

TRENDS IN THE HEALTH OF THE ELDERLY

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■ **Abstract** Health among the older population as measured by most dimensions has improved during the last two decades. Mortality has continued to decline, and disability and functioning loss are less common now than in the past. However, the prevalence of most diseases has increased in the older population as people survive longer with disease, and the reduction in incidence does not counter the effect of increased survival. On the other hand, having a disease appears to be less disabling than in the past.

INTRODUCTION

Interest in trends in the health of the elderly has become widespread in recent years. Until about two decades ago, trends in mortality were assumed to provide a good indicator of the health of the elderly, and because mortality was decreasing fairly steadily, it was assumed that health was improving. Subsequently, both researchers and policy makers have come to understand that health is a multidimensional concept and that trends in mortality do not necessarily represent trends in all other dimensions of health; and, in fact, change in all dimensions does not have to be similar (11, 78).

This recognition of the multidimensionality of health, and the potential for variability in trends in different aspects of health, have led to questions about whether increases in life expectancy have been accompanied by increases in healthy life or whether they have been concentrated in years of unhealthy life (36). Significant research has focused on this topic in recent years (64, 68).

Of course, trends in healthy life can be defined in terms of any of the health dimensions. In addition, information on the prevalence, incidence, and duration of health conditions provides different answers about health trends. Insights into these complex interacting processes affecting population health change have come from the development of models and simulations linking these aspects of health change (5, 14). These efforts have allowed researchers to better understand the mechanisms underlying time trends in population health. Because empirical studies differ in the definition of health used, the time period analyzed, and the population covered, results on time trends have been somewhat confusing. However, in the 1990s time

trends have become somewhat clearer as studies have reported most dimensions of health to be improving.

This discussion first reviews early theoretical clarifications of how population health change is linked to reduction in mortality at older ages. We briefly discuss evidence of trends prior to recent decades, subsequent understanding of trends from empirical models of health, and developments in understanding the dimensions of health and the process of health change for an aging population. Recent trends in each dimension of health are then reviewed, ending with a discussion of trends in healthy life, which is a combination of mortality and morbidity dimensions.

BACKGROUND

Theoretical Underpinnings of the Study of Trends in Health

Theoretical development in the area of health change in an older population began with the realization that the rapid mortality decline among the old beginning in the late 1960s could be linked to important population health consequences (15, 75). Fries (36) generated some of the interest in trends in health with his promotion of the idea that there was an ongoing “compression of morbidity.” His assertion rested on assumptions that mortality at the older ages would reach a limit beyond which there could be no further decline and that there was an ongoing increase in the age of disability onset. Under these conditions, there would be a compression of morbidity into a smaller number of years at the end of life. Subsequent research has addressed both of these assumptions.

This optimistic view of Fries was replacing a pessimistic view, termed the failure of success, expressed earlier by Gruenberg (38). This view, also based on limited evidence, felt that the extension of life for persons with chronic conditions, without a reduction in the incidence of these conditions, would lead to deterioration in population health. Manton (48) proposed a position somewhere between the two outlined above. His view, termed dynamic equilibrium, hypothesized that the severity and rate of progression of chronic disease would be related to mortality changes so that, with mortality reduction, there would also be a reduction in the rate of the deterioration of the vital organ systems of the body. Manton indicated that this could result in more disease in the population, but the disease would be at a lower level of severity.

The above theoretical discussions have been useful in clarifying that one needs to use a basic epidemiological approach in thinking about the relationship between trends in different aspects of health. Mortality is a dynamic process that removes people from the population at a faster or slower rate over time. The number or proportion of people who are not healthy in a population is an indicator of population health—or a stock measure—at a point in time. This indicator is affected by a number of dynamic processes: the age-specific onset rates of unhealthy conditions, the rate of health deterioration of people with these conditions, and the likelihood that

people with and without conditions will die. The number of processes involved means that the relationship between changing mortality and changing health is not as simple as once assumed and that understanding trends in health requires understanding trends in a series of processes.

Models Linking Mortality Change and Health Change

The theoretical approaches described above were developed without reference to empirical findings. Initial examinations of empirical health trends indicated that the trends differed when different aspects of health were examined and that some indicators showed improving health and some deteriorating health. For instance, Verbrugge (76) noted that from 1972 to 1981 there were increases in reported disease presence and disability, yet improvements in self-reported health. A number of researchers from a variety of countries noted that the 1970s were a period of decreasing mortality and increasing disability (4, 19, 67).

