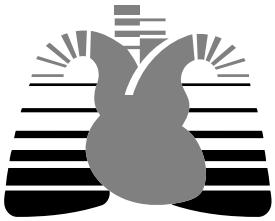
National Heart, Lung, and Blood Institute
National Institutes of Health

Data Fact Sheet

Congestive Heart Failure in the United States: A New Epidemic

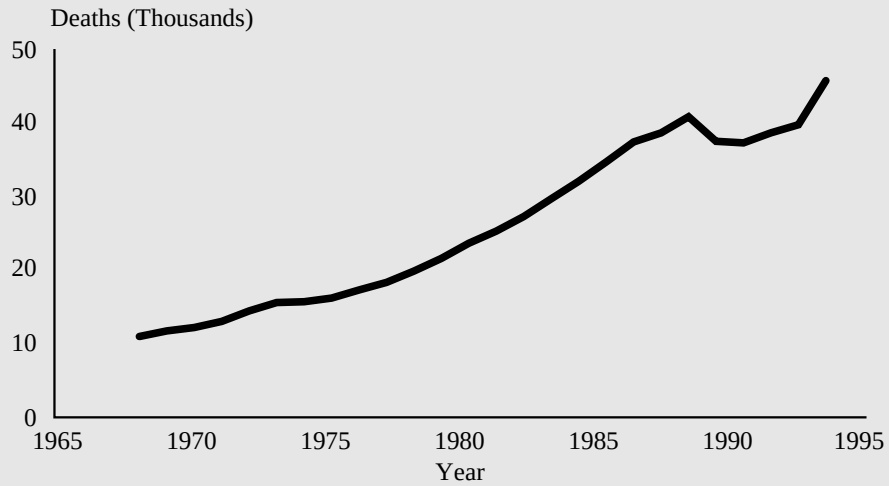


An estimated 4.8 million Americans have congestive heart failure (CHF). Increasing prevalence, hospitalizations, and deaths have made CHF a major chronic condition in the United States. It often is the end stage of cardiac disease. Half of the patients diagnosed with CHF will be dead within 5 years.

Each year, there are an estimated 400,000 new cases. The annual number of deaths directly from CHF increased from 10,000 in 1968 to 42,000 in 1993 (figure 1), with another 219,000 related to the condition.

CHF is the first-listed diagnosis in 875,000 hospitalizations, and

Figure 1
Deaths From Congestive Heart Failure, 1968 to 1993



ICD Code 428.0.
The sharp drop occurring in 1989 is attributed to revision of the death certificate.

Source: Vital Statistics of the United States, National Center for Health Statistics.

the most common diagnosis in hospital patients age 65 years and older. In that age group, one-fifth of all hospitalizations have a primary or secondary diagnosis of heart failure.

Visits to physicians' offices for CHF increased from 1.7 million in 1980 to 2.9 million in 1993. More than 65,000 persons with CHF receive home care each year. In 1993, an estimated $17.8 billion was spent for the care of CHF patients in hospitals, physicians' offices, home care, and nursing homes as well as for medication. The financial and other losses of caregivers for these patients are large as well.

The magnitude of the problem of CHF is large now, but it is expected to get much worse because:

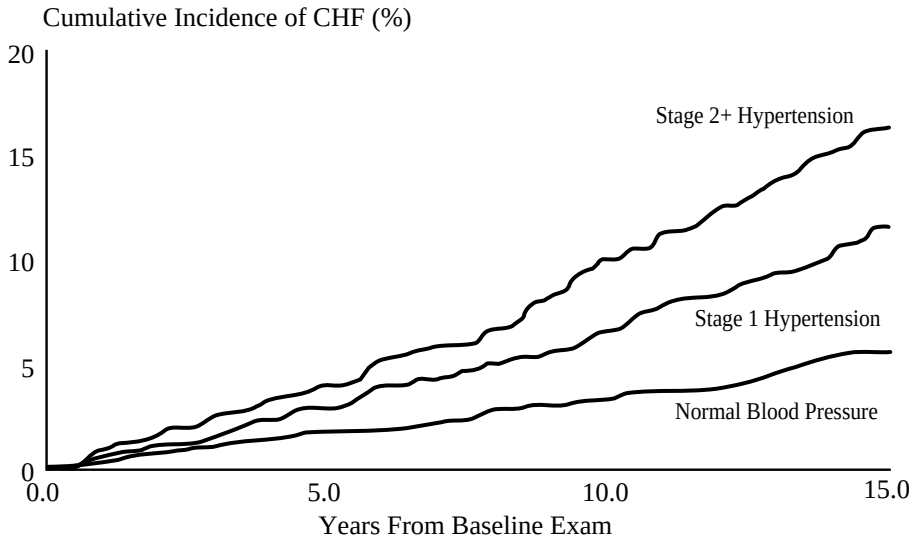
- As more and more cardiac patients are able to survive and live longer with their disease, their opportunity for developing CHF increases.
- Future growth in the elderly population will likely result in increasing numbers of persons with this condition regardless of trends in coronary disease morbidity and mortality.

Incidence

Incidence data on congestive heart failure are not available on a national basis. The following estimates are from the study in Framingham, Massachusetts, funded by the National Heart, Lung, and Blood Institute. Incidence of CHF is equally frequent in men and women, and annual incidence approaches 10 per 1,000 population after 65 years of age. Incidence is twice as common in persons with hypertension compared with normotensive persons (figure 2) and five times greater in persons who have had a heart attack compared to persons who have not (figure 3).

Figure 2

Incidence of CHF in Men and Women Age 50 to 79, by Hypertension Status

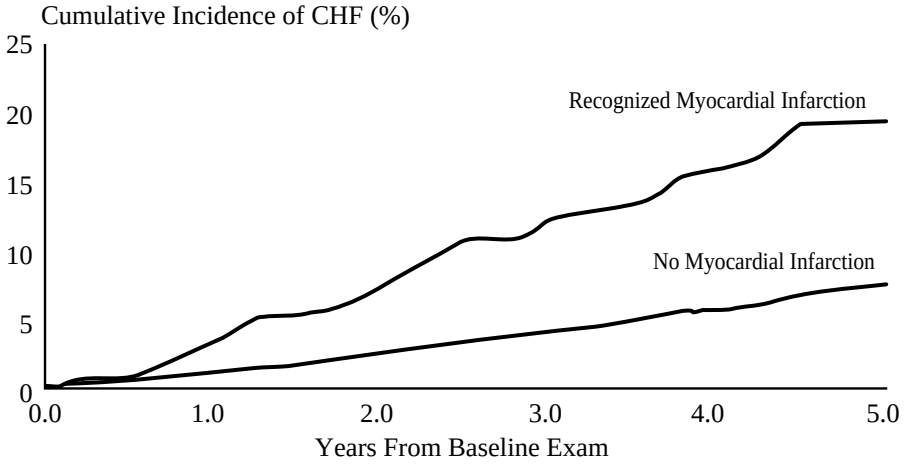


Note: Hypertension is defined as systolic blood pressure (SBP) of 140 mm Hg or greater or diastolic blood pressure (DBP) of 90 mm Hg or greater or taking antihypertensive medication. Stage 1 hypertension is defined as SBP of 140 to 159 mm Hg or DBP of 90 to 99 mm Hg in people not receiving antihypertensive medication; stage 2 or greater hypertension (stage 2+) is defined as SBP of 160 or greater, DBP of 100 or greater, or current use of antihypertensive medication.

Source: Framingham Heart Study, National Heart, Lung, and Blood Institute.

Figure 3

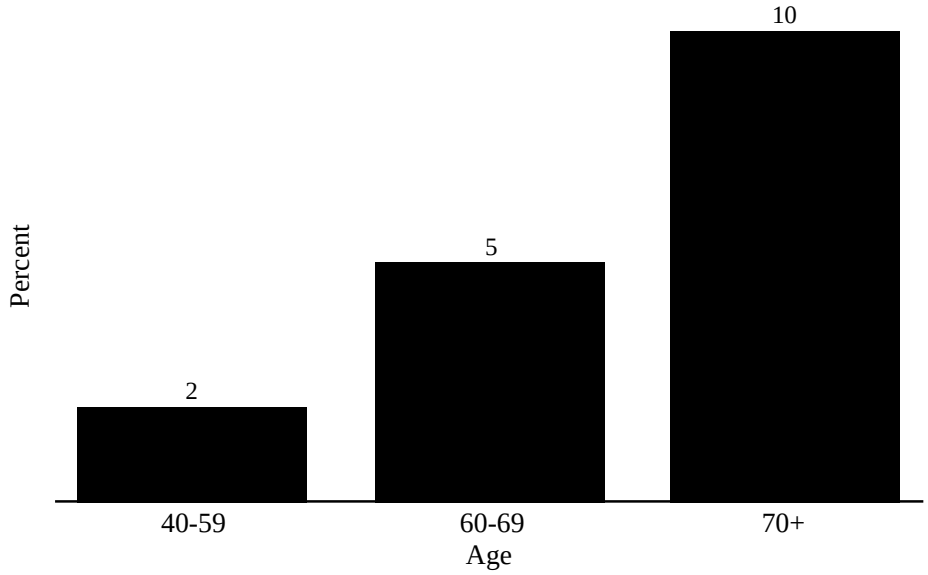
Incidence of CHF, by Myocardial Infarction Status



Source: Cardiovascular Health Study, National Heart, Lung, and Blood Institute.

Figure 4

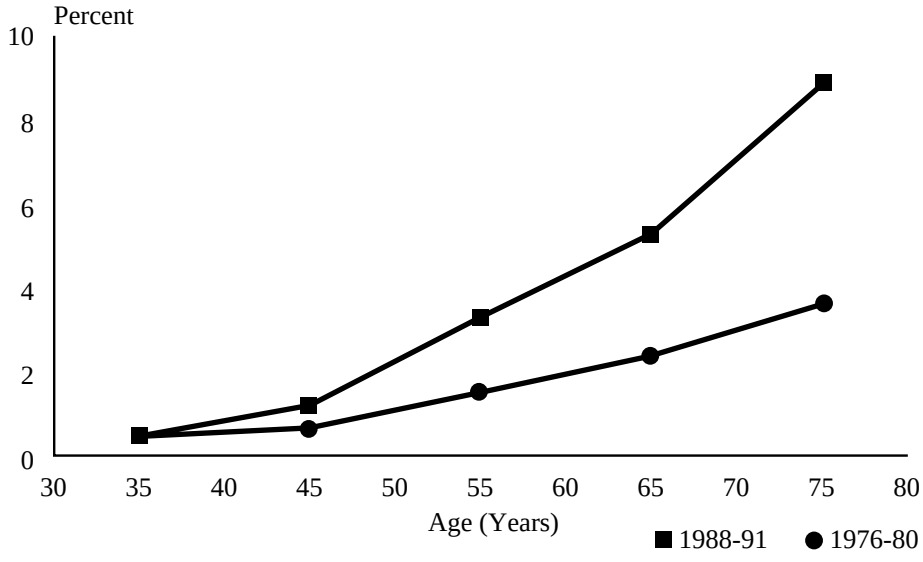
Prevalence of CHF, by Age, 1988-91



Source: National Health and Nutrition Examination Survey (1988-91), National Center for Health Statistics.

Figure 5

Prevalence of CHF, by Age, 1976-80 and 1988-91



Source: National Health and Nutrition Examination Survey (1976-80 and 1988-91), National Center for Health Statistics.

Prevalence

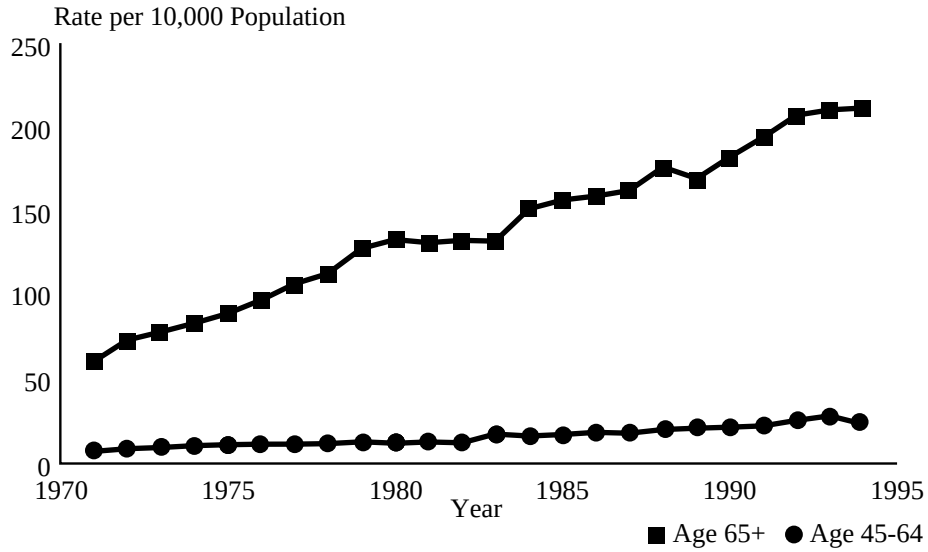
According to the National Health and Nutrition Examination Surveys, an estimated 4.8 million Americans have congestive heart failure, with approximately equal numbers of men and women. Almost 1.4 million are under 60 years of age. CHF is present in 2 percent of persons age 40 to 59, more than 5 percent of persons age 60 to 69, and 10 percent of persons age 70 and older (figure 4). Prevalence is at least 25 percent greater among the black population than among the white population. Prevalence at each age increased substantially between two periods surveyed nationally: 1976-80 and 1988-91 (figure 5).

Hospitalizations

The rate of hospitalizations for heart failure increased more than three times between 1970 and 1994 at age 45 to 64 and age 65 and older, with a large absolute increase in the older age group (figure 6). In 1994, CHF was the first-listed discharge diagnosis in 874,000 hospital discharges (alive or dead) and a secondary diagnosis in another 1.8 million discharges. One in five of all discharged patients age 65 and older had CHF as a primary or secondary diagnosis. The percentage of CHF patients discharged dead from hospitals, however, decreased from 11.3 percent in 1981 to 6.1 percent in 1993. This trend is seen for persons age 45 to 64 and for those age 65 and older (figure 7).

Figure 6

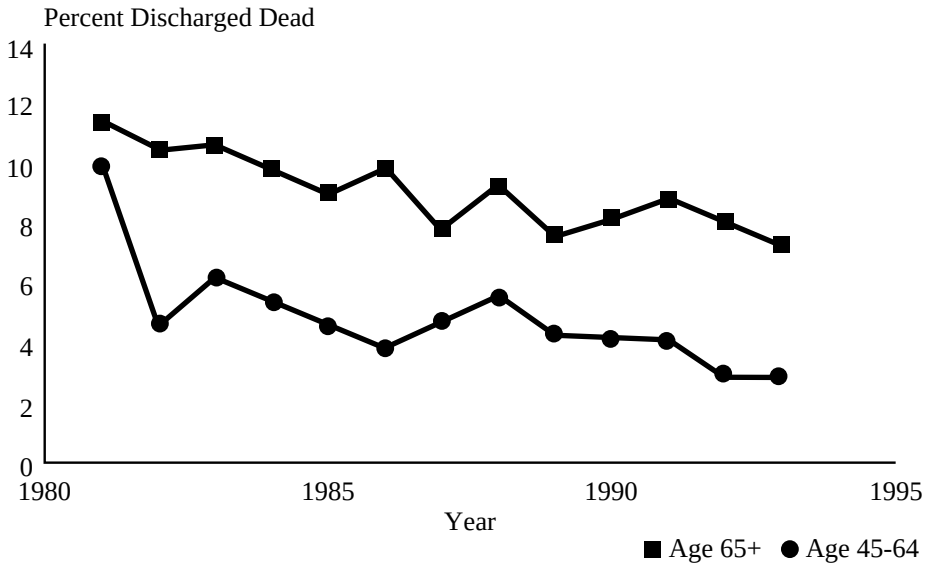
Hospitalization Rates for CHF, by Age, 1971 to 1994



Source: National Hospital Discharge Survey, National Center for Health Statistics.

Figure 7

Percent of Hospitalized CHF Patients Discharged Dead, by Age, 1981 to 1993



Source: National Hospital Discharge Survey, National Center for Health Statistics.

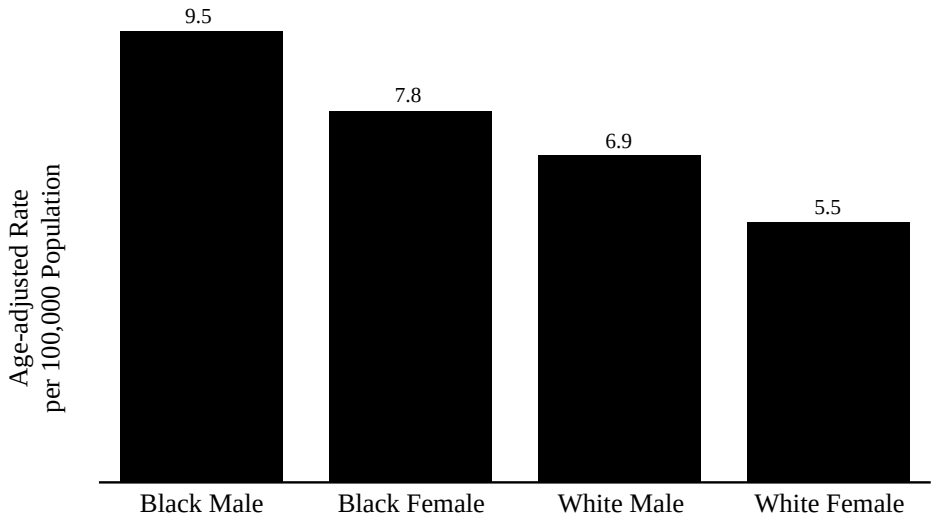
Prognosis

Survival following diagnosis of congestive heart failure is worse in men than women, but even in women, only about 20 percent survive much longer than 8 to 12 years. The outlook is not much better than for most forms of cancer. The fatality rate for CHF is high, with one in five persons dying within 1 year. Sudden death is common in these patients, occurring at a rate of six to nine times that of the general population. Thus, CHF remains a highly lethal condition. With the use of angiotensin-converting enzyme (ACE) inhibitors as a possible exception, advances in the treatment of hypertension, myocardial ischemia, and valvular heart disease have not resulted in substantial improvements in survival once CHF ensues.

Mortality

The death rate for congestive heart failure increased most years between 1968 and 1993 (figure 1). These increases are in contrast to mortality declines for most heart and blood vessel diseases. In 1993, there were 42,000 deaths where CHF was identified as the primary cause of death and another 219,000 deaths where it was listed as a secondary cause on the death certificate. The death rate for CHF in 1993 was nearly 1.5 times higher in black men and women than in white men and women (figure 8).

Figure 8
Death Rates for CHF, by Race and Sex, 1993



Source: Vital Statistics of the United States, National Center for Health Statistics.

Research

The National Heart, Lung, and Blood Institute (NHLBI) supports a wide range of basic, clinical, and epidemiological research to better understand the causes and improve the prevention, diagnosis, and treatment of CHF. The studies include investigations of how the heart contracts normally and what goes wrong in CHF, the development of new drug therapies and other innovative treatments of CHF, and ways to better detect the condition in those at a high risk of CHF.

Some studies are trying to stop the loss of cell function that happens in CHF. Muscle cells die or no longer function properly, which causes the heart to lose its ability to pump blood. In studies on animals, researchers have begun inserting healthy muscle cells into a failing heart to replace damaged cells. Results so far have been promising: The grafted cells appear to thrive and function normally. This animal research has shown that the grafted cells can even come from muscles other than the heart, such as muscles of the leg. Furthermore, it may be possible to genetically engineer grafted cells to make them stronger.

Other studies are developing drugs with multiple actions to treat CHF. Such a drug would have several effects. For example, a drug might improve the heart's pumping ability, open clogged arteries, and prevent tissue damage from free radicals, a byproduct of the body's metabolic processes. Free radicals are thought to contribute to the development of atherosclerosis. One of these multiple-acting drugs has already been tested and appears not only to lengthen survival but also to improve symptoms for those with CHF.

Investigations also are being done to improve heart transplantation for CHF patients. In some cases, a heart transplant is the only possible treatment. However, such patients face a shortage of donor hearts. A possible solution to this critical shortage may be the use of a heart from other animals. Called xenotransplantation, this procedure once was made difficult because of the rejection of the heart by the CHF patient's immune system. However, new technologies have been forged that can overcome such a barrier. For example, scientists have been able to alter genes in the heart of a pig to diminish the immune system reaction in a baboon. Scientists still need to discover how to turn such genes on and off to prevent human rejection.

Researchers are continuing efforts to develop better devices to help the damaged heart function. Already in use is a small mechanical pump called a left ventricular assist device (LVAD). The ventricles are the heart's main

pumping chambers. These chambers enlarge as CHF progresses. Muscle fibers stretch, and the heart loses strength. The LVAD is now used as a temporary assist for patients with severe CHF who are awaiting a heart transplant. However, researchers have found that the heart in patients with an LVAD often improves after months of use—so much that a transplant is no longer needed. Thus, efforts are under way to identify patients who may benefit from a longer-term LVAD.

Through its national education efforts, the NHLBI is working to prevent CHF too, especially through the early detection and aggressive treatment of high blood pressure and heart attack—the two leading causes of CHF. New drug therapies, better diagnosis, speedier therapies are lessening those conditions' impact on the heart.

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