least 1 faculty member for each baccalaureate degree program and 48 to provide 1 faculty member for each graduate school of nursing. In public health, 50 are needed to provide 1 consultant for each State health department division of nursing and 860 to serve as consultants in public health and home nursing care programs. Another 250 are needed as rehabilitation specialists in rehabilitation centers and hospitals with comprehensive rehabilitation services.

Psychologists.—Psychological services are essential in the rehabilitation of persons with heart disease, cancer, or stroke.

The National Education Association has estimated a demand for 7,500 new college and university faculty members in the field of psychology in the 1960's. In addition, a need during the current decade for 8,000 to 10,000 psychologists in nonacademic positions has been predicted. Expanded programs of research and services in the areas of mental illness and mental retardation further underscore the need for many more psychologists.

Since it take a minimum of 4 postbaccalaureate years to train psychologists in rehabilitation, and since rehabilitation centers, private and public, are utilizing psychologists to a greater degree each year, the need for psychologists in rehabilitation has increased significantly. Many positions remain unfilled because of the shortage of trained persons.

At present, 80 students who are recipients of VRA traineeships are enrolled in doctoral training programs that emphasize the psychological rehabilitation of the disabled. Though there is an annual recurring need for at least 400 doctoral graduates, only about 40 students complete their doctoral training each year in rehabilitation psychology.

Occupational therapists.—Since 1955, about 1,400 students have received financial assistance in completing training in occupational therapy. The number of traineeships has increased from 52 in 1955 to 274 in 1963 and an estimated 350 in 1964.

A most significant development has been the marked interest on the part of experienced occupational therapists in graduate study to prepare for teaching or research positions. Since 1960, traineeships have been awarded to 65 individuals for advanced study, and graduates are now filling key posts in training and research programs.

About half of the 31 schools of occupational therapy have received teaching grants to help them expand their faculty, increase the rehabilitation content in the curriculum, and strengthen the integration of theoretical and clinical course work.

Our national supply of qualified occupational therapists is approximately 7,500 but unfortunately less than half, 3,200 are professionally active. National needs are estimated at 12,000, with 4,000 new graduates needed annually. Currently 2,450 students are enrolled in basic professional education and 59 in graduate education. The annual number of graduates in occupational therapy programs is around 400.

Physical therapists.—With the withdrawal in 1962 of National Foundation support in the field of physical therapy, the VRA has been the major source of support for teaching grants and traineeships for this critical field of rehabilitation. In 1964, traineeship grants were made to 41 of the 42 approved schools of physical therapy. In addition, teaching grants were given 32 schools to assist them to employ additional faculty and to strengthen and coordinate their clinical programs. In 1962, 134 students were recipients of VRA undergraduate traineeships and the next year 305 students received assistance. This number in 1964 is 350 students, which represents approximately one-third of the enrollment of schools of physical therapy.

Since 1958, VRA graduate traineeships have prepared 78 physical therapists for teaching, research, and administration positions in universities, hospitals, and clinical settings.

Currently the national supply of qualified physical therapists is around 9,000. There are known vacancies of more than 1,000 but in many instances new positions are not created despite known need because experience shows such positions will not be filled. A nationwide manpower survey conducted by the American Physical Therapy Association may provide firm data but experience would indicate there is a national need for 14,000 physical therapists. Fortunately, there has been a marked increase in enrollments in the past few years. It is estimated that 1,000 students, including declared majors, primarily at the junior and senior levels, were enrolled during the 1963–64 academic year and the actual enrollments may be much larger.

Recreation personnel.—Social and personality factors exert a powerful influence in the success or failure of an individual's rehabilitation program. Severe disability, such as is encountered so frequently among persons who have suffered heart disease, cancer, or stroke, often produces a "withdrawal" pattern in which the patient's unwillingness to present himself and his disability to others in a normal social relationship presents a major obstacle to successful rehabilitation.

In coping with this problem, therapeutic recreation plays an important and sometimes decisive role. Functioning as part of the total rehabilitation effort, recreation offers an attractive and acceptable way for the patient to begin reestablishing social contacts and healthy relationships with other people, and in the process to build the confidence in himself which is so essential to complete recovery and successful living. Often these recreational outlets are the beginning of new attitudes, improved personal appearance, and other factors which are prerequisites to getting and keeping a job.

At present the Vocational Rehabilitation Administration provides grant support to seven universities which offer graduate programs in recreation for the ill and handicapped, including clinical affiliations with hospitals. However, the need for well-trained recreation personnel to serve the ill and handicapped far outstrips the present supply coming from this limited number of training resources.

The present limitation here is almost solely a matter of funds. The Vocational Rehabilitation Administration should be provided the additional Federal funds necessary to furnish teaching and traineeship grant support to the additional schools which now have acceptable graduate teaching programs in recreation for the ill and handicapped. This will not only show prompt results in greater number of students being trained but also will encourage several other universities which presently are considering the strengthening of their curricula to offer a full graduate program in this important field.

Counselors.—Since 1954, grants to support the training of rehabilitation counselors for employment in State vocational rehabilitation agencies and other community rehabilitation programs have been given 246 different colleges and universities.

In fiscal year 1963, 35 institutions were conducting rehabilitation counsel or training programs. In addition, one other university was engaged, with the help of a VRA grant, in recruiting faculty and students. Enrollment statistics for 1963 indicated that the 35 programs had 651 full-time students. An additional 414 students in related fields were enrolled part time in rehabilitation counseling courses.

Of the 651 students enrolled for full-time study in 1963, 545 (83 percent) received a VRA traineeship for all or part of the year. There has been a steady increase in the number attracted to the field, along with some decrease in the proportion of full-time students receiving a VRA traineeship, a significant indication of the acceptance of a relatively new professional concentration.

Periodic followup studies of the employment status of graduates have indicated that about two-thirds are working in a rehabilitation program and that an additional 10 percent are continuing graduate study directed toward a doctoral degree.

Of about 5,000 active rehabilitation counselors in the Nation 3,500 are employed in the public programs and 1,500 in others. To fill existing vacancies and newly established positions, 1,200 new rehabilitation counselors are needed annually. Currently there are from 900 to 950 enrolled in graduate training programs and around 300 graduated annually.

Social workers.—In 1963, teaching grants were given 39 of the 56 graduate schools of social work, primarily to enable them to employ field instructors for students in supervised field work units in rehabilitation settings. Grants were awarded also for traineeships for 255 students of social work in 1963.

Between 1955 and 1963, 1,236 traineeships were awarded to students in schools of social work for part or all of their 2-year course. A followup study of the employment status of 539 VRA trainees on April 1, 1962, indicated that of 451 whose status was reported, 86 percent were in the labor market. Of those employed, 71 percent were working in agencies providing rehabilitation services to disabled people. The major achievement, however, has been the changes in curriculum content relating to rehabilitation, so that all graduates of schools of social work bring to their future jobs a better understanding of the potentialities of disabled people and methods of rehabilitating them.

Currently there are around 105,500 persons in the United States employed in what are usually described as social work positions, but only about 20 percent hold master's degrees from a school of social work. To fill existing vacancies, around 15,000 more social workers are needed. Of these 15,000, about 2,250 are needed for the health field. Currently some 6,600 students are enrolled in 56 graduate schools of social work and 2,700 graduate annually.

Speech therapists.—Despite progress in the effort to increase the numbers of personnel qualified to diagnose and treat individuals with communicative disorders, the shortages are still acute. Since the beginning of support of training in these fields in 1958, the number of universities with teaching grants has grown from 7 to 60 in 1964 and the number of traineeships from 23 to 475 in 1964.

As a result of teaching grants, universities have been able to strengthen their graduate courses and clinical practice so that graduates are better prepared to treat adults with speech and hearing handicaps. In 1962 a study of 228 students who had completed training as speech and hearing specialists with the help of VRA traineeships showed that about 85 percent were making a direct contribution in these fields.

In 1964 our national supply of persons engaged in speech pathology and audiology was around 14,000. Our national need is 20,000, with only 1,500 new persons entering the field annually. Currently 1,100 students are enrolled in training and 750 graduate annually.

Within the field of speech pathology there are two highly specialized areas in the field of heart disease, cancer, and stroke—post laryngectomy speech and aphasia.

There is a relatively small number qualified to work with laryngectomees. At the present time it is estimated that fewer than 400 trained persons are providing services in postlaryngectomy or esophageal speech to laryngectomees. More are being trained in short-term programs.

A conservative estimate of the number of trained persons providing language and speech training to the aphasic on a full-time basis would be 250. In addition, there are a number of speech clinicians, some with limited training, providing minimal services. Some of these clinicians may provide services to one or two aphasic patients each year.

It is important that every speech clinician receive specialized training in working with both the laryngectomee and the aphasic. Competence in this work is important to every clinician in a large rehabilitation center, in small community hospitals, private practice, and other environments.

Every rehabilitation environment should have at least one speech clinician who possesses special competence in working wtih the aphasic. This would mean that some 400 to 500 speech clinicians with special competence in working with the aphasic should complete training each year. In addition, training should be provided to the clinician presently in practice through a series of intensive, short-term courses.

Prosthetists and orthotists.—Since 1953, 3 major medical centers have conducted more than 500 short-term courses with a total enrollment of about 8,000 trainees. In 1963 more than 1,400 rehabilitation personnel attended 87 courses which were a part of the extensive courses in upper and lower extremity prosthetics and orthotics, management of the juvenile amputee, and orientation.

VRA support was first extended in 1957 when responsibility for support of training programs in this field was transferred from the Veterans' Administration. VRA teaching grants enabled the three universities to employ a year-round teaching staff.

To facilitate coordination and communication, the University Council on Orthotic-Prosthetic Education (UCOPE) was established in 1962. Composed of the medical and educational directors of the major programs, the Council has been able to achieve a more uniform approach in curriculum offerings, teaching materials and methods, and evaluation procedures.

Supported jointly by the Vocational Rehabilitation Administration and the Veterans' Administration, the National Academy of Sciences' Committee on Prosthetics Education and Information has continued to develop and expand an extensive informational program for these fields, has assisted in the development of new amputee clinics, and has prepared brochures, films, and slides for use in medical training programs and in schools of physical and occupational therapy.

Supported by a training grant, the first undergraduate program in prosthetics-orthotics was developed at New York University in 1961. Five students were enrolled in this curriculum in 1964. In June 1965, the first class of students will receive academic degrees for professional training in prosthetics-orthotics.

Training programs at three universities have provided short-term courses in prosthetics and orthotics to prosthetists, orthotists, physicians, surgeons, occupational therapists, physical therapists, rehabilitation counselors, and related personnel. In addition, specialized training programs have been developed for prosthetists and orthotist-trainees, at the undergraduate and technicians level so that they may function more effectively as recognized members of amputee clinic teams in rehabilitation centers, medical schools, and hospitals throughout the country.

In its initial stage, this program was limited to prosthetics which, of course, may be employed for amputations due to cancer. There has been increasing emphasis recently on orthotics with implications for services to stroke victims.

Currently, there is a national supply of 1,100 certified orthotists and prosthetists, and an estimated need for an additional 40 certified orthotists and 20 certified prosthetists each year. In addition, approximately 180 new prosthetic-orthotic technicians are needed annually to back up the certified personnel in these fields. By selecting, fitting, and teaching the use of artificial limbs, braces, and other orthopedic appliances these services may contribute materially to the function and comfort of cancer and stroke patients.

Short-term training

An indispensable part of the training grants program has been support of workshops, seminars, institutes, and other training courses of brief duration. These are conducted to keep professional personnel in various fields abreast of new developments.

The VRA utilizes its nine advisory panels on training to identify major needs and priorities for continuing professional education as well as the ad hoc advisory committees and regional committees on inservice training of State vocational rehabilitation agency personnel.

A VRA Committee on Short-Term Training, composed of three Assistant Commissioners and the Chief of the Division of Training, reviews the annual plans for short-term training submitted by the regional offices and various units in the Washington office and determines the distribution of available funds for the year.

In 1965, trainees in short-term courses number 873; in 1963, about 6,000 attended courses with VRA financial assistance.

VRA-supported short-term training courses in fiscal year 1962 were distributed as follows:

Subject of course	Number of courses	Number of trainees	
		State vocational rehabilitation	Non-vocational rehabilitation
All courses	131	1,002	1,957
Executive development	5	92	
Supervision	3	70	
Orientation of new counselors	4	121	
Medical aspects of vocational rehabilitation	3	16	36
Prosthetics and orthotics	63	307	1,008
Mental retardation	3	25	52
Mental illness	4	60	51
Rehabilitation of the blind	9	125	44
Rehabilitation of the deaf	5	34	150
Rehabilitation facilities	4	6	21
Prevocational evaluation	3	9	50
Curriculum improvement	7	23	226
Other courses	18	113	319

In 1963, there was an important endeavor to raise the standards of professional competence of speech pathologists and audiologists in providing diagnostic and treatment services to adults with communicative disorders. VRA-supported 18 short-term courses for a total of 570 trainees. These courses focused on (*a*) teaching of esophageal speech to laryngectomized patients, (*b*) diagnosis and treatment of stutterers, (*c*) auditory rehabilitation, (*d*) evaluation and rehabilitation of the aphasic patient, (*e*) neurological aspects of diagnosis of speech and hearing disorders, (*f*) oral linguistic deficiencies in handicapped adults, and (*g*) speech therapy of cerebral palsied persons.

Courses in prosthetics and orthotics supported from 1963 funds are noted above. More than half of those enrolled in short-term courses were on VRA traineeships. Continued emphasis is placed on provision of training in orthopedics or physical medicine and rehabilitiation to physicians still in residence or serving in prosthetic teams in the community.

Short-term training courses on improvement of methods of training rehabilitation personnel and on curriculum development have been supported for the field of medicine, physical therapy, rehabilitation counselling, psychology, and social work in 1963.

Employment placement.—Specialized courses on placement of handicapped persons in employment and in the development of employment opportunities for disabled persons are planned for 1965. It is expected that about 10 courses will be held for about 250 counselors and other personnel in State agencies.

Improvement of training.—Seminars and other short-term training courses will be held in 1965 to assure continued improvement in university and other rehabilitation training programs. About 3 such courses, attended by about 225 VRA trainees, are planned.

Rehabilitation facilities.—Short-term training courses for directors of sheltered workshops and floor supervisors will be increased in 1965; about 5 training courses will be conducted for 75 VRA trainees.

Prosthetics-orthotics.—Pilot courses were conducted in 1962, 1963, and 1964 in spinal orthotics, in lower extremity orthotics, and in prosthetic techniques related to the total contact socket. These lead naturally to programing of additional courses in these relatively new subjects. Not only will these advanced courses bring new members of clinic teams to the training centers, but also former trainees who have had the basic courses in prosthetics of the lower and upper extremities will be expected to return for training that incorporates the latest developments.

The American Board of Certification in Prosthetics and Orthotics requires attendance at these courses for certification and the Veterans' Administration requires such attendance in its contracts with prosthetic-orthotic firms.

About 1,100 individuals will attend these courses in 1965, of whom 350 will be VRA trainees.

Continuing education

One of the greatest deterrents to more effective rehabilitation services is the failure of practicing physicians to utilize rehabilitation concepts and methods in the early care of patients with heart disease, cancer, and stroke and their failure to make early referral of severe cases to specialized institutions with an effective staff. One study showed that many physicians were not familiar with services available from the State-Federal vocational rehabilitation program; 92 percent did not know the source of funds used to pay for such services; 80 percent did not know a State vocational rehabilitation agency representative; and 80 percent had never referred a case to the State vocational rehabilitation agency.

It is encouraging, however, that there is increasing awareness of the value of rehabilitation among physicians and that the percentage of clients of State rehabilitation agencies referred by physicians and hospitals is gaining. In 1963, the two largest sources of referral to State rehabilitation agencies were private physicians (16 percent) and hospitals and sanatoriums (13 percent).

In February 1958, the American Medical Association reported that 25 of 53 State medical societies had committees on rehabilitation. In January 1964, the number had risen to 44 of 54 State medical societies.

Despite the efforts of the American Medical Association, American Heart Association, American Cancer Society, the heart disease control program of the Public Health Service, the Vocational Rehabilitation Administration, and other groups, the concentrated efforts on continuing education have not been as productive as desirable.

In relationship to need, there is also a paucity of audiovisual and other teaching materials on rehabilitation for use in the continuing education or enlightenment not only of physicians but of paramedical personnel and others. The value of such material has been shown by the excellent reception of the publication, "Strike Back at Stroke," films produced by the Division of Chronic Diseases, Bureau of State Services, Public Health Service, and the series of audiotapes on rehabilitation produced by New York University with the aid of a grant from the Vocational Rehabilitation Administration.

It is apparent from the statistics on national needs for personnel in some of the professions discussed earlier that there is no possibility of our national supply meeting national needs in the foreseeable future. Professional aids have been successfully utilized in some of these professions. Nursing, for example, has made use of practical nurses, attendants, ward clerks, and other ancillary nursing service personnel for many years. The American Occupational Therapy Association with the aid of grants from the Vocational Rehabilitation Administration has launched programs for the training of occupational therapy assistants particularly in the care of the chronically ill and the aged. These programs have been successful and are being expanded for training of such assistants for neuropsychiatric services. Some use is made of case aids in social work and rehabilitation counseling.

This Subcommitee believes that a national conference on the development of professional aids in rehabilitation would be of value.

The function of such a conference would be—

(*a*) To gather selective representatives of the therapeutic professions.
(*b*) To exchange information about present methods of care.
(*c*) To discuss ways and means of implementing present recruitment activities.
(*d*) To review alternative solutions for meeting personnel needs.
(*e*) To discuss the selection of screening of aids.
(*f*) To develop safe care principles to avoid poor practice.
(*g*) To discuss methods of training.
(*h*) To review problems of legality and certification.

This Subcommittee also recommends that funds be made available to the Vocational Rehabilitation Administration for the following activities:

(*a*) Medical undergraduate training: One of the means for increasing professional interest in rehabilitation and for recruiting physicians into careers in rehabilitation medicine is to develop and expand the teaching programs in rehablitation in all medical schools. One of the best mechanisms for providing for such a development is an undergraduate training grant which will provide funds for additional faculty in this specialty, for fellowships for medical students, and allied purposes. Currently, the Vocational Rehabilitation Admin-

istration is making annual grants of up to $25,000 to 70 medical schools to enrich their teaching of rehabilitation medicine. It is recommended that an additional $2 million be appropriated annually to the Vocational Rehabilitation Administration to provide grants of $100,000 a year to 20 medical schools for increased emphasis on the teaching of rehabilitation medicine with priority being given to medical schools which have stations for persons with heart disease, cancer, or stroke.

(*b*) Clinical fellowships in rehabilitation: The Vocational Rehabilitation Administration has a program for the support of comprehensive and integrated programs designed to provide training in the fundamental principles of rehabilitation during the residency of physicians receiving specialized training in internal medicine, neurology, cardiology, etc. It is recommended that this program be expanded and that an additional sum of $500,000 be appropriated annually to the Vocational Rehabilitation Administration for this purpose.

(*c*) Training grants in rehabilitation: The Vocational Rehabilitation Administration presently provides grants to selected medical schools for the support of programs designed to train specialists in rehabilitation. It is recommended that this training grant program be expanded with an additional sum of $500,000 a year.

(*d*) Postgraduate education: Additional funds should be appropriated to the Vocational Rehabilitation Administration to provide grants to key medical and public health institutions and agencies throughout the country for support of short-term training courses, seminars, conferences, and workshops in rehabilitation services for heart disease, cancer, and stroke patients.

BIOMEDICAL ENGINEERING

At the hearing of the Subcommittee on Rehabilitation, experts in bioengineering testified that the full potential benefits of the application of bioengineering in the rehabilitation of persons with heart disease, cancer, and stroke had not been fully recognized or exploited. The challenge, they said, was to maximize the positive benefits which the field of rehabilitation can possible derive from bioengineering.

Such contributions thus far have been limited. Engineers who work on medical and rehabilitation projects currently work with small, inefficient, and inadequate facilities. Lacking a broad base of staff, equipment, and facilities capable of being directed toward broad problems and problem areas, such activities tend to be limited to gadgets and the development of a specific device to meet the needs of a specific patient.

Even under these conditions, when a device has been developed which has shown its merits, there are seldom means of making the value known to potential users or producing the necessary numbers. As a result, the cost per unit is extremely high and results of such service are not generally available except in the most sophisticated rehabilitation centers. Even in the most advanced rehabilitation centers, the utilization of engineering talent, skills, and experience is limited.

Private industry should be encouraged to devote its resources to developing new bioengineering equipment useful in the rehabilitation of persons with heart disease, cancer, or stroke.

More clear-cut authority should be given the National Institutes of Health to support bioengineering activities on a broad basis as well as the more restricted basis of rehabilitation services to persons with heart disease, cancer, or stroke. Under present regulations, research project directors are unable to subcontract with industry for engineering consultation or services. If this roadblock could be eliminated, money would be saved and services greatly enhanced by the facilities, experience, and knowledge of private entrepreneurs.

The Department of Health, Education, and Welfare should have an advisory committee of experts in engineering, electronics, clinical medicine, research medicine, rehabilitation, and other appropriate disciplines to guide its policy for support of research and training grants in bioengineering. Such a body, could also serve in an advisory capacity to other Federal agencies, such as the Interstate Commerce Commission, in the efficacy and safety of equipment.

There is a need for specialized centers in which highly experienced engineers can work in research and development in a clinical environment as a part of the rehabilitation team where they can learn about bioengineering problems which they may help to solve.

It is, therefore, recommended that funds be made available to the Vocational Rehabilitation Administration to provide grants to medical and research institutions with outstanding rehabilitation services to establish three regional rehabilitation-biomedical engineering research centers. The following table gives the annual cost of this program in millions of dollars.

[Dollars in millions]

Years	1st	2d	3d	4th	5th
New centers established	1	1	1		
Construction costs	$1	$1.0	$1		
Operating expenses		.5	1	$1.5	$1.5
Total	1	1.5	2	1.5	1.5

HOWARD A. RUSK, M.D., *Chairman.*

REPORT OF THE SUBCOMMITTEE ON MANPOWER

(Dr. Edward Dempsey, Chairman, Dr. Marion Fay, Mr. Marion Folsom, Gen. Alfred Gruenther, and Dr. Hugh Hussey, Staff; Stephen J. Ackerman, and Dr. William L. Kissick)

PREFACE

The President's charge to the Commission on Heart Disease, Cancer, and Stroke was in very broad terms. It asked for recommendations concerning a total program of attack. Recommendations for needed research were requested, and programs for applying already existing knowledge were also desired.

The Commission, in responding to this charge, concluded that to expedite its work, it should form several subcommittees of which this, on manpower, is one. The Subcommittee, in turn, decided that it should concern itself with health care as a whole, since heart disease, cancer, and stroke represent 71 percent of all deaths currently, and these diseases constitute, as it were, the majority stockholders in the health field. As such, the interests of the other health fields must be considered and safeguarded, else serious imbalances result.

The Manpower Subcommittee, therefore, took as its purview the needs for personnel in the entire health establishment. This is a formidable task. Between $35 and $40 billion are expended annually for health; between 3 and 4 million persons work in health-related activities. The subcommittee found it necessary to concern itself with the supply and training of doctors and nurses aids, scientists and X-ray technicians, nurses, and animal caretakers, specialists, and general practitioners. There are approximately 40 health occupations; moreover, indications are that the occupations loosely grouped as auxiliary and supportive are rapidly increasing both in numbers and variety.

To carry out its task, the subcommittee sought information about present and prospective sources of manpower. It examined the extent and adequacy of the present devices and facilities for training men and women in the requisite numbers and skills. Because it discovered very early in its deliberations that the presently available manpower is woefully inadequate and that training facilities are seriously deficient, the subcommittee undertook to inquire about approaches for better and more efficient use of existing personnel and of increased utilization of current resources, facilities, and authorities for training; and finally, because even with the greatest attainable efficiency, our current resources appear still to be inadequate, the subcommittee gave thought to programs whereby the necessary manpower may be ultimately provided. The following chapters and sections contain the considerations upon which these conclusions are based. There is, ultimately, a concise list of our specific recommendations.

The Subcommittee on Manpower, in submitting this report, would like to record that it has found its task challenging, arduous, and rewarding. The "continuing education" it has obtained has come at an almost excessive rate. It has reviewed countless publications, has heard testimony from 35 experts in 8 full days of hearings during a 4-month period and has received numerous depositions from other individuals unable to appear personally. It has had

access to the deliberations of the other subcommittees, especially those dealing with research, facilities, and communications. It has had the dedicated services of staff members who are most knowledgeable and energetic, and for whom no limits can be set to mark their contributions. Nevertheless, despite its debts to others, acknowledged or unacknowledged, the subcommittee herewith submits this report as a consensus of the considered judgments and opinions of its own members. We owe to others most that is good; we cheerfully accept responsibility for what is not.

MARION FAY.
MARION B. FOLSOM.
ALFRED M. GRUENTHER.
EDWARD W. DEMPSEY, *Chairman.*

SUMMARY

The manpower needed for attacking the three great killers—heart disease, cancer, and stroke—requires expansion of the work force of the entire health establishment. The principal reason for our failure today to maintain the health of millions of people who are dying or incapacitated by these killers is the paucity of health manpower available to do the necessary work.

The necessary work force, professional and nonprofessional, cannot be diverted from other fields. There are critical shortages in all fields of medicine already; diversion would simply compound the difficulties. Developing shortages of physicians were forecast by the Bane Committee in 1959 and by the Jones Committee in 1960; we are experiencing today the results of our past failure to enlarge our programs of medical education.

Medical education has a long leadtime. No matter what we do today, the number of graduating physicians is fixed through 1969 by the number already enrolled. The leadtime for training specialists is also 4 or more years. Specialists trained in heart disease, cancer, or stroke cannot be produced in sufficiently increasing numbers until the end of the decade.

Faced with these unhappy facts, the subcommittee has concluded that the manpower needs for physicians and other highly skilled health personnel, caused by our expanding economy, our enlarging population, and our increased opportunities, are so great as to be unattainable during the next decade. We believe, therefore, that we must make the most efficient use of our present institutions and personnel in order to spread their effects as widely as posssible.

We must immediately undertake programs designed to provide semiskilled assistants, since these can be trained more rapidly than can specialists, and they can be used to augment the effectiveness of specialists. We must undertake recruiting and training programs for the myriad kinds of supporting personnel needed in the health industry.

We must encourage extensive planning by community agencies leading to the formation of medical complexes, whereby health care can be delivered more effectively and in which programs of continuing education will decrease the rate at which a physician's knowledge becomes obsolescent.

We must take all possible steps to assure that the potentials of existing facilities and institutions are used effectively for training manpower. In particular, we believe the Federal institutions such as the Veterans' Administration hospitals and those of the Department of Defense and the Public Health Service should be developed to realize their full training potentials, as should also municipal and community hospitals.

All of these programs, listed above, are desirable in their own right as they are directed toward producing the best possible medical care with the most effective use of manpower resources and at the least possible cost. They should, therefore, be implemented immediately. They are not adequate in the long term, as they make no provision for the increased research needed to discover still more fundamental causes for and therefore better ways of preventing or treating human diseases. They are designed to relieve the emergency caused by our past failure to develop effective manpower resources.

We therefore wish to endorse the present research and training programs and to urge that they be continued and expanded, especially with research in better ways of delivering patient care and better devices for graduate and continuing education.

We favor the recommendation of the Research Subcommittee that regional biomedical laboratories and animal resources be established.

We also endorse the concept that renewed efforts be made to establish a larger number of "centers of excellence" than we now have.

But, especially, we urge that an immediate and massive program be undertaken, leading to new construction and enlarged operation of medical and dental schools, nursing schools, and institutions for training of auxiliary personnel so that shortages in the health professions will be eliminated, so that manpower will be available in numbers sufficient to meet the present and forthcoming challenges of new and exciting opportunities for better health, and so that the United States, in the future, can contribute manpower to improve the health of the world rather than be dependent upon imported physicians.

The Subcommitee has noted with great interest the progress in vocational training and in practical nursing reported by agencies such as the Office of Education and the Labor Department under the Area Redevelopment Act and the Manpower Development and Training Act. It is also aware of the rapidly expanding vocational programs being undertaken in community colleges, as regular studies and as evening and correspondence courses.

The Subcommittee wishes to endorse these programs and to indicate its belief that these are the devices of choice for training subprofessional personnel.

We believe, however, that the Department of Health, Education, and Welfare should establish an office for the coordination of these vocational and other training programs, since too often there is little contact between the secondary school system and medical education. There should be the greatest cooperation between the educational and the health service professions. The Subcommittee believes this recommendation to the especially important, as it applies also to the proposals made by the Surgeon General's Consultant Group in their report entitled "Toward Quality in Nursing." The Subcommittee believes that the closest coordination should exist among all the groups carrying out programs of nursing, technical and vocational education and that the practical training of health personnel should be carried out in hospitals, and medical and dental school facilities.

Except for mental health, authority to give grants for training applies to training in research. We believe a strong case can be made for the support of clinical training in all fields, because demonstrable shortages exist, the stipends of interns and residents are insufficient, and the long and unremunerative period of training in a medical specialty is discouraging to students of moderate means. We believe, therefore, that legislative authority should be sought whereby the Public Health Service could offer training grants to clinical as well as research trainees. We make this recommendation in the expectation that the fewer the restrictions placed on the activities of the trainee, the more efficiently he will be able to undertake his mission.

The Subcommittee recognizes that these programs will be expensive and that, judged by present appropriations, substantial additional sums will be required. Nevertheless, it believes strongly that its recommendations are justified. Expenditures for health, and for health manpower, contribute remarkably to the economy. Salaries paid to health personnel return by one channel or another to the gross national product. They enhance the GNP by restoring to effective production those persons incapacitated by disease. The 365,000 Americans between the ages of 25 and 64 who died of heart disease, cancer, and strokes in 1962 would have earned wages totaling more than $1.5 billion and paid close to $200 million in Federal income taxes had they lived one more healthy working year. Besides being justified on humanitarian grounds, health pays remarkable dividends. The Subcommittee is confident, therefore, that its recommendations are sound, judged either by humanitarian or by economic standards.

CONCEPTS AND DIMENSIONS

Scope

Health services, one of the largest social enterprises in the United States, represented total expenditures of $35.4 billion (5.9 percent of the gross national product) and employment of upward of 3 million individuals (4 to 5 percent of the total labor force) during 1964. Health manpower needs are diverse and requires many special skills. Any review of the encyclopedic resources concerning manpower reveals that the range of skills, aptitudes, and general interests required of health manpower is as great as in virtually any other societal institution. There are careers in the health disciplines for individuals with highly disparate backgrounds, diverse levels and duration of preparation, and significantly divergent interests and capabilities.

A successful program to combat heart disease, cancer, and stroke will require a diversity of manpower and a broad spectrum of services. These diseases are responsible for a substantial portion of the morbidity and disability experienced by our society. The application of a wide range of skills is necessary in assisting the individual patient to achieve optimum restoration in order to perform a useful role in society.

The most recent Health Manpower Source Book (1) characterizes the scope of health manpower as follows:

"In broad terms, 3 to 4 million persons can be considered as being involved in the many aspects of health services. The health services industry in 1960 employed about 2.6 million persons in hospitals, clinics, health organizations, private offices, laboratories, and remaining places where medical and other health services are provided. This count does not include military personnel in hospitals and other settings who also contribute to the health of the Nation. An additional half million persons in occupations usually considered in the health field are employed in other than the health services industry. For example, only 3 percent of the veterinarians and 7 percent of the pharmacists are classified as in health services. Another half million or more persons are in industries directly or indirectly related to health services. For example, large numbers of persons are engaged in the manufacture of drugs and medicines and the wholesale and retail trade connected therewith."

The Bureau of Census counted 2.6 million members of the health services industry in 1960. More than two-thirds of those workers, 1.7 million, are employed in hospitals. Health services, ranking third following agriculture and construction, represented 4 percent of the 64.6 million people counted in 71 industries. About half of the total health workers have college degrees or are highly trained. It may be surprising to learn that 8 percent of all librarians are employed in the "health services industry," as are 30 percent of all biologists, 4 percent of personnel workers, 4 percent of recreational workers, 30 percent of psychologists, 7 percent of secretaries, 4 percent of telephone operators, 8 percent of laundry workers, 6 percent of stationary firemen, 8 percent of cooks, and a bewildering variety of other occupations, including electricians, carpenters, chauffeurs, barbers, seamstresses, meatcutters, and bakers. "Only the candlestick maker is no longer employed in the health services industry."

The Public Health Service estimates manpower supply for approximately 40 health occupations. In 1960, the manpower in these fields totaled in excess of 2.1 million. In addition to physicians, dentists, nurses, and optometrists, the number includes health physicists, biostatisticians, medical care administrators, and certain less well known therapists and technologists. Furthermore, estimates of manpower supply are not available for personnel in food and drug protective services, health information and communications, medical engineering and electronics, and orthopedic and prosthetic appliance work.

Trends

Health manpower has increased rapidly during every decade of this century. Although the proportion (50 percent) with a college education has persisted, a smaller share of these employees are physicians or dentists. Despite increased demands for health services by an aging and prospering population, the ratio of physicians to population has remained static. Specialization and increasing use of diverse health personnel are the most prominent characteristics of health manpower. The trends seem to be related to population increases, to higher levels of education, and to increased availability of procedures benefiting health, as well as to an expanding economy which has generated more disposable personal income.

The vigor of the health establishment can be measured by its rate of growth in comparison with that of the whole population, or with the growth of other social institutions. Since 1900, the population of the United States has increased 2½ times, but the college-educated or professionally trained moiety of health workers has increased sixfold, from fewer than 0.2 million to exceed 1.1 million in 1960. In the same period, the number of physicians has doubled, dentists have tripled, and other personnel have increased by a factor of 18.

With these changes in growth rate and numbers, there have also been profound changes in medical practice. At the turn of the century, the changes in medical education stimulated by the Flexner report were still in the future. Few physicians had benefitted from foreign study, the system of residency training begun by Halstead and Osler was unknown, and the practice of medicine was, numeri-

cally, confined largely to general practice. Thirty years ago, one doctor in six was a specialist; at the beginning of World War II only one in five had specialized. Today, however, 4 out of 5 of our graduating physicians are undertaking specialized training. With the greatly enhanced interest in advanced training, the number of specialists rose to 36 percent of all M.D.'s in private practice in 1950, 44 percent in 1955, 56 percent in 1960, and 61 percent in 1963. Correspondingly, the proportion of physicians having "first contact" with patients (personal or family physicians) has fallen sharply.

Qualitative changes are largely the result of an increasing range of service, educational, and research opportunities. The development and growth of specialization has resulted from efforts to achieve the depth of knowledge necessary for effective performancce in specific areas. The exponential growth of scientific knowledge has contributed to the inexorable trend of specialization as well as to the potential for improved health services. Whereas in the early part of this century, a single health professional could provide a wide range of services, now these services are provided more effectively with greater skill and competence and in more depth by several specialists, no one of whom conventionally provides the range of services formerly demanded of practitioners.

It is hardly a coincidence that specialization and increased employment of various assistants have gone hand in hand. The solo practice characterized by the doctor of the old school required only casual assistance. Laboratory procedures did not exist, nor, if they had, would they have been useful since drugs with specific actions and tolerances were hardly known. Social workers were little needed when family practice and home care were the watchwords. With the advent of anesthesia and asepsis, surgical procedures previously only dreamed of became commonplace; hospital care supplanted home care when adequate nursing and superior knowledge exorcised the fear of cross-infection; the gathering together of physicians and trained assistants set the stage for still further specialization. Finally, in World War II, the superior results obtainable by specialists became widely evident. Physicians returning from military service demanded specialty training in unprecedented numbers, and the tide thus gathered was never slackened. In 1941, there were 7,553 interns and 4,100 residents in U.S. hospitals. Almost all of the internships (92 percent) offered were filled. By contrast, in 1963, 12,229 internships were available of which 9,636 were filled, and 37,357 residencies were offered to 29,485 takers. With the continuous surge of new technology, one can anticipate additional careers as new specialists emerge in an effort to cope successfully with the potential offered by scientific and technological advances. Specialization and diversification will no doubt continue as major characteristics of health manpower in future decades.

Manpower for heart disease, cancer, and stroke

The Subcommittee early concerned itself with the question of manpower needs for heart disease, cancer, and stroke as separate from the requirements for those of the rest of medicine. Although specifically charged to make recommendations in these categorical areas, the Subcommittee believes it impossible to plan programs for training manpower only for heart disease, cancer, and stroke. We believe the problem facing this Commission to be immense. The diseases that fall within our purview cause over 70 percent of all deaths; consequently, we believe we cannot separate their requirements from those of the rest of medicine without inadvertently creating the most serious imbalances. Peter cannot be robbed to pay Paul that much. We believe, therefore, that we must concern ourselves with the manpower needs of the entire social institution we call health.

RESOURCES

Neglected sources of talent for health services are to be found at every hand; among youth, the retired, women, the underprivileged, minorities, the unemployed and in the health professions themselves.

Youth

The Nation's foremost manpower resource for the health establishment is that sector of the population that reaches age 18 each year. The number has increased from 2.8 million in 1963–64 to 3.7 million in 1964–65, reflecting an upsurge in births at the end of World War II. Approximately 3.5 million will celebrate their 18th birthday each year during the remainder of the decade, with 4 million reached by 1975.

As noted previously, the range of talents and skills required of health manpower is broad. Accordingly, efforts to acquire talent and energy for the attack on heart disease, cancer, and stroke require approaches to various abilities and capacities. A concern with graduate education must be complemented by programs aimed at appropriately preparing and utilizing individuals whose educations have progressed only to the secondary schools. Manpower for both the complex, sophisticated, and highly analytic functions as well as the more limited tasks requiring a modest intellectual capacity is abundantly available in our Nation's youth.

Approximately two-thirds of our students attain high school graduation. Much of the remainder, other than the mentally retarded or chronically ill who either drop out or fail to complete their studies, represents a critical waste of human resources and a deficiency in our social system. Imaginative new approaches to vocational, technical, and academic programs are needed to convert this waste into an asset. Some have been proposed; more are needed.

Among the 64 percent of the age group graduating from high school, only half enroll in institutions of higher education. Not all who have the intellectual capacity and aptitude for collegiate and graduate study continue formal education. Both the person and the public benefit when a youth with talent pursues education in a junior college, professional, or vocational school, or university.

The variety of skills required for the Nation's health services mandates the participation of all educators dealing with the health disciplines in attempts to approach these problems in the broadest societal context. Imaginative innovations in the training of individuals for health careers can assist a substantial number of young people to find employment in an economy which has a diminishing need for unskilled, untrained individuals.

Women

Although 51 percent of high school graduates are girls, only 42 percent of the entering classes in institutions of higher learning are females. Moreover, the attrition among women in institutions of higher education is greater. Without going into a more detailed analysis, it may be noted that the tendency for women to neglect their intellectual potential represents a serious social waste and personal loss. Women are approximately one-third of the Nation's labor force. The report of the President's Commission on the Status of Women revealed that an increasing portion of women are returning to the labor force as they are relieved of the raising and care of their children. These women, many in the fourth, fifth, or sixth decade of life, compose an expanding resource, particularly in the health disciplines where patient care and other services put a premium on maturity and effective personality. The waste represented by the loss of talented women need not be tolerated.

Socially and economically disadvantaged

Another neglected source of manpower is found among the many who suffer social or economic handicaps. Our educational institutions have been responsible for truly extraordinary accomplishments in providing oportunities for talented and motivated youngsters to acquire a variety of skills. They have been singularly unsuccessful, with few exceptions, in approaching the student with unrealized potential who is unmotivated or disenchanted. Often these neglected individuals have the necessary innate ability, but they are frustrated because technical or professional work represents an alien culture. Such waste of human resources is especially notable among Negroes and other minority groups as well as among the 11 million children and youth who live in relative poverty.

Technologically displaced

The large number of unemployed persons in a period of great prosperity is a paradox of our time. Our economic growth results, in part at least, from the rising productivity achieved by automation; yet, this very triumph dislocates employment opportunities. Many who because of automation are unemployed remain unemployable unless retrained. Meanwhile, the increasing complexity of our industrial procedures requires an ever more highly trained work force. The unemployed have a double meaning for the Commission. That poverty and disease share the same bed is well known; that the technologically displaced are a manpower resource which can be retrained for employment in the health industry should be equally evident.

For the technologically displaced, automation represents more of a threat than a benefit. In many respects, they are another facet of the challenge to our edu-

cational system represented by the high school dropouts. As our technology advances and becomes more sophisticated, technological displacement moves up the ladder of skills. Thus we find a diminishing market for many white-collar positions as the cybernetic revolution takes over the jobs of office workers. Health services, confronted with enormous manpower needs, must explore recruitment and retraining efforts that attempt to use the talents of those displaced or deprived of work by automation.

Handicapped persons

The physically and mentally handicapped, all too frequently, are considered as a burden to society rather than as a human resource, even if only marginal. During a period of full employment such as World War II, many individuals who previously were classified as handicapped or incapable rehabilitation found places in the economy and recouped their social value. The unique challenges and needs related to heart disease, cancer, and stroke can be approached in imaginative ways so that in ministering to the needs of one individual, the opportunity can be presented to another—himself handicapped—to assume a socially useful role and thus enhance his own dignity.

Retired persons

In our society, retired or aged persons unquestionably are the most frequent victims of heart disease, cancer, and stroke. Many of these individuals are frustrated as they seek a role and function in society. But many constitute a resource which is seldom perceived. Usually they are regarded only as consumers of health services, which they are for the most part. However, striking examples of their potential as a manpower resource are seen in their services in the home care, friendly visitor, and meals-on-wheels programs that have been developed in some communities for chronically ill individuals, including a high number of victims of heart disease, cancer, or stroke.

Effective use—A potential resource

The final manpower resource may seem paradoxical for it comprises the individuals currently engaged in health services. A far greater impact and effectiveness can be realized for them through organization and modification of their roles. Many of the services provided currently by individual callings have accrued more by force of tradition and custom than by logic or economy. There have been only a few scattered attempts to define appropriate roles for various professions through job analysis. Shortages of manpower require that trained professionals spend the maximum portion of time with those responsibilities that best employ their knowledge and experience. Less demanding tasks must be allocated to other categories of personnel if skilled manpower is to be used effectively.

In a society where there is great concern for insuring the availability of health services of high quality, there is always the danger of the underutilization of human resources because many receive training which extends beyond the requirements of the tasks they are called upon to perform. This is a difficult concept to grasp, especially in the face of widespread concern for quality performance in all research, educational, and service activities in the health professions.

Prof. Eli Ginzberg has noted underutilization of highly trained personnel in "capital-poor institutions" such as universities, hospitals, and other agencies in the service sector of our economy (2). It is not unusual for a scholar or scientist of substantial accomplishments to waste his time trying to type a letter or repair a piece of scientific apparatus, a task that could be completed by an experienced typist or technician in a fraction of the time. The exploration of these issues as they influence the health professions and their effectiveness in combating heart disease, cancer, and stroke require careful formulation of concepts, investigations, and demonstrations. We have made advances, but the application of principles learned must be much more widespread. The pathologist does not read all of the slides prepared from cervical smears but rather supervises a corps of cytotechnologists. On the other hand, a specialist fully trained in the diagnosis of ocular changes in hypertensive disease can waste hours of valuable time, energy, and talent in performing refractions, a task that can be performed with ample skill by a person with much less training.

Increasing specialization in the provision of health services has led to the suggestion of the team approach for the provision of services that were previously provided by one individual. This is not to imply that a team will pro-

vide the same services; but the team can furnish much more highly skilled, extensive, and competent versions of the same category of services. In addition, research is needed to test the validity of having services that were once provided by one professional category transferred to one or more individuals with a lesser level of preparation. This redefinition of role and the appropriate modification of specific tasks in order to have them carried out effectively by a person with lesser skills can result in vastly increased effectiveness in the use of health manpower. The increasing need and demand for health services to combat heart disease, cancer, and stroke, as well as increasing educational needs and expanding research opportunities require enlightened use of supportive personnel working in concert with the more highly trained specialists.

Changing the dimensions of health manpower and restructuring tasks are closely related. Each requires new techniques for the provision of health services. The purpose of both is to increase the efficiency and effectiveness of the single professional; to expand the quantity and enhance the quality of all health services, research endeavors, and educational activities; and to achieve the fullest range and the highest quality of these for the entire Nation.

SUPPLY AND GOALS: 1965–75

Each achievement in the treatment of heart disease, cancer, and stroke presages new challenges. As our scientific capacity grows, the greater is our need for effective application of this knowledge to benefit individual patients. Moreover, the greater our success in coping with the organic aspects of these diseases, the more we are challenged to maintain the individual's level of function and to enhance his capabilities and potential for rehabilitation after illness strikes. These medical advances also affect the needs and demands for health manpower.

Changing health needs

Sir Geoffrey Vickers has characterized the history of public health as "* * * a record of successive redefinings of the unacceptable" (3). Even a few cases of polio in a community with a population of several million are unacceptable. By contrast, 400 deaths each year from cancer of the cervix—usually susceptible to detection and cure—are accepted, albeit reluctantly, in New York City alone. This permissiveness need not and must not persist. This waste of human life need not be tolerated.

The advances being made with respect to acute leukemia in children suggest that deaths from this disease need not be accepted a few decades hence. Man's persistent optimism and continuous search for new fields to conquer can find sustained stimulation and challenge in the investigation of the causes of heart disease, cancer, and stroke and in the provision of the most complete and responsive care for patients for whom these diseases represent an awesome burden and all too frequently a death warrant. Each gain in health service or knowledge is antecedent to new and more complicated health needs that require expanded health services and manpower capable of adopting to new requirements.

A Presidential Commission addressing itself to the challenges of heart disease, cancer, and stroke is one result of significant success in combating infant mortality, a host of communicable diseases, nutritional deficiencies, and environmental stresses. This commission is a vivid illustration of the truism that the health achievements of one generation are instrumental in determining the health challenges of the next.

Substantial changes in our economy have occurred in the past decade and a half affecting future health needs. The population of the United States has increased sharply, from 152 million in 1950 to over 193 million in 1964, and is projected to be between 209 and 214 million in 1970. At the same time, the economy of the country has expanded greatly; the gross national product (GNP) has increased from $285 billion to over $600 billion in 1964. An increasing proportion of this GNP is spent on education and health. In 1950, 26 percent of the 18- to 21-year-olds were enrolled in institutions of higher education; this figure increased to over 40 percent in 1963. Our institutions of higher education spent $2.7 billion in 1950 (less than 1 percent of GNP); by 1963, the figure had more than tripled to $8.9 billion (1.5 percent of GNP). Health care expenditures in 1950 were $12.2 billion (4.6 percent of GNP); in 1963, the figure was $32.9 billion (5.8 percent of GNP). Estimates place the expenditures in 1964 at $35.4 billion. There seems to be every indication that we have the capacity to respond to the challenge of our expectations.

We stand at a point in time when great achievements are possible. To cite three pertinent examples, realistic estimates indicate that application of current

knowledge could save the lives of one-third of all those now dying of cancer; the ravages and deaths caused by rheumatic heart disease could be effectively prevented; strokes could be prevented in large numbers of individuals destined to suffer from them, or the resulting disability could be alleviated by rehabilitation. These benefits are not now widely available because of deficits in trained manpower. We cannot treat many cases of surgically curable cervical cancer because we do not have enough cytological technicians to staff screening programs. We lack enough pediatricians, public health personnel, nurses, and other workers to detect and treat the streptococcal infections which, if ignored, lead to valvular damage to the heart. We have shocking deficits in personnel needed to detect, prevent, treat, or cure the cardiovascular diseases to which man is heir. Judged against these needs, nothing less than a maximum effort is justifiable.

Requirements

Manpower requirements may be estimated in various ways depending on the selection of premises. Several groups, comprised of experts in their fields, have reported the specific manpower needs following detailed analyses based on anticipated demand, increased utilization of existing resources, and expansion of resources to meet realistic goals. Only a few studies are mentioned here.

The Bane report in 1959 stated that, to graduate 11,000 physicians a year by 1975, it would be necessary to have an increase of 3,600 graduates over the current number. Three approaches were recommended: (*a*) expansion of enrollment in existing schools; (*b*) establishment of new programs of basic medical science; and (*c*) establishment of new 4-year schools.

A report on manpower for biomedical research, prepared by the National Institutes of Health in 1962, projected net additional requirements of "45,000 professional workers, fully qualified to engage in medical research as independent investigators by 1970" based on an estimate of $3 billion for total national expenditures for medical research in 1970. It was further determined that, of these new research workers, 56 percent will be Ph. D.'s, 25 percent M.D.'s, and 19 percent less than doctoral level. The report assumes that 15 percent of the physicians graduated in 1965 will enter research within 15 years following graduation.

Although increases among professional nurses more than keep up with population growth, the supply falls far short of recognized needs. The report of the Surgeon General's consultant group on nursing has set 680,000 nurses by 1970 as a feasible goal, while calculating 850,000 to be the ideal goal. The feasible goal represents almost a 25-percent increase over the 1963 estimate of 550,000 professional nurses in practice.

Judgments of experts as to specific requirements for health manpower are urgently needed, particularly judgments as to the increasing ratios of auxiliary to professional workers. Such a professional judgment has been made in the field of nursing. Comparable decisions for other health services could contribute significantly to the formulation of patterns of medical care that would assure the most effective use of health manpower.

The Subcommittee on Manpower has reexamined some of the alternative methods of formulating manpower requirements and goals. Two such approaches studied are:

1. Projections based on maintenance of existing ratios of health personnel to population in future years' and
2. Projections based on existing manpower resources, capacity of the Nation's educational facilities, and the potential expansion of such facilities.

Projection of existing ratios

Our manpower resources will be taxed to capacity to meet the foreseeable demand for health services. The most conservative estimate of the need for physicians—that we merely hold the present ratio of physicians to population—projects a need for 346,000 physicians by 1975. The Nation's 87 medical and 5 osteopathic schools had a total enrollment of 33,595 during the 1963-64 academic year; 7,694 physicians were graduated. Assuming current expansion of existing schools and opening the 12 to 15 new schools now in various stages of development will probably yield approximately 9,000 graduates per year by 1975. This will not maintain the present ratio of 149 physicians per 100,000 persons. That ratio can be maintained only by the substantial importation of foreign-trained physicians.

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A stable, or even rising, ratio of total physicians to population can disguise a declining ratio of physicians in private practice. As of December 31, 1963, 13 States and the District of Columbia had at least 1 physician in private practice for every 1,000 in the civilian population. Assuming that this ratio is a reasonable measure of need for the remaining 37 States, it is estimated that there is a shortage of 20,000 physicians for private practice at the present time. Were we able to expand the output of the Nation's medical and osteopathic schools by 25 percent immediately, it would require 10 years to make up this deficit alone. Moreover, this goal does not consider the additional requirements for physicians in teaching, research, and administrative positions or the fact that about 20,000 of the physicians now in private practice are 65 years of age or older and are reaching the age of professional obsolescence.

Dentists, like physicians, are not being prepared in sufficient numbers to maintain ratios to population. There has been a decline in the ratio of active non-Federal dentists per 100,000 civilian population from 49.9 in 1950 to 44.9 in 1963. Even with current planned growth of U.S. dental schools, a continued decline in the dentist-to-population ratio is forecast.

Effective development of manpower resources

What are our manpower resources? Are we effectively planning the development of these resources for the health professions? Determination of the potential members of certain health disciplines can be projected from the percentages of college graduates who enter these callings. By applying current ratios to estimates of future bachelor's degrees, we can project the number available to enter health professions.

More than 365,000 bachelor's degrees were awarded in 1961. In the fall of that year, approximately 8,900 medical and osteopathic and 3,600 dental students commenced their professional education, following the attainment of the bachelor's degree. Roughly 742,000 bachelor degrees are predicted for 1975. If the above ratios hold—40 to 1 for physicians and 100 to 1 for dentists—we have the manpower potential for more than 18,000 new medical students and 7,000 new dental students for the fall of 1975. Since the existing and anticipated facilities will accommodate only two-thirds of these potentials, our manpower resources far exceed the existing and anticipated capacity of our educational institutions. Moreover, future college graduates will face restricted opportunities to prepare for these professions. It is not the scarcity of manpower resources that requires us to depend on the contribution of approximately 1,600 physicians from foreign medical schools per year, to meet our demands for health services, but rather the limited capacity of our own educational institutions to accommodate the available potential manpower. The ironic situation, in which the wealthiest nation in the world depends on the less affluent for health manpower, can be corrected. We should become a creditor and not a debtor society.

Health manpower goals

Our goals are the minimization of human suffering and the maximization of social usefulness of the individual which yields dignity in life. With standards such as these, the health manpower needs for research, service, and educational programs directed toward the mitigation of heart disease, cancer, and stroke are enormous. Accordingly, the subcommitee can see no alternative but to expand to the maximum the Nation's educational capabilities for training health manpower.

The Bane report stated that the average physician sees twice as many patients in a given period of time compared to a generation ago. Professor Seymour Harris has noted the increase in the number of patients handled by physicians is related to the increase in the hours worked and to rising productivity resulting from greater use of other personnel, equipment, drugs, and improved medical education and training (4). There is no doubt that 1 hour of a doctor's time today is more productive than a generation ago. It is also a fact that his greatest productivity level has not been attained.

Efforts to achieve increased productivity of health manpower through organization, coordination, and planning are essential.

The expansion of existing schools and the development of new schools for educating physicians, dentists, nurses, scientists, and other allied health personnel requires extensive planning and the investment of large sums of capital. Consequently, the rate of growth of these schools (the number of graduating

physicians has increased only 2.4 percent in the past 5 years) has been and, unaided, will continue to be slow.

Because the needs for trained health manpower are so great as to be unattainable during the next decade, we believe that a double-edged program should be undertaken immediately. On the one hand, the greatest efforts must be made to utilize our present manpower resources in the most effective manner possible. This will not be easy. Nevertheless, we must make every possible effort to achieve the most effective use of scarce professionals to obtain the ultimate level of productivity.

On the other hand, we must also immediately begin a massive program for the training of additional physicians, dentists, nurses, and other health personnel as rapidly as possible. The leadtime in medical, dental, and scientific education is long. Nothing we can do toady can increase the number of physicians before 1969. We must plan so that our deficits will ultimately be made up, our dependence upon foreign graduates will be abolished, and our ability will be restored to provide medical care of the highest quality for our Nation and to assist other parts of the world to improve its medical care.

PLANNING THE EFFECTIVE USE OF HEALTH MANPOWER

A factor of controlling importance in our time is the spectacular advance of medical science during the past 50 years. It has brought with it great scientific and technical advances but it has also created great problems in applying the technology for the benefit of all people. Specialization, fragmentation, increasing costs and the split of the cultures between scientist and practitioner have confused us all. Dr. Vannevar Bush has indicated that before this century goes much further, there must be bold social and economic innovation to match the giant strides being made by the scientists.

The rapid growth of health activities has created problems now becoming troublesome indeed. Small institutions, necessary for health care a generation ago when transportation was slow and medical procedures were simple, are now inefficient when access is easy and duplication is expensive. The rate at which new knowledge found its way into practice was inconsequential when research was an amateur's avocation, but it is critical today when medical science is making rapid and spectacular advances. The organizations whereby health research is translated into medical practice are no longer adequate. Rapid progress, transportation, and communication both demand and permit new dimensions to health institutions.

Medical complexes, in which medical schools are coupled with teaching hospitals and in turn both are affiliated with community health institutions, furnish an organizational structure whereby research can quickly be applied to patient care, whereby specialty training can be related to health needs, whereby continuing education can prevent medical obsolescence, and whereby the public's interests can be best served.

The Subcommittee's principal recommendations, therefore, will relate to the development of such medical complexes as the prime instrument for bringing about the community planning necessary if health care is to achieve these new dimensions and if manpower is to attain new effectiveness.

Community health planning

The institutions responsive to health needs have compounded, rather than simplified, the problem of effective manpower use. Historically, hospitals, clinics, medical schools, and other health care institutions have been located where they are because of parochial or political considerations. Communitywide planning has played very little part. The topsylike growth of these institutions was costly and inefficient but was bearable so long as the procedures carried out in them were relatively simple, since no great strain was placed on the manpower in shortest supply nor was the economic burden caused by duplication unduly heavy. Recently, however, specialization has greatly changed this situation. The more complex procedures, now common, require expensive equipment, sophisticated laboratory determinations, and teams of highly skilled people. When such people and procedures are active only part of the time, the inefficiency is very great. Thus specialization, created in order to improve the quality of medicine, has, as an adverse side effect, made medical care so expensive as to limit its availablity.

Comparable needs for optimum utilization exist with health programs and the use of health facilities. In many situations improvements can be more readily

accomplished with facilities than with people. It is unfortunate that our society has been able to afford the waste represented by two competing hospitals, each operating at substantially less than full capacity, existing to serve some of a community's health needs, when a single community hospital with a bed capacity larger than either one but less than the combined total of the two could operate with far more economy. The inappropriateness of this lack of community planning is emphasized when it is realized that such a community, with its excess of beds for acute hospitalization, usually has unmet needs for long-term care beds, ambulatory services, a home care program, and other health services.

Unnecessary duplication, and the waste of material and human resources that it represents, is also found in two situations of particular relevance to this Commission. The newer technologies and instrumentations found in medicine are often glamorous and prestigious. Thus, the two competing community hospitals mentioned above, in addition to being overbedded struggle to match each others new acquisitions. Each wants to offer its clientele the finest scientific medicine available, so there will be two pump oxygenators or two cobalt bombs or two high voltage X-ray devices in a community where even one would not be utilized to capacity. Since each of these instruments must be maintained by a competent staff of professionals and technicians, the waste of the equipment for a substantial portion of its useful life is compounded by the useless dissipation of scarce manpower.

A beginning response to these problems can be seen in a few of the Nation's more progressive and active communities. The concept of areawide planning is being implemented through councils of social agencies, utilization committees, and community health or patient care councils. These voluntary organizations attempt to achieve coordinated efforts on the part of various independent agencies and individuals concerned with the health and medical needs of the community's citizens. Unfortunately, in most situations, these activities can function only in an advisory capacity for lack of the statutory responsibilities comparable to those existing in the State of New York. Such endeavors are of the utmost importance if we are to realize our aspirations for programs that will have maximum impact on heart disease, cancer, and stroke. Independent and often competing activities of hospitals, health departments, and medical practitioners —each working in isolation and often at cross purposes—are not in the best interests of the consumers of health services, the health profession, or the Nation.

Moreover, the total scheme of health services available in a community must be considered or the highly specific and carefully focused efforts can come to naught. Thus, a failure to provide for needed ambulatory services, long-term care facilities, home care programs and the like, can result in a siphoning off of high-cost acute hospital beds by patients whose needs are for other than the highly complex skills and resources represented by the general hospital. In such a situation, failure to perceive the specialized need within the context of more general patient requirements generates a self-defeating fragmentation. Just as the availability of cardiologists in a community has major implications for the professional activities of the general practitioner, so does the addition of a specialized activity such as a "stroke center" affect and evolve with the reaction of the societal matrix in which it is placed.

When specialization breeds fragmentation in health services as the cost of enhanced quality the apparent gain is in reality temporary and is more than offset by the long-term losses. Such a policy is patently folly in medicine as well as in the market. Therefore, a program of incentive grants is needed to encourage community inventories, utilization committees, and other coordinating activities.

Within individual communities, only rarely are there effective mechanisms for preventing duplication, or for efficient use of manpower or for reporting and controlling costs. Even within single institutions, methods for allocating costs are originarily rudimentary as judged by business standards. As a result, no effective way exists for measuring the relative merits of two different procedures leading to the same objective. Laboratory procedures, for example, often can be done either by manual determination, using a technician's time, or by automated methods with an initial high capital cost but with negligible costs for labor. Accounting, billing, and data handling systems represent other cases in point: relatively few institutions have adequately evaluated the cheapest and most efficient way of getting the job done.

The interest of the Subcommittee on Manpower in the matter of cost analysis stems from the fact that objective data concerning the efficient utilization of

manpower simply do not exist at present. Many examples of glaring inefficiency come easily to mind. Doctors whose patients are in two or more hospitals lose worktime in traveling between them. The standby use of highly trained personnel in emergency rooms duplicated in nearby institutions is clearly wasteful. Such examples suggest gross inefficiency, but without cost analysis the real magnitude of the problem is unknown. Without cost procedures, one service cannot be compared with another; the efficiency of one institution cannot be proved as contrasted with another, and the benefits provided to the community by its investment of money and men cannot even be estimated.

The development and application of standardized cost procedures would go far toward eliminating another cause of inefficiency—that resulting from the disagreement, acrimony, and opposition caused by misunderstandings. There is a general suspicion that the high per diem costs of teaching hospitals are caused, somehow, by loading patient care with the costs of teaching and research—in other words, that the sick are being victimized. On the other side of the penny, proponents for academic medicine point out that the care provided in teaching hospitals is superior, that the medical schools contribute knowledge and manpower over and above that needed for minimum standards, and that teaching cases, by their very selection as such are the more difficult and time-consuming ones. Without the knowledge gained from agreed-upon accounting procedures, such disagreements foster suspicion between hospital and medical school, between clinician and academician, and between trustee and faculty members. The resulting bickering is destructive to morale and constitutes an important drain upon efficiency.

Out of considerations such as those touched on above, come some suggestions for improvement of health care administration and the most effective use of our manpower resources. With the adoption of standardized cost finding procedures, planning on a wider scale becomes possible. With community planning for health facilities, cooperation, and coordination rather than competition, will result. With the organization of health care complexes, each consisting of a medical school—teaching hospital as a center, and with community hospital associated with it, an organization is created whereby medical care of the high quality provided in teaching institutions is available to entire communities, whereby costly duplication of the partly used personnel and equipment is minimized, and whereby the dangerously scarce skilled manpower can be deployed in the most effective way.

The Subcommittee has been impressed with testimony it has heard indicating that preventive medicine can be made vastly more effective and can, therefore, complement the therapeutic management of acute disease. Concepts of comprehensive medical care are now so far advanced that it should be possible in 10 years to assure any community that large numbers of its people would not have their medical problems neglected. We wish to state this objective here, as our manpower projections should be compatible with the evolution of medical practice now occurring. We believe medical complexes such as those suggested here to be the organizations of choice for developing programs of comprehensive care.

The Subcommittee wishes to suggest as one of its major recommendations that expanded medical complexes be encouraged and established in those communities where the necessary patient populations, medical facilities, groups of highly skilled health personnel and leadership in community planning render the concept feasible. We, therefore, have included the following account of medical complexes as an extended guide to the concept.

The medical complex

Institutions devoted to health education and health care, are, today, vastly different from their antecedents. Medical education was originally an apprenticeship, sometimes augmented by lectures and reading on selected subjects. Our present hospitals are derived from pest-houses used merely to isolate the sick.

The transformation of medical schools into medical school-teaching hospital hospital associations—prototypes of the current medical centers—came about through a fortunate combination of circumstances. A cadre of well-trained young physicians brought to the United States ideas they had received in Germany; Flexner pointed out that most institutions of medical education fell abysmally short of what could be done; the Rockefeller and Carnegie Foundations used their funds to establish demonstration projects in selected schools; the American Medical Association established an effective accreditation mech-

anism; and an aroused public, made aware of health benefits then available, used its disposable income to create institutions destined to change the face of the medical world. But the process took 30 years to accomplish—roughly from 1910 to 1940.

With the close of World War II, two new phenomena made their appearance. The first was that young physicians returning from military service had noticed the demonstrably more successful care provided by specialists as contrasted with that by those lacking specialty training. These returning veterans besieged medical schools and teaching hospitals, demanding the specialty training the value of which they so keenly appreciated. As first believed to be a passing fad, encouraged by the GI Bill which made it economically possible to acquire this training, medical educators paid relatively little attention to the phenomenon. However, it continued, having caught on; the current graduates also demanded specialty training; the tide of residents rose and rose until today, more than 10 percent of all physicians are in house-staff positions, and about 80 percent of current graduates plan to become specialists.

The second postwar phenomenon consisted of massive funding of medical research through Federal and private agencies. During the war, the Office of Scientific Research and Development had played an important role in the war effort; after the war intensive efforts were made to find permanent devices to continue this fortunate coupling of public funds with private science, both being used in the national interest. Out of these efforts grew institutions such as the National Institutes of Health, the National Science Foundation, and a host of programs also concerned with some aspects of health such as those of the Armed Forces, the Veterans' Administration, and the Atomic Energy Commission. With the support forthcoming from these agencies and programs, the research potential of the country was greatly enhanced. With the manpower derived from the enlarged specialty training programs mentioned above, a source of academically oriented, scientifically minded physicians was assured. With the greatly expanded activity in each specialty area, an extensive building program got underway, one result of which was that specialty departments in general hospitals affiliated with medical schools were transformed into entire hospitals, eachc in its own right. Medical schools, therefore, became the unifying center of a cluster of specialty hospitals in which teaching, service, and research all are carried out. In such medical centers today, there are maternity, psychiatric, children's, orthopedic, eye, ear, nose, and throat and other specialties, to name only some. Institutes of radiology, of neurology, of cancer, and of various other supporting or disease-oriented categories are also common.

That speciality training is desired—indeed demanded—is indicated by the fact that four out of five graduating physicians seek it. That the medical school-teaching hospitals association is a highly desirable place to undertake this training is shown by the fact that two-thirds of al house staff are now located in such affiliated hospitals, despite the fact that nonaffiliated hospitals pay larger salaries and often spend relatively large sums to support directors of medical education and other full-time staff members in an attempt to provide attractive teaching programs. That the medical care provided in the teaching hospitals is superior, is ordinarily accepted without question. As a model upon which to build still larger and more perfect medical institutions, the medical center has much to recommend it. It is an instrument which permits harmonious blending of public and private philanthropic funds. The expansion of present centers to include peripheral community hospitals, health departments, and other community health facilities within their organizational framework would provide the final part of the center concept, namely, the mechanism by means of which teaching, research and patient care can best be delivered to the entire community.

Medical schools have as a primary responsibility the education of students to the stage at which the M.D. degree is awarded. The faculties of medical schools also often teach students in the health professions other than medicine, they prepare scientists, guide postdoctoral interns and residents through their graduate, specialty training, and they supervise the clinical conferences, symposia, seminars, and other exercises which, for the voluntary staff, represent continuing education. The expansian into complexes including other community health resources provides a mechanism whereby graduate and continuing education can be greatly enhanced, as each such peripheral facility becomes a focus for the continuing education of its staff, under the guidance and supervision of appropriate faculty members. A mechanism is therein provided whereby education becomes a continuum and not an interlude in the physician's life.

Besides teaching, research is the other pervading theme providing counterpoint in institutions delivering excellent medical care. It is the process whereby the system constantly renews itself; it prevents dogmatism; its fosters a questioning, self-critical attitude; and it constantly generates new information to stimulate the inquiring mind. Laboratory research is perhaps best done in a clositer, but clinical research begins at every bedside and at every clinic examination. Clinical research, especially on rare diseases, requires large initial patient populations from which suitable cases can be selected. Clinical research requires an organizational system whereby cases occurring in different places may be treated identically. Clinical research to achieve greatest usefulness, should be carried out under the scrutiny of the entire medical staff in order that the patient may best be protected and the results most quickly disseminated. The expansion of present medical centers to include community hospitals provides the mechanism whereby greatly improved clinical research becomes possible.

The support of medical enterprises comes, today, from a bewildering variety of sources, both public and private. Unrestricted endowment and tuition income, restricted endowment and gifts, research, and training grants, income from patient care and from ancillary sources related to patients, all play a part. Gifts and grants come both from public and private sources and are provided by separate agencies too numerous to count and with separate restrictions too disparate to summarize. Confronted by this confusion of sources it seems unlikely that an orderly system of support can quickly be created and, therefore, that planning on an extensive scale can be accomplished by donor agencies. The grantee institution can, however, engage in comprehensive planning, can fit each piece of support into its proper niche, and can create the orderly mechanism whereby enormously varied kinds of support may be coordinated into a single continuous system of medical education, research, and patient care. The advantages of such coordination are obvious; the expansion of medical centers by the inclusion of community hospitals provides the enlarged scope whereby the economic advantages of comprehensive planning can be increased.

Expanded medical complexes of the type envisioned here cannot be created overnight, nor rapidly in large numbers. A start can be made, however, in individual instances, where feasible. For example, in Kentucky, a satellite institution has been adopted at Moorehead, 80 miles away, and at Washington University, the Ellis Fischel Cancer Hospital at Columbia, Mo., has a full-time staff provided by the medical school at St. Louis. In other instances, a single service within a hospital might be incorporated into the complex, this to furnish the stimulus for the remaining services to bring themselves up to the standard necessary for incorporation. In other instances, stroke, heart, or cancer stations, as recommended by other subcommittees of this Commission, might be formed within community hospitals by the medical complex, again to furnish not only patient care but also the example and stimulus necessary for the other services to bring themselves up to higher standards. The expansion of medical complexes by the inclusion of community hospitals, or of individual services within community hospitals, is thus feasible immediately.

To encourage development of such expanded complexes, as a basic device for best providing training, research, and patient care, the Subcommittee recommends a program of institutional grants, these to be flexible in nature in order to provide whatever the individual institution may most need to bring about the organization of the enlarged complex. The Subcommittee understands that in some instances buildings may be most urgently needed, in others laboratory equipment and renovation to foster a research program in the community location, in still other places, a nucleus of full-time staff may be essential and in most instances support for an administrative mechanism will be required. These complexes are justifiable, largely by their regional nature, by their service and patient care aspects, and by their utility in the continuing education of physicians. Because these functions go far beyond the classical missions of medical schools and other local institutions, there should be full funding of the necessary expenditures, both for construction and for operation.

A PROGRAM FOR THE FUTURE

The foregoing chapters have presented evidence that the needs for health manpower are virtually insatiable. The present rate of training is not maintaining our present capabilities in the health field. Increasing population, increasing demand for medical services and procedures conferring benefits un-

dreamed of a few years ago, all have combined to create a crisis in health manpower. Because the numbers of physicians, dentists, and other highly trained specialists are woefully inadequate, and because our training facilities are seriously deficient, we propose that maximum efforts be made to increase professional health manpower, and that intensive efforts be made to improve efficiency of the use of our present scarce professionals.

Increased health manpower

That we need greatly increased numbers of physicians is, today, unarguable. We are presently not even graduating enough new doctors each year to keep up with population growth. We can hardly count on, nor can we morally defend, the importation of physicians trained by countries less fortunate than ours. Such current imports are at the rate of about 1,600 per year. Our best efforts since 1959—the year of the Bane report—have resulted in planning for 12 to 15 new schools. Clearly, without more massive support of medical education than we have as yet been able to generate, we face a grim future, medically. In the face of the rising demand for physicians in every field of service, it is futile to think of diverting physicians into heart disease, cancer, and stroke programs; to do so would be catastrophic in a nation in which faulty distribution of physicians and increasing abandonment of general practice is already posing serious, if not critical problems for the provision of medical care. It is inescapable that we need more doctors, that the opportunities now apparent in heart disease, cancer, and stroke cannot be realized until we have more doctors, and that the support of medical education is the only way we can get more doctors.

We can no more separate national from international aspects of heart disease, cancer, and stroke than we can distinguish the manpower needs for these diseases from those of medicine at large. Medicine in the United States owes an immeasurable debt to other countries; Vesalius, Pasteur, and Virchow lived and taught in Italy, France, and Germany. The modern medical world is no less international; Fleming's discovery of penicillin in England made possible the prevention of rheumatic hearts, and the cytological test for detecting cervical cancer was developed here by Papanicolaou, who came from Greece.

Heart disease, cancer, and stroke observe no national boundaries, yet their incidence and severity vary in different countries and so provide fascinating clues for research to explain these differences. Discoveries, once made in medicine, are freely available everywhere; we have benefited from Lister's principles of antisepsis as Europe has profited from the Salk and Sabin polio vaccines.

Foreign laboratories are an important training resource for young American scientists. Foreign scientists collaborate extensively with Americans in conjoint research projects. Foreign experience with variant forms of disease is valuable in devising measures to deal with our own medical problems.

For years, we have been importing physicians from other countries. Indeed, the Bane report in 1959 anticipated that we would continue to do so at a rate of 750 per year, although the consultants questioned then whether or not this should be done when physicians were needed so badly in other parts of the world. Despite these qualms, we are parasitizing other countries at an increased rate (1,651 in 1963). Approximately one-third of the medical graduates in Canada each year migrate to the United States—296 in 1961 (5). This drain upon other nations is neither to their best interest or ours; the "brain drain" is resented by the countries suffering from it; the inability of the United States to provide for its own needs ill fits our posture as a world leader; offers by the U.S.S.R. to provide medical personnel for the emerging African nations and for international efforts against disease have counted heavily on the propaganda front; in short, our national interest requires us to provide the manpower necessary for our obligations as a world leader in medicine.

The Subcommittee believes that the solutions to the physician shortage must be found in Federal programs. We are well aware that the diversity of medical education in the United States is one of its greatest strengths, and we know further that this diversity is maintained by the admixture of private, municipal, State, and Federal funds which support medical education. Nevertheless, we believe the present shortages to be so critical, and their further neglect so disastrous, that Federal programs must be undertaken as the only solution which can be found in time. Moreover, physicians are, in fact, a national resource in that the welfare of the Nation depends upon their ministrations. The schools that produce them are also national resources—their graduates migrate

freely throughout the country, their demonstration projects modify medicine widely, and the knowledge gained in them is immediately available everywhere. While in no way wishing to discourage local philanthropy—indeed elsewhere we recommend community planning—we nonetheless believe the local communities are presently unable to shoulder all the load; we believe that benefits of better medicine to observe no boundaries; in short, we believe the support of medical education to be a national necessity. We, therefore, recommend that the nettle be grasped firmly by the introduction of an entire system of programs supporting medical education; for institutional grants, for student scholarships, for traineeship stipends during the graduate years of specialty training, for the support of senior faculty of medical schools and complexes, and for construction and renovation of facilities to permit enlargement of our medical educational system. We do not fear the encroachment of the Federal Government upon local management if this recommendation is carried out; indeed, past experience has been that the infusion of Federal support into medical institutions has actually stimulated the availability of local funds.

Two other points should be made in support of this position. Graduate training, toward the Ph. D. degree, has been accepted for years as suitable for scholarship aid, justifiable because scientists are in short supply and their training is in the public interest. However, the attrition rate in graduate training is substantial. A majority of all beginning graduate students fail to reach the goal of the Ph. D.'s degree. Against this alarming attrition rate for Ph. D.'s only about 10 percent of medical students drop out. Considering that each year increased numbers of medical doctors are joining the research and teaching ranks, one can argue successfully that health research manpower would be increased as much by scholarship support for M.D.'s as for Ph. D.'s. There thus seems to be no real justification for withholding scholarship support from medical students, even if only research needs are considered. Moreover, since critical shortages of physicians now exist, and since those in private practice are declining at an alarming rate, we believe medical scholarships are necessary to prevent diversion of excellent candidates into other fields. Recent studies have shown a preponderance of medical students to come from relatively high-income families. Although only 5 percent of American families have more than $15,000 annual income (before taxes in 1962), these families supply almost 30 percent of the medical students. One-half of all medical students come from families with annual incomes of $10,000 or more. It can hardly benefit the Nation to permit its physicians to be recruited predominantly from among the wealthy. Whichever way we turn, the Subcommittee is forced to conclude the substantial support for health education is needed. The Subcommittee believes that scholarship assistance for medical students and stipends for graduate clinical training especially for physicians aspiring to careers as teachers should be made available to assist the recruitment into medicine of highly qualified individuals now unable to enter medicine for financial reasons.

The second point concerns the effect of our federally supported research programs upon medical schools. It is certainly true that, in balance, medical schools are greatly improved as a result of the intellectual ferment engendered by the enlarged research activity and by the additional people supported by research and training grants. Nevertheless, a price has been paid: single-minded attention to teaching has been disturbed; funds have been diverted within the schools because of less than adequate reimbursement for indirect costs; the regulations which inhibit investigators paid exclusively by research grants from engaging in teaching and patient care fly in the face of the philosophy universally held that a combination of teaching, research, and service is desirable, and the fragmentation of interest thus created has been divisive and not in the schools or the Nation's best interests. At the same time, the poorer medical schools have been unable to benefit from enlarged research activities to the degree possible in richer institutions, since they do not have the free funds necessary to prevent imbalances. It is certainly in the national interest, in view of the shortage of physicians, to assist these impoverished schools so that they can continue to provide medical education of adequate quality.

We believe, therefore, that teaching and patient care should be recognized as part and parcel of research efforts. We know that many individuals in our medical centers and complexes work more nearly an 80-hour week than the 40-hour norm on which accounting principles have been based. We can find no impropriety in permitting an investigator paid from research grant funds to teach and to see patients as do his colleagues paid from institutional funds. We recommend, therefore, that scientists wholly paid by research grants be

allowed to teach and care for patients as do other faculty members. We also recommend that institutional grants be made for the support of costs, including faculty salaries, of medical schools, and finally, in order to support additional numbers of full-time faculty and as awards of great prestige and special recognition, we recommend the continuation and expansion of the Research Career Award and the Research Career Development Award programs as Faculty Career Awards and Faculty Career Development Awards.

Lest the foregoing paragraph seem to downgrade the need for research scientists and technicians in favor of physicians and allied health workers in the service areas of medicine, we wish to affirm emphatically our understanding that health research, in the end, will provide better methods for the prevention, detection, and cure of heart disease, cancer, and stroke than those we have now. Fascinating new vistas are now opening up in our understanding of these disease processes. The relationships between viruses and cancer, the factors influencing inherited susceptibility to cancer, the associations among factors relating to diet, obesity, and cardiovascular disease, the degree to which damage to the elastic tissues are involved in aneurysms and atheromatosis; these and many other problems illustrate the degree to which research may soon alter profoundly our understanding of disease processes. In considering health manpower needs, therefore, continued, determined, and imaginative programs for training research scientists, technicians, biomedical engineers, and other health allied personnel should be strongly emphasized. Indeed, in reviewing the history of some of the present research training programs, we have been struck by the facts that support has sometimes been grudging and capricious; that programs once started have been restricted or have retrogressed; and that total needs, for example, the training of technicians, have had little consideration. We recommend, therefore, that the research training programs be carried forward vigorously and completely.

When considering ways in which medical schools can best be helped to increase the number and quality of the Nation's physicians, it is apparent that different schools have very different problems. Some of the newer and some of the impoverished schools badly need full-time faculty in larger numbers. They need research programs of greater vigor and size, and they need to develop the local prestige which permits the full-time faculty to assume the leadership necessary in order to set standards of practice. At the other end of the spectrum, the traditionally prestigious and well-supported institutions have faculties and facilities the envy of their less well-endowed competitors, but have lacked any stimulus to relate themselves more widely to the total health problems of their communities. Between these extremes a large number of medical schools need long-term financial assistance in order to enlarge and stabilize their full-time faculties. The leading schools, with suitable encouragement, can expand immediately into medical complexes, as discussed in chapter 4. The middle group can grow into institutions which later will have the strength to form complexes and the more impoverished schools need emergency assistance to prevent their actual disappearance from the scene. It seems nonsensical to plan for rapid formation of new schools without at the same time stabilizing those already operative. We believe, therefore, that institutional grants should be provided whereby all medical schools could strengthen their faculties in order to assume greater community responsibilities. One component of these grants should be weighted to favor the schools with small full-time staffs. Conversely, grants for the formation of complexes together with career and career development awards would enable the leading schools to continue development of their intellectual resources and encouragement deployment of their faculties in ways most advantageous for the health of their communities.

We come at last to examine whether or not additional doctors can be recruited to meet the needs discussed here. Not too many years ago, Cassandras cried that a falling number of applicants to medical schools portended failure for any attempt to expand the medical education system. However, the tide has turned and is now running in strongly. The ratio of baccalaureate graduates to first-year medical students has been approximately 40 to 1 for many years; projections of college graduates forecast that 742,000 degrees will be awarded in 1975; and, if so, we could accommodate about 18,000 medical students without any decrease in quality from present standards. In addition, recent trends have shown that national merit scholarship winners are turning in increasing numbers toward the health sciences as careers. Women also represent a vast and nearly untapped resource for the health professions. The Soviet Union has long had a

preponderance of women in medicine (approximately two-thirds) and in England, about one-quarter of all medical students are female. All of these indicators lead to the conclusion that adequate numbers of qualified applicants will be forthcoming. In view of the presently enormous need for additional physicians, and considering that highly qualified applicants will be available in large numbers, we have no real choice except to expand our institutions for medical education as rapidly as possible. We believe this to be a problem of national dimensions, partly because one can hardly expect local resources to provide fully for the needs of other regions, and partly because the provision of medical education for those young men and women who are highly qualified is necessary as a matter of public policy.

The President's charge to the Commission requires us to determine where impediments now hamper successful programs. We have determined that inadequate facilities and resources, particularly in the preclinical years of medicine, are the primary obstacle inhibiting the training of adequate numbers of physicians. We suggest, therefore, that the construction and other features of the Health Research Facilities Act and the Health Professions Educational Assistance Act should be implemented fully. We believe further that the statutory limitations in these acts, both in dollars and in time, should be increased and extended.

The foregoing discussion has focused almost exclusively on the education and training of physicians. The subcommittee does not wish to imply that shortages and the problems of supply are limited to this category of health manpower. It is fully recognized that many of these same problems exist in dentistry, nursing, and other health professions. Moreover, the close relationships and interdependency of the educational and training programs of several health professions in university medical centers indicates that there is a sharing of common problems and a mutual interest that mandates planning and a comprehensive approach to the development and expansion of the Nation's resources for the preparation of increased personnel for the health professions. Construction grants; institutional support; scholarships, traineeships, and fellowships; and faculty career and development awards are needed, not just in medicine, but in the several health professions that are so critical to the viability and effectiveness of the health establishment. The Health Professions Educational Assistance Act ,the Nurse Training Act, the Graduate Public Health Training Amendments of 1964, and other training programs of the Public Health Service represent enlightened first steps toward even more imaginative and responsive programs in the future.

All too frequently the importance of allied, auxiliary, or supportive health personnel is ignored in consideration of the Nation's requirements for health manpower.

Since physicians and nurses are not available in sufficient quantity, we must make better use of trained assistants at the same time we expand our medical and other health professional schools. Not too long ago, nurses could not give medications, nor use a hypodermic syringe. Today, these and much more complex procedures are routinely performed by nurses. In the last generation, what laboratory work there was, was done by the physician; today, the much-enlarged battery of laboratory determinations are performed by corps of technicians working under the direction of a clinical pathologist. Yet, the degree to which medical procedures have been separated into component, and simpler, maneuvers is much less than that done as a matter of course in industry. Similarly, automation has hardly been developed at all in the medical field, yet it is obvious that cell counts, chemical tests, analysis of bioelectrical records, and many other procedures are suitable for mechanization. We believe, in consequence, that there should be strong support for research in methods leading to job analysis and to the mechanization of medical procedures, so that they can be performed by other than the scarce, highly trained categories of manpower.

This recommendation leads directly to the question of whether adequate manpower exists to supply the needs for these new, partly skilled jobs. Here, the information is heartening. The rising tide of war babies, the large numbers of employable women, the technologically displaced, and the other categories discussed in chapter 2, all point to a presently sufficient supply of untrained men and women power. What is needed is increased capacity for training. Given the necessary funds, the facilities now available in high schools, community colleges, hospitals, and medical centers are probably adequate to train such auxiliary and supportive persons; however, adequate teachers are not available

in anything approaching sufficient numbers nor are adequate teaching programs available. We recommend, therefore, strong support of the vocational education programs of the Office of Education as they relate to the health fields and to the similar programs supported through the Department of Labor's Area Redevelopment Act, the Manpower Development and Training Act, and the Economic Opportunity Act. We believe that the Department of Health, Education, and Welfare should assume leadership in assessing needs and in encouraging and promoting the development of new and expanded programs of vocational training in the health fields.

We believe that shortages of teachers will continue to plague health programs for some time to come, and we strongly urge teacher-training programs in these activities. Also, since the Office of Education customarily works with and through the school systems of the States, whereas medical education and many of the health profession schools, even in State institutions, have little contact with the secondary school system, we recommend that a coordinating function be established within the Department of Health, Education, and Welfare. Ideally, it would seem that support through the Office of Education might well go to the schools and community colleges providing vocational education courses, and that assistance for the practical training or on-the-job experience might come through grants made by the Division of Community Health Services to the health institutions. The Subcommittee believes that adequate authority for such programs now exists, but that the Division lacks sufficient funds to implement these incentive grants adequately. In this instance, the investment of relatively small sums of money for planning and coordinating activities in health institutions could greatly enhance the effectiveness and impact of the funds available for the training of health manpower under the Vocational Education Act.

Promoting effective use of health manpower

Whichever way we turn, the Subcommittee is forced to conclude that rapid and substantial Federal support of education is needed in all the health fields. That this is not the whole answer is clearly recognized by the Subcommittee. Increased efficiency must be achieved in the health establishment. The importance of community planning and the creation of medical complexes as steps toward increased effectiveness in the use of health manpower has been stressed in chapter 4.

Areawide or community planning of health facilities is widely discussed, frequently advocated, but all too seldom practiced. Few planning activities have gone beyond facilities to attempt to plan in terms of health manpower and services. The Hospital and Medical Facilities Amendments of 1964 authorized grants for "* * * developing and supervising and assisting in the carrying out of comprehensive regional, metropolitan area, or other local area plans for coordination of existing and planned health facilities, and facilities related thereto, and services provided by such facilities." The Subcommittee wishes to go on record as supporting this legislation; furthermore, we recommend the fullest implementation of this program and its expansion as soon as is feasible.

Throughout any discussion of the mechanisms for achieving the most effective use of skilled manpower there is recognition of the need for research and investigations concerning patterns of organization, communications, and interpersonal relations. Such research is of singular importance to the health establishment if we hope to achieve new methods of patient care, and more adequate approaches for the delivery of high-quality health services that incorporate the very latest biomedical achievements. Such research must be directed toward a range of topics including training techniques, job analysis, multidisciplinary health services, continuation education, patient response to health needs and the like. Research in health services can enable us to achieve the maximum yield in both quantitative and qualitative terms from our existing health manpower.

The next logical step following the acquisition of new knowledge is to implement these findings through demonstration projects. In areas other than health, development is recognized as the companion of research. Such a relationship and its merits are often overlooked in the health establishment. The principles of coordination of health services or of comprehensive care that are formulated through research must be tested and improved through repeated attempts at implementation in different settings. The health establishment can profit from the extraordinary achievements in industry where basic research, applied research, and development are carried out sequentially in pursuing an objective.

An extensive program of demonstration grants can stimulate the necessary developmental activities that are so desperately lacking in health programs today.

We should like to close this section with some remarks on the scale of future planning. Many of the manpower problems are the result of inadequate preparation in the past. The health industry has grown rapidly, from $13.5 billion in 1955 to $35.4 billion in 1964, and some projections predict health expenditures of $84.4 billion by 1975. This trend is in line with the commonly expressed opinion that rising productivity should be coupled with increased expenditures in the public sector of our economy. As these changes have occurred, the expanded health research programs of the postwar years have generated a multitude of new procedures, some of which are simple and readily applicable and some of which are complex, expensive, and esoteric. High energy radiotherapy, open-heart surgery, hypothermia, hyperbaric oxygenation and many others are examples of procedures requiring expensive equipment and well-trained teams. Others are even now visible on the horizon; it is certain that transplantation of organs and correction of inheritable defects will soon receive extensive trials. In research, similar developments are commonplace; the light microscope has given way to the electron microscope and the X-ray microscope is in prospect. Each is more expensive, each requires more space and each involves larger numbers of more highly trained manpower than did its predecessor. The foresight needed to plan today's institution which can meet tomorrow's needs is surely not beyond our capabilities. We have in the United States several medical schools planned 50 years ago which accommodate today twice the original number of students and immeasurably enlarged research programs. We can, and should, plan today's facilities and organizations large enough and flexible enough to expand for tomorrow's needs. Yesterday's small and parochial institutions are being transformed into today's larger and more comprehensive units; these in turn must inevitably coalesce into communitywide complexes, each part of which has room to breathe and grow. Our plans and dreams must be on a scale to fit tomorrow's reality. Niggardly and haphazard contrivances today will ill subserve and long constrain tomorrow's progress. To build health complexes, to provide centers of excellence, to produce enough dedicated people, to improve the Nation's health, and the world's—these are challenges to test our souls. We have already begun; let us continue.

RECOMMENDATIONS

Throughout this report of the Subcommittee on Manpower there runs a theme of urgency. Our expanding population, particularly that component especially susceptible to heart disease, cancer, and stroke, is creating demands for health manpower never before realized.

The recommendations of this Commission, if needed, will employ many additional people, both professional and subprofessional in health services. The public demand for the medical care now possible or soon to be realized has created needs for health personnel which are, for the time being, insatiable. Faced with inexorable needs, unattainable objectives, and inadequate resources, the Subcommittee recommends intensive programs to utilize scarce professional manpower effectively and to enlarge rapidly our resources for increasing the preparation of health personnel needed so urgently. Toward these needs we believe the following actions to be necessary:

We must expand the basic resources and facilities for educating and training health personnel. The Subcommittee on Manpower recommends that:

1. The Health Professions Educational Assistance Act of 1963 be amended to eliminate the ceiling on appropriations; that a severalfold increase in appropriations be provided so that no school with capacity to expand its student body be held up for lack of funds; and that boldness be exerted to stimulate the development of new schools.

2. Legislation be sought to permit forthright support of medical education, this to include formula grants to health profession schools.

We must develop increased opportunities for education and training leading to careers in the health occupations. The Subcommittee on Manpower recommends that:

3. Programs designed to attract young people into the health professions and related disciplines.

4. A coordinating office be established within the Department of Health, Education, and Welfare to provide liaison among the agencies and programs concerned with health manpower.

5. A program of grants be made available to stimulate the training of health personnel in community and junior colleges, in cooperation with medical centers.

6. The Health Professions Educational Assistance Act of 1963 be amended to provide for a program of Federal scholarships for talented medical and dental students in need of financial assistance and that matching grants for the cost of education accompany each scholarship.

We must increase the efficiency and effectiveness of the highly skilled health manpower now available. The Subcommittee on Manpower recommends that—

7. There be established a health manpower unit to carry out continuous assessment of national manpower requirements for health services. The Subcommittee further recommends that the Surgeon General appoint a consultant group, to be staffed by the Manpower Unit, to advise on problems of health technician personnel.

8. Greatly increased emphasis and support be given to programs of research and research training in community health with special emphasis on the problems of more effective use of health manpower and improvement in the coordination and delivery of health services.

9. There be increased support of demonstration projects under the Community Health Facilities and Services Act of 1961 with special emphasis on new patterns for the delivery of health services that achieve more effective use of health manpower.

We must shorten the time between scientific discovery and widespread application. The Subcommittee on Manpower recommends that—

10. A broad and flexible program of grant support be undertaken to stimulate the formation of medical complexes whereby university medical schools, hospitals, and other health care and research agencies and institutions will work in concert.

11. The establishment of full-time career awards in universities and other institutions, not only for research personnel but also for clinical investigators and clinical professors.

Report of the Communications Subcommittee

(Mr. Emerson Foote, Chairman, Mr. Barry Bingham, Mr. John Carter, and Dr. R. Lee Clark. Staff: Dr. Bayard H. Morrison, Mr. Marcus Rosenblum, and Dr. Abraham M. Lilienfeld. Consultant: Mr. Mike Gorman)

The prevention and control of heart disease, cancer, and stroke—the saving of a human life—begins not with the doctor, the hospital, or the medical center. It begins with the individual himself.

He decides to go for a checkup—either before symptoms appear or at the earliest sign of trouble. Or he decides not to. The decision, often made casually or even subconsciously, may add or subtract a decade from his life.

Many factors influence his decision. One is his financial condition. Another is the convenience and accessibility of medical attention. The most important factor is the state of his knowledge about health matters.

Once he enters the medical orbit, his fate is again subject to many whims of chance. If he is wise enough to make his appointment soon enough, and if the physician he chooses is trained and equipped to detect an incipiently dangerous condition and make the proper referral, and if his community is blessed with the special skills and facilities his condition requires and if he is able and willing to follow through the prescribed course of treatment—in this happy conjunction of circumstances—his life will be prolonged, his function unimpaired or restored.

Breakage of any link in this chain can nullify the strength of the others. Nearly every link depends upon the right knowledge in the right place at the right time. Conversely, many thousands of heart disease, cancer, and stroke deaths occur because of failures in the communication of lifesaving knowledge to the potential victim or to the physician who treats him.

It is to these costly failures that the Subcommittee on Communications has directed its principal attention. We recognize the vital importance of research communication—between scientist and scientist. We wholeheartedly endorse the

recommendations of other Subcommittees concerning the need for strengthening the medical library system and adding to the electronic capability for handling research information. But we feel that the greatest impact on death and disability from heart disease, cancer, and stroke, now and in the years immediately ahead, can be made through intensive nationwide effort to bring to the physician and the public the information they need about these diseases. It has been said that knowledge is power. In health, it is the power of life and death.

A Federal mandate

The Federal Government, as described elsewhere in this report, has been given a clear mandate and substantial resources to support the generation of health knowledge through biomedical research. The results of this policy have been the great scientific advances that characterize our time.

But knowledge unused is knowledge wasted. And strangely, the Federal Government has not been given a similar mandate and similar resources to support the transmission of medical knowledge to its point of application.

One point of application is the meeting place of physician and patient. Knowledge or the lack of it on the part of the patient brings them together in time or keeps them apart too long. Knowledge or the lack of it on the part of the doctor determines the success of their encounter. Clearly, this is the ultimate target of biomedical research. These are the prime audiences. Equipping both patient and physician for their encounter is a communications task: a process of education and information.

There are longstanding and largely unspoken obstacles to vigorous Federal participation in this process. Federal support of education in any form has been viewed darkly because of fears of Federal control in a political sense. Strong Federal programs of public information have been treated with suspicion through fear of self-aggrandizement via press agentry.

Without seeking to judge broader policy matters, we submit that in the communication of health knowledge these fears are illusory and irrelevant. They are worse: they contribute to unnecessary death and disability.

In the generation of health knowledge, the Federal Government has abundantly demonstrated its aiblity to stimulate and support productive effort without stifling control. It has done so by developing a partnership of Federal and non-Federal scientific resources in a system which promotes individual freedom and initiative. Similarly in the communication of health knowledge, it can and must develop a partnership whereby scientific and communications skills and resources, both Federal and non-Federal, work together to transmit the urgent messages upon which health depends.

The Subcommittee on Communications therefore recommends, as a fundamental policy underlying its subsequent specific recommendations, that the communications functions of the Public Health Service, and especially those related to public information and the continuing education of the health professions, be recognized and supported on a scale commensurate with their importance as a major weapon in the prevention and control of disease.

Public information

The public has an almost insatiable thirst for health information. Newspaper readership studies have shown that health articles rank high both in number of readers and in retention of information. Every major daily newspaper has at least one column devoted to health. News which suggests a scientific breakthrough is given front-page prominence. The general interest magazines rarely go to press without a substantial quota of health information.

Yet the public remains remarkably uninformed, or remarkably slow to act, on many matters which are quite literally "of life and death." Part of the problem may stem from the sheer profusion of available information, sometimes contradictory and frequently half-true or halfhearted.

In all three disease fields falling within our purview we were told by medical experts that the average American family today is not aware of the simple, fundamental measures necessary to protect its members from these diseases. This is a failure of communications. The coronary-prone middle-aged male, the young mother with one of the seven danger signals of cancer, the corporation executive who is suffering from one or more precursors of stroke—why don't they act while there is still time? Because they either lack the information, or the information has been presented in such a fashion that they lack the motivation to act upon it.

We must therefore make much greater and more imaginative use of existing communications media, and we must create bold new channels of information to close the alarming gap between the acquisition of research knowledge in our medical centers and laboratories and its dissemination to the family physician and to the general public.

We have a magnificent and exciting story to tell. Every American is deeply concerned with the preservation of his own health and that of his loved ones, yet we have not capitalized upon that concern. We must take the plunge into the mainstream of modern communications. We must use the advertising and promotional techniques which have been so successful in creating a demand for consumer goods to create a similar demand for the knowledge which will save thousands of precious lives.

We therefore recommend the following steps be taken:

STRENGTHENING PHS INFORMATION SERVICES

We believe the Public Health Service has a duty and a responsibility to use every possible resource to bring the latest health information to the American people. In a matter so urgent as the prolongation of life and the prevention of needless disability and death, we must insist upon the highest priority for these communications activities.

For this reason we recommend that the funds appropriated for the Office of Information and Publications in the Office of the Surgeon General should appear as a budgetary line item. They should be increased by $750,000 per year to finance such additional activities as—

(*a*) Recruitment and inservice training of information specialists, selected from among young college graduates, to improve dissemination of health information to the public;

(*b*) Creation of materials for free public service announcements on health for use by radio, TV, and magazines;

(*c*) Development of fact books on specific health topics, summarizing present scientific knowledge for the use of reporters and community leaders;

(*d*) Development and production of a health yearbook, similar in scope and quality to the agriculture yearbook, to create a series of authoritative and understandable reference volumes in specific health topics;

(*e*) Assignment of writer-editors to accompany foreign PHS missions and to report promptly on the findings and experiences of such missions;

(*f*) Assignment of writers to produce prompt summary reports of scientific conferences in forms suitable for the health professions.

TRAINING IN HEALTH COMMUNICATIONS

Because the transmission of medical information has been given such a low priority in our total national health effort, we have given little attention to the recruitment and training of communications specialists in the health field. There is a desperate shortage of these skilled specialists, both in the Public Health Service and in medical centers and universities throughout the country.

We therefore recommend that the Office of Information and Publications in the Office of the Surgeon General be allocated a specific annual sum of $1 million solely for these training purposes:

(*a*) A grant program to educational institutions for the development of pilot training programs in the field of medical communications. Such grants should support the development of a core curriculum, the payments of faculty, and provision of stipends for trainees. A university which has both a medical center and a school of journalism would probably serve as an excellent setting for these pilot training programs in communications.

(*b*) Provision of fellowships for the on-the-job training of a variety of personnel in the gathering and writing of science information materials. Many of these fellows would be trained in the various agencies of the Public Health Service; many would be trained in our medical centers and large research institutions throughout the country.

In addition, we recommend that the Public Health Service conduct and support seminars and other methods designed to give professional science writers the background they need to write accurately, responsibly, and clearly on health subjects.

Science writing is a highly developed skill. The popularization of such scientific fields as nuclear physics and space has been brilliantly successful.

In the medical field, both within and outside Government, there has been a persistent reluctance on the part of scientists and physicians to take professional writers behind the scenes on a basis of mutual confidence and open doors to genuine understanding on matters of profound interest to the public. As a result, medical writing in the popular media—again with some outstanding exceptions has tended to be fragmentary and often misleading. The Public Health Service should take the lead in remedying this condition, and its public information offices should be authorized and encouraged to do so.

RESEARCH CENTER ON HEALTH MOTIVATION

In mounting preventive attacks upon heart disease, cancer, and stroke, we face the difficult challenge of changing the life patterns and habits of millions of people. For example, it is fairly easy to put out a pamphlet listing the various factors which predispose an individual to a heart attack, but it is extraordinarily difficult to get that individual to reduce his calorie intake, to give up cigarette smoking, or to limit the stress factors in his daily life.

Little research has been done on the effectiveness of the various approaches which have attempted to change the ingrained habits of people. Unless this important research is conducted by behavioral scientists, sociologists, and other specialists, we will lack a solid scientific base from which we can tailor our educational efforts toward motivating change in people.

We, therefore, recommend that the Public Health Service be provided with funds to initiate the development of a center for research in health motivation. In addition to specific behavioral studies directed at the individual decision-making process in changing patterns of living, the center would analyze the contents of public campaign materials with reference to their effectiveness and influence upon behavior, and it would hopefully concentrate particular attention upon hard-to-reach population groups which reject existing educational campaigns emphasizing individual initiative and changes in living patterns.

It is estimated that $500,000 a year for 5 years would be necessary to initiate the development of such a motivational research center.

Continuing education of the health professions

The forward sweep of medical science has brought about a kind of instant obsolescence in medical knowledge. Most physicians practicing today received their medical education in the 1930's and 1940's. The fact that they are practicing two or three decades later poses a critical obstacle to the delivery of up-to-date health care.

For many years, lipservice has been paid in the medical profession, as in most other professions, to the concept of continuing education. But the facts of daily life are hard to overcome.

Most doctors work a 60-hour week. Even their free time is never truly free. They are deluged with paper, ranging from professional journals to flyers advertising the latest medical gimmick. Among the papers are invitations to attend lectures, seminars, clinical conferences. But only the supermotivated or the semileisured are able to respond often enough to keep pace with their changing profession.

Thus the greatest single obstacle to a cohesive program of continuing education for the medical profession is time. The second is diversity of interests and needs. The third is the fact that continuing education, although it is recognized as a critical problem in medicine today, is not the primary responsibility of any significant segment of our national health resource.

Medical schools, the logical locus for the major effort, are correctly preoccupied with undergraduate education first and research second. Continuing education, if it receives any attention at all, must settle for what is left of already inadequate resources. Similarly, community hospitals could contribute greatly to the continuing education of community physicians, but their first job is to care for the patients. Professional societies have many other responsibilities.

Yet continuing education is a categorical imperative of contemporary medicine. Without a large-scale, effective organized effort, the worlds of science and practice will spiral still farther apart. The gap between what is known and what is received by patients will be harder and harder to bridge.

The Public Health Service clearly has a leadership role to play in helping to forge a national continuing education effort, by assisting all the available resources in giving due attention to this problem.

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STRENGTHENING CONTINUING EDUCATION PROGRAMS

The Subcommittee recommends that appropriate units of the Public Health Service be provided with funds and authority to:

(*a*) Stimulate and support through grants, contracts, or in other appropriate ways, demonstration projects and experiments directed by medical schools, community hospitals, professional organizations, or any other appropriate agency, designed to make important scientific knowledge systematically and conveniently available to practicing physicians.

(*b*) Stimulate and support research projects designed to develop new and improved methods of conducting continuing education programs, including experimentation with various media (i.e., closed or open circuit television, etc.), various instruction methods (i.e., programed instruction, seminars, etc.), and various means of evaluating such programs in terms of their actual impact in upgrading medical practice.

(*c*) Disseminate as widely as possible the results of experiments, demonstrations, and other projects in the continuing education field, whether sponsored by the Public Health Service or by others, so that all interested organizations may benefit from the experience of others.

(*d*) Conduct studies and demonstrations in communications technology and educational methodology.

For these purposes the Subcommittee recommends appropriations of $2 million for the first year, $4 million for the second, and $6 million for the third.

A NATIONAL MEDICAL AUDIOVISUAL FACILITY

The imaginative use of new communications media offers the best hope for necessary breakthroughs in continuing education. The Subcommittee believes that in addition to its broad program of support for continuing education outlined above, the Public Health Service should also take leadership in producing, disseminating, and promoting the use of audiovisual materials for continuing education of the health professions.

The Public Health Service Audiovisual Facility, located at the communicable disease center in Atlanta, Ga., on a small scale, has already demonstrated high competence in the production of training and educational materials, and in the collection and dissemination of such materials produced elsewhere.

We, therefore, recommend that the Public Health Service Audiovisual Facility be enlarged in scope and strengthened so that it may become a national medical audiovisual center. To this end we recommend the following specific steps:

(*a*) The appropriation of $1.5 million for necessary renovation and expansion of facilities.

(*b*) Appropriation of $1.5 million for the first year, scaled upward to $4 million for the fifth year, to develop an intramural program which would include production, experimental use, and evaluation of educational materials in such areas as radio, television, motion pictures, programed instruction, etc.; research and training programs in audiovisual fields; international exchange of medical motion pictures; and other purposes.

(*c*) Authorization of an extramural program of grants and fellowships and appropriations to support such a program, beginning at the level of $1.5 million per year and rising to $8 million at the end of a 5-year period; such a program would enable the Center to support selectively promising projects in audiovisual communication at medical schools, community hospitals, and other institutions and to assist, through training grants and fellowships, in the development of a national cadre of medical communications specialists.

In addition to the program outlined above, the Subcommittee feels that the National Medical Audiovisual Facility should exert immediate and strong leadership in two communications media of particularly high promise for continuing education of the health professions. These are, first, the field of closed circuit television which is already being used sporadically, to a limited extent, by medical schools, hospitals, and other health agencies; and, second, the use of portable projectors for cartridge-type films which are especially adaptable to private use by physicians in their own offices, at times of their own choosing.

We therefore recommend: (*a*) That an appropriation of $2 million per year, initially, be made to the National Medical Audiovisual Center for the specific purpose of developing, disseminating, and evaluating closed circuit television programs on subjects of vital interest to the health professions.

(*b*) That an initial appropriation of $1 million per year be made to the National Medical Audiovisual Center to produce short films for use in cartridge-type projectors, and to promote the widespread use of this promising new educational device by the medical profession.

TELEVISION

The health world has been slow to focus the awesome power of television on specific health problems requiring specific public understanding and response.

The medium is ideally suited for delivering clear visual information in dramatic and forceful terms. The art of the documentary film, true to science and at the same time challenging to the interest, is highly developed. Commercial television is capable of reaching an overwhelming majority of the American people, and educational television is growing rapidly.

Yet health documentaries have been few in number, uneven in quality, and generally drab in presentation. It has been their quality, rather than their subject matter that has relegated them to unattractive scheduling and doomed them to small audiences. Television producers are as aware as newspaper and magazine editors of the tremendous public interest in health. The products, with a few shining exceptions, have simply been inferior in the highly competitive world of commercial television.

The Subcommittee recognizes the problems faced by a Government agency like the Public Health Service in recruiting and employing scarce topflight creative talent in motion pictures and television. It recognizes the scientific knowledge necessary to give complete accuracy and authenticity to health documentary programing and the impressive beginnings already made at the Service's Communicable Disease Center in creating a truly national medical audiovisual center.

We therefore recommend that the Public Health Service be authorized, and that funds be appropriated, to contract with professional television producers for the production of twelve 30-minute documentary films each year of the highest quality, on subjects related to heart disease, cancer, and stroke, and any other subjects as may later be deemed desirable. Each film should be budgeted at or about the level of $150,000 to assure writing and production that will make the films competitive with the best of commercial television. This price should include a sufficient number of prints to assure widespread use on local commercial television outlets across the Nation. The contract should also provide for the full participation of the producer and his organization in the marketing of the films. The Public Health Service, in conjunction with non-Federal scientists and physicians designated by the Service, should have full control of the content of each film. The films should be available for commercial sponsorship within a predetermined range of appropriate product classifications, excluding such obviously inappropriate sponsors as tobacco companies, pharmaceutical firms, and the like.

In the Subcommittee's view, the potential of television as a disseminator of health information to the public can be realized only through quality production of authoritative material, made available in such a way that it can be viewed in prime television time by the widest possible audience. The method proposed, which consists essentially of a Federal investment in communication talent, would cost about $1.8 million per year. Alternative methods, such as the governmental purchase of prime time, would cost as much and result in the showing of inferior products, with inevitably inferior results. The impact of 12 first-class documentary films, each carrying a message of urgent importance for the protection of American families, would be immediate and overwhelming.

The Subcommittee further recommends that the Public Health Service be authorized, and that funds be appropriated to the National Medical Audiovisual Center to support through appropriate mechanisms, such as grants or contracts, the development of effective television programing in the health field on the Nation's educational television stations. The sum of $1 million per year is recommended as a beginning figure.

ETV programs reach school audiences at all levels from primary school through college. In many communities, the ETV program is viewed widely by the adult intellectual and civic leadership as well. It represents an excellent medium for attracting young people to health careers, for establishing and maintaining desirable health habits, and for stimulating desirable communitywide health activities. In many areas, ETV facilities can also be used for continuing educa-

tion of health professionals. The health potential of this growing educational force has scarcely been touched.

A CLEARINGHOUSE FOR DRUG INFORMATION

The Subcommittee recognizes the fact that improper use of drugs is today an important cause of avoidable disease. Because the gaps and wasteful duplication associated with present independent efforts to handle drug information are repsonsible for much important information failing to recah those who need it most, and in view of the progressive increase in the consumption of medications and other chemical products, the Communications Subcommittee endorses current proposals for the establishment in association with the National Library of Medicine, a national drug information clearinghouse, serving and supporting governmental and nongovernmental drug information units.

We believe that the clearinghouse should be given authority and eventually additional funds for providing grants to promote compatibility and cooperation among drug information units.

The clearinghouse should include full information on the chemical structures and biological properties of all known compounds and the derivatives of such chemicals, with regard for their cellular, environmental, and social effects. It should gather information from all reliable sources, including the published literature, conference proceedings, Government reports and other records. Further, that the clearinghouse should produce, both for general and specific users, annotated bibliographies, systematic files of information on drugs in forms suitable for replication, critical reviews, compilations of evaluated data, judgmental responses to individual inquiries, and other appropriate information.

The promotion of health

The Subcommittee on Communications is well aware of the fact that its recommendations range beyond the problems of heart disease cancer, and stroke, if these problems are considered narrowly. We feel strongly that more effective transmission of health information to the public and the professions—whatever the specific subject may be—is essential to the saving of human lives.

We believe further that strengthening our health communications resources must inevitably advance the crusade against heart disease, cancer, and stroke. As a member of the Commission stated early in its deliberations:

"We have a majority interest in personal disaster in the United States—and conversely a majority opportunity to help improve the health and prolong the life of the U.S. population.

"That is because 71 percent of all U.S. deaths are caused by heart disease, cancer, or stroke.

"Seventy-one percent is a majority interest in anything."

People want information about heart disease, cancer, and stroke. If reliable information is presented to them, they will act upon it. And their action will set in motion a chain of events that will sharply reduce the toll of these diseases.

In this sense, communication is as fundamental to health as research itself. We of the Communications Subcommittee urge that the worlds of medical science and medical practice accept this added challenge. And we strongly recommend that the Federal Government fulfill its responsibility to promote the health of the Nation through strong and effective communications programs.

REPORT OF THE SUBCOMMITTEE ON FACILITIES

(Mr. Arthur Hanisch, Chairman; Mrs. Florence Mahoney, and Dr. E. M. Papper; Staff, Dr. Bayard H. Morrison, and Dr. Abraham M. Lilienfeld)

INTRODUCTION

Research, patient care, education, and training of health personnel require appropriate, well-equipped facilities. The burgeoning population and simultaneous obsolescence of existing facilities have severely strained State and community abilities to provide new facilities and renovate old. Federal assistance through the Health Research Construction Act and the Hospital Survey and Construction Act, has been a vital force in alleviating a critical, nationwide need for care and research construction. The recently enacted and funded Health

Professions Educational Assistance Act holds out a similar promise for educational and training facilities.

Yet, the mounting of an expanded national effort to reduce the burden and incidence of heart disease, cancer, and stroke will clearly require the establishment of additional facilities for research, education, and the care of patients with these diseases. Other Subcommittees of the Commission have cited the need for and recommended the development of additional categorical facilities.

However, since a large part of medical research, patient care, and health education in all health institutions is necessarily concerned with heart disease, cancer, and stroke, the Facilities Subcommittee considered it desirable to determine the entire national need for patient care, research, and educational facilities. As no estimate of national need was available, the Subcommittee undertook a survey of medical, dental, osteopathic, public health, and veterinary schools; of research centers; and of community hospitals. The aim was to obtain information regarding their needs, plans, and problems in respect to construction of new facilities and reconstruction of old.

Each institution was asked to estimate not only their needs but also how much could be met through present Federal programs, including Federal money awarded without requiring matching funds.

Questionnaires were sent to 378 institutions: 99 medical schools (88 established, 1 to open in the fall of 1964, and 10 in various stages of planning—medical schools were asked to provide information on their affiliated hospitals); 49 dental schools; 5 colleges of osteopathy; 12 schools of public health; 18 schools of veterinary medicine; 24 research institutes; 53 community hospitals (largely unaffiliated with medical schools, with a bed capacity of less than 300, representing an 8.5-percent sample of the national complement of hospitals of this size); and 118 largely unaffiliated community hospitals (with a bed capacity of 300 or more, representing a 28.8-percent sample of such hospitals).

In addition to requests for information on needed facilities, the deans and administrators received the following questions:

"What obstacles are presently impeding or may later serve to impede implementation of your plans for construction and renovation?"

"What is your view of categorical research centers, i.e., cancer, cardiovascular or stroke centers, embodying clinical and nonclinical disciplines? If desirable, how should they be constructed and administered, e.g., within the university framework, university-affiliated, federally sponsored, independent, etc.?"

On the whole, there was better than a 75-percent response to the survey. Nearly 60 percent of the institutions provided detailed categorical estimates of their needs. The results of this survey are presented separately, as a source paper, although specific items are cited throughout this report of the Subcommittee.

This report discusses facilities recommended by Subcommittees on Heart Disease, Cancer, Stroke, and Rehabilitation; research facilities in general; educational facilities; patient care facilities; medical library facilities; and animal care facilities.

This Nation has numerous other resources which could be developed, strengthened, or modified in ways that would expand research, education, and health care. It would have been manifestly impossible for the Subcommittee to consider them all. Therefore, this report will deal with the following few: general research support grants; the Veterans' Administration; Public Health Service Hospitals; grants for developing new resources; and statistical resources.

FACILITIES RECOMMENDED BY OTHER SUBCOMMITTEES

The Facilities Subcommittee has reviewed the facilities recommendations of the Commission's Subcommittees on Heart Disease, Cancer, Stroke, Rehabilitation, and Research and concurs wholeheartedly.

It appears, moreover, that there is widespread support for the concept of categorical research and care units as endorsed by these subcommittees. In the survey conducted by the Facilities Subcommittee, 63 percent of responding institutions, particularly research institutions and health professional schools, favored the establishment of categorical research centers. Furthermore, most suggested that such centers should be developed within the university-medical school framework or be university affiliated.

Regarding construction and renovation of research centers, and facilities for patient care and professional education, almost 75 percent of the responding

institutions asserted that the primary obstacle to growth was a lack of sufficient funds. Among those who commented on the proper role of the Federal Government in construction and renovation of health facilities, a great majority indicated that such assistance was not only necessary but should be expanded and made more flexible through the use of low ratio or nonmatching funds.

RESEARCH FACILITIES

Of the institutions surveyed, 218 submitted categorical estimates which, in total, presented a need for research and research training facilities that would cost $1.1 billion in 10 years for these institutions alone. It was felt that only 46 percent of this need could be met with existing requirements for obtaining Federal support. Nearly 90 percent could be met, it was estimated if Federal grants were available on a nonmatching basis.

Approximately 85 percent of the total need for research facilities was expressed by 124 responding schools. The remaining 15 percent represents the stated needs of 77 hospitals and 17 research institutions.

If the 10-year needs of these 77 hospitals are used as a basis for estimating the requirements of 1,034 hospitals with similar characteristics, a 10-year program of building and renovating research facilities would amount to about $1.5 billion. By the same method of calculation, the total 10-year program for 1,217 institutions—hospitals and health professional schools—would be $2.8 billion.

EDUCATIONAL FACILITIES

The Facilities Subcommitee fully concurs with the Manpower Subcommittee's recommendations concerning educational facilities. The Facilities Subcommittee found in its survey a striking confirmation of the national need for strengthening biomedical facilities.

The 218 institutions submitting categorical information estimated a 10-year educational facilities need of $868 million, more than 90 percent of which represents the requirements of 124 schools. These schools feel able to satisfy only 53.6 percent of these needs with present sources of support. Present support is said to be sufficient to finance only 31 percent of a much smaller need presented by 77 hospitals and for only 20 percent of the estimated needs of 17 research institutions. If nonmatching Federal money were made available, the institutions indicated that all their 10-year needs could be met.

A projection of 10-year needs—based on the information submitted by the relatively small number of responding institutions—was made for 1,034 hospitals and for 1,217 institutions of all types, using the method explained in the separate survey report. Based on the response of 77 hospitals, the estimated 10-year need for educational facilities for 1,034 hospitals would cost more than $950 million. Based on estimates provided by 201 institutions (excluding research institutions), the 10-year need for educational facilities for 1,217 institutions, excluding those predominantly in research, is approximately $2 billion.

PATIENT CARE FACILITIES

Hill-Burton program.—The program for the construction of hospital and medical facilities under the Hospital Survey and Construction Act (the Hill-Burton Act), as amended, has been one of the most remarkable achievements in the history of health services. It has contributed to the health of this Nation in the unique American way, capitalizing on freedom and private initiative but summoning the resources of Government to catalyze, raise funds, and provide legal support where private resources are inadequate, and to do this through the Federal-State partnership exemplified by the grant-in-aid technique. Since inception of the program (August 13, 1946), more than 7,000 projects have been approved, investing $6.64 billion of which $2.11 billion were grants by the Federal Government. These funds have provided more than 300,000 hospital beds and more than 2,000 rehabilitation facilities, public health centers, diagnostic and treatment centers, and State health laboratories. The general hospital beds of the Nation are now sufficient to meet 83 percent of current needs, in contrast to 59 percent in 1948. However, State agencies report that 133,000 additional new beds must be provided to meet the Nation's prospective requirements.

The Hill-Burton program has also stimulated improvements in hospital design and construction; it has raised State licensing standards for hospital maintenance and operation and for construction and equipment; and it has assured efficient and

economical use of these resources through surveys which guided planning for hospitals and other health facilities. The program has also helped to attract physicians and other health personnel to the modern working facilities in rural areas formerly deprived of elementary health services.

These gains are indeed impressive. But many unfinished tasks remain. The population continues to expand and to move to new neighborhoods. There are serious shortages of hospital beds in many new suburbs. Sparsely settled areas are still insufficiently supplied. Metropolitan areas with well-established old institutions are seriously lacking modern facilities. Older hospitals in the major cities are deteriorating at a disturbing rate, and plans to prevent this decline in quality are impossible to execute with available funds.

Also new methods of treatment and new demands for patient care require new facilities, especially those needed for an aging population and for treating cancer, heart disease, and stroke. A 1960 study conducted by the Public Health Service with the collaboration of the American Hospital Association concluded that the need for modernization and replacement of obsolete hospitals would total $3.6 billion. In addition to the need for modernization, it is estimated that the critical need for new beds to serve patients with chronic diseases is on the order of 500,000. Testimony before the Subcommittee on Facilities suggested also that such beds should be provided not only in chronic disease hospitals and nursing homes, but in medical centers where the best medical care would be applied both as a service and as an example to students, residents, and house officers.

These needs have been recognized. The 1964 Amendments to the Hill-Burton Act embody forward-looking principles appropriate to their solution.

Modernization of hospitals.—Despite the outstanding success of the Hill-Burton program, it is yet to cope with the increasing rate of obsolescence and inefficiency of the bed capacity of the large metropolitan hospitals. This hospital situation is not only a local handicap to health services, but ultimately it will have a retrogressive effect on standards of medical care. The reason for special attention to these centers is that most of them are affiliated with universities where they carry on research and train and educate specialists in the various health sciences. The metropolitan hospitals, in fact, are the bedrocks of basic medical and clinical knowledge.

In 1960, $3.6 billion was estimated by the Public Health Service as the amount required to modernize metropolitan hospital beds. Undoubtedly, the cost would be greater today.

Until this year, the allotment formula and priority principles of the Hill-Burton program have favored rural areas on the basis of relatively greater need for additional beds. Because of the urgent needs of urban hospitals for modernization on contrast to the need for new beds, it is desirable that a fund for modernization be specifically established in the Hill-Burton program and that annual appropriation be sufficient to respond to the urgent need for modernization.

The Subcommittee notes with satisfaction that the legislation of 1964 gives special consideration to obsolescence of health facilities in the more densely populated areas of the States.

The Subcommittee views the $160 million appropriation authorized for a 4-year period as a sound but less than optimal level of support for the urban modernization program.

Planning of hospital facilities.—The complexities of hospital facilities and health care are such that no single or simple solution to their developent is warranted. Time-proven methods of providing hospital service to patients with chronic disease, of course, must be continued and expanded. However, it is also essential that health facilities in a given area be so planned and directed by local and State agencies, in collaboration with appropriate voluntary groups, that they may be effectively and economically coordinated. Because the planning of health facilities has been so successfully demonstrated, it is desirable to extend this program of planning to larger areas on a formal basis. The Public Health Service should be charged with the development of the coordination of health facility planning by local and State agencies. Therefore, the Subcommittee applauds the adoption in the amended Hill-Burton Act of a multimillion dollar program whereby the Surgeon General of the Public Health Service is empowered to make grants to State agencies to meet up to 50 percent of the costs of projects relating to the development of areawide plans for coordination of health and related facilities and services.

Long-term-care facilities.—The shortage of facilities for the care of chronically ill patients is serious. This dislocation should be corrected if only to minimize the use of acute general hospital beds for chronic disease purposes. However,

the chronic disease patients in many instances should be in specialized institutions professionally associated with general medical centers. It is reported by the State agencies that more than 530,000 additional beds for long-term patients are required. This figure represents a current shortage only. It does not take into account the fact that the population over age 65 is rapidly expanding: by 1980, the aged population will probably exceed 24 million.

It is necessary, therefore, not only to correct the present deficiencies but to anticipate the needs of an aging population which will inevitably be afflicted with cardiocirculatory and malignant diseases to a significant degree. Testimony and written reports suggest to the Subcommittee on Facilities that the coordination of chronic disease hospitals and nursing homes in the present legislation should be combined into facilities for long-term care. The previous annual appropriation called for a ceiling of $20 million for each of these two categories. The Hill-Burton program has already built more than 40,000 beds for long-term care. An annual appropriation of $40 million should produce 8,000 beds each year, an increase insufficient to keep up with the aging population.

Therefore, the Subcommittee warmly endorses the 1964 provision whereby (1) chronic disease hospitals and nursing homes are combined into a single category of long-term care facilities and (2) the appropriation ceiling for long-term facilities is increased from $40 million to $70 million annually.

This $70 million appropriation will produce about 15,000 beds on an annual basis. When one adds this 15,000 to the estimated 30,000 beds for long-term care which are constructed outside of the Hill-Burton program annually, a total of 45,000 beds annually will be produced. This number will match the population increase plus the obsolescence rate and also reduce the deficit by more than 26,000 beds annually. Even though this rate of growth is not ideal, the approach is sensible and practical.

Administration of State plans.—Success of the Hill-Burton program depends in large measure on planning and operations by each State. Accordingly, the Facilities Subcommittee warmly endorses the 1964 provision whereby each State is authorized to use 2 percent of their yearly allotment (up to $50,000 a year) to pay as much as 50 percent of the cost of administering the State plan, on the condition that the State funds in support of administration are expended in an amount at least equal to the amount so expended in the fiscal year 1964.

Survey results.—The need for facilities for patient care which was estimated by 218 institutions that submitted categorical data amounted to more than $1.6 billion in 10 years. Again, the greatest part of this $1.1 billion—represented the needs of health professional schools, primarily the schools of medicine. As a group, the schools estimated that only 46 percent of this amount could be paid with the aid of existing programs; e.g., the Hill-Burton program. The schools of osteopathy, whose needs are relatively modest, indicated that they could meet less than 0.1 percent of their needs for patient care facilities with existing sources of support; schools of dentistry, on the other hand, indicated an ability to satisfy 63 percent of their wants with the help of these programs. The combined group of hospitals felt capable of meeting only 44.7 percent of their needs; the combined group of research institutions only 53.5 percent.

The consensus of responding institutions was that nearly 85 percent of the needs for care facilities could be met if Federal grants were available on a nonmatching basis. Each institutional group indicated that prospects for improving facilities would be substantially improved if nonmatching grants were available.

Based on the information submitted by 201 institutions of all types, the projected needs of 1,217 institutions for construction, renovation, and equipping of facilities for patient care would cost more than $7 billion in 10 years. Of this estimate, nearly $2 billion is for schools and more than $5 billion is for hospitals.

MEDICAL LIBRARIES FACILITIES

A detailed analysis of the need for medical library facilities appears as a source paper for this Subcommittee. Rather than repeat substantial portions of this report, it is sufficient to note here only the main argument, the Subcommittee's conclusions, and recommendations.

The disrepair of the medical library system, so essential to the transmission of medical knowledge across time and space, constitutes a major weakness in both Federal and private health and medical programs.

The medical library function.—The concept of ready access to a comprehensive store of recorded knowledge has for centuries tantalized the scholar and investigator. To achieve fingertip control of the literature, of all that is known about the causes, treatment, and prevention of heart disease, cancer, and stroke, and to make this knowledge available to researchers, educators, and practitioners, is an objective to which this Subcommitte wholeheartedly subscribes. Traditionally, the medical library plays the central role in the interchange of published biomedical information.

Imbalance of support.—While most medical institutions have made spectacular advances in recent decades, the medical library has failed to keep pace. The Department of Health, Education, and Welfare appropriations for 1964 totaled over $5.5 billion. Of this, $36.1 million (approximately 0.65 percent) were devoted to scientific and technical information activities, but less than $1 million accrued directly or indirectly to the support of non-Federal medical libraries.

The adverse effects of neglected libraries have been protested by librarians themselves for many years. Physicians and scientists today reinforce their argument. The National Advisory Health Council on April 3, 1964, passed a strong resolution urging prompt and effective remedial action.

The medical library community.—The number of specialized health-related libraries in the United States estimated at 6,503, is growing. Of these, 995 are associated with educational institutions, 3,178 with hospitals, 1,180 with agencies of State and Federal Government, 1,100 with industry, and 50 with State and local medical societies. The estimated total number of medical libraries which the Subcommittee identifies as the legitimate objects of its concern is 4,223.

The community of medical libraries with its common dedication to the improvement of health may be thought of in terms of a more or less integrated network. The medical libraries lend and borrow from each other to supplement their resources to a far greater extent than any other library group.

In relation to this community, the National Library of Medicine (NLM) has developed unique functions. It has provided leadership in dissemination of information, accepting responsibility for the provision of the indexing tools used by these libraries, and, by lending otherwise unobtainable books and journals, accepting responsibility to act as a central depository. The NLM may, therefore, be considered the heart of the national medical library network. Through its development of the world's largest collection of the published medical literature and through its sponsorship and operation of the medlars system, the largest computer-based information storage and retrieval system yet to be devised for a published literature, the NLM has demonstrated its leadership, capacity, and responsibility. In the Subcommittee's judgment the proper base for the development and implementation of plans to strengthen the Nation's medical libraries is the National Library of Medicine.

Conclusions and recommendations.—Conclusions and recommendations in the following pages have been reached after careful consideration of this complex issue and with a full understanding of the magnitude of effort called for.

CONCLUSIONS

The deficiencies in medical communications, particularly in the Nation's medical libraries, affect the activities of 3 million medical and paramedical personnel. The effect of the weaknesses of the medical library system on medical research, teaching, and practice should be recognized as threatening.

To a large extent, the medical library deficiency has been compounded by health activities funded by the Federal Government. Increases in users, service demands, or needs for materials and the volume of documents are a direct consequence of Federal stimulation. A third factor is that the Federal Government alone is capable of supplying the support in the volume and within the time limits indicated.

RECOMMENDATIONS FOR FEDERAL ACTION

Programs to be conducted by the National Library of Medicine.—The NLM requires both legislative authorities and funds for the purpose of strengthening and enlarging its intramural activities and for the purpose of conducting the type of support program described below. The Subcommittee recommendations, there-

fore, aim at strengthening of NLM in order to bolster the other components of the Nation's medical library network.

National Library of Medicine.—For a number of years the NLM, serving as a backstop for all medical libraries, has faced operating problems developed by the same forces affecting others in its community. These include the massive increases in volume of medical and paramedical literature, the increasing dependence of the health professions on interdisciplinary literature not previously associated with health research, and the urgent need to develop new and nonconventional systems for the bibliographic management of these literatures.

In order to meet these challenges, the NLM must be strengthened. It is essential to provide adequate resources not only to keep abreast with the volume of health publications, but also to acquire books and journals in closely related scientific fields. The computer-based medlars program is undermanned in relation to both the volume of the literature and the power of the machine system. At present, the human component required for machine searching equates to only 10 percent of the potential machine capability. The machine search potential of the medlars system should be shared at the earliest possible date with universities having adequate computer and medical library facilities. The Subcommittee thus endorses the NLM's plan for decentralization of medlars output while recognizing the need for continued centralized control of input. Of paramount importance is the conduct of an intramural research and development program for the purpose of exploring and exploiting new technologies for more efficient management of the world's biomedical literature.

The Subcommittee therefore recommends that $2 million per year for a 5-year period be made available to the National Library of Medicine for research and development of basic knowledge in the handling of biomedical information.

Medical library assistance program.—The NLM should be made responsible for the development of a program designed to rehabilitate the medical library network. Such a program would have the dual objectives of strengthening the depressed elements of the existing network, and simultaneously of developing new technologies and service patterns applicable to medical library practice of the future.

Included in such a program should be provision for matching grants to support construction of new medical libraries and the renovation of existing facilities, training grants expressly designed to attract and develop professional medical librarians and other information specialists, in order to remedy critical existing manpower deficits, and grants to enable medical libraries to strengthen their collections until they approximate the minimal standards established by professional organizations.

The library should also conduct a program for the support of library-related secondary scientific publications such as translations, abstracts, bibliographies, and critical reviews.

Concurrently with the above programs, the library should sponsor research and development in medical library science and related mechanisms through grants and contracts. It should actively pursue the development of new techniques, systems, and equipment for processing, storing, and distributing information in the medical and related sciences. The importance of developing a coordinated national system of cooperating medical libraries should be the concept underlying support of these technical projects.

It is recommended, therefore, that the NLM should support and assist the development of improved medical library services in the United States through a program of grants and contracts in areas of medical library facilities, resources, personnel, and secondary publications. The library should also conduct forward-looking research and development for the purpose of increasing the effectiveness of medical library service throughout the Nation. It is recommended that $30 million per year for 5 years should be appropriated to the National Library of Medicine for this support program.

Legislative authorities.—At present, the NLM lacks clear and comprehensive authorities to undertake such a broad-scale program. Through delegation by the Surgeon General, the library has authority "for research fellowships, traineeships, and grants-in-aid related to library-based programs and health communications" and by ruling of the Comptroller General of the United States authority to make grants for such research-related functions has been confirmed.

Nonetheless, these authorities are distinctly limited and do not constitute a clear expression of full authority for the library's pursuits in behalf of our national needs. For lack of a clear-cut legal base, the NLM cannot develop pro-

grams in such areas as the rehabilitation or construction of library facilities and resources.

New legislative authority is necessary if the NLM is to upgrade the national medical library network. Such a legislative move should have sufficient scope to encompass the broad aspects of this proposed program, and should authorize adequate funding over an extended period of time; i.e., a 5-year period.

Therefore, it is recommended that the Department of Health, Education, and Welfare should initiate broadly conceived legislation clearly authorizing the National Library of Medicine to assist the medical libraries of the Nation as proposed in this report.

ANIMAL RESOURCES FOR BIOMEDICAL RESEARCH

It has been estimated that 50 million animals were used for biomedical research in 1963. The Pharmaceutical Manufacturers Association estimated that its member concerns used 9 million in 1961. The Cancer Chemotherapy National Service Center of the National Cancer Institute uses approximately 3 million animals yearly, while 1 million are used yearly by NIH in its Bethesda facilities. Almost 50 percent of current NIH-supported research grants are dependent on animals.

Many striking advances in disease control could not have been achieved without the use of laboratory animals. As research vistas widen, the dependence on animal test systems becomes greater. The need is not only for increased numbers but also for improved quality, both in respect to freedom from disease and to specificity of genetic makeup. The sophisticated research of today demands sensitive instruments which can reproducibly record subtle changes.

If the research animal, which represents such a sensitive system, by virtue of disease or variable genetic constitution, reacts inconstantly or unpredictably to experimental situations, time, money, and the experiment are lost. Such occurrences are, in fact, not uncommon. Inadequate animal housing facilities, often by promoting a high incidence of infection, have frequently accounted for such experimental failure.

To provide a controlled environment for animals is not merely humane: it is essential to a successful experiment. The need for increasing and improving animal resources has been voiced on a number of occasions by concerned parties including the Surgeon General of the Public Health Service, a congressional advisory committee, and the Institute for Laboratory Animal Research.

Major problem areas and program recommendations are listed below:

Institutional animal resources.—There are approximately 650 nonprofit and nongovernmental biomedical research institutions. Although the principles expressed in "Guide for Laboratory Animal Facilities and Care" are generally accepted, it is widely acknowledged by members of the scientific community that most institutions are unable to implement fully the guidelines expressed. A recently completed survey of 561 institutions conducted by the National Academy of Sciences Institute of Laboratory Animal Resources (ILAR) revealed that only 50 percent of the surveyed institutions could meet the standards for adequate care. (Of the 561, 58 institutions, including medical, dental, and veterinary schools, hospitals, and private laboratories were visited. An additional 503 were sent questionnaires.)

The following table of existing characteristics of animal care facilities may help in understanding the expressed needs of the institutions surveyed.

Needs expressed	*Percent*
Centralized animal care facilities	60.9
Thermostatically controlled heating system	66.0
Air conditioning of animal quarters:	
Complete	51.3
Partial	14.4
Recirculation of air	42.8
Postoperative recovery rooms for animals	41.0
Cage-washing machines	32.0
Autoclaves for bedding and equipment	50.0

Fifty percent of the institutions visited cited a need for new construction. In addition, there were many other expressed needs for renovation, additional space, and equipment. As a further example of the space needs, 411 of the 563 institutions reported an immediate unfunded need for more than 1 million square

feet of space. This need did not take into account presently funded construction or future 10-year needs.

Therefore, the Subcommittee recognizes that the most urgent need in respect to laboratory research animals is that of strengthening institutional laboratory animal resources.

It recommends that the Public Health Service be given increased appropriations to implement a national program of construction and improvement of integrated institutional animal resources.

Establishment of regional research centers.—Research progress, in the judgment of the Subcommittee, will be expedited by regional centers with special animal facilities.

LABORATORY ANIMAL GENETIC CENTERS

Although the demand for a variety of animals of specific genetic makeup has exceeded the supply and although a number of techniques for producing such animals are known, there are neither sufficient funds nor facilities to utilize these techniques in a program designed to meet existing needs.

To meet the needs of increasingly diverse and sophisticated research, where reproducible accuracy is mandatory, there is a critical demand not only for greater numbers of known strains but also for development and provision of new strains. For example, the extensive program of the National Cancer Institute meets only the needs of its contractors and of some grantees. Supplies of animals suitable for research in immunology and tissue transplantation are inadequate; exchange of such animals is often on the basis of friendship rather than on need.

In addition, species not ordinarily considered as laboratory animals may well prove ideal for certain research purposes. At present, facilities for evaluation, breeding, and supply of such animals do not exist.

Furthermore, there are no means for preserving and supplying animals which represent a unique genetic composition or exhibit the unique heritable defects which appear fortuitously in breeding colonies and which lend themselves so peculiarly to research purposes.

Therefore, suitable regional facilities are needed to provide the following services:

Productions of highly inbred standard strains of rodents in numbers sufficient to meet the needs of the biomedical community.

Preservation of animal strains manifesting unique genetic characteristics or heritable defects, such traits having occurred fortuitously in breeding colonies.

Research, development, and production of new strains of animals with unique characteristics of value in specific research areas.

Research and development, for research purposes, of animal types not generally considered as laboratory animals.

A monitoring service whereby the genetic purity of commercial lines can be periodically evaluated and insured.

Provision of either colony seed stock or larger numbers of animals to investigators or commercial breeders on the basis of competence and need.

Establishment, maintenance, and propagation of a nuclear colony of each strain.

LABORATORY ANIMAL MEDICINE

As mentioned above, the laboratory animal is as critical to the success of an experiment as is any other sensitive instrument. To insure reproducible and accurate results, research animals must be not only of known and consistent genetic makeup, but also free from disease. Unfortunately, the characteristics of the normal animal are not an open book. Little is known of the normal hematology, biochemistry, anatomy, and physiology of the laboratory animal. Furthermore, the nature, diagnosis, and control of animal diseases are not well understood. It is known, however, that animals obtained in the wild or from the pound are typically invested with parasites or evidence other signs of illness.

The ILAR survey of animal facilities revealed that nearly 50 percent of the dogs used by the various institutions are obtained from pounds.

Primates other than rhesus monkeys are usually collected from nature. Nearly 40 percent of the cats used were obtained from pounds or from nature. Further, few institutions placed great emphasis on disease control in their animal stock, by provision of quarantine or isolation facilities, routine necropsies for colony deaths, studies of diseases of laboratory animals, or provision for or utilization of facilities for such investigations or procedures.

For such purposes, regional centers, patterned after the successful primate centers, should be established for the study of animal medicine. These center should be established within the university framework, should maintain close ties with veterinary schools, and should undertake the following projects:

Determine the normal state of laboratory animals, by defining normal hematologic and biochemical values as well as by filling in the gaps in existing knowledge of anatomical and physiologic characteristics.

Undertake studies of animal diseases and environmental health problems as well as methods for diagnosis, control, and prevention.

Provide diagnostic and consultative services to nonprofit health research centers and, when consistent with program interests, to commercial breeders.

Hence, acknowledging the critical part that laboratory animals play in biomedical research and realizing the problems that exist in providing these animals, the subcommittee submits the following recommendation:

The Public Health Service should be given appropriations to construct and operate two or three regional laboratory animal genetic centers (other than primate) and two or three regional centers for research in laboratory animal medicine (other than primate).

Research project grants in laboratory animal medicine.—In addition to developing several new centers for research in laboratory animal medicine, existing capabilities should be utilized and strengthened. A project grant and contract program should be initiated to provide funds for the support of studies designed to determine the characteristics of the normal and diseased laboratory animal and by doing so improve the health of the major laboratory animals needed for biomedical research. Therefore, realizing the importance of advancing knowledge in laboratory animal medicine on a broad front. The subcommittee submits the following recommendation:

The capabilities of existing animal research institutions should be fully utilized through a program of project grants and contracts.

Animal farms.—The subcommittee favors the development of animal farms and their integration into a national network of animal resource facilities. The animal farm, which logically should be established in relation to health professional schools, provides an ideal environment for the breeding and care of certain animals to be used in biomedical research. In addition, such farms, rather than more confined urban facilities, could provide logical centers for the temporary quarantine of newly procured animals and for the isolation, care, and study of sick animals.

Under suitable circumstances, larger farms could be used profitably not only by affiliated schools but also by nearby research institutions and community hospitals.

Training.—There is a critical need for personnel at all levels in the laboratory animal field. The ILAR survey revealed that only 30.8 percent of the animal care activities of 143 medical, veterinary, and dental schools and private laboratories are under professional supervision.

It appears reasonable to assume that responsibility for these activities within hospitals lies even less frequently in the hands of those versed in laboratory animal medicine. There is also a need for additional animal technicians. Increased availability of training programs will be instrumental in enhancing career possibilities for all those involved in the specialized field of laboratory animal medicine and care.

The Subcommittee realizes that the development of manpower is a critical feature of improved programs in laboratory animal medicine. Therefore, it offers the following recommendation:

The Public Health Service should be given the specific legislative authority and appropriations necessary to support training programs for veterinarians, husbandrymen, and other animal disease specialists.

Appropriations.—Appropriation levels recommended for these activities are $10 million for the first year increasing to $20 million by the fifth year, for the facilities and $0.5 million for the first year of the training program, increasing annually until $1.5 million is reached in the fifth year.

GENERAL RESEARCH SUPPORT GRANTS

Authority for the general research support program of instiutional grants was provided by the Congress in 1960 and funds for its implementation were first made available on January 1, 1962.

The enabling legislation states that funds up to 15 percent of the yearly amounts provided the Public Health Service for research grants or research training grants may be set aside and awarded to institutions in general support of their research and research training programs.

Prior to passage of this legislation, the desirablility of finding ways to permit institutions to shape more actively the character of local research and training activities had been widely acknowledged. The recognition of this need has arisen as the Federal Government assumed an increasing role in research support, generally through specific project and training grants which tended to unbalance instiutional research programs.

The formulas and criteria determining insetitutional eligibility for general research support grants were carefully formulated and serve to select competent centers heavily engaged in research but demonstrating a potential for significant further growth. Priority has been given schools for the health professions.

In awarding such grants, prior scientific and budgetary appraisals by study sections or advisory councils are not required. The grantee institutions determine fully how the awards are used. Fundamental decisions in respect to eligibility, entitlement, and review of end-of-year progress reports are the responsibility of the Public Health Service and advisers.

The program is constituted, therefore, in a manner that will permit grantee institutions to exercise greater control over the content and direction of their research efforts and thereby cultivate and strengthen an atmosphere of broad-based scientific excellence.

The experience and reports of recipient institutions indicate that the program is accomplishing this goal in an exemplary manner. As intended, the funds have been used in a variety of ways to foster research objectives. For example, new faculty and scientists have been recruited and supported; new areas of research have been supported; central research resources, e.g., animal facilities and statistical services, have been strengthened; trainee programs have been aided; and risk capital has been provided.

During the life of the institutional grants program, yearly appropriations have ranged from an initial $20 million to an anticipated $40 to $45 million for the current fiscal year. At no time has program funding reached the authorized limit of 15 percent of total Public Health Service research grants.

In 1964 the funding level was approximately 7.9 percent of the grants total. The authorized limit will not be reached in 1965.

The Subcommittee, recognizing that a stable, well-balanced, and progressive research environment is generally one that is responsive to the needs of the institution, and recognizing that the institutional or general research support grant program serves as a powerful but incompletely utilized force in the development of such an atmosphere, strongly believes that the total authorized resources of this program should be made available to eligible institutions. Therefore, it submits the following recommendations:

Henceforth, the general research support grants program of the Public Health Service should be funded at the authorized yearly limit of 15 percent of the total research and training grant appropriation.

Graduate schools engaged in biomedical research supported by Public Health Service grants should be entitled to receive grants under the general research support program.

General research support grants should be awarded in two categories: Unrestricted funds to be devoted to research as at present, and awarded on a formula basis; negotiated awards to facilitate the conduct of research, based on documented applications, to defray the direct and indirect costs of the supporting organization and services which are not ordinarily chargeable as indirect costs.

VA RESEARCH AND EDUCATIONAL ACTIVITIES

With its 168 hospitals, 89 affiliated with medical schools, and 91 outpatient clinics and regional offices, the Veterans' Administration (VA) has the largest system of health care facilities in the world. In the past year, 610,000 patients were admitted to VA hospitals; 3,695,000 were followed as outpatients. Of the patients admitted, 107,000 had cardiovascular disease and 40,000 had cancer, newly diagnosed in about 30,000. A professional staff of more than 9,000 physicians, psychologists, social workers, and Ph. D. scientists provide a high level of care and participate extensively in research, educational, and training activities. A complete and sophisticated record system is maintained and lends itself readily

to rapid analysis. Thus, through its comprehensive pool of reseources, the Veterans' Administration offers a unique potential for care, research, and education programs in heart disease, cancer, and stroke.

The VA is carrying on a vigorous and comprehensive program in fundamental and clinical research. Utilizing an appropriation of $32.4 million in fiscal year 1964, approximately 25 percent of the VA's professional staff participated in more than 6,500 research projects and 40 cooperative studies and published nearly 2,500 scientific papers. Of the research projects, over 1,200 concerned cardiovascular problems, 450 were in neurological disease, and over 400 dealt with cancer and allied diseases.

Clearly these research efforts, enriched by a close contact with major universities and other Federal agencies, benefit not only the veteran population but also the general population.

The Subcommittee takes cognizance of and commends the Veterans' Administration for the impressive strides they have made in utilizing a vast research potential. Realizing, however, that this potential has not been fully developed, the Subcommittee offers the following recommendation:

The Veterans' Administration should be given increased appropriations to carry out research in aging and chronic disease, including heart disease, cancer, and stroke.

Research grant program.—Much of the VA research effort is carried on in close collaboration with 78 affiliated medical schools. Therefore, to utilize and coordinate VA and university resources in a way that will serve to transmit the benefits of research to the greatest number, the Subcommittee makes the following recommendation:

The Veterans' Administration should be given specific authority and funds to make research project grants to the affiliated medical schools for collaborative research projects in chronic diseases, including heart disease, cancer, and stroke.

Education and training program.—In the area of education and training, the VA uses its extensive physical and human resources, including 89 hospitals with medical school affiliations, in all phases of medical education. During fiscal year 1963, nearly 38,000 students and employees participated in a variety of educational activities sponsored by the Veterans' Administration.

Under the auspices of affiliated medical schools or universities, 17,790 undergraduate and graduate students in medicine or allied fields received some part of their education and training in VA facilities during fiscal year 1963. Among this number were included 10 percent of the Nation's medical residents, 21 percent of the dental residents, 19 percent of the Nation's dental interns, 27 percent of medical undergraduates, and 10 percent of the Nation's student nurses.

A recent survey conducted by the Association of American Medical Colleges revealed that if VA hospitals were not available, affiliated medical schools would be required to expend approximately $8 million for staff and $90 million for facilities.

It appears clear, therefore, that the VA represents a significant force in the education and training of manpower in the medical and paramedical fields. The Subcommittee commends the VA for the industry and initiative shown in assuming a leadership role in these activities which are so vitally related to the provision of superior medical care for the veteran and general populations of the Nation.

Here, too, however, a vast resource is being incompletely utilized.

Therefore, the Subcommittee recommends that the Veterans' Administration be given the support and increased appropriations necessary to develop its scientific manpower training program to its full potential.

PUBLIC HEALTH SERVICE HOSPITALS

The Hospital Division of the Public Health Service Bureau of Medical Services operates 12 general hospitals, 2 neuropsychiatric hospitals, a leprosarium, and numerous outpatient clinics for the purpose of meeting the health needs of approximately 400,000 legal beneficiaries, not including the American Indians and Alaskan natives. To illustrate the Hospital Division's involvement with the diseases of concern to the Commission, it should be noted that during fiscal year 1963, its units treated approximately 5,000 patients with a primary diagnosis of heart disease and 1,700 with cancer. In addition to providing medical care, the majority of PHS hospitals are engaged to some extent in research and training. In general, these activities are carried out in close collaboration with nearby medical schools.

PHS hospitals are currently training 100 interns and 135 residents in 11 specialties. Training in cardiovascular research is offered at two hospitals; clinical cancer research fellowships exist at two hospitals; and a cooperative program with the National Institute of Neurological Diseases and Blindness supports the training of medical neurologists. In addition, there are training programs for dentists, pharmacists, nurses, and physical and occupational therapists.

The clinical facilities of affiliated medical schools are frequently used in PHS training programs; furthermore, PHS hospitals are used in the education of medical students.

In fiscal year 1964, 118 professional staff engaged in cardiovascular and cancer research projects funded at a level of approximately $1.1 million, an amount which reflects a progressively increasing interest and commitment to the conquest of heart disease, cancer, and stroke. A variety of funding mechanisms, including direct appropriations, grants, and transfers of funds, are required to support these projects. It is apparent, however, that persent research efforts employ but a small part of the Division's exceptional human and physical resources.

An increase of these programs would clearly benefit not only the merchant seamen, Coast Guard, and other legal beneficiaries of PHS hospitals, but also the American people.

An important obstacle to realizing these goals is the critical need for research space in PHS hospitals, either through renovation of present quarters or construction. Steps to fulfill space requirements must necessarily precede significant continuing expansion of research efforts.

In summary, the Subcommittee acknowledges and commends the PHS Hospital Division for its role in meeting the health needs of an important segment of the population; in training health professional an paramedical personnel; and in carrying out research in the areas of concern to the Commission. The Subcommittee also believes that the Division must use its resources more thoroughly if it is to realize its potential for research and training. It offers this recommendation:

The Public Health Service should receive an appropriation of funds needed to permit renovation and development of additional research space within its existing hospitals and to support increased research and training activities in chronic diseases, including heart disease, cancer, and stroke.

DEVELOPMENTAL GRANTS

Several Subcommittees of the Commission have made specific recommendations for construction of centers in which talented scientists representing many disciplines will utilize modern techniques and equipment to mount attacks on heart disease, cancer, and stroke. It appears likely that initially such units will be established within institutions that have strong and comprehensive research and clinical capabilities in terms of interest and ideas as well as human and physical resources.

Employment of existing centers of excellence for this purpose must, of necessity, be only one aspect of a broad-based assault on these diseases. The other must, of course, be the development of new centers of scientific and clinical excellence, either by building them from the ground up or by increasing the competence of existing institutions.

The importance and necessity for such developmental programs have been stressed by responsible members of the biomedical community. This Subcommittee, through its survey of yearly 400 health institutions across the country, has been impressed by the widespread interest of schools and hospitals in creating research environments or expanding their existing research efforts.

The need for additional space and equipment was expressed by almost all institutions; the inability to meet fully these needs through existing programs was voiced by most. Institutions with little or no investment in research activities for the most part saw little hope of siginficant program changes in view of the overriding demands of their service and educational activities.

Many institutions significantly engaged in medical research and positively interested in expansion of these activities into heart disease, cancer, and stroke found their efforts hampered by similar handicaps. In addition, they cited the tasks of capitalizing the research space and equipment needed and manning and operating the facilities, if provided.

It appears clear to the Subcommittee that many of this Nation's developing and underfinanced professional schools, community hospitals, and research institutions represent fertile ground from which the research programs necessary for a concerted attack on heart disease, cancer, and stroke could spring.

Yet, today Federal agencies generally recognize only a limited mandate for such resource development. The National Science Foundation has mounted a limited national program of developmental grants for science programs in liberal arts colleges and universities. The National Heart Institute has been favorably impressed by the results of its experimental developmental grant program wherein a limited number of community hospitals have been supported in their efforts to create and strengthen cardiovascular research programs.

The Subcommittee believes that this concept should be broadened to include support for research activities in heart disease, cancer, and stroke. A developmental grants program for medical schools should be nurtured and administered by the Public Health Service. The following aims and criteria should characterize this program:

Creation of an atmosphere conducive to the formulation of programs wherein skilled scientists, through a multidisciplinary approach, could bring to bear on the three diseases their most advanced equipment and techniques.

Initial awards should be made to institutions with demonstrated research interest, capability, and leadership. Subsequent awards should be made to institutions with comparable levels of interest and potential, but less evidence of achievement and capability.

Efforts should be made to disburse these funds in a manner that will create focuses for the development of medical complexes, with prime emphasis being directed to those regions evidencing greatest need.

The funds awarded should not be designated for support of usual patient care activities, nor should they include the costs of specific research projects, nor should they support general research training programs. Funds for the support of these activities should be obtained from other sources.

Funds should be granted by the Federal Government on a nonmatching basis. Recipient institutions should plan and indicate in their applications how the funds would be expended in relation to program objectives. Grant applications should be reviewed by a peer group of medical educators and other distinguished citizens.

Moreover, the Subcommittee feels strongly that the Public Health Service should collaborate closely with the National Science Foundation (NSF) in conducting its developmental grants program. Care should be taken that the activities of the NSF in stimulating all of the sciences should integrate with, rather than overlap or conflict with the activities of PHS, whose responsibilities lie directly in health and health-related sciences. It is through such coordination of efforts that the Federal Government can best stimulate the development of research to meet the health needs of the Nation.

Therefore, realizing the importance of conducting research programs in heart disease, cancer, and stroke from a broad base and realizing that a great undeveloped potential for such work lies within existing health institutions, the Subcommittee submits the following recommendation:

The Public Health Service should be given appropriations of $40 million over the next 5 years to initiate a program of nonmatching developmental grants in accordance with the aims and criteria specified above. During the first year, $3 million should be appropriated.

STATISTICAL RESOURCES

The Commission, in reviewing existing statistical data on heart disease, cancer, and stroke, recognized certain areas of health statistics that are in need of development. In our expanded national effort to reduce the toll of heart disease, cancer, and stroke, strong statistical programs are necessary to describe the nature of the problems to be dealt with and to provide indications of progress toward the goals. Therefore, the Commission offers a series of recommendations on mortality statistics, morbidity data, training of statisticians and physicians, and community service statistics.

Mortality statistics.—Registration of deaths, as a guide to administration and epidemiology, calls for professional quality of performance and standard methods, applied throughout the system with regard for several contributing factors in death.

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THE VITAL STATISTICS SYSTEM

The administration of public health measures for the control of widespread diseases, such as heart disease, cancer, and stroke, is directed by local officials. In order to plan for applying control measures, detailed information is needed for each local jurisdiction about the specific groups exposed to the greatest risk or most susceptible to the disease to be controlled. Furthermore the information must be available year in and year out in order to measure the effectiveness of the programs.

The only comprehensive source for such statistical information is the data obtained from the registration of deaths. It covers the entire population: State by State, county by county, and city by city. All States and local areas have mortality data available to them but only a few are able to employ this resource effectively. The frequent failure to employ such data is, in part, attributable to lack of money and lack of competent personnel.

For the first half of this century, mortality studies were in the mainstream of research and health practice. Mortality statistics furnished an essential tool for epidemiological studies of our principal disease problems; such as, smallpox, tuberculosis, diphtheria, malaria, typhoid fever, scarlet fever, whooping cough, diarrhea and enteritis in children, and maternal complications due to childbirth.

The problems presented by the effective use of mortality data for heart disease, cancer, and stroke are much more subtle and difficult than those encountered in infectious diseases. As a result, higher skills in the use of statistics as well as greater resources are needed. Against these needs, we face the fact that the States and local areas have necessarily had to apply the resources for vital statistics largely to furnishing the public with legal records on demand. In consequence, State and local governments have tended to neglect the development and exploitation of statistics for the study and control of disease.

The States have sole authority for collecting records of births and deaths in the United States. The Federal Government develops national vital statistics from copies of the records supplied by the States. The only compensation to the States is for actual copying costs and this may not exceed 4 cents per record. Thus, the major share of the cost of the Federal-State system has been a State burden; yet, the major scientific applications of the system have been made by the Federal Government. The Federal Government is also almost entirely dependent upon the State efforts for maintaining the quality of information on the records. Aside from technical assistance provided to the States by the Federal Government, there is no present means by which the latter can give support adequate to the national requirements for data.

These facts point to the need for and propriety of Federal aid to the States in strengthening the system.

Financial aid to the States for vital and health statistics should be provided through a categorical grant program administered by the Public Health Service: the agency charged with the responsibility for collecting, analyzing, and publishing these national data. Such aid should finance the salary of competent statisticians and necessary supporting services. The aid should be dedicated to the following objectives:

Improving the quality and timeliness of data collected through death registration;

Carrying out regular epidemiological studies using the death record as a starting point; and

Intensive tabulation and analysis of the mortality data with special reference to describing the problems in detail and measuring progress and change.

The subcommittee recommends that a sum of $750,000 should be appropriated to the National Center for Health Statistics to initiate this grant program. This amount should be increased to $1,500,000 during the second year and increased gradually thereafter until it reaches $3,500,000 during the fifth year, representing roughly about 50 cents per vital record filed.

MULTIPLE-CAUSE CODING

The traditional practice in the compilation of official mortality statistics has been to attribute to each death a single disease entity as the underlying cause of death. This practice served the purposes of public health well, while infectious diseases constituted the major public health concern. With the decline in in-

fectious disease mortality, and with the growing importance of the chronic diseases, official mortality statistics have become less satisfactory for the study of chronic conditions; such as, the cardiovascular diseases where more than one disease is usually present at the death. For example, a cardiac patient frequently dies of stroke but it is not possible to characterize this event suitably by the present method of compiling mortality statistics. The selection of a single disease for tabulation, in such events, inevitably results in the loss of information.

For the chronic diseases, the single or the underlying cause concept is outmoded. Cardiovascular disease often occurs not as a single process but as a disease complex. The underlying cause concept requires that the disease which started the sequency of events that led to death be identified. For the clinician, this task is frequently impossible. In the nature of events, mortality statistics on chronic disease give an incomplete and often inaccurate view.

It is recommended that data of this kind be prepared by coding all diagnoses reported on death certificates and tabulating statistics on disease complexes as well as the reported associations between various diseases. This procedure will require additional coding, punching, and tabulation after the development of coding principles and necessary guidelines. It is estimated this can be done by the National Center for Health Statistics for about $125,000 per annum.

Statistics of morbidity and disability.—Much progress has been made in measuring morbidity and disability as a result of the passage of the National Health Survey Act in 1956. The surveys authorized by this law are carried out by the National Center for Health Statistics with the help of the Bureau of the Census.

Measures of disability and other types of impact on the family from recognized illness are available from the health interview survey. The survey has recently completed a study which included a carefully standardized cardiovascular examination of a representative sample of adults, aged 18 to 79 years. This study adds previously unavailable data on untreated morbidity.

Nevertheless, knowledge of the complete spectrum of morbidity remains far from incomplete. Most needed at the present time is detailed diagnostic information regarding treated cases of a kind that can be obtained from records of physicians, hospitals, and other medical and nursing institutions. The mechanisms, to be discussed below, for producing statistics on hospital, medical, and nursing care will also provide the diagnostic detail in statistics of morbidity.

A special word needs to be said about cancer statistics. The most comprehensive and useful surveys of cancer in the United States have been those made by the National Cancer Institute in 1937–39 and 1947–48. These surveys, covering 10 large cities in the country, were conducted by canvassing completely all potential sources of information about treated cancer in the cities surveyed. Nonresident cases were eliminated and census population statistics were used to provide the population-at-risk. Consideration should be given to repeating this survey on a wider scale at the time of the 1970 census.

Much has been said about the lag in time between the discovery of new medical scientific facts and the application of this knowledge. There is undoubtedly a considerable gap between, on the one hand, existing knowledge of the means of preventing or alleviating chronic diseases; i.e., the advanced methods of prevention, treatment, and rehabilitation and, on the other hand, the application of these methods in everyday medical care. We know good measure of the magnitude of this gap, however, because there is little or no systematic statistical information about methods of treatment in day-to-day use in the practice of medicine.

Evaluation of progress, or lack of progress, in closing the gap requires comprehensive statistics on patient care and treatment. Such statistics must be compiled from surveys of records at all levels of care, in the offices of physicians, in hospitals, and in long-term care institutions of all types.

Unlike other medically advanced nations of the world, the United States has never had detailed national statistics on hospital inpatients. However, a promising start has been made in the National Center for Health Statistics. Working with the American Hospital Association and the Blue Cross Association, the Center is developing a continuing sample survey of hospital discharge records which will not only produce an accurate cross section of the cases treated in short-term hospitals but will do so with a minimum of burden on the hospitals.

The initiation of this survey will be a contribution of great importance to our knowledge of methods of treatment, and, as has been pointed out earlier, such data will also help to fill in a missing piece in the coverage of the entire

spectrum of morbidity. The Public Health Service has requested $700,000 in additional funds for the first full year of operation of this survey. From the standpoint of the interests of the Commission, this request deserves full support.

While this project represents an excellent start in collecting needed statistics on patient care and treatment, it does not, of course, cover the full range of care. Records of inpatient care in most hospitals are reasonably complete and uniform. Records of outpatient care in clinics and doctors' offices, and records of care in long-term institutions, such as nursing homes, are a different matter. Much methodological work needs to be done in order to make reliable studies of care in such places.

In resident-type institutions, for example, records must be designed that can be filled out in a uniform fashion by all such establishments. Many of the most seriously ill people are found in these reservoirs of chronic disease, but the problems in studying them are formidable. However, here, too, a start has been made in the National Center for Health Statistics, with a series of surveys of patients in places providing nursing and personal care. Such surveys should be contined and extended.

We still need to know a great deal more about the everyday care being given patients with heart disease, cancer, or stroke. What prescriptions are given? What regimens prescribed? What operations called for? When are specialists called upon? What rehabilitation efforts are made? The great majority of these decisions are made in the offices of the attending physicians. But as yet there have been few surveys in the United States to provide such descriptive information.

It is time to begin to interest the medical profession in participating in such studies. It is possible, by the use of sampling, to design studies in such a way that the burden on any one physician is minimal. The chief obstacle, perhaps is to overcome the natural reluctance of the physician to report intimate details of his practice. The organization carrying on the work must have a foolproof mechanism to insure confidentiality and a reputation for complete impartiality. The Commission strongly urges that the Public Health Service stimulate studies of general and specialty practices on a sampling basis to determine methods of treatment in everyday use.

Professional training and physician education.—There is an urgent need to improve the professional qualifications of statisticians and the statistical sophistication of physicians.

TRAINING IN HEALTH DEMOGRAPHY

As pointed out in the previous section, it is necessary to increase the resources available to vital statistics activities of the States in order to assure production of reliable and useful mortality statistics. The Commission's recommendation that a grant program be instituted for assistance to States in this area would provide minimum funds for payment of salaries, computer services, etc., but it would not solve the other problem that has been mentioned: the severe shortage of trained statisticians.

The changing character of public health practice coupled with the demographic, social, and economic changes in the United States has placed strong demands on health departments for skilled statistical services. Health departments are becoming involved in various kinds of research, most of which require a combination of high order statistical sophistication and a practical, operating statistical organization. There is need to develop practical skills for various levels of statistical work in data collection, data processing, data analysis, and data presentation. Among other things, this includes registration methods, coding practices, tabulating techniques, questionnaire construction, forms design, records management, computer programing, and statistical administration.

To insure a satisfactory supply of trained personnel for these programs, the Subcommittee offers the following recommendation:

A grant program should be established to be administered by the National Center for Health Statistics for training in health demography. Such a program would provide both academic training at the graduate level at universities and applied training at the National Center for Health Statistics. It is anticipated that approximately 50 individuals would participate in the former type of training and about 20 in the latter each year. Annual cost is estimated at approximately $500,000.

MEDICAL CERTIFICATION

As has been implied, the death certificate has long been the chief source of information for guiding plans for the study and control of cardiovascular diseases

and cancer. Mortality statistics depend on the accuracy and completeness of the medical certification entered on the death record.

A pilot study of the clinical evidence available in completing medical certifications demonstrated serious problems in reporting the conditions causing death. These problems reflect variations in understanding of the requirements for certification, in diagnostic information available regarding the decedent, and in State laws concerning the certification of deaths falling under the jurisdiction of the medicolegal system.

A program should be initiated to improve the quality and accuracy of cause-of-death statistics and to maintain a continuous measure of its quality. Its first goal should be to educate medical students, interns, and practicing physicians in a uniform understanding of what information should be reported on the death certificate. Second, a regular mechanism to measure the completeness and quality of the reported information, particularly for the cardiovascular diseases, should be established. Third, since a large number of sudden deaths from the cardiovascular diseases fall under the jurisdiction of coroners and medical examiners, efforts to improve the quality of reporting must extend to these officials, by strengthening and supporting the medicolegal responsibilities in each State.

COMMUNITY HEALTH PROGRAM

The Subcommittee attempted to obtain a national picture of the present status of community health programs concerned with heart disease, cancer, and stroke at a State and local level. Meaningful information and data describing services currently being provided at the State and local level to patients afflicted with these diseases was absent. The various programs within the Division of Chronic Diseases of the Public Health Service have also indicated that the absence of such data represents a serious deficiency in their program planning.

In order to carry out effective program planning, a national inventory of community health program activities is necessary. There is a need for benchmarks to describe the current level of program activity and from which progress in the future can be measured. To develop such a national inventory, the Subcommittee offers the following recommendation:

A Center of Program Statistics should be established in the Division of Chronic Diseases of the Public Health Service. This Center would coordinate the plans developed by each operating program to assemble pertinent program statistics to meet their needs. Each program should establish a statistical capability to formulate data collection methods and procedures, review the data assembled, analyze the information for completeness and accuracy, and identify program implications.

Periodic and recurring surveys should be initiated, using sampling methods wherever applicable, to provide data relative to each program. Whenever possible, data should be collected to permit a qualitative classification of each activity on the basis of its relative effectiveness in reducing morbidity, mortality, or disability.

It is estimated that during the initial year of the proposed program that an additional personnel ceiling of 32 persons will be required by the Division. An annual budget of $500,000 is recommended to cover salaries, administrative support, service contracts, and methodological research.

REPORT OF THE SUBCOMMITTEE ON RESEARCH

(Dr. Philip Handler,[1] Chairman, Dr. Frank Horsfall,[1] Mr. James Oates,[1] Gen. David Sarnoff,[1] Dr. Edward Tatum, Dr. Efraim Racker.) Consultants to the Subcommittee on Research: Dr. Edward Dempsey,[1] Dr. Renato Dulbecco, Dr. Philip P. Cohen, Dr. Irvine Page, Dr. Charles Dunlap, Dr. Harry Eagle, Dr. Irving London, Dr. J. F. A. McManus, Dr. Alexander Hollaender, Dr. Herman Rahn, Dr. Eugene Stead, Dr. Lewis Thomas, Dr. Maurice Visscher. Staff: Dr. John D. Turner

INTRODUCTION

Research related to heart disease, cancer, and stroke was, at all times, in the forefront of the minds of the members of this Commission. Each of the several Subcommittees of the Commission devoted much of its attention to current means for the acquisition of new knowledge concerning these disorders, their alleviation

[1] Member of the Commission.

and prevention, and proposed plans for enhancing and extending the national effort in this regard. Nniquely among the Subcommittee of the Commission however, the Subcommittee on Research, which was composed of several members of the Commission augmented by Dr. Efraim Racker, of the Public Health Research Institute of the City of New York, and Dr. Edward L. Tatum, of the Rockefeller Institute, devoted itself to means of acquiring greater insight into fundamental aspects of the normal biology of man himself as well as those physiological phenomena which lead to the development of heart disease, cancer, and stroke.

The Subcommittee engaged in two major activities:

1. The Subcommittee met with a group of invited consultants for several days in Washington to discuss specific means whereby our national capability for the conduct of biomedical research might be enhanced and extended.

The consultants present on that occasion were:

Dr. Philip P. Cohen, University of Wisconsin.
Dr. Renato Dulbecco, Salk Institute for Biological Studies.
Dr. Charles E. Dunlap, Tulane University.
Dr. Harry Eagle, Albert Einstein College of Medicine.
Dr. Alexander Hollaender, Oak Ridge National Laboratory.
Dr. Norvin Kiefer, Equitable Life Assurance Society.
Dr. Irvin London, Albert Einstein College of Medicine.
Dr. J. F. A. McManus, University of Indiana.
Dr. Irvine Page, Cleveland Clinic Foundation.
Dr. Herman Rahn, University of Buffalo.
Dr. Eugene Stead, Duke University.

The major recommendations and philosophy espoused in the report which follows reflect the discussions of this group. The Commission is much indebted to these consultants for their imagination and wisdom.

2. The Subcommittee solicited, from the individual viewpoints of each of a series of knowledgeable experts, substantive summaries of the present state of diverse facets of the biological espects of heart disease, cancer, and stroke. Most generously, our respondents contributed summaries which were invaluable to the Subcommittee. Unfortunately, considerations of space alone preclude publication of these summaries in their entirety. Accordingly, it appeared desirable to present with the report of the Subcommittee a single capsular summary of current knowledge and research into the biology of heart disease, cancer, and stroke, as gleaned from the essays so generously contributed. For the effort involved in preparation of these summaries, the Subcommittee is particularly indebted to Mrs. Norma Golumbic, of the National Cancer Institute, and Dr. John D. Turner, of the National Heart Institute, and of the staff of this Commission. Although the Subcommittee is pleased indeed to present these summaries, for which it must acccept responsibility jointly with the immediate authors thereof, it is pleased also to acknowledge its indebtedness and express its gratitude to the scientists who so carefully presented thoughtful essays which reflect both their knowledge and their scientific philosophy while expressing its deepest regrets that this volume cannot include these essays in their entirety. Here, we can only list these worthy contributors to this common effort.

Dr. Edward H. Ahrens, the Rockefeller Institute, "Hardening of the Arteries: Can It Be Prevented by Appropriate Choice of Diet?"

Dr. Albert J. Dalton, National Cancer Institute, "The Role of Electron Microscopy in Cancer Research."

Dr. Harry Eagle, Albert Einstein College of Medicine, "Significant Features of the Growth of Mammalian Cells in Tissue Culture."

Dr. W. U. Gardner, Yale University, "Endocrine Factors in the Etiology and Pathogenesis of Cancer."

Dr. Alfred Gelhorn, Columbia University, "Endocrine Factors and Neoplastic Growth."

Dr. Leonard D. Hamilton, Sloan-Kettering Institute for Cancer Research, "Ionizing Radiation in the Genesis of Cancerous Change in Cells."

Dr. W. Stanley Hartroft, University of Toronto, "Etiology and Pathogenesis or Arteriosclerosis."

Dr. Charles Heidelberger, University of Wisconsin, "Chemical Inhibition of the Growth of Normal and Malignant Cells."

Dr. Sibley W. Hoobler, University of Michigan, "Hypertension."

Dr. Kurt J. Isselbacher, Harvard University, "Lipoproteins of Serum and Tissues."

Dr. John A. Jacquez, University of Michigan, "Permeability and Transport: With Particular Reference to Cancer."

Dr. Hilary Koprowski, the Wistar Institute, "Progress and Prospects of Viral Tumorigenesis."

Dr. Leopold G. Koss, Sloan-Kettering Institute for Cancer Research, "Cancer Cells in Light Microscopy."

Dr. Paul Kotin, National Cancer Institute, "Chemical Agents in the Genesis of Cancer."

Dr. Lloyd W. Law, National Cancer Institute, "The Role of the Thymus in the Reaction of the Host to Cancerous Cells."

Dr. William D. McElroy, the Johns Hopkins University, "Current Understanding of the Mechanisms of Cellular Differentiation."

Dr. Daniel G. Miller, Sloan-Kettering Institute for Cancer Research, "Immunological Defects in the Individual Afflicted With Cancer."

Dr. Lloyd J. Old and Edward A. Boyse, Sloan-Kettering Institute for Cancer Research, "The Antigenicity of Malignant Tumors."

Dr. Clarence P. Oliver, University of Texas, "Inheritance of the Tendency to Cancer."

Dr. Irvine H. Page, Cleveland Clinic Foundation, "The Kidney in Hypertension."

Dr. O. H. Pearson, Western Reserve University, "Endocrine Factors in the Etiology and Pathogenesis of Cancer."

Dr. Van R. Potter, University of Wisconsin, "Metabolic Abnormalities in the Host: Tumor Relationship."

Dr. J. H. Quastel, McGill University, "Transport Processes in Tumors."

Dr. Philippe Shubik, the Chicago Medical School Institute of Medical Research, "Summary of Chemical Carcinogenesis."

Dr. Chester M. Southam, Sloan-Kettering Institute for Cancer Research, "Reaction of the Host to Transplantation of Cancer Cells."

Dr. P. R. Srinivasan and Ernest Borek, Columbia University, "A Biochemical Basis for the Genesis of Cancer."

Dr. Eugene A. Stead, Jr., Duke University, "Physiology of the Failing Heart."

Dr. Daniel Steinberg, National Heart Institute, "Metabolism of Adipose Tissue."

Dr. C. Chester Stock, Sloan-Kettering Institute for Cancer Research, "Chemical Inhibition of the Growth of Normal and Cancerous Cells."

Dr. James F. Toole, Bowman Gray School of Medicine, "A New Cause for Stroke—The 'Steal Syndromes.'"

Dr. Arthur C. Upton, Oak Ridge National Laboratory, "Inhibition by Ionizing Radiation of the Growth of Normal and Cancerous Cells, and Ionizing Radiation in the Genesis of Cancerous Change in Cells."

Dr. F. Stephen Vogel, Duke University, "Contributions of Electron Microscopy to the Understanding of Brain Tumors."

Dr. Sidney Weinhouse, Temple University, "Metabolism of Neoplastic Tissues."

Dr. Jack P. Whisnant, Mayo Clinic, "Experimental Cerebral Infraction, Embolism and Hemorrhage, and Other Observations."

Dr. Abraham White, Albert Einstein College of Medicine, "Endocrine Factors in the Etiology and Pathogenesis of Cancer."

Dr. Irving S. Wright, Cornell University, "Etiology and Pathogenesis of Myocardial Infarction."

Dr. Donald B. Zilversmit, University of Tennessee, "The Metabolism of the Arterial Wall."

Dr. C. Gordon Zubrod, National Cancer Institute, "Physiology of the Individual Afflicted With Cancer (Anemia, Infection, and General Debility)."

The Subcommittee is also pleased to express special thanks to Dr. E. Cowles Andrus, Conference Director, and to the many scientists who prepared papers for the Second National Conference on Cardiovascular Diseases for making these papers available to the Subcommittee and the Commission to aid them in their deliberations and in the preparation of the source papers contained in this report.

The Subcommittee on Research,
Dr. Philip Handler, *Chairman.*
Dr. Frank L. Horsfall, Jr.
Mr. James F. Oates.
Gen. David Sarnoff.
Dr. Edward L. Tatum.
Dr. Efraim Racker.

ON THE CURRENT STATE OF BIOLOGY

The prime reason for hope that man may learn to control these dread diseases is the remarkable rate at which insight has been gained into the nature of life, the structure and function of living forms. One hundred years ago, no more was known of man than could be determined with the naked eye or a primitive microscope. Chemical examination of living tissue had only begun and the concept that all living forms are built of relatively similar "cells" had only recently gained acceptance. Since then, the pace of investigation has accelerated progressively so that, seen in retrospect, the total body of knowledge has doubled approximately every 10 years. The fund of knowledge descriptive of human biology today is about 1,000 times as great as it was in 1864.

It is almost 150 years since it was recognized that living organisms are constructed of aggregations of cells, each of which, in mouse, man, whale, or, for that matter, spinach, is usually about the same microscopic size and exhibits generally similar, grossly observable characteristics. Accordingly, it has been apparent that, if one is to understand "life," one must first understand the nature of its basic unit, the cell. Much remains to be learned; nevertheless, acceptable albeit only partial answers are currently available to most of the major questions which have been raised concerning the living cell:

Is there a functionally meaningful arrangement of subcellular structures? Of what chemicals are these constructed? How do cells manufacture the organic compounds of which they are composed from the materials available in their environments? How do cells maintain the constancy of their internal composition when bathed by a fluid of dramatically different composition? Why do cells need energy? How is useful energy made available to the cell by the chemical transformations undergone by carbohydrates and fats? If the cell is a miniature chemical plant in which hundreds of individual chemical reactions are constantly in progress, what factors are operative to assure that the totality functions as a harmonious, integrated whole? What are enzymes and how do they work? Where in the cell does the genetic information reside? What chemical structures serve as the repository of that information? How is the information encoded and how is it read out so as to control the structure and function of the cell? And how is this information duplicated perfectly during cell division?

Woefully incomplete but nevertheless rather satisfying answers are presently available to each of these, the cardinal questions of cell biology. Remarkably, to the extent to which these matters are presently understood, such understanding has virtually all been gained since World War II. It is precisely this glimmer of understanding, a preliminary description of the living cell in the language of chemistry, which constitutes the frequently cited "revolution in biology." And it is no exaggeration to state that our hopes that understanding and, hence, control of cancer as well as of most forms of genetic, metabolic, and infectious disease must derive from the answers to these questions if these hopes are to be realized.

Animals, including man, are highly organized structures, built of vast numbers of cells of many kinds. Most of these cells are quite remote from the exterior of the body and are dependent upon the circulatory system to provide a continuing supply of nutrients and oxygen while removing metabolic end products including carbon dioxide. Failure of the circulation, therefore, is incompatible with life.

The major single cause of such failure is atherosclerosis, the deposition of insoluble matter in the cells lining the inner surface of arteries, be they the coronary vessels which nourish the heart itself, the vessels leading to or within the brain, the aorta, trunk supplier of most of the body, or the vessels which nourish legs or arms.

The past 10 years have witnessed an ever more sophisticated attack upon atherosclerosis, an attack which includes such facets as: detailed examination of the manner whereby such fatty deposit in the arterial wall takes place; study of the factors which influence this process, particularly the amount and nature of the blood lipids; study of the relation of these factors to diet, age, sex, or endocrine factors; or examination of the physiology of the individual so afflicted, particularly the relation to blood pressure, kidney function, brain function, or cardiac function.

In parallel has come a diversity of therapeutic trials based on the limited understanding already at hand with respect to dietary control, drugs, and vascular surgery.

Neither the current level of understanding nor the available therapeutic procedures are adequate, at present, and endeavors in both directions must be prosecuted with great vigor if future generations are, hopefully, to be spared the pain of watching men and women destroyed during what should be their middle years. The success of this venture can, by no means, be guaranteed. That the goal is even conceivable in the minds of some reflects the confidence engenered by the ever greater understanding afforded by biomedical research in our time.

How has this come about? It is a truism of science that "one cannot do the right experiment until the right time." Two interpretations, both correct, may be placed upon this aphorism. In one sense, it implies that a given observation may defy interpretation or remain, seemingly, without significance until there has been gathered, by design or otherwise, enough related information to permit building the original observation into a logical conceptual structure. Indeed such an observation may be the very keystone of that structure but, unless there be some vision of the total structure, that keystone is devoid of meaning.

Consider, for example, the fact that the viral origin of a malignant tumor of chickens has been known for more than 50 years. In the minds of all but a few investigators, this failed to engender a general hypothesis concerning the viral origin of tumors until the following had occurred: (*a*) Neoplasia was found to be associated with viruses in a considerable number of additional instances. (*b*) Viruses were found to be built, in part, of nucleic acids, the chemical carriers of genetic information. (*c*) Studies of the relationship between the chromosomal material of bacteria and some of the specific viruses which infect them revealed the manner in which viral nucleic acids can enter a bacterium, become physically associated with the latter's own genetic material, be duplicated each time the bacterium undergoes division, and yet find no obvious "expression" until some untoward alteration occurs in the cell's environment, such as a change in temperature. Only then does the cell machinery normally responsible for duplication of its own genetic material embark upon the synthesis of many copies of the original invading virus. As these leave one cell, they invade other cells about them. These studies provided a model for the manner in which a virus, capable of subtly modifying the life of an animal cell so that it grows abnormally ignoring normal constraints, might persist in that cell undetected for a prolonged period, and, later, be found in all the cells of a growing tumor. (*d*) Other viruses were found to invade animal cells in tissue culture and to affect them much as could be predicted from the bacterial model. Only when all of this information was in hand was the stage set for a general theory of the viral origin of cancer—and, hence, its current testing—although the prime observations had actually been made two generations earlier.

The second sense in which the aphorism concerning the timing of experiments is correct relates to the availability of tools and techniques as well as the state of science and its own technology. In a general way, the further one departs from the immediate experience of man's own senses, the larger, more complex and more expensive is the equipment required for observation. This has long been apparent in our examination of the physical world. The more detailed the study of the remote vastness of the universe has become, the larger and more complex have become the telescopes and their spectroscopic cameras. Perhaps the ultimate in this art are orbiting telescopes controlled from the ground, the television cameras mounted in Ranger VII, and the huge earthblasted radiotelescopes of our time.

Again, as physicists have turned their attention penetratingly inward to the planetary electrons about the atomic nucleus and then to the subparticles of the nucleus itself, the finer and more detailed their examination, the larger and more costly have their instruments become, from simple electroscopes and X-ray tubes to cyclotrons, bevatrons, and synchrocyclotrons.

This process has been no less characteristic of the progress of biology. Within our lifetimes, the equipment of a typical biology laboratory has gone from crude light microscopes, test tubes, staining jars, and a museum to electron microscopes, ultracentrifuges, chemostatic growth chambers, hyperbaric operating rooms, recording spectrophotometers, and their like. In biology, as in physics, chemistry, geology, and astronomy, the more remote from common experience is the bit of information sought by an investigator and the more detailed and sophisticated the understanding which is hoped for, the more powerful and costly are the tools required to secure it. Until such tools are designed, produced and made available, it may well be impossible for even the most gifted investigator to attack, meaningfully, the problem to which he has addressed himself.

The accelerated growth of knowledge and understanding of living forms in our time, then, expresses both senses of the aphorism. Chemistry and physics have now developed to the point where they are applicable to biology. The bits and pieces of yesterday's biological understanding, which was largely descriptive, have slowly been welded into a more consistent, coherent and rational pattern which permits far greater understanding as well as prediction, and offers a guide to further investigation. Such investigation has become possible as the tools to do the job have been developed.

At this writing, there is reason to believe that this pace can continue to quicken if the American people will choose to support exploration of biology as they have supported exploration of the atom and of the universe. Then can we hope to attain the more detailed understanding of the living cell which may reveal the nature of the delicate change in the balance of cellular activities which is manifest as neoplasia.

Hopefully, also, there may be an unraveling of the next layer of understanding, the manner in which highly specialized cells such as those of the brain, kidney, or heart perform the specific functions which, uniquely, they contribute to the total living organism. In parallel we can hope to witness revelation of the manner whereby the nervous and endocrine systems coordinate and integrate the entire organism.

With such information in hand, incisive understanding of disease, i.e., disturbances of this orderly functioning, may be expected whereas without such information, sufficient understanding is inherently impossible. In such comprehensive biological understanding lies most of our hope for control of the wide variety of disease to which man is heir.

Withal a serious caveat, in two parts, must be placed before the American people. First, it must be understood that biomedical research is not simple: it is extremely difficult and treacherous. Even when dealing with minimally complex organisms such as bacteria, one must contemplate systems immeasurably more complex than those usually considered by the physicist, chemist, or astronomer. How much simpler is the nuclear chemistry of a remote star than the myriad aspects of a single cell composed of thousands of representatives of each of perhaps 2,000 different proteins, each of which, in turn, is a skein of several hundred amino acid molecules assembled in a specific and invariant order. And how much more difficult is it to ascertain, in reliable fashion, something of the biology of a given man in a clinical setting and then to establish whether that information is unique to that individual or true of men generally.

It is for this reason that guarantees or promises that, next year or that following, we shall understand cancer, or heart disease, or arthritis, or schizophrenia are both extravagant and irresponsible.

One day, we almost certainly shall possess such understanding. But, whereas cancer and heart disease have probably been with man since first he appeared on this planet, biomedical science is virtually a newborn babe. About 90 percent of all the biomedical scientists in history are alive and working today, and most of them began working after 1945. The studies in which they are engaged are immensely complex and difficult. Utterly desirable as attainment of their goals may be, their research, which can be facilitated and even somewhat accelerated, simply cannot successfully be hurried and none can say when the labor will be completed.

Second, whereas it is clear that our hope that means may be found to cope successfully with cancer and atherosclerotic disease rests upon our ability ultimately to wrest understanding of these disorders from unwilling nature, promises that such understanding will certainly lead to means of prevention or cure are equally extravagant and irresponsible and can only be viewed as a disservice to the American people.

To be sure, there are clues and leads at hand and others will surely suggest themselves as understanding increases. But it does not necessarily follow that these abnormal processes are truly susceptible of control and promises to such effect have no current validity. What can be promised, in clear conscience and good faith, is that if the effort is not made, there can be no hope of cure, no hope of prevention. If the effort is successful, then the boon to humanity will be beyond measure and whatever the cost, the price will have been low indeed.

ON THE NATURE OF RESEARCH

The term "research" is well entrenched in the American vocabulary, but is rarely given definition. Indeed, it connotes quite different activities within var-

ious spheres of endeavor. A student speaks of doing "research" when he goes to the school library to ferret out a piece of information. A manufacturer of consumer goods speaks of "research" as he gages public reaction to several possible new packaging forms of his product. And it is commonplace to cite the research and development component of the Federal budget, a phrase which, by its existence, implies some distinction or difference between the two processes, yet fails to indicate what that may be.

In a general sense, scientists use the term "research" to describe the process whereby questions are asked of nature, however the answers may be obtained, thereby enriching man's knowledge of the physical and biological world. The information obtained is usually recorded in one of the numerous scientific journals. The driving motive in performance of this activity is the interest and curiosity of the investigator.

"Development," in contrast, is the sum of those activities required to create some new product, such as microscope, electroencephalograph, hyperbaric chamber, or drug, utilizing information and understanding already in hand.

In the performance of research, the investigator must first clearly state what it is that he wants to know, e.g.: "How is it that, during embroyic life, cells with identical genetic information, assume quite different morphological (structural) and functional character?" or "Is there a relative mixture of dietary saturated and unsaturated fats which permits pleasant and adequate nutrition while keeping the serum cholesterol at a minimum?".
Those so engaged may ask, for example: "What are the attributes of a drug build a microscope with sharper resolution than those presently available?" "How can one build an instrument which, with a minimum of human attention, could precisely measure the concentration in a single sample of blood, or cholesterol, sodium, albumin, and insulin?" In each such development, in formulating the question, the questioner has a specific use in mind and hopes that the basic information required for his answer has already been provided by past research.

Admittedly, there is an intermediate zone of activity, frequently called applied research, in which those primarily interested in development find that the supply of fundamental information is insufficient to the task at hand and, accordingly, engage in what is quite truly basic research, but with the specific end in view of obtaining information applicable to a specific product or service. Those so engaged may ask, for example: "What are the attributes of a drug which could halt the growth of a tumor yet not interfere with the life of the normal cells of the body?" In many instances, research so conducted has proved to be a vital significance in understanding nature.

Although the approaches, techniques and even the problems undertaken may be quite similar, the chief difference between those engaged in "applied" and in "basic" research is one of motivational attitude. The latter know no stopping place in their quest for understanding; the former may halt when the specific information required for product development has been secured.

Within biomedical science, the lines separating research from development are not sharply drawn. Instead, a hierarchy of activities, each of which shades into the other, may be assembled somewhat as follows:

1. Fundamental inquiry into the nature of living cells.
2. Investigations of the integrated physiology of the mammalian organism.
3. Laboratory investigation of experimental disease states.
4. Clinical and epidemiological investigation of disease as it occurs in man.
5. Experimental pharmacology: Studies of the mechanism of drug action.
6. Synthesis and experimental trial of new drugs.
7. Development of instruments and procedures for use in investigation, diagnosis, or the clinical care of the ill.
8. Clinical trial of proposed preventive and therapeutic procedures or materials.
9. Clinical care by accepted procedures.

Each of these activities feeds the others at all times. For example, knowledge of the problems of the diabetic led to isolation of insulin, determination of its structure, and ultimate synthesis, while at the same time it set the stage for understanding of carbohydrate and fat metabolism. Hereditary diseases, "nature's experiments," have been of profound significance in elucidating the molecular basis for genetic mechanisms. Interest in the mode of action of antibiotics has resulted in elucidation of the structure and biosynthesis of bacterial cell walls. The search for effective cancer chemotherapeutic agents has

provided compounds which have been of great utility in the study of intermediary metabolism.

Far more frequently, however, studies of normal biochemistry and physiology have set the stage for understanding of human disorders. Research at the first three levels cited above has provided the tools and methodology as well as the conceptual framework which have permitted ever-increasing sophistication of clinical research and practice. Indeed clinical research cannot be mounted as an independent venture. Valuable and essential as it must be, it can progress no faster than the fund of general biological knowledge will allow.

A clear trail of research, commencing with seemingly abstruse and recondite studies of the most fundamental aspects of living cells and animals, can readily be portrayed for the actual development and current clinical use of each of the hormones, vitamins, antibiotics, cancer chemotherapeutic agents, and antiviral vaccines, as well as modern surgical techniques and diagnostic devices and procedures. To the extent that it is true that a random patient encountering a random physician today has an excellent chance of benefiting from this encounter, this fortunate circumstance is entirely due to the biomedical research hierarchy.

With respect to this functional hierarchy, then, one may properly ask, "Which of these activities presently limits progress in understanding and treating cancer, heart disease, and stroke?" Those who are most knowledgeable in such matters are agreed that this limit is imposed chiefly by the rate of progress in the first three activities cited. Difficult as are the problems of scientific communication, in every major medical center there are knowledgeable individuals who can and do rapidly translate the findings of fundamental research (activities 1, 2, and 3) into their clinical settings and apply them in clinical research (activities 4–8).

This Subcommittee and its consultants are unaware of any significant body of fundamental information which is stagnantly awaiting clinical application by competent practitioners. Indeed, it considers that the art of clinical investigation consists, in large measure, of a considered, deliberate judgment of the utility and applicability of such fundamental information and careful avoidance of the meaningless, feckless, and indeed harmful activity which is the consequence of ill-considered attempts to apply the inapplicable.

At all times, such basic and applied research are limited by the capabilities of the instruments and apparatus available. Development of a new instrument (cineradiography, electron microscopy, electron spin resonance spectrometry) invariably touches off a great wave of previously impossible research. Although there has been no major breakthrough accomplished by research related to cancer, heart disease, or stroke which currently awaits application, it is agreed that there is a lag between development of improved clinical procedures in the great medical centers and the general adoption of such procedures in medical practice. But, to reiterate, the most serious bottleneck, the major limiting factor, is the rate at which fundamental understanding is provided by research on the structure and function of normal organisms and coordinate studies of experimental pathology.

Accordingly, it is recommended that, whereas progress in understanding, and hence clinical control of cancer, heart disease, and stroke, is limited by the inadequacy of fundamental information concerning the structure and function of living organisms, every effort should be made to support and quicken the pace of research addressed to these problems.

ON THE CONDUCT OF BIOMEDICAL RESEARCH

Only yesterday, biomedical research was largely the province of the gifted amateur. Clinical research was conducted by physicians with no training other than that required to polish their clinical skills and with no tools other than those commonplace to hospital, bedside, or epidemiological practice. Study of pathology required little more than the dissecting table and the light microscope. Physiological and biochemical research were conducted in part by physicians, in part by scientists trained in the university graduate schools. The training of the former was utterly inadequate for this purpose and that of the latter was meager. And they worked in hospitals, medical schools, and occasionally in biology or chemistry departments or in a few research institutes.

These earlier circumstances have been altered dramatically. The likelihood that the most gifted amateur can contribute significantly to the progress of biomedical science without having invested in years of training specifically tailored to his research aspirations and without the complex paraphernalia of the modern

biomedical laboratory has been reduced almost to zero. If we may quote a distinguished English scientist, "Alas, the day of the gifted English amateur is over."

Once the avocation of an occasional physician whose primary responsibility was medical care or that of an occasional professor whose primary responsibility was instruction of the young, research today must be a major, if not the major, responsibility of those who are so engaged. Moreover, the investigator cannot merely be a graduate of a medical curriculum devised for the education of practioners; he must also have devoted additional years and effort to acquiring the knowledge, lore, and skills of one of the research disciplines as well as the habits of mind characteristic of the investigator.

This is patently the case for the biochemist or microbiologist but is no less true for the clinical investigator. The latter must not only be skilled as a physician, he must also bring to bear all of the concepts and technics of the discipline most suitable to his problem. In dealing with cardiovascular disorders, he should be competent as either a physiologist or biochemist. In seeking understanding of the fundamental basis for cancer, he has no choice but to approach the problem as a biochemist, cytologist, microbiologist, or geneticist. However he may have secured the additional 2 to 4 years of training required—and there is no lack of controversy concerning how this should best be done—there can be no shortcut if ultimately he is to warrant the support of society as he pursues his investigations.

Moreover, if indeed he is to be successful, he requires about him a suitably equipped laboratory, a coterie of technical assistants, a substantial sized peer group with whom to discuss problems of common interest, other colleagues equally proficient in related disciplines, and a supporting organization which can provide diverse services such as accounting, purchasing, animal keeping, a library, supplies of consumable items, instrument shops, and sterile glassware.

Accordingly, it will at once be apparent that the pool of investigators and of institutions qualified to undertake programs of fundamental applied or clinical research is limited indeed. By far the greatest concentration of such individuals is to be found in the faculties of the medical schools and the graduate schools of our great universities and a lesser pool in a restricted number of research-oriented hospitals and research institutes. Research directed toward the development of new drugs (categories 5 and 6 of the hierarchy cited earlier) is largely conducted in industrial laboratories or in research institutes especially organized to this end.

Within the university, the most powerful and successful arrangement presently conceived for the prosecution of research consists of a professor and his group of fellows and graduate students. They combine the wisdom and cunning of experience with the imagination, enthusiasm, and energy of youth while leaning on all the other resources of the institution in which they find themselves. For them, research and education are the same process and their presence and activity enriches the experience even of those students, fellows, interns, and others who are not directly engaged in the research enterprise. In those hospitals and research institutes which lack a university affiliation but which enjoy success in biomedical research, again the critical elements are found to be a seasoned investigator surrounded by younger associates almost exclusively engaged in research, a critical mass of peer colleagues in similar or related disciplines, and a sufficient supporting organization.

The research upon which this minimal research unit, the seasoned investigator, and his immediate associates, may be engaged is dictated, in the last analysis, by the investigator's own interests and motivation. He must be free to follow his own bent, to identify what he considers to be the major questions which should be addressed to nature, and for which the times permit possibility of successfully seeking an answer.

If such studies properly fall in categories 1 to 3 as defined above, they may equally well merit support from an agency devoted to furthering understanding of radiation effects (the Atomic Energy Commission), cancer (National Cancer Institute or American Cancer Society), or hereditary disorders (National Institute of Arthritis and Metabolic Diseases). Indeed, such an investigator may actually, and properly, we supported by each of these sources, providing the total of such support is compatible with his competence and need.

To be sure, the consequence of this permissive system is support of more than one investigator in pursuit of the same goal. This does not constitute unnecessary duplication. It is essential to the process. The titles of their research grant applications may be identical, but also invariably the detailed approach will be different. And none can predict, in advance, which approach will find

success. Moreover, one can be confident that there will be continuing communication among those so engaged, to the mutual benefit of their endeavors.

No scientist wittingly undertakes to pursue the same problem in the same manner as another. He knows that the end product is publication in a scientific journal, a journal which will not accept for publication a second paper describing exactly the same findings obtained in the same manner. The scientist's status is determined by his peers, and there is no reward for "me-tooism." Thus, except for occasional accidents, the ethos of the scientific community is safeguard against real duplication of effort.

These thoughts must be considered apart from the essential, deliberate repetition of the work of others which is an integral part of the scientific process. No finding may be considered valid until it has been confirmed in another laboratory; no scientist will undertake to build upon the work of others until he has confirmed their findings for himself, else vast amount of effort may be wasted.

It is appropriate here to comment upon another aspect of alleged duplication, the phenomenon noted above wherein several agencies, both governmental and private, may undertake support of similar areas of research. This is not unnecessary duplication but a desirable overlap of interest. Such overlap is minimal as the research is strictly related to the mission of the agency; e.g., cancer chemotherapy or vascular surgery, and entirely understandable and necessary when considering the most basic aspects of biology, the aspects of cellular biochemistry or organ physiology. Moreover, as in science generally, it should be a matter of policy that research be supported by a variety of agencies rather than by a monolithic department of science or a single national institute of health.

The present structure of mission-oriented agencies, each aware of its prime responsibility and each acutely aware of the necessity for much more fundamental knowledge if it is to achieve its mission, is efficient and effective as a means of progress while, at the same time, it provides a series of juries so that a scientist whose ideas have been denied support by one group can appeal, as it were, to another, thereby assuring that neither the prejudices of any one group, nor personality conflicts, will impede progres.

Within the intramural research program of a mission-oriented research institute; i.e., an institute devoted to cardiovascular disease or cancer, research is somewhat more programatic. Within the walls of a single such institute, by intent, individuals will engage, for example, in experimental vascular surgery, testing of drugs which may lower the blood pressure or the blood cholesterol level; examining the metabolic activities of adipose tissue or the muscular tissue of the heart; attempting to correlate the electrical signals of the electrocardiogram with metabolic events, in the heart, which must generate those signals; and studying, at the enzymatic level various aspects of the metabolism of carbohydrates and fats. This is a balanced program, deliberately arranged. But it is not foisted upon the investigative staff. Those responsible for the institute, having outlined the nature of such a balanced attack on the problems of vascular disease, then examine the scientific community and, if possible, recruit scientists with these research interests. Much as in a university or medical school, the institution must provide freedom and opportunity if the research program is to be successful.

One final general aspect of biomedical research need be noted. Derek De Solla Price has called attention to the differences between big science and little science. It is little science which predominates in biomedical research today, the thousands of research projects each of which involves a principal investigator, his senior associates, fellows, and graduate students. The total cost of each such project depending on its scope, varies from $5,000 to $500,000 per year with perhaps 90 percent of all projects costing $15,000 to $100,000 per year. Little science then is the classic approach of university science and, within biology and medicine, is also the main theme in research institutes as well. Big science which originated in the conduct of physical research, can be identified, albeit rather arbitrarily, as any project which, by its nature must cost in excess of perhaps $500,000 per year, a fact which reflects either (1) that central to it is a large, complex and extremely expensive apparatus of which our Nation has but a few and which can and must serve the needs of a large group of investigators or (2) a problem of such nature that research devoted to its solution demands a large group effort and an extensive physical facility.

It was the large instruments which engendered big science in high-energy physics (reactors, accelerators) and in astronomy (optical telescopes, radiotelescopes)

but these are rare in biology or medicine. Originally, we became aware of big biological science for the second reason. Thus, the early programs of the Atomic Energy Commission at Oak Ridge and Argonne, designed to ascertain the effects of ionizing radiation of varying energy levels in single or multiple doses, whole body or restricted to a single organ, in young or old animals, as acute or long-term effects, predictably demanded huge numbers of animals, many technicians, and a wide variety of scientists. An endeavor of this nature was foreign to the academic world and, accordingly, the Oak Ridge, Argonne, Hanford, and Los Alamos biological laboratories were brought into being.

It is imperative that projects which are, inherently, big science, be recognized as such and be implemented accordingly. The pattern of the Biology Division of the Oak Ridge National Laboratory can serve as a successful model: a large core program, surrounded, as it were, by competent scientists who approach the central problem by diverse means. The major effort at cancer chemotherapy is of this nature, demanding biochemists, organic chemists, pharmacologists, biological screening procedures and, finally, clinical testing. Certain large-scale efforts at clinical trial of therapeutic procedures in vascular disease similarly must be conducted as packaged, big science.

Increasingly, biomedical research will be dependent on relatively large resources: a primate colony, a large computer, or a wholesale attempt at the study of human genetics. As such opportunities are manifest, it is imperative that they be recognized as such, funded as such, and so located and managed as to maximize their utility and success. Indeed, in general the corollary is also valid; halfhearted funding of such endeavors in piecemeal fashion is both inefficient and wasteful.

ORGANIZATION AND SUPPORT OF BIOMEDICAL RESEARCH

The organization and support of biomedical research in the United States have developed as a patchwork over a relatively short period. As we have briefly seen, biomedical research is conducted in medical schools, graduate schools, industrial laboratories, and private and Government research institutes. The total annual cost of this activity now approximates $1 billion which is provided by university endowments, State legislatures, individual and corporate gifts, philanthropic foundations, public voluntary agencies, and the Federal Government. Of these, the last now provides somewhat more than half of all the funds employed. This structure which rather awkwardly expresses one of the major aspirations of the American people, the prevention and alleviation of disease, functions rather clumsily, yet the extent and manner in which it should be altered are questionable.

In other countries (Germany, England, France, the Soviet Union), the research talent of the country is virtually all sequestered in especially organized research institutes, largely under governmental auspices. Several major criticisms may be leveled at this arrangement. Perhaps most serious is the removal of research personnel from the educational process. No more distinguished laboratories may be found in the world than the various units supported by the Medical Research Council in England. But these units and their outstanding staffs are at—not of—the universities where they are located, and the only "students" to be found there are advanced postdoctoral fellows. How much more could be contributed by these giants if bright young minds could be exposed to their incisive and imaginative thinking.

Second, such institutes frequently develop and cultivate a "cult of personality." They tend to be dominated by their directors and young, imaginative energetic investigators may be subservient and deprived of opportunity and self-expression. This stands in direct contrast to the typical American academic department wherein the chairman is chief administrator but not scientific director and his academically junior colleagues are free to follow their own research bents and seek financial support for their own enterprises.

The current position of leadership of American biomedical science derives largely from this fact, together with the availability of the supporting funds and the growth of a supporting industry which provides chemicals, apparatus, and equipment. However, that the "cult of personality" is not an inescapable, intrinsic feature of a research institute divorced from the educational enterprise will be apparent, for example, from an examination of the intramural program of the National Institutes of Health. The table of organization of each Institute makes provision for substantial numbers of independent investigators at varying stages of development and responsibility and the freedom of each

to raise his own questions and pursue the answers has been jealously safeguarded.

The diversity of both our research institutions and of the sources of their supporting funds should be considered one of our great national assets. The variety of institutional character has permitted "fitting square pegs into square holes." The investigator who functions best as a lone wolf can find a milieu in which this is possible. Those who require stimulation from repeated contact with their peers—by far the greatest number—gravitate to the appropriate institutions. Those who wish also to teach can do so while others, who so prefer, can avoid this function. Some can engage in full-time research; others divide their efforts variously among clinical care, teaching, and research. This tailoring of opportunity to personality possesses obvious advantage and should be maintained at all cost.

Another aspect of our system is noteworthy. At this time, our spectrum of organization appears to extend from the completely private institution through State institutions to fully Federal organizations. But the differences are more apparent than real. Most non-Federal institutions engaged in research today employ their own funds largely as a form of entrepreneur capital. Private and State funds are used for construction only to the extent dictated by current "matching" policy. Salaries are assured only to a cadre of tenured staff. Virtually all operating funds, for equipment, consumable supplies, research associates and technicians, or travel, must be procured by the individual investigators from external sources, most frequently the Federal Government.

Clearly, this mode of operation offers several great advantages: maximal use of the institution's own funds; large-scale use of Federal funds without Federal control; opportunity for even the youngest qualified investigator; and assurance that, in determining the fact or level of his financial support, each investigator is judged by a jury of his peers assembled from other institutions, each of whom is truly competent to make the required scientific judgment and none of whom are rivals, on the local scene, for prestige, salary, space, or influence.

But there are also grave disadvantages: instability of funding with consequent apprehension in the minds of all so employed and the all too real temptation for the investigator to address himself to studies which promise a quick return rather than the difficult, long-term investigations of which he may dream; the increasingly burdensome tasks of application, reporting, and recordkeeping (see the treasurer's report of any major university for the number of individual research grants in an active department of medicine or biochemistry); an increasingly cumbersome system for evaluation of research grant applications, involving the time and efforts of thousands of investigators and staff; considerable difficulty to the institution in embarking upon new research ventures or areas of research; and the failure, for lack of appropriate funding, of most institutions to develop and maintain supporting organizations sufficient to their own research enterprises. The latter is a serious handicap and reflects the historical accident whereby universities, for example, have entered the modern era of research by a series of small steps rather than by deliberation and commitment to a responsibility which formerly was trivial in comparison with their educational responsibilities.

Although research has been conducted in American universities for about 150 years, until only recently the trustees, faculty, and public generally regarded instruction as the prime, unrivaled function of the university. From 1920 to 1940, the pace of academic research was increased substantially but it was World War II and its aftermath which witnessed the major development of universities and their medical schools as centers of research, with common recognition of the public expectation that universities should serve not only to store and transmit knowledge but to generate new knowledge. With the recognition that a vigorous ongoing research program enriches the teaching program at the same time that inquiring young minds enhance and stimulate research, the university became the chosen major instrumentality for investigation in the United States. The means by which this was accomplished was permissive acquiescence by the university administration as members of its faculty seized the opportunities afforded by the grant-in-aid programs of foundations, voluntary agencies and the Federal Government.

But today that system is in crisis. While the American people, through the voluntary agencies and the Federal Government, wish to prosecute biomedical research with all the vigor at our command, there remains insistence that the university be a financial partner in the enterprise. And this, at a time when

the financial resources of the university are stretched to the breaking point by its instructional responsibilities. It is therefore financially impossible for the university to respond to both calls in the manner expected, or indeed as it should prefer to do.

Thus, never having deliberately embarked on a large-scale research venture, no university has planned or provided the ancillary supporting organization which is to be found in every major research institute and industrial laboratory. With a salary structure tied to its educational responsibilities, no university has the means to expand the size of its faculty so as to meet its teaching responsibility while maximizing its research enterprise. Few universities can create, out of their own resources, new research groups in such scientific areas as biometry, biophysics, or genetics, for example. No university, unassisted, can afford to bring into being a multidisciplinary group which will address itself to the problems of vascular disease or cancer. Few can afford the salaries of research professors relatively free of responsibility for undergraduate instruction. None possess hidden assets or a capital reserve with which to bring into being or maintain a computer center, a bioengineering group, or a colony of esoteric animals maintained for research purposes. Hard pressed to provide dormitories for an ever increasing horde of freshmen clamoring for admission, where is a university to find the funds to use for matching a grant to assist it in construction of a new or expanded medical research building? The Subcommittee therefore submits that—

Whereas at this time, the financial resources of the universities are insufficient even to meet their educational responsibilities; and

Whereas no program of direct Federal support to higher education is currently available; and

Whereas it is the avowed intent of the American people to have biomedical research prosecuted in as vigorous a manner as our national pool of trained talent will permit; and

Whereas universities, their medical schools, and various research institutes are the instruments most suitable to this task; and

Whereas from their own resources, universities cannot underwrite the large costs of major research programs, including: salaries of senior investigators in numbers greater than those dictated by the basic educational programs of these institutions; creation of new disciplinary departments or of interdisciplinary research groups; establishment of adequate research supporting organizations; or construction of necessary new physical facilities; and

Whereas if the tempo, magnitude, and scope of the biomedical research enterprise are to be expanded in a manner compatible with our potential national capability, funds greatly in excess of those currently available will be required.

It is, therefore, recommended that Federal and other agencies in support of biomedical research in universities and research institutes identify, recognize, and provide the total direct and indirect costs of such research in an amount commensurate with our national capabilities.

It would seem, therefore, that the time is at hand for a serious examination of our national program for the organization and support of biomedical research. The present patchwork should be consolidated into a more workable mechanism while retaining the highly desirable features which have facilitated the great strides made in the recent past. We must retain the diversity of institutional character, tighten the coupling between research and education, maximize opportunity for talented young investigators, and increase the number of institutions in which truly significant research is conducted, while reducing current administrative burdens, arranging for adequate supporting organizations, and assuring both the institutions and individual investigators of stable, relatively long-term support.

To this end, the Subcommittee on Research offers a series of specific recommendations which are presented below.

Role of individual research grants

The Subcommittee considers that the individual research grants program, which entails a relationship between the Government and each individual investigator, is the heart of our national research endeavor and responsible for the preeminence of American biomedical science. Regardless of all other considerations and funding devices, the subcommittee recommends that the national

program of individual research grants be continued and expanded commensurate with the pool of competent, training investigators.

Funding devices in support of research

The Subcommittee has considered various alternate schemes for the funding of biomedical research and concluded that the present diversity of funding devices, which came into being in response to expressed needs, remains appropriate to those needs. Rather than single, large packaged grants to each university or research institute, the Subcommittee recommends that Federal agencies in supporting biomedical research continue to do so by diverse means including individual research grants, fellowships, career awards, training grants, center grants, general research support grants, construction grants, etc., developing new modes of support as these are identified and found to be suitable.

Training and support of investigators

While requiring facilities, apparatus, assistants, etc., research is conducted, essentially, by the minds of trained scientists. It is in the national interest, therefore, to insure a continuing and expanding supply of biomedical scientists adequately trained to insure the quality of biomedical research tomorrow, scientists well grounded in biology and medicine, knowledgeable in chemistry, physics, and mathematics, alert to the concepts and methodology of the biological research disciplines.

(*a*) The funding instrument most suitable to the task of assisting the university, or other research-educational organization, in providing such advanced training is the "training grant." This instrument permits local identification of young men and women with research potential, provides them with appropriate stipends, and, equally important, by diverse means assists the institution to improve the quality of research training while enlarging its capacity for so doing. The National Institutes of Health (NIH) program of training grants has resulted in a pronounced upgrading of research training in the last 5 years. Its continuation and growth is vital to the entire biomedical research enterprise. Indeed, failure at this time to expand such training support must, automatically, limit the magnitude of the entire national biomedical research program in subsequent years.

Accordingly, it is urgently recommended that the national program of research training grants should be enlarged and expanded at a rate commensurate with the training capacity of organizations so engaged and the national pool of young investigators desirous of such training.

(*b*) The basic curriculum by which medical schools educate physicians and which leads to the award of the M.D. degree is decidedly insufficient as a training for an investigative career. Recognizing this fact, universities have developed a variety of mechanisms for enriching the experience of potential physician-investigators. The most formal of these lead to the award of both the M.D. and Ph. D. degrees; other programs provide essentially similar training but lead to the award of only the M.D. degree. In either case, the student so engaged must devote several additional years to this experience, as well as satisfy the requirements for the medical degree, undertake several years of postdoctoral training, and perhaps serve his obligated military experience before actually embarking on a research career. This is demanding not only of his time but of the financial resources of his family. Without additional support, clearly, the pool of clinical investigators becomes limited to those whose families possess the financial resources to underwrite this lengthy and expensive program.

Accordingly, it is recommended that a continuing national program should be developed to provide full financial support to those qualified students who aspire to an investigative career in medicine and for whom the institution provides a clearly defined, special program which combines medical education with research training.

(*c*) The budgets of universities are rather closely tied to their educational responsibilities; the number of continuing faculty positions provided by the budget, therefore, is directly related to the number of students and courses to be taught. Although the university is the best setting known for the conduct of biomedical research, there is no necessary relation between the scale of the educational and research enterprises in a given institution. In view of the financial straits of the universities, they simply cannot be expected to fund staff positions in numbers greater than that required by their instructional

function. If, therefore, the biomedical research endeavor is to [illegible] the magnitude to which we aspire, it becomes imperative that a [illegible] be funded by external means, utilizing funds appropriated in support of research. Moreover, the positions so created must be sufficiently stable as to permit pursuit of long-term inquiries, undisturbed by the thought that the investigators' salaries may disappear in the next fiscal year.

A variety of mechanisms to this end have presented themselves, e.g., inclusion of stable salary support in training grants; a contract between the granting agency and the university whereby, on request, the agency automatically provides some fixed proportion (e.g., 50 percent) of the salary of a principal investigator after award of a research grant, inclusion of staff salaries in general research support grants, continuation and expansion of the program of research career awards. Each device has merit, each provides a partial solution to the problem.

Accordingly, it is recommended that Federal agencies in support of biomedical research should proceed rapidly and vigorously to establish mechanisms to expand the number of reasonably stable, continuing positions for responsible investigators in institutions which sponsor programs of biomedical research.

To this end, it is further recommended that, at an early date, officials of Federal agencies in support of biomedical research convene a conference of representative officials of institutions engaged in such research to explore and determine those mechanisms which appear most satisfactory as a means of expanding the number of the aforesaid positions.

General research support grants

Several years ago, it was recognized by the Congress and by the administrators of the National Institutes of Health and of the National Science Foundation that the pattern of funding of research generally and of biomedical research in particular had failed to provide opportunity for the university to embark on wholly new research ventures, to develop appropriate organizations in support of the research enterprise, to underwrite initial exploration of a research idea which is, as yet, insufficiently grounded to warrant major support in the usual manner, or to recruit new staff in research areas unrepresented in the present organizations.

Both agencies developed a program of institutional general research grants, the amounts to be related, by formula, to the magnitude of the research enterprise at each institution. Within the institutions eligible for such awards, there is virtually unanimous enthusiasm for this program and its accomplishments.

With the passage of time, however, the magnitude of such awards has not been increased in the manner authorized by the Congress although, as suggested earlier, the need is ever greater. Hence, universities cannot readily undertake new ventures as had been hoped. Scientists complain increasingly of the serious inadequacies of the supporting organization and services in their institutions which might otherwise facilitate and expedite their research and, for lack of which, they are increasingly forced to devote their energies to activities better left to others.

As described earlier, present funding devices have not permitted expansion of the continuing research staff. Moreover, whereas an increasing fraction of significant biomedical research is done in graduate departments outside the schools of medicine, dentistry, and public health, such activity is not reckoned in the present computation by NIH and these graduate schools do not participate in the desirable features of the general research support program of this agency.

Accordingly, it is recommended that—

(*a*) The magnitude of the general research support grants programs of Federal agencies should be expanded as rapidly as possible, at least to the full extent originally authorized by the Congress.

(*b*) Graduate schools and departments engaged in biomedical research supported by grants from the NIH should be included in the general research support program.

(*c*) General research support grants should be awarded in two categories:

(i) Unrestricted funds to be devoted to research as at present, and awarded on a formula basis.

(ii) Negotiated awards, based on documented applications, to defray the direct and indirect costs of the supporting organization and services

provided by each institution to facilitate the conduct of research and which are not ordinarily chargeable as indirect costs.

Libraries

The end product of a research project is publication of the findings and conclusions in an appropriate medium, i.e., a medical or scientific journal or as a monograph. Such publication constitutes the enduring record of research in progress. It is available to other investigators engaged in immediately related research and to all others who can utilize the information so provided. Hence, it is not archival; it is the living means of general communication within the scientific community.

The library, then, is an indispensable research tool and must be as readily available as microscopes, spectrophotomers, or experimental animals. With the increase in scale of biomedical research has come, ipso facto, a torrent of publication which exceeds the capacities of our libraries and librarians while demanding ever-increased use of the library by those engaged in research. Nevertheless, despite the fact that the results of research crowd the shelves while investigators crowd the stacks and reading rooms and badger the librarians, no ongoing program provides support for this endeavor. Consequently, biomedical library services the country over are deteriorating. Neither the National Library of Medicine, the National Institutes of Health, nor the National Science Foundation presently operates a program in support of the beleaguered libraries despite the fact that such support, in good conscience, should be a legitimate charge against funds appropriated in support of research.

The inadequacy of payments for indirect costs precludes use of such funds for libraries. Meanwhile, the institutions engaged in biomedical research rarely can obtain private funds for such purpose.

Accordingly, it is recommended that a national program in financial support of biomedical libraries should be initiated at the earliest possible date.

It is recognized that much effort is currently invested in studies of information retrieval systems based on computer operation. The present recommendations are not intended to delay or substitute for such activity. However, although the Subcommittee cannot prognosticate the form which scientific communication will take after 1980, it is convinced that the present form of the biomedical library will, nevertheless, retain its utility and vital significance for many years to come.

Centers and institutes

The Subcommittee has carefully examined the current organization of biomedical research and compared this with needs, opportunities, and capabilities. On the one hand, it recognizes the need for an increasing number of research centers, i.e., organizations dedicated to a large task, a research problem which existing institutions are unlikely to undertake, or a special resource which properly can be categorized as "big science," and which serve national or regional requirements. At the same time, it considers that whereas educational institutions, even in their present format, are excellent locales for the conduct of "little science," rarely do they take maximal advantage of the opportunity and occasional necessity for multidisciplinary research. Accordingly, two sets of recommendations are offered in this regard.

A. Specialized national or regional research centers

The Subcommittee recommends that the current program of specialized research and resource centers of the National Institutes of Health be expanded and extended as need arises and opportunity affords. Certain instances can readily be identified.

i. *Primate centers.*—These represent a relatively new and essentially, as yet, untried venture. Those already authorized should be fully funded and supported; new centers should be created only as need arises.

ii. *Other animal centers.*—The Subcommittee is aware of the need for a variety of special animals not presently available in quantity. Attention is, therefore, directed to the possible need for centers for the maintenance and breeding of genetically standardized, highly inbred, strains of dogs, rabbits, and other small animals, and the responsibility to be alert to other such requirements. If such centers are created, the pattern of university management developed for primate centers seems eminently acceptable. At least one center for maintenance of colonies of exotic animals with unusual deviations of the cardiovascular system and another for maintenance of animals with unusual malignancies might

well be of service to the entire program of research in cardiovascular disease and cancer.

iii. *Toxicology centers.*—A serious lack in our Nation is a center or centers devoted to long-range study of toxicology, the effects of herbicides, pesticides, new and widely used drugs, rare and trace elements, as well as common chemicals. The critical need for such information has repeatedly been documented, perhaps most clearly in a report of the President's Science Advisory Committee.

In the present context, such a need will continually arise as new, promising drugs are introduced for cancer and cardiovascular therapy. But the philosophy, technics, and facilities required for these therapeutic agents are essentially identical to those necessary to acquiring sufficient information concerning the acute and long-term effects of the diverse organic chemicals which are introduced into man's environment for other reasons. Each year in which we lack such information may, conceivably, bring us that much closer to a national disaster.

The intrinsic nature of the required effort is truly "big science." Several centers, appropriately organized, could be established in one of several patterns, industrially managed (e.g., Oak Ridge), managed by a consortium of universities (Brookhaven), on a university campus (Argonne), part of an intramural program of the National Institute of General Medical Sciences, or become a cornerstone of a new National Institute for Environmental Health. But the need is urgent and, accordingly, it is recommended that several national centers for toxicology be established at the earliest opportunity.

iv. *Bioengineering centers.*—It was stated earlier that each major new instrument provided to the research community has resulted in a wave of previously impossible research. The need for such instrumentation is by no means satisfied, and a great variety of opportunities would be afforded were a group of competent biologists, physicists, and engineers to engage in collaborative development.

Accordingly, the Subcommittee recommends that there be brought into being several centers for bioengineering. The most likely pattern for success is considered to be a center under joint auspices of a medical and an engineering school. The number of such centers would best be established by experience. At this time, it would seem that perhaps half a dozen such centers, each with a complement of 15 to 20 responsible scientists would be commensurate with national need. As national expenditures for the defense and space efforts decline there should be released more than sufficient numbers of qualified physicists and engineers to staff such centers.

As an incidental but extremely important function, such centers could properly undertake to train substantial numbers of instrumental technicians and service personnel as well as technicians skilled in specific aspects of biomedical technology, such as electron microscopy, ultracentrifugation, or radioactivity determination.

v. *Microbiological resource centers.*—Much current research demands the availability of large quantities of a given species of bacterium, of a given animal cell type, or of viruses which infect them. Development and management of a center which could provide animal cells or their infecting viruses seem desirable, but unduly costly at this time. However, a resource center, analogous to the New England Enzyme Center, which could undertake to produce on request large quantities of bacteria or bacterial viruses would provide an invaluable service, and it is recommended that at least one center for microbial production be supported.

vi. *Center for human genetics.*—The last 15 years have witnessed a remarkable growth of knowledge of genetic mechanisms. Dozens of genetic markers have been identified in human beings. Yet there has been no systematic large-scale approach to human genetics. The Subcommittee suggests that the time may be apropos for creation of a National Center for Human Genetics which would include a computer-based tabulating center to make possible diverse correlations which are presently impossible.

Accordingly, the Subcommittee recommends that there be convened a planning conference on human genetics to explore, in depth, the desirability and feasibility of establishing a National Center for Human Genetics.

vii. *Information retrieval centers.*—As suggested earlier, the Subcommittee is in complete sympathy with all attempts to expedite information retrieval. As a corollary to the medlar system, it is suggested that retrieval centers of limited capability and specialized interest be established. One such—for human genetics—was cited above. Additional limited and hence, hopefully manageable centers might include toxicology, properties of drugs, physical properties of organic compounds.

B. Multidisciplinary university-based research institutes

i. Clinical research centers, located at medical schools and other medical research institutions, of both a general and categorical nature, have already demonstrated their inherent merit. Such clinical research centers should be continued and the number increased as new medical centers truly become eligible. In no instance, however, should the magnitude of such a center be increased without unusually close examination of the capacity of the institution to make use of such resource.

ii. *Multidisciplinary university-based research institutes.*—Repeated reference has been made to the inability of universities to mount multidisciplinary research programs or to found new disciplinary research departments, largely because their organization and budget are rigidly related to their educational responsibilities. Confronted with the need to assure that each discipline and subdiscipline of biological science is represented on the faculty, and hence, presented to its students, no university can also arrange, from its own resources, to gather and house a multidisciplinary group which, in concert, will attempt to ascertain how an enzyme works, or the fundamental nature of the cancerous change in cells, or a correlation between the metabolism of the heart and the signals evident in the electrocardiogram, etc.

It is the considered judgment of this Subcommittee that the most promising means of expanding the national biomedical research effort, particularly that directed at cancer, heart disease, and stroke, is the establishment, at qualified institutions with a record of research productivity, of fully supported biomedical research institutes.

The scope and mission of each such institute would be determined locally. It is anticipated that some institutes might be of a general biological character (e.g., cell biology), some restricted to a more limited area (e.g., genetic mechanisms, macromolecular structure, mechanism of enzyme action, cardiovascular physiology, or neurophysiology), whereas others would be distinctly categorical (e.g,. cancer, stroke, cardiovascular disease, metabolic disease, or allergy and immunology). To implement such a program requires that each such institute be fully funded, including construction of the necessary physical plant. Were both supporting funds and physical facilities for these institutes available, the national capacity to mount this program would then be limited only by the availability of sufficient numbers of competent, trained manpower.

The appended budget projections seem commensurate with the current and expected pools of appropriately trained scientists from our national educational enterprise. In the firm belief that the coupling of research and education enriches both, the Subcommittee urges that the senior staff of such an institute be members of the university faculty, expected to participate in the normal academic program and to welcome into their laboratories both graduate students and postdoctoral fellows.

No device known to this Subcommittee offers equal opportunity for dramatic expansion of the national biomedical program while insuring its quality yet without draining teacher-investigators from the educational enterprise.

Accordingly, it is strongly recommended that, at the earliest opportunity there should be brought into being a national program of university-based biomedical research institutes.

iii. *Computer centers.*—It is abundantly evident that computer technology will shortly pervade much of biomedical research. Every institution with an ongoing research program of sufficient magnitude will soon be seriously handicapped if it lacks at least a minimal computer of a configuration appropriate to its requirements since such technology adds a new dimension to many aspects of biomedical research; e.g., cardiovascular physiology, and cencer therapy. Since large computers invariably exceed the ability of any one research group to employ its capacity, computers, except in unusual instances, should be provided as institutional resources.

Centers of excellence

The recommendations above would, if implemented, permit a marked expansion in the magnitude of the national biomedical research program while insuring its quality. However, as in almost all such programs, there is the inbuilt property that, of necessity as one insures proper use of public funds, the "rich automatically get richer." A few years ago, the Seaborg report of the President's Science Advisory Committee noted the increasing tendency to place research and training funds in a restricted number of institutions and suggested that, as a means of expanding the research base of the Nation and also achiev-

ing more equitable distribution of research funds without diminution in the quality of the research effort, special assistance be provided to a group of perhaps 20 institutions of demonstrated potential so that they might achieve the same standards of research performance as the present topmost 20 institutions. This suggestion will shortly be implemented by the National Science Foundation in its science development program whereby each year a few schools will receive a single "no year" grant of no more than $5 million to support the school's own program of science development and research improvement. However, for this program the NSF can look forward only to an appropriation of about $28 million per year, hardly sufficient to this end.

Accordingly, it is recommended that the NIH should enter into a cooperative arrangement with the NSF in its science development program in which the NIH assumes responsibility for the biomedical aspects of such a program.

Management of Government-university relations

The Subcommittee shares with the entire scientific and medical community concern for the threat posed to the research enterprise by an evermore burdensome enmeshment of research in bureaucratic regulation both by the Government and by the universities. It shares the belief that this situation can be relieved only by transfer of such responsibility to university administrations accompanied by full acceptance of such responsibility.

A set of guidelines and principles with respect to university-Government relationships has been presented by the National Academy of Sciences, Committee on Science and Public Policy in the report entitled "Federal Support of Basic Research in Institutions of Higher Learning." This Subcommittee on Research warmly endorses the recommendations presented in that report.

Animal care

An ample supply of healthy, humanely treated animals is a sine qua non for biomedical research. To the best of its ability and the extent permitted by its resources, every responsible institution attempts to meet this need. Hopefully, sufficient funds will be provided to permit each institution to bring operation of its facilities to the quality all agree to be desirable. In this regard, however, it is noted that there is an acute shortage of properly qualified and trained veterinarians to assume responsibility for such animal facilities.

Accordingly, it is urgently recommended that authority and funds be sought to support a few centers for the specific training of veterinarians in the management of central animal facilities in biomedical research centers.

In addition, it is agreed that the physical facilities available for central animal facilities are rarely of desirable quality. It is, therefore, earnestly recommended that, an especially funded program for support of renovation of old animal quarters and construction of new quarters for animals used for biomedical research be established at the earliest opportunity.

The Subcommittee sees serious dangers inherent in regulatory legislation concerning animal experimentation. A vocal group of American citizens is requesting the Congress to establish an elaborate mechanism to police the care and use of laboratory animals in biomedical research and teaching when supported by Federal funds. The most actively promoted bill would prohibit the use of vertebrate animals unless the desired information could be obtained by other means, would require that animals used by surgeons-in-training be killed before they regain consciousness, and would allow a Federal official to determine how many animals might be used in any particular study. Such legislation would dangerously frustrate and seriously impede biomedical research and teaching. All concerned should be alert to prevent passage of legislation which would hamper, needlessly, the use of animals in biomedical research.

International biomedical research

Several Federal agencies which support health related research and research training—National Institutes of Health, National Science Foundation, Office of Naval Research, Atomic Energy Commission—operate international programs of some magnitude. It is precisely because these programs were not conceived as a form of foreign aid that these programs, perhaps more than most, require frequent reexamination with regard to principle, practice, and order of magnitude.

The Subcommittee affirms the principle that support of research outside of our country by competent foreign nationals, collaborative research involving American and foreign laboratories and training of American scientists in foreign laboratories and of foreign scientists in American laboratories is most certainly

in our national interest and the Subcommittee endorses these programs designed to such ends.

The arguments in favor of an international biomedical research are neither new nor novel. They include:

(*a*) Biomedical science, by its nature, is international.

(*b*) Our Nation has no monopoly on scientific talent. The "revolution in biology" may well have matured in this country but, in large measure, it was spawned in Europe. Aided by American funds, foreign nationals have made many of the most significant contributions to fundamental biology as well as to knowledge of the specific diseases of concern to this Commission. Indeed, many laboratories outside the United States can boast unusually productive research directors and staffs. There is no more distinguished laboratory in the world than the Medical Research Council unit at Cambridge and many of our brightest young investigators have received both training and inspiration there, as well as in the great laboratories of Paris, Stockholm, Oxford, Copenhagen, Munich, Naples, and Tel Aviv.

(*c*) It is platitudinous but no less true to note that a finding significant to fundamental biology or to the understanding or control of heart disease, cancer, or stroke, made in a European or Latin American laboratory, is as relevant to the health of the American people as if it had been made in Boston, St. Louis, or Berkeley.

(*d*) It is quite clearly in the national interest to have a significant fraction of young American scientists receive research training in laboratories abroad where they may be exposed to scientific philosophy, points of view, and methodology not encountered within our own borders. Granted this premise, we must not be reluctant, indeed we are obliged to support, in some measure, the research programs ongoing in the laboratories to which they are attracted. In this regard, it is encouraging to note that, of the 300 American biomedical scientists engaged in postdoctoral research training in foreign laboratories in fiscal year 1964, 250 are in laboratories which have American research support. Thus European laboratories have been scrutinized by two independent groups: our prospective young scientists, and the research grants reviewing committees. It is clear that the two sets of judgments are in excellent agreement and that in supporting research in these laboratories we truly are supporting the training of American scientists.

(*e*) There are dramatic differences in the geographic distribution of many diseases, e.g., of various forms of cancer, of essential hypertension, and of atherosclerotic disease. Research directed at understanding of the cultural environmental or genetic bases of these variations should shed much light on the origins of these disorders and exploitation of such unique research opportunities is virtually mandatory in our national medical research program.

(*f*) Research directed at understanding of those tropical diseases which are exotic in an American setting but which affect more than a billion people about the globe is justifiable on several grounds. A humanitarian concern for the welfare of immense numbers of wretched fellow human beings should be self-evident. Of immediate but lesser consequence, perhaps, is the need for sufficient knowledge to protect the health of Americans in tropical areas, be they there as tourists, on business, or in Government service. Finally, from the purely financial point of view, it must be remarked that if one could remove the heavy hand of disease which enervates entire tropical nations, the gain in their national vitality, economy and, hence, trade relations with this country would dwarf the relatively meager research costs which may be required.

(*g*) It will be self-evident that it is in our national interest to welcome into our own laboratories, for training, foreign clinicians and investigators who may return home to undertake research particularly germane to their own countries. This must ultimately lighten the burden on us to support investigation in those countries and, if the total effort is successful, must diminish the necessity for conventional foreign aid programs.

(*h*) At the same time, the combination of research support for foreign scientists and training of young foreign scientists in our laboratories may be regarded as meager recompense for the annual immigration, gratefully accepted by our country, of about 1,600 physicians and a yet greater number of trained scientists without whom it would be impossible to man our hospitals and laboratories.

(*i*) Finally, it must be noted that, in the sense generally employed, a program of support for international research is not a form of foreign aid but it is an almost unique and superb mechanism for continuing improvement of our for-

eign relations. Foreign scientists who have received part of their training here return home as our friends and supporters; this group includes many who have become influential figures in their home countries. Young American scientists abroad are effective spokesmen and excellent examples of the American ideal while enjoying an easy rapport with their foreign counterparts. The notion that this country voluntarily appropriates funds for support of health research, conducted the world over, preserves and extends the humanitarian image of this country abroad. Indeed, it is unfortunate that means have not been provided to direct more public attention to the program. In any case, in these several ways, dollars invested in support of international biomedical research yield a handsome return.

Granted the many virtues of a program in support of international biomedical research, it will at once be apparent that this country lacks the means to undertake total support of biomedical research, independent of national boundaries, and further that we should not do so in any case since one of the goals of such a program must be to assist other nations in developing their own national capabilities. Accordingly, this program must be limited to a scale commensurate with both our means and our goals. What then are these limitations?

(*a*) Since total funds in support of biomedical research are inadequate, even the most ardent proponents of support of biomedical research abroad agree that the magnitude of our international research support program should never be such as seriously to limit our domestic program.

(*b*) Accepting the philosophy that our research-support programs should be designed to assist other nations in developing and sustaining their own programs, the International Science Panel of the President's Science Advisory Committee suggested that our own support should gradually be phased out, although the time scale of this activity was not determined. Further, it was suggested that the time has arrived to begin this process in several of the Western European nations which enjoy economic prosperity and have vigorous, growing biomedical research programs.

However, it is these very nations—United Kingdom, Sweden, France, West Germany, Italy—which can presently boast the most productive and distinguished laboratories outside our bounds. It is to those laboratories that young Americans go in search of additional training and it is from those laboratories that there come to this country the most welcome additions to our scientific work force. It seems imperative then that these laboratories be assured of the stability requisite to their training function. Moreover, it would be unthinkable to retreat from support of those laboratories engaged in studies which may appropriately be deemed intrinsic aspects of our own national program of biomedical research unless they are assured of adequate support by their own countries and we are assured of the same ease of intellectual access afforded by current practice.

(*c*) In view of national concern with the balance of payments and the outward flow of gold it has been argued that this, of itself, constitutes sufficient reason to limit our program of oversea support of research. This argument is irrelevant to support of research in those relatively underdeveloped countries in which there has been accumulated substantial amounts of counterpart funds which, by Public Law 480, can be used for research support. It is relevant to the more advanced countries of Western Europe wherein the most dynamic medical research is in progress. However, the argument, in the view of this Subcommittee, lacks force when one considers the trivial magnitude of this total program as compared for example, with the total expenditures of American tourists in the same countries. The subcommittee shares the view expressed by Senator Humphrey at the appropriations hearings for fiscal year 1965.

"* * * once again, this year, I renew my recommendation to the Bureau of the Budget—that we not allow concern for America's balances-of-payments problem to intrude into a relatively tiny—from a fiscal standpoint—but relatively crucial—from a medical standpoint—area of NIH contribution. I refer to its support of oversea research, exchange, and training."

In view of the above considerations, the Subcommittee submits the following recommendations:

1. It is recommended that the United States should vigorously support all formal international mechanisms and devices which exist to promote international communication in the field of biomedical research and international cooperative ventures in the conduct of research.

(In this regard, the subcommittee has in mind the activities of the various international scientific unions, and the World Health Organization.)

2. Since the number of trained scientists must limit both our national and all foreign programs of biomedical research, it is recommended that those programs, whereby Americans are trained abroad and foreign scientists are trained here, should be fostered and expanded as the number of competent, qualified applicants increases. A doubling of both activities by 1972 seems commensurate with the opportunities.

3. Research projects which are collaborative ventures between American and foreign scientists seeking to take advantage of some unique research opportunity outside our borders are, in effect, direct extensions of our domestic research program. Accordingly, it is recommended that cooperative research projects and programs representing joint efforts of American and foreign investigators should be budgeted from funds appropriated in support of domestic rather than international research.

4. Support of biomedical research and research training in relatively underdeveloped countries, which can be paid for with counterpart funds, presents an exceptional opportunity to aid such nations, improve foreign relations, and seize the unique advantages of disparate factors which contribute to unusual incidence of diseases of interest to this Commission, all at essentially no cost to this country.

Accordingly, it is recommended that biomedical research and research training in those nations, wherein there are substantial amounts of Public Law 480 funds, should be supported to the maximum extent possible within limits imposed only by their resources of trained manpower and research facilities.

5. As noted previously, biomedical research and research-training opportunities are maximal in those countries of Western Europe which are enjoying economic prosperity but which attract our own young scientists for training and from which emigrate, to the United States, thousands of trained physicians and scientists annually. Although we cannot and should not undertake to support a proportion of the medical research and research training in these nations of the same order as that in economically and scientifically less privileged countries, it is imperative that we continue to support such efforts in some degree.

Accordingly, it is recommended that:

(*a*) Federal agencies, in support of research and research training, continue to support some such activities in all nations in which such opportunities exist.

(*b*) The criteria for judging applications for research grants from such countries should be unusually rigorous with respect to the quality of the project proposed and the competence of the investigator-applicant.

(*c*) The magnitude of our biomedical research-support program should reflect local opportunities and the needs of agency programs rather than an arbitrarily fixed fiscal ceiling.

(*d*) Prior to payment of research grants overseas, a representative of the agency concerned, together with our science attaché in that nation, should enter into negotiation with appropriate officials of the nation concerned with a view to establishing the terms and limits of the research support in question.

The following table summarizes the appropriation recommendations necessary to implement some of the key recommendations presented in this report. It should be noted that some of the recommendations made in this report appear with suggested appropriation figures in reports of the other subcommittees (e.g., animal resources is found in the report of the Subcommittee on Facilities): for this reason, they are not included in the table below.

	Year				
	1	2	3	4	5
Biomedical research institutes	[1] 7.5	15.0	22.5	30.0	37.5
Bioengineering centers	1.25	1.6	2.0	1.5	1.5
Centers of excellence	3.0	6.0	9.0	10.0	12.0
Research grants, NIGMS [2]	3.0	5.0	7.0		
Training grants and fellowships, NIGMS	6.0	9.25	12.5	15.5	18.5
Stabilization of research positions	4.0	6.0	8.0	10.0	12.0
Total	24.75	42.85	61.00	67.00	81.50

[1] Figures in millions of dollars over and above current appropriations.
[2] Figures represent minimum ones, sufficient to support current programs only.

APPENDIX B

SUMMARY OF APPROPRIATIONS RECOMMENDATIONS INCLUDING THOSE FOR NEW PROGRAMS AND INCREASES FOR EXISTING PROGRAMS AND COMPARISON WITH ESTIMATES OF CURRENT LEVELS OF SUPPORT

Chapter		Estimated current level of support (1965) [1]	Year				
No.	Title		1	2	3	4	5
3	A National Network for Patient Care, Research and Teaching in Heart Disease, Cancer, and Stroke		[2] 153.25	237.875	364.475	421.4	453.45
4	Application of Medical Knowledge in the Community	18.5	49.65	61.65	63.15	45.15	53.15
5	Development of New Knowledge	152.8	56.55	83.7	107.9	40.2	49.5
6	Education and Training of Health Manpower	37.7	45.05	63.95	78.15	93.75	110.65
7	Additional Facilities & Resources	11.2	52.25	56.00	61.00	66.00	72.50
	Total		356.75	503.175	674.675	666.50	739.25

[1] Includes only programs for which specific appropriations recommendations are made in this report.
[2] Figures in millions of dollars.

Furthermore, it became apparent to us that the Public Health Service and particularly the National Institutes of Health would be absolutely unable to initiate the sweeping recommendations we endorse in the body of this report unless its personnel force is increased appreciably, and unless present Federal salary ceilings are raised significantly to both retain existing personnel and to attract new personnel. We are aware of the fact that the National Institutes of Health is still losing some of its top scientists and administrators because its salary scales do not compete with salary scales for comparable positions in medical schools, universities, and industry.

The major problem seems to be an insufficient number of high-level policy positions to provide effective leadership and coordination of the Department's many programs which are basic to the internal strength of the nation. The Department has only five such positions: Secretary, Under Secretary, two Assistant Secretaries, and an Advisory Special Assistant to the Secretary (Health and Medical Affairs). It also has a career Administrative Assistant Secretary and a General Counsel.

These people are expected to provide effective leadership of a Department with over 80,000 employees, with about 130 programs (over 40 in health), and with annual expenditures of $6 billion from budget appropriations and about $15 billion from trust funds.

Even from a casual study of the situation, and certainly in comparison with other Departments of Government, it seems obvious that strengthening of the Department of Health, Education, and Welfare at the top is greatly needed.

Recommendation

The Commission recommends that a reorganization of the Department of Health, Education, and Welfare be effected to provide specific high-level policy, direction and coordination of health programs, with adequate supporting policy positions.

Chapter 3: A National Network for Patient Care, Research and Teaching in Heart Disease, Cancer, and Stroke

Recommendation		Year				
No.	Title	1	2	3	4	5
1	Regional Centers for Heart Disease, Cancer, and Stroke	[1] 87.5	126.5	198.1	208.9	230.7
2	Diagnostic and Treatment Stations	36.75	66.875	106.125	138.25	133.75
3	Development of Medical Complexes	25.0	37.5	50.0	62.5	75.0
4	Development of Additional Centers of Excellence	3.0	6.0	9.0	10.0	12.0
5	A National Stroke Program Unit	1.0	1.0	1.25	1.75	2.0
	Subtotal	153.25	237.875	364.475	421.4	453.45

[1] Figures in millions of dollars.

Chapter 4: Application of Medical Knowledge in the Community

Recommendation		Year				
No.	Title	1	2	3	4	5
6	Community Planning Grants	[1] 1.0	1.0	1.0	1.0	1.0
7	Community Health Research and Demonstration	5.0	6.0	7.0	8.0	10.0
8	Support of Community Programs	18.5	24.5	18.0	24.0	30.0
9	Statewide Programs for Heart Disease Control	2.5	2.5	3.5		
10	National Cervical Cancer Detection Program	5.0	7.5	10.0		
11	Continuing Education of Health Professions	10.1	12.1	14.1	8.1	8.1
12	Public Information on Heart Disease, Cancer and Stroke	7.55	8.05	9.55	4.05	4.05
	Subtotal	49.65	61.65	63.15	45.15	53.15

[1] Figures in millions of dollars.

Chapter 5: The Development of New Knowledge

Recommendation		Year				
No.	Title	1	2	3	4	5
13	Biomedical Research Institutes	[1] 7.5	15.0	22.5	30.0	37.5
14	Specialized Research Centers	4.05	6.7	9.4	10.2	12.0
15	Research Project Grants	35.0	47.0	56.0		
16	Contracting Authority for Research and Development	10.0	15.0	20.0		
	Subtotal	56.55	83.7	107.9	40.2	49.5

[1] Figures in millions of dollars.

EDUCATION AND TRAINING OF HEALTH MANPOWER

[illegible]	Year				
	1	2	3	4	5
[illegible] Professions	[1] 1.0	2.5	5.0	7.5	10.6
[illegible] in Medical and [illegible]	7.05	7.55	8.05	8.55	8.55
[illegible]	16.1	21.4	27.1	32.7	38.5
[illegible]	10.0	12.0	14.0	17.5	20.0
[illegible] Positions	8.0	16.0	18.0	20.0	24.0
[illegible]cians	1.4	2.8	4.2	5.6	7.0
[illegible] Health Communi- [illegible]	1.0	1.0	1.0	1.0	1.0
[illegible] of Health Man- [illegible]	.5	.7	.8	.9	1.0
[illegible]	45.05	63.95	78.15	93.75	110.65

[illegible]

[illegible] 7: ADDITIONAL FACILITIES AND RESOURCES

[illegible]ation	Year				
[illegible]	1	2	3	4	5
[illegible]	[1] 32.0	32.0	32.0	32.0	32.0
[illegible]ovisual Center	7.5	8.0	10.0	12.0	15.0
[illegible]	2.75	3.5	4.0	4.5	5.5
[illegible] Biomedical Research	10.0	12.5	15.0	17.5	20.0
[illegible]	52.25	56.00	61.00	66.00	72.50

[illegible]lars.

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