Initially, the possibility that health could deteriorate while mortality improved was dismissed, and instead the accuracy of self-reports of disability and disease was questioned (70, 79). Subsequent analyses and further developments of models linking health and mortality have made it clear that this is not only possible but likely under some scenarios (5, 14). Through simulations of relationships among changes in mortality, morbidity incidence, and the prevalence of health problems, it has become clear that decreases in mortality or increases in life expectancy do not have to be linked to improvements in population health. For incurable chronic diseases, the prevalence of poor health is determined by the incidence of the disease and the length of time people have the disease. If mortality declines because people with the disease are saved from death but the onset rate stays the same, the proportion of the population with the disease will increase. On the other hand, if mortality declines because the age-specific incidence of disease has been reduced, then longer life will be accompanied by fewer people with disease (5, 14, 76). The effects of change do not have to be consistent across all segments of the population. Improvements in the health of persons in their 60s can be linked to eventual deterioration in the health of those in their 80s (5). This understanding of the complex process of health change has been important in our current approach to the question of how different aspects of health change are related. It has also shown the value of simulation models in addressing some of the theoretical questions.

Dimensions of Population Health

As noted above, early investigations of health trends did not differentiate among the dimensions of health. A number of researchers and international organizations have developed approaches to clarifying health dimensions during the past three decades that allow us to better understand how trends in dimensions of health may differ (65, 78). The underlying ideas developed in different classifications are generally the same, although there are important differences in terminology



Figure 1 The process of population health change.

between Americans and that used in many other countries and many international organizations. Figure 1 is derived from the discussion of Verbrugge & Jette (78) and reflects an American view of the dimensions of health. The five boxes represent different dimensions of health. Trends in any one of them have been used as evidence of health trends overall, but they represent quite different aspects of health and may be affected by different processes.

To begin, at the left of the figure, trends in risk factors or biological markers such as cholesterol and other lipids, weight, and indicators of insulin regulation are separate markers of underlying health and population propensity to disease. At the population level, the age of onset of these factors generally precedes the onset of related diseases like cardiovascular disease and diabetes. The second box includes diseases, conditions, and impairments. Sometimes it is difficult to separate diseases from conditions that may or may not have a clear disease process and may or may not have associated impairment. Cognitive deterioration is not always linked to a recognized disease process, and it is not always accompanied by impairment. This example underscores that population health includes both mental and physical conditions.

Functioning loss is the inability to perform certain physical or mental tasks, such as lifting, walking, balancing, reading, writing, counting, and using fingers and hands to grasp and open. Functioning loss generally results from the onset of diseases and conditions and occurs at a later age than disease onset. Disability is the inability to perform an expected social role. For older people, this has generally been defined as independent living and self-care. For middle-aged people, disability is defined in terms of ability to work or do housework. For children, disability is the inability to participate in mainstream education. An important difference between functioning loss and disability is the potential influence of the external environment. Although in practice it may sometimes be difficult to clearly separate the two concepts, functioning loss is defined as a functioning deficit in an individual; disability on the other hand is an inability to perform within the environment. Disability can be affected by conditions external to the person. For instance, moving to a house without stairs or a home with a walk-in shower might allow someone to live independently who could not do so with different housing characteristics.

All of these dimensions of health should be affected by changes in underlying risk factors, and all can be influenced by interventions of various types. For instance, health care interventions for those who have a disease—heart disease—may

delay the progress of the disease and reduce subsequent functioning loss, disability, and death from heart disease.

Figure 1 is simplified in that it provides a view of health change in a population, not change within individuals. Individuals do not have to pass through all phases of health deterioration. Some people have a heart attack and die from heart disease before they ever know they have the condition, before they have a chance to be disabled. In addition, individuals can move in and out of some of these health states: Disability and functioning loss may be transitory, and people can return to full functioning and ability. Whether chronic diseases are absorbing states from which there is no return to the healthy population depends somewhat on the condition. We do not think of cures from heart disease, but we do speak of cured cancer after some number of years have passed. Additionally, there is a strong link between mortality and morbidity for some conditions, e.g., cardiovascular disease; for others, e.g., arthritis, there is no link between morbidity and mortality.

HEALTH TRENDS

Mortality Trends

During the entire twentieth century, mortality among the old declined about 1% per year, and the whole period has been a time of fairly regular increase in life expectancy (43, 62, 81). There have been some years of more rapid decline in old age mortality, such as from 1968 until the early 1980s, and years of slower decline, such as from 1954 to 1968 (10, 43). Even the last two decades have been a mixture of slower and more rapid periods of mortality decline for the older population (81).

Compared to the 1970s, there was substantial slowing in the rate of mortality decline in the 1980s among the entire older population in the United States, but it was due to a slowdown on the rate of decline among females. In the 1990s the overall rate of decline was somewhat higher than in the 1980s. Trends in annual death rates by gender from 1981 to 1998 for three age groups of the old are shown in Figure 2. Mortality for males in each age group shows a fairly regular decline during the 20 years. For females in some age groups, the early 1980s were not even a period of decline. This differential trend by gender is almost the opposite of what occurred in the 1970s when females experienced greater decline than males. One explanation for the different gender patterns of change is that because of their higher likelihood of smoking, men did not experience the same gains as women in the 1970s; then, decreased smoking among men resulted in more mortality improvement.

Since 1980, the decline in mortality in the United States has resulted in a three-year increase in life expectancy at birth with an increase about half as great at age 65 (Table 1). Because of the differential mortality decline described above, men above age 65 have gained about 2 years of life on average since 1980, whereas women have gained about 1 year.

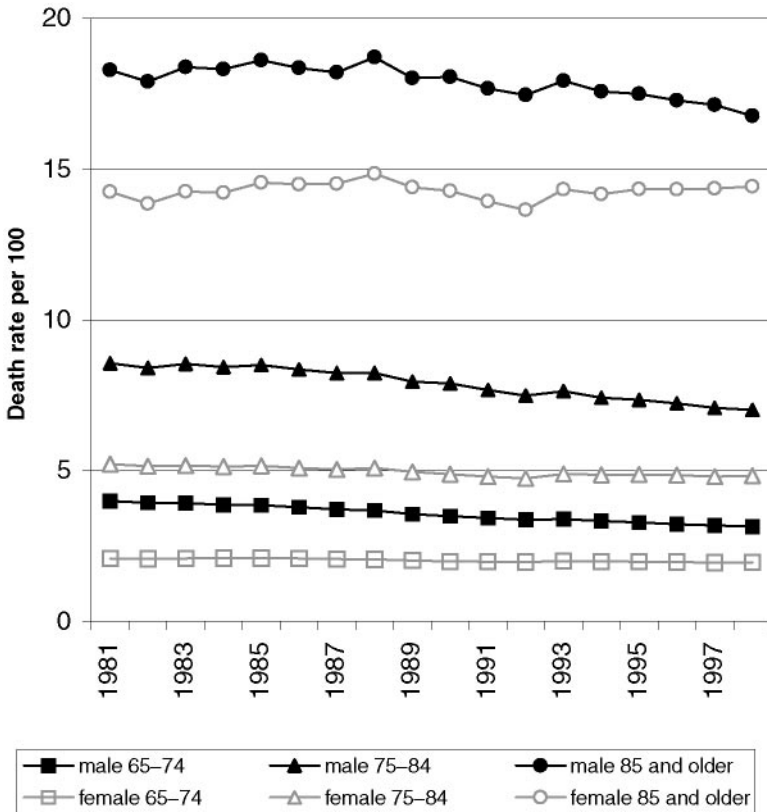


Figure 2 Death rates, all causes, 65-74, 75-84, 85+, 1981-1998 (58).

There is mixed opinion on the likelihood of continued long-term increase in life expectancy. Most demographers including Vaupel and Lee (44, 45, 62) are optimistic about continued increases in life expectancy and decreases in mortality among older persons. Olshansky (63) has been a promoter of the idea that future increases will be minimal. The arguments for modest expectations generally rest on the notion that it would take very substantial decreases in mortality at older ages to achieve continued increases in life expectancy, and these would require scientific understanding and an ability to address the basic mechanisms of aging that are unlikely. The argument for continued optimism is that what would happen in the future is likely to be similar in magnitude of effect to what has happened in the past in terms of decreased mortality and scientific progress, and thus increases in life expectancy would continue. In addition, empirical evidence provides no sense that a limit to life expectancy, or old-age mortality decline, has been reached (83). For the United States in particular, much decline is necessary to reach the life expectancy of the current world leader, which is Japan; however, it seems likely

TABLE 1 Life expectancy in the United States at birth and age 65: 1980–2000^a

	At birth			Age 65		
	Total	Male	Female	Total	Male	Female
1980	73.7	70.0	77.4	16.4	14.1	18.3
1990	75.4	71.8	78.8	17.2	15.1	18.9
2000	76.7	73.9	79.4	17.9	16.3	19.2

^aSource: Natl. Cent. Health Stat. (61).

that we will reach the levels of life expectancy currently experienced by exemplar countries like Japan in the coming decades.

Trends in Disability

Most investigations of trends in health among the old have actually focused on trends in disability (21, 22, 37, 73). A rationale for this focus is that the small percentage of people with extreme disability have large expenditures for the use of nursing homes and other types of long-term care (74). Discussion of trends in disability is complicated because disability can be defined and measured in many ways (13, 41, 77). Most studies of disability among the old define disability relative to ability to live independently and take care of one's own personal needs. The most severe disability is generally defined as inability to provide self-care, and this is measured by the inability to perform what are known as activities of daily living (ADLs). These include eating, bathing, dressing, toileting, transferring from bed and chairs, and sometimes walking around the house. Somewhat less-severe disability is indicated by the inability to perform or difficulty in performing instrumental activities of daily living (IADLs), which often include doing housework, shopping, preparing meals, using the telephone, managing medications, managing money, or using transportation. Although the use of these definitions of disability is generally limited to the elderly, there are indicators of less-severe disability that are used at all ages, including the elderly. These include an inability to work, keep house, or to engage in any activities thought to be part of one's normal routine.

The earliest studies of disability trends addressed change in the less-severe type of disability in the late 1960s and 1970s. The general conclusion of these studies was that disability did not decrease in this period in the United States (19, 42, 75, 84). Although mild disability appears to have increased during these years, severe disability did not change. These findings for the United States were similar to those for a number of other countries: Canada (82), Great Britain (2, 66), Japan (66), and Australia (54).

Most studies of the period from 1980 to the present have found some decline in disability among the older population (9, 49). Freedman et al. (30) provide a

synthesis of results from seven recent studies of trends in disability (20, 50, 52, 71, 80). Although the studies differ in population coverage, sample design, method and periodicity of measurement, use of proxies, and treatment of nonresponse and missing data, the authors conclude that most analyses using data from the post-1980 period show declines in the percentage with moderate disability and IADL disability. These declines have been shown to vary by gender (18, 47) and level of education (18); and they also differ between the young-old and the old-old (19). Generally, there is more improvement in less-severe disability. Figure 3 provides a simple graphical presentation of the amount of change in IADL functioning during a recent seven-year period from the Medicare Beneficiary Survey (MCBS), a longitudinal study of the entire Medicare population, including those in institutions. There is, for example, a clear decline even during this short period in the percent of the older population reporting difficulty doing heavy housework and shopping. Declines are smaller but significant in the activities with lower levels of disability, such as preparing meals and using the telephone.

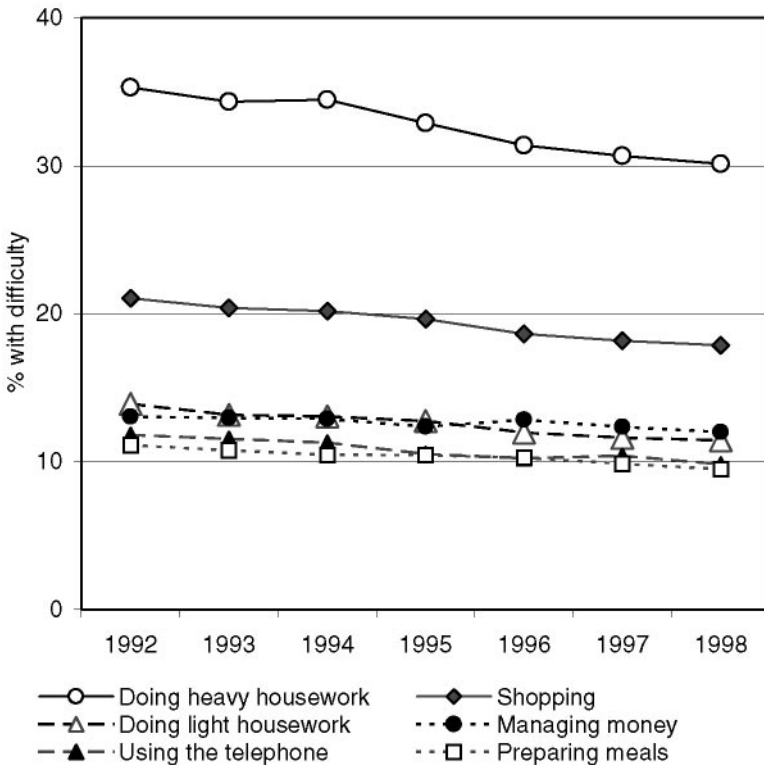


Figure 3 Percentage with difficulties in performing IADLs, Medicare beneficiaries, 65+, 1992–1998 (58).

Trends in needing help with such activities as housework or shopping may be due to changes in the physical abilities of the older population, but they may also be related to the availability of help in the house, either familial or paid, the availability of appliances, and the accessibility of transportation (1, 12). However, causes of trends in IADL functioning have not been apportioned to reasons residing in the person and reasons outside the person.

The trends in what is termed ADL disability have not been nearly as consistent as those in IADL disability (31). Conflicting evidence has been provided by a number of researchers (18, 20, 47, 52, 71, 80). To help clarify trends in ADL ability and see if any consensus could be achieved with reexamination of multiple data sets, the National Institute on Aging convened a 12-person working group on this topic in August 2002. This group examined a variety of definitions of ADL disability from five surveys and concluded that ADL disability has been reduced beginning at some time in the 1990s (30). There is no clear decline before that time in any of the surveys.

The MCBS is one of the surveys showing the strongest declines during the 1990s in ADL difficulty. For most ADL tasks, there were reductions in the percentage of persons with difficulty performing the task (Figure 4).

Trends in Physical Functioning

Declines in physical functioning problems throughout the 1980s and 1990s have also been evaluated in a number of studies (19, 32–34, 47) and synthesized in Freedman et al. (35). These studies have found improvements fairly consistently in functioning ability as indicated by ability to lift, carry, walk distances, stoop, etc. As an example, shown in Figure 5 are declines in the percentage of the older population with difficulty performing a number of indicators of physical functioning reported in the MCBS during the 1990s. The percentage of those above age 65 having difficulty performing specified functions reflecting both upper- and lower-body strength and mobility generally decreased during the seven years, with stooping being the exception to this trend.

Trends in Disease Prevalence and Incidence

Most analysts report increases in disease prevalence in recent decades. For the older population, Cutler & Richardson (23) report prevalence increases between 1970 and 1990 in arthritis, some cancers, cardiovascular disease, diabetes, hearing problems, and orthopedic problems; only visual impairments decreased, whereas the prevalence of paralysis remained the same.

Crimmins & Saito (17) report a higher prevalence in the 1990s than the 1980s of many diseases in the population age 70 and above, particularly heart disease and cancer (See Table 2). Manton et al. (53) found that the prevalence of some conditions decreased among older persons from the 1980s to the 1990s (arthritis, circulatory and cerebrovascular conditions), whereas others increased (pneumonia, bronchitis, broken hips, and diabetes). Because their results report disease

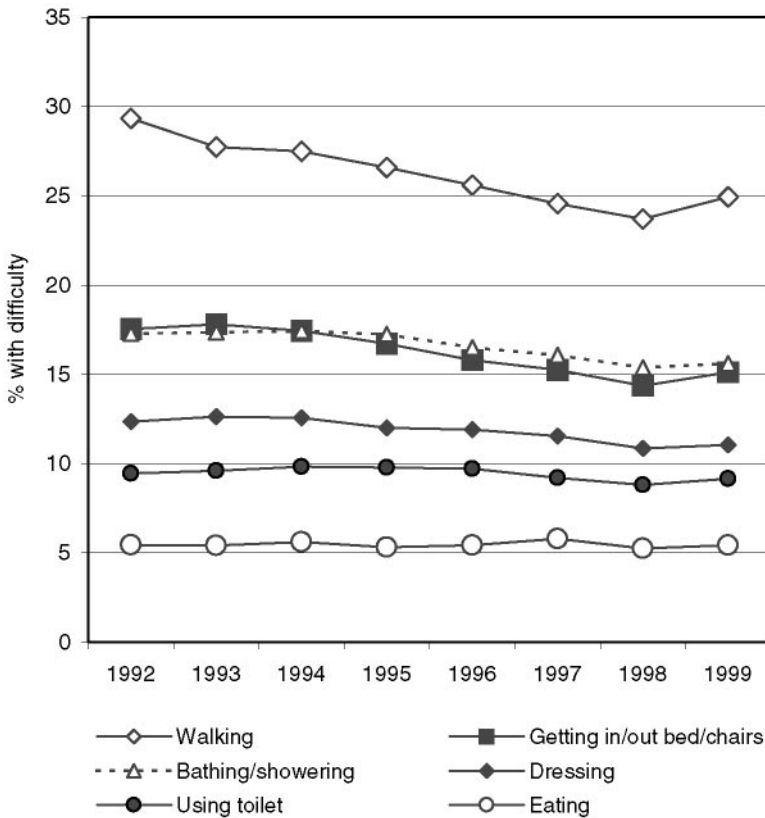


Figure 4 Percentage with difficulty performing ADLs, Medicare beneficiaries, 65+, 1992–1998 (58).

presence controlling for disability status, it is hard to compare them with other reports.

Mortality from heart disease rose in the first few decades of this century and began decreasing in the 1960s (25). Decreases in heart disease mortality since the 1960s are the most important cause of the overall mortality decline at older ages since 1968. However, a number of analysts report that the prevalence of heart disease rose through the 1980s as death rates among those with heart disease decreased (17, 25, 39). Cutler & Richardson (23) estimate from the National Health Interview Survey that the prevalence of heart disease increased by 2.2% annually for the older population during the 1970-to-1990 period and that this estimate is consistent with estimates from several major community studies such as the Framingham Heart Study, the Minnesota Heart Survey, and the Rochester Heart Study. The explanation for a rising prevalence of heart disease is that there has been

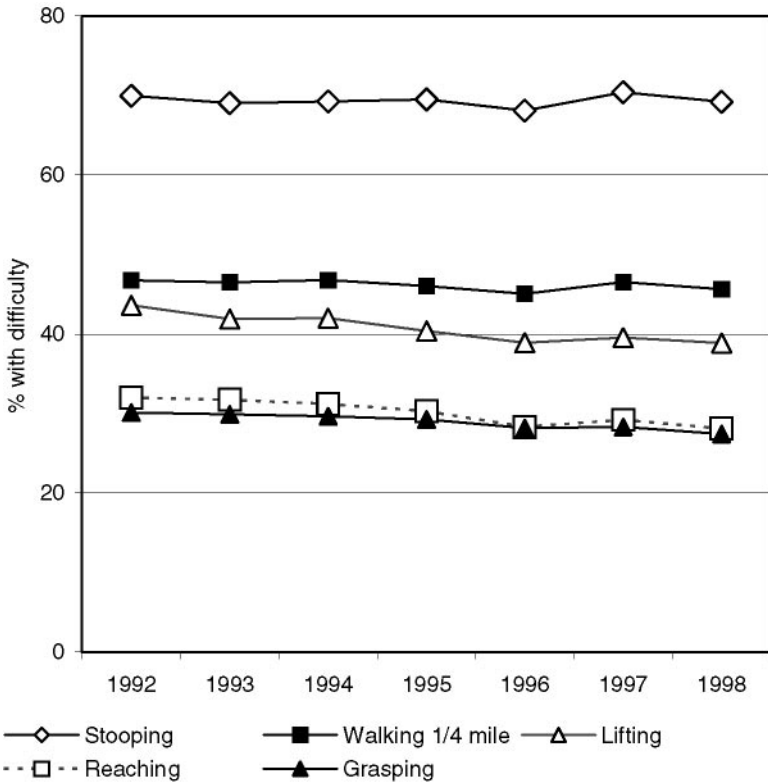


Figure 5 Percentage with difficulty in physical functioning, Medicare beneficiaries, 65+, 1992–1998 (58).

a greater decline in cardiovascular mortality than in the incidence of cardiovascular disease, which results in more persons with heart disease in the population. This pattern has been confirmed in community studies where incidence can be tracked (8, 24, 40, 55, 57).

Stroke is a vascular disease for which mortality and morbidity are relatively well-documented because most stroke victims are admitted to hospitals. Trends in stroke mortality, incidence, and prevalence are somewhat similar to those for other cardiovascular conditions. Stroke mortality has been decreasing since the 1960s, but without a consistent decrease in stroke incidence. Stroke incidence has even been reported to have been higher in the 1980s than during the 1970s, and there was no sustained decline in incidence during the 1990s (7, 56, 72).

Persons suffering from cardiovascular disease and stroke tend to be less disabled than in the past. Persons with cardiovascular and cerebrovascular conditions in their 50s and 60s were less likely to be disabled in the mid 1990s than they were in the mid 1980s (16). Women above age 70 with heart disease or a stroke had less

TABLE 2 Estimated probability of having specified disease at age 70: 1984 and 1994 U.S. noninstitutionalized population

		Males		Females	
		1984	1994	1984	1994
Mortal diseases	Heart disease	.19	.25	.12	.16
	Hypertension	.40	.43	.49	.47
	Stroke	.07	.09	—	—
	Cancer	.12	.21	.11	.16
	Diabetes	.11	.14	.12	.13
Morbid conditions	Arthritis	.44	.49	.59	.62
	Osteoporosis	.01	.01	.05	.12
	Broken hip	—	—	—	—
	Glaucoma	.04	.06	.05	.08
Impairments	Cataracts	.13	.16	.21	.24
	Blindness	—	—	—	—
	Hearing trouble*	—	—	—	—
	Dizziness	—	—	—	—

—No significant change at .05 level.

*Hearing trouble includes deafness in one or both ears and other trouble hearing with one or both ears.

Source: Crimmins & Saito (17).

functioning loss and IADL disability in the mid 1990s than in the mid 1980s (17). Older women with many other conditions also reported less disability in the 1990s than the 1980s: arthritis, cancer, osteoporosis, cataracts, and hearing loss (17). Younger persons—50 to 69—also report less arthritis and less disability linked to the arthritis (16).

Among those above age 70, the average number of diseases that each person reports has increased in recent years (17). This increase is because people have survived a number of diseases that once would have been fatal, and they have lived to acquire additional conditions, both potentially fatal and nonfatal, such as arthritis. Thus, older people have more diseases, but less disability, than in the past.

Inclusion of indicators of cognitive functioning in nationally representative surveys of the older population has allowed Freedman and colleagues (29) to estimate change in the prevalence of cognitive impairment during a five-year period during the mid 1990s. They estimate very significant reduction in this disabling condition. Further replication of such results will be important to document this trend.

Trends in Risk Factors

Much has been written recently about the increase in weight and obesity as an adverse trend in health over the past two decades (26, 27, 31). Older persons, like those of other ages, are more likely to be overweight and obese now than in the past. In the past two decades the percentage of obese has increased by about 0.5%

per year (59). On the other hand, the percentage of those age 65 and above who are current smokers has declined by about 3% over the same period, which results in about 12% current smokers (59). Trends in these two major behavioral risk factors thus have moved in opposite directions.

There are a number of well-recognized indicators of biological risk for cardiovascular disease, diabetes, and death for which change over some period of time can be determined from the U.S. National Health and Nutrition Examination Surveys (NHANES). Collection of some measures began as early as the 1960s, and some are not available until the 1980s. NHANES data show that the percentage of the older population with high cholesterol has decreased since the 1960s, somewhat faster for women than men (60). Examination of recent change shows a reduction in average total cholesterol during the 1990s for the older population (Table 2). Since the 1960s, at least for those ages 65–74, the percentage with high blood pressure has decreased, partly because more people are using antihypertensives and have controlled high blood pressure (60). On the other hand, during the 1990s, for the whole older population, average diastolic blood pressure was reduced, whereas systolic blood pressure increased significantly. Although only a short period is represented in Table 3, there are significant decreases in average levels of fasting triglycerides. On the other hand, there is no change in average glycated hemoglobin. Thus, the evidence of change in biological risk for the older population in the past decade is mixed.

Trends in Self-Reported Health

People's assessments of their own health can be considered a summary indicator related to trends in all dimensions of health. Survey respondents include what they know about their own health (diseases, risk factors, functioning loss, and disability) in their reported self-assessments (46). Measures of self-reported health have been collected fairly regularly during the 1980s and 1990s from the noninstitutional population. Consistent declines have been seen since 1982 in the percentage of

TABLE 3 Average levels of specified biological risk factors: 65+ noninstitutionalized population, 1988–1994 and 1999–2000

Biological risk factor	1988–1994	1999–2000	Sig. T T-Test	Change
Diastolic blood pressure	71.5	69.8	*	Better
Systolic blood pressure	140.0	143.0	*	Worse
Total cholesterol	222.0	215.5	*	Better
Fasting triglycerides	157.9	154.8	N.S.	No change
Glycated hemoglobin	5.8	5.8	N.S.	No change
Range of N	3,801–4,343	1,090–1,157		

Source: Individual data from NHANES III and NHANES 1999–2000.

*Significant at 0.05 level or below.

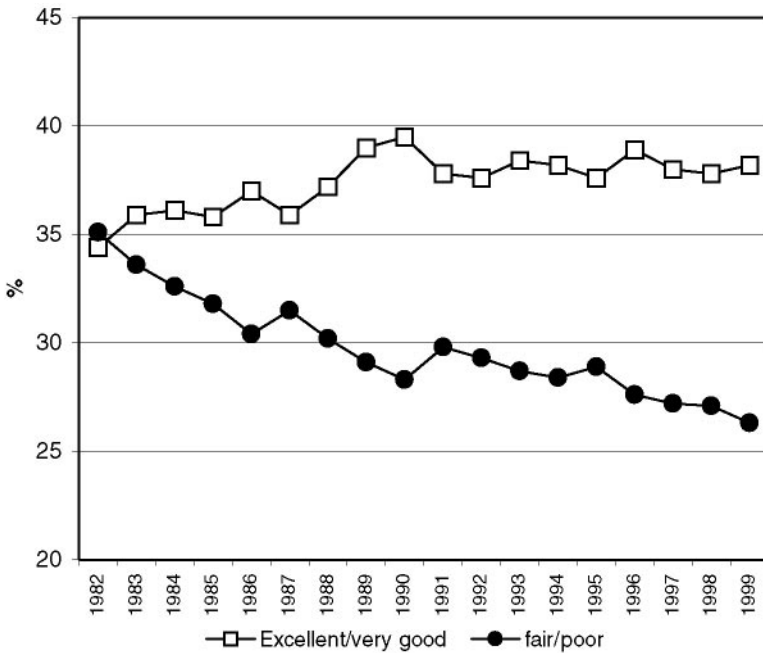


Figure 6 Self-reported health, 65+ (age-adjusted), noninstitutionalized population, 1982–1999 (59).

the older population characterizing their health as fair or poor. During the 1980s there was some increase in the percentage of the population reporting excellent and very good health, but continued improvement was not observed in the 1990s (Figure 6).

Trends in Measures that Combine Mortality and Morbidity

In the past two decades a number of investigators have attempted to combine measures of mortality and morbidity in order to address issues of whether Americans are living longer, healthy lives, as well as just longer lives. In general, a life-table approach is used to divide increases in years lived into healthy and unhealthy years. These measures have the same useful characteristics as life-table measures based only on mortality. They can be compared across time and place, and they summarize a large amount of age-specific data. Because indicators of disability are the most frequently collected measures in surveys, they have been used most frequently to examine change over time. This approach has shown that the increase in life expectancy in the 1970s was concentrated in disabled years, but longer life in the 1980s was concentrated in nondisabled years (19). As trends in disability have been similar across countries, these changes in healthy and unhealthy life expectancy characterize not only the United States but also Canada, France, and Great

Britain (3, 69). Although most of this work on trends in healthy life has been based on disability, other dimensions could be used or combined in the calculations.

CONCLUSIONS

The general picture is that older people of today are healthier than older people of two decades ago. There have been improvements in most dimensions of health. People live longer and have fewer disabilities, have less functioning loss, and report themselves to be in better health. Over time there has been some reduction in risk from smoking and a lowering of cholesterol and average triglyceride levels. However, weight increase has been notable during this period. Because people live longer, a greater percentage of people have some specific common diseases, and, on average, older people live with more diseases. The decade of the 1990s was not one of improvement in all risk factors.

The confusion that resulted from attempts to synthesize early studies of trends in health is linked to the fact that not all dimensions of health have changed in the same direction at the same time. A number of the improvements in health discussed here were not noted until the 1980s or 1990s. In addition, for some indicators trends have differed by age within the older population, with more improvement for those in their 60s.

There have been few systematic explanations of observed trends in health among the older population (16, 22, 33, 51). Certainly, improved treatment and diagnosis have led to an increased life expectancy for those with a disease, as well as a delay in the progression of disease to disability, but there are also strong cohort factors that are likely to have played a role in some of the improvements in health. Education has increased markedly in recent years in the older population. The compositional change among the old to a higher lifelong socioeconomic status may have important implications for reducing old age mortality. Further, recent older cohorts had healthier younger lives than previous cohorts owing to the reduction in infectious disease, which fueled the long-term mortality decline up to the middle of the twentieth century. Further work on period and cohort factors that explain trends is an important part of the research agenda.

Recent trends need to be put into a longer-term perspective. The assault on the most common causes of old age mortality by public health and medical personnel was only begun in the 1960s after the elimination of deaths from most infectious diseases in the first half of the twentieth century. In an assault on new diseases, the usual biomedical approach is to begin at the end of the disease process and save people who have the disease from death. We learned more quickly how to prolong the lives of those with diseases such as heart disease through treatment than how to promote effective prevention and to diagnose disease earlier.

There appears to have been a period of lengthening life expectancy but deteriorating health in the 1970s. As prevention delayed the onset of disease among younger cohorts and treatment delayed the progression among older cohorts, we experienced the decade of the 1980s, when health improved by some measures for

the older population. For those who could be regarded as the young old, health appears to have improved even more. In the 1990s, health improved by all indicators except disease prevