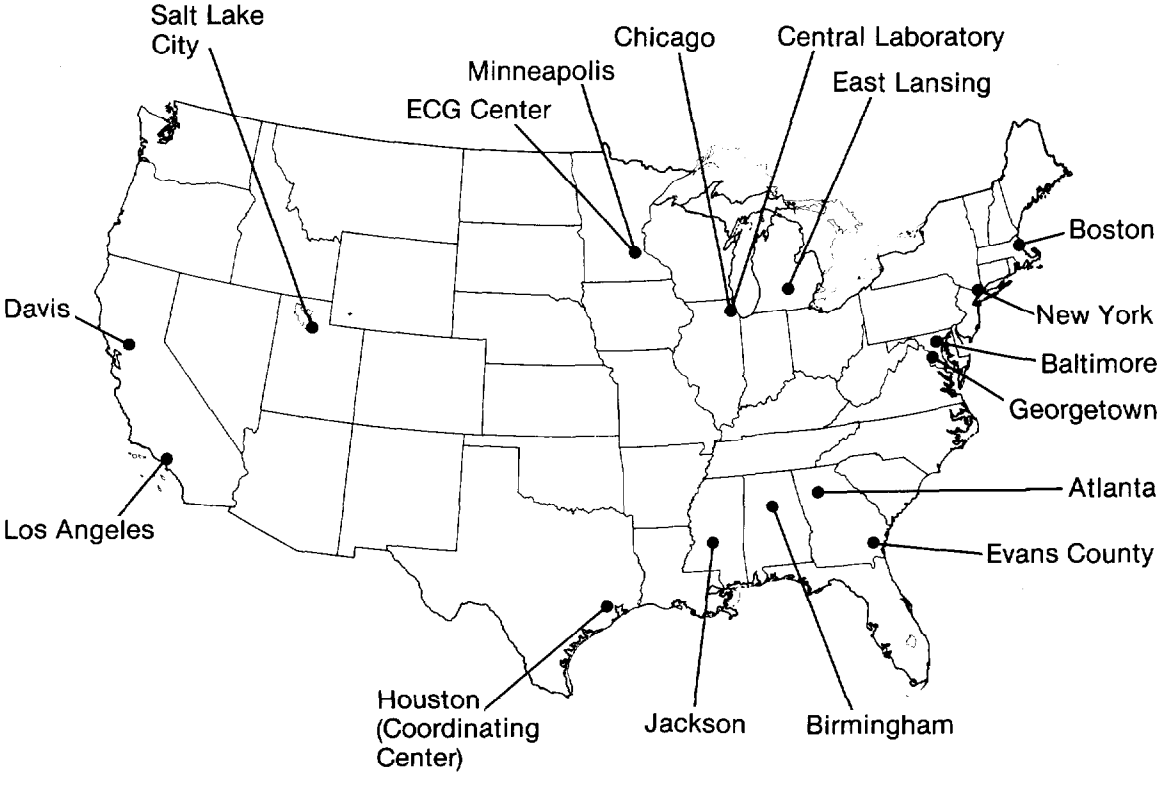
Hypertension Detection and Follow-up Program

Presentation of 5-year Mortality Results



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Public Health Service
National Institutes of Health
National Heart, Lung, and Blood Institute
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The National Heart, Lung, and Blood Institute (NHLBI) has several multi-year clinical trials under way, and these findings are those reported at the conclusion of the Hypertension Detection and Follow-up Program (HDFP) at a press briefing on November 27, 1979, at the National Institutes of Health in Bethesda, Maryland.

Statements and comments made within this document are based on the November 27th presentations by the following:

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Presentation of 5-year Mortality Results

In 1972, there were many unanswered questions regarding the treatment of high blood pressure. Although, the Veterans Administration (VA) trials demonstrated that drug therapy was effective in preventing stroke, renal failure and heart failure in males with moderate to severe hypertension, we did not know the extent to which the VA findings could generally be applied to the community at large or to women, minorities, the young or to individuals with "mild" hypertension -- those with a diastolic blood pressure between 90 and 105.

Magnitude and Impact of Hypertension

- 35 million Americans have definite hypertension
- An additional 25 million have so-called borderline hypertension

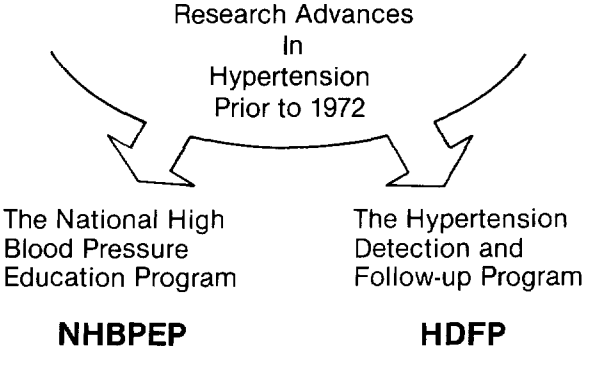
Hypertension:

- Is the most important factor contributing to 500,000 cases of stroke each year resulting in 175,000 deaths
- Is a very significant factor in the 1,250,000 heart attacks that occur each year
- Costs this Nation more than $8 billion annually

At that time the NHLBI launched two major efforts:

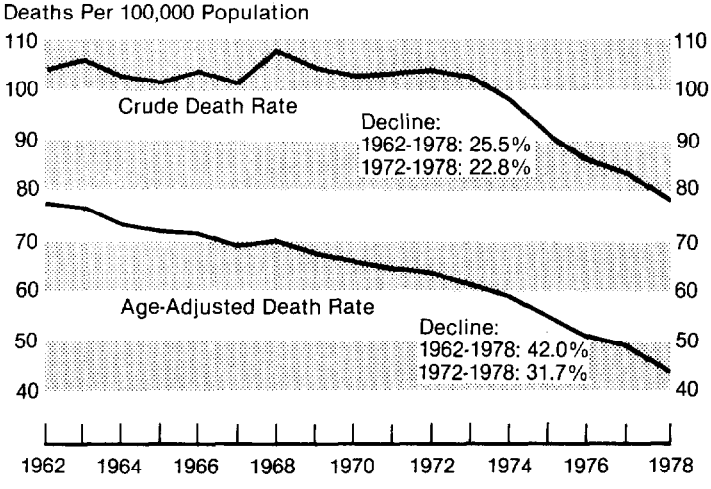
The first -- the **National High Blood Pressure Education Program** -- to inform the public and health care professional about the facts and opportunities on hand about high blood pressure so as to stimulate more awareness and aggressive treatment of the disease.

The second -- the **Hypertension Detection and Follow-up Program** -- to gain additional facts and to resolve unsettled issues regarding the treatment of high blood pressure.



There have been encouraging indicators of progress associated with the National High Blood Pressure Education Program, a program coordinated by the National Heart, Lung, and Blood Institute but involving numerous Federal, private and voluntary agencies and organizations. The public is now more understanding of high blood pressure and its implications. Patient visits for the detection and treatment of high blood pressure have steadily climbed. There is a growing number of health professionals who have accepted, and continue to accept, the program's recommended approach for managing the disease.

Cerebrovascular Diseases: Crude and Age-Adjusted* Death Rates, United States, 1962-1978



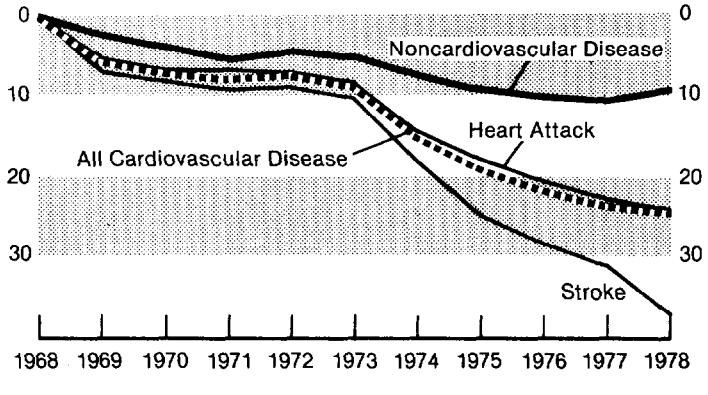
*Age-Adjusted to U.S. Population, 1940

Source: National Center for Health Statistics

Most significantly, and this is the final bottom line in any disease prevention program, progress in controlling high blood pressure is temporarily associated with the dramatic decline in death rates from cardiovascular disease, particularly in the case of stroke.

In the 1940's and 1950's, stroke deaths were falling at about one and one-half percent each year. Since the beginning of the National High Blood Pressure Education Program in 1972, stroke death rates have plummeted over 5 percent each year. **From 1972 through 1978, we have witnessed a 31.7 percent decrease in stroke deaths in this country.**

Trends in Cardiovascular Disease and Noncardiovascular Disease: Decline by Age-Adjusted Death Rates, 1968-1978



Hypertension Detection and Follow-up Program

The emphasis of the NHLBI with the National High Blood Pressure Education Program has shifted with time from one of awareness and detection to the more difficult area of adherence to treatment. The major theme has become making physicians and the public alike aware of the necessity and value of staying on a treatment regimen in order to avoid symptomatic cardiovascular disease and premature death.

As the national education program was implemented, the NHLBI also carried out the HDFP, a multicenter clinical trial designed to find answers to questions which are as pertinent today as they were in 1972:

- Is a systematic aggressive approach to hypertension effective in reducing mortality for hypertensive adults in the community setting?
- Can a substantial proportion of all hypertensives detected in the general population be brought under medical management aimed at reducing blood pressure to normal levels, and can they be kept under management?
- Do the benefits of hypertension treatment exceed possible toxicity, especially in the case of patients with so-called "mild" hypertension?
- Is antihypertensive therapy effective in **young** adults, women, and **equally** effective in blacks and whites?
- Can mortality from coronary heart disease (from heart attack) be decreased by antihypertensive therapy?

Purpose and Basic Design

The primary purpose of the Hypertension Detection and Follow-up Program was to determine whether a systematic approach of antihypertensive therapy (Stepped Care) compared with community care is effective in reducing risk of 5-year mortality for adults with elevated diastolic blood pressure in the community.

This effort embraced a wide spectrum of adults from 14 communities:

Study Population:	10,940 persons, age 30-69 and with elevated diastolic blood pressure
Duration of Follow-up:	5 years
Treatment Groups:	**Stepped Care:** 5,485 participants treated in HDFP centers
	Referred Care: 5,455 participants referred to private physicians or other community sources of care
Primary Endpoint:	All-cause mortality

Stepped Care

The stepped care group was offered free antihypertensive therapy in special centers. Therapy was increased stepwise to achieve and maintain reduction of blood pressure to or below set goals. Emphasis was on clinic attendance and adherence to medication schedules. Economic barriers to adherence were removed as much as possible. Waiting times were minimized by efficient operation and use of allied health personnel. Appointments were made at convenient hours. A program physician was on call at all times to deal with problems related to hypertension.

Goal Diastolic Blood Pressure

The goal diastolic blood pressure (DPB) was 90 mm Hg for those entering with DBP of 100 mm Hg or greater and for those receiving antihypertensive medication at entry. The goal DBP was a 10 mm Hg decrease for those entering the program with DBP of 90-99 mm Hg.

Stepped Care Drug Regimens

Step 1: The diuretic, chlorthalidone, is the primary agent.
- — Triamterene or spironolactone can be used as a supplement.

Step 2: Chlorthalidone plus reserpine.
- — Methyldopa may be substituted for reserpine if the latter is contraindicated.

Step 3: Chlorthalidone plus reserpine plus hydralazine.
- — Methyldopa may be substituted for reserpine.

Step 4: Chlorthalidone ± reserpine, ± hydralazine plus guanethidine.

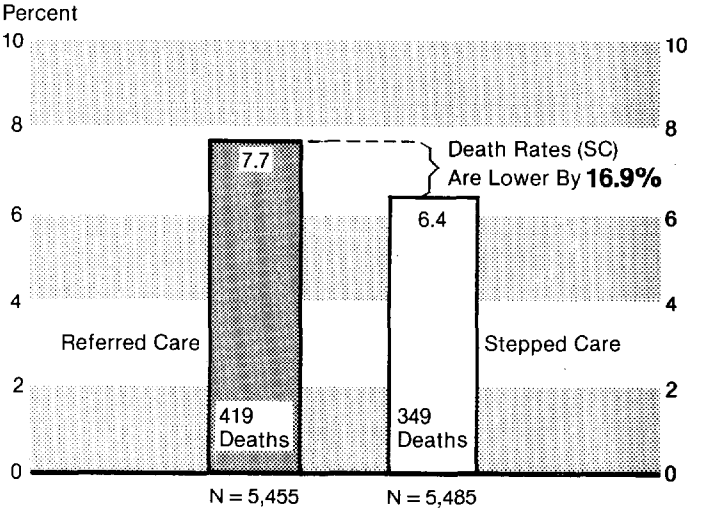
Step 5: Individualized therapy.
- — Only FDA approved antihypertensive agents can be prescribed in the program centers. Other antihypertensive drugs approved by FDA during the trial were made available for Step 5 use.

Step 0: If goal blood pressure was achieved at the first treatment visit without antihypertensive medication, no treatment was prescribed at that time.

Hypertension Detection and Follow-up Program

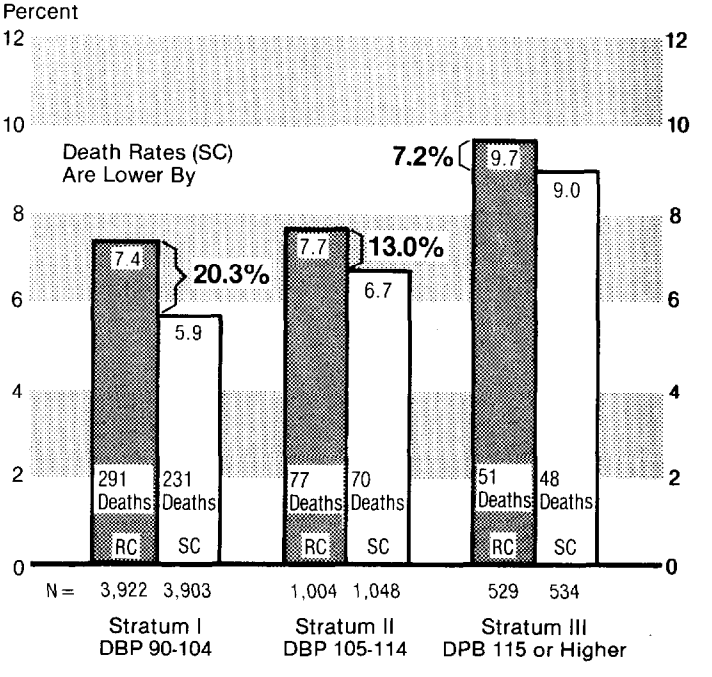
Mortality - All Causes

5-Year Mortality Rates (%) From All Causes for Stepped Care (SC) and Referred Care (RC) Participants



Mortality - All Causes by DBP

5-Year Mortality Rates (%) From All Causes for Stepped Care (SC) and Referred Care (RC) Participants By Diastolic Blood Pressure (DBP) Stratum at Entry



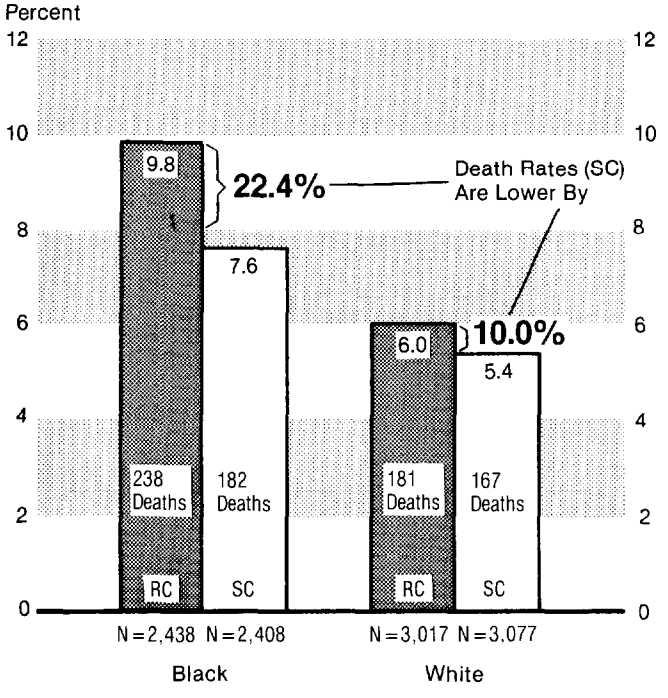
HDFP Entry Diastolic Blood Pressure (DBP) Strata

	N	%
Stratum I (DBP 90-104 mmHg)	7,825	71.5
Stratum II (DBP 105-114 mmHg)	2,052	18.8
Stratum III (DBP 115 mmHg and higher)	1,063	9.7
Total	10,940	100.0

Hypertension Detection and Follow-up Program

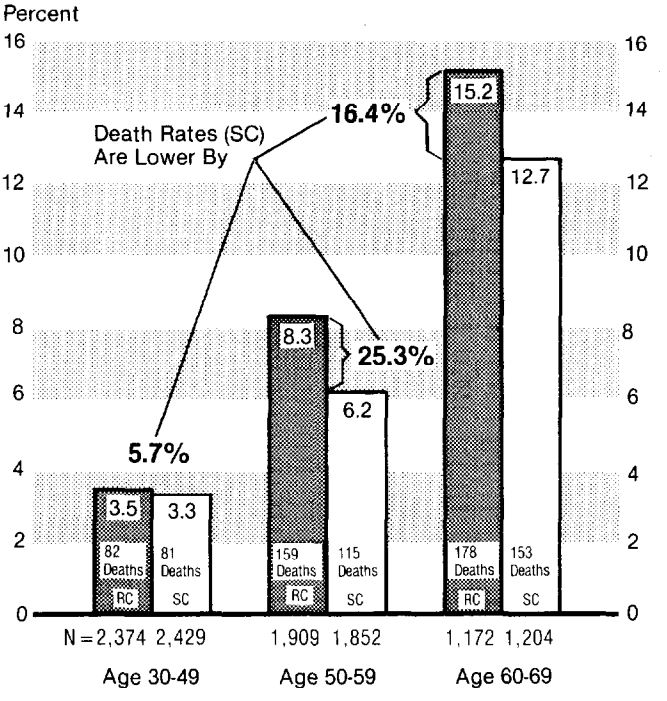
Mortality - All Causes by Race

5-Year Mortality Rates (%) From All Causes for Stepped Care (SC) and Referred Care (RC) Participants By Race



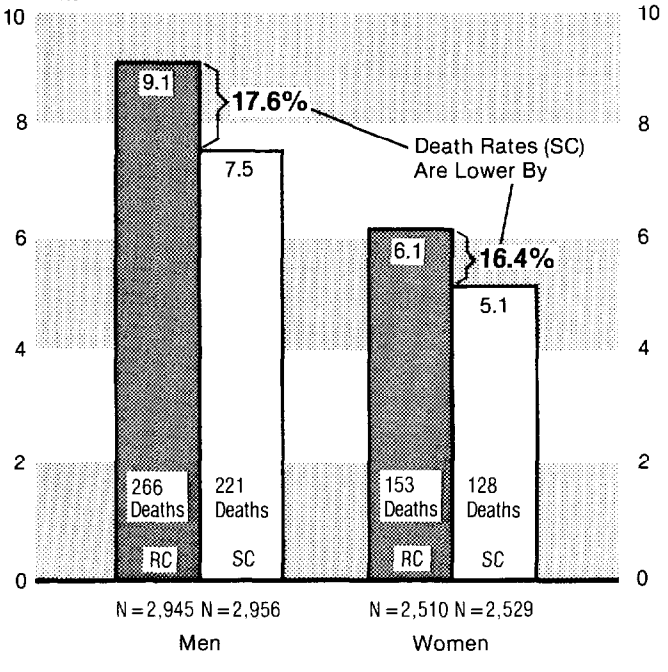
Mortality - All Causes by Age

5-Year Mortality Rates (%) From All Causes for Stepped Care (SC) and Referred Care (RC) By Age at Entry



Mortality - All Causes by Sex

5-Year Mortality Rates (%) From All Causes for Stepped Care (SC) and Referred Care (RC) Participants By Sex



Demographic Characteristics

Demographic Characteristics of Stepped Care and Referred Care Participants

Characteristic	Stepped Care	Referred Care
Number	5,485	5,455
Average Age (years)	50.8	50.8
% Blacks	43.9	44.7
% Whites[1]	56.1	55.3
% Men	53.9	54.0
% Women	46.1	46.0

[1]Non-black minorities represent less than 1% of participants and are included in the category - "Whites."

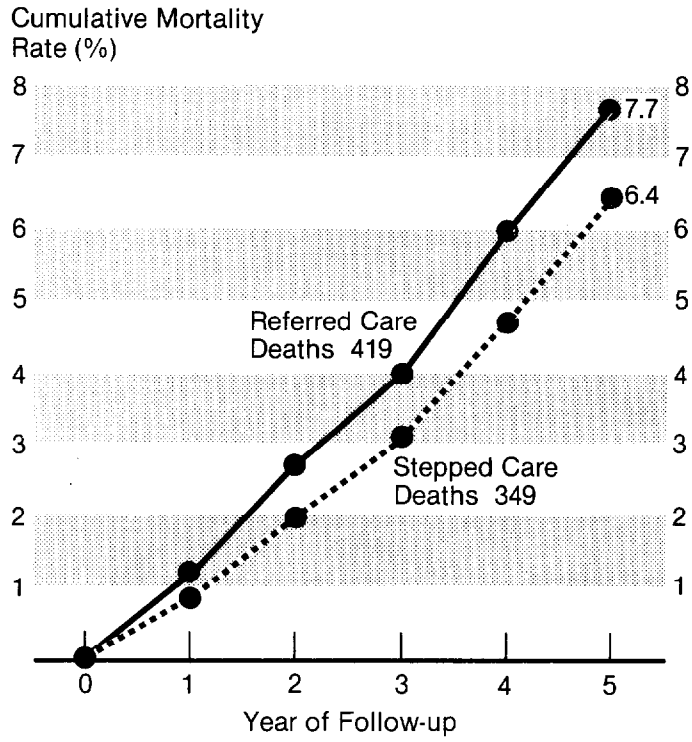
The HDFP has been a successful study. As great as the national death rate declines have been, the HDFP has achieved an even better outcome. Looking at the so-called "control group" for this trial, our investigators agree that if we had not had a successful national high blood pressure education effort, the findings of the HDFP would be even more dramatic.

People with high blood pressure, who undergo systematic care will live considerably longer than those who receive no care or routine care. If everybody who is now under treatment for high blood pressure were given this systematic care, it might be possible to reduce premature death among hypertensives by 17 percent.

Looking at it another way, tens of thousands of Americans with high blood pressure are now probably dying at an earlier age than they should.

All Participants - Cumulative Mortality

HDFP Cumulative Life Table All-Cause Mortality Rates



Of the approximately 25 million Americans with so-called "mild" hypertension, millions are not being treated because they or their doctors feel that there is little benefit in treating hypertension if it is in the mild range. Until now, there wasn't clear scientific proof of the benefits of treating this group of patients.

This study clearly demonstrates that the systematic, effective treatment of **mild** hypertension may reduce premature deaths by 20 percent.

It is important to remember that the control group in this study was not a placebo group. This was not a case of comparing good care with no care. It was a comparison of aggressive versus the typical care one would find in our communities. And the fact that the care routinely given in communities today for high blood pressure has improved considerably over recent years, just adds to the significance of this study and to the basic finding that systematic care of high blood pressure saves lives.

To the millions of Americans who have high blood pressure, this study says: Get on treatment and **stay** on treatment. It will mean a much longer life . . . more years to spend with your loved ones.

To the physicians with high blood pressure patients, it says: Take the necessary steps to make sure your

patients follow your instructions and stay on their treatment. It also says that if you have patients with **mild** hypertension, you can now offer them treatment which may add years to their lives.

The multiyear Hypertension Detection and Follow-up Program will have a final cost of between 60 and 70 million dollars. But, if we apply the lessons learned as a result of HDFP, we will see a return well into the billions of dollars as the number of premature deaths decrease among the millions of hypertensives in this country.

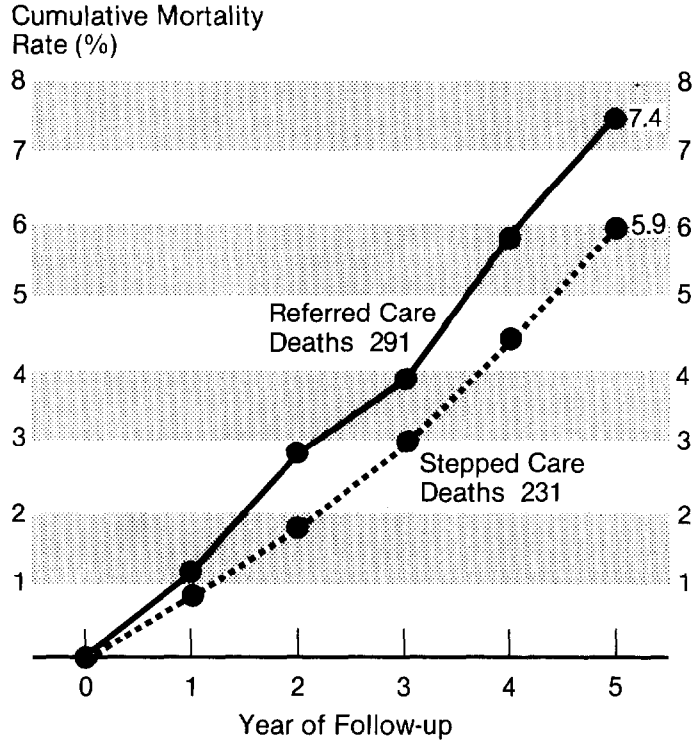
In the *1980 Report of the Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure* the following guidelines are presented:

"Dietary management is a reasonable initial approach in young patients with uncomplicated mild hypertension and no additional cardiovascular risk factors. To be successful in the long run, extended nutritional counseling may be necessary. If nondrug treatment reduces blood pressure and maintains it at normal levels, it may be considered definitive therapy. If diet proves ineffective in normalizing blood pressure after an adequate trial, drug therapy should be considered in addition."

"Factors that support the decision to initiate drug treatment in patients with mild hypertension include: presence of target organ damage; smoking; family history of premature cardiovascular complications; elevated systolic blood pressure; diabetes; and elevated cholesterol level."

Stratum I - Cumulative Mortality

HDFP Cumulative Life Table All-Cause Mortality Rates, Stratum I (DBP 90-104)



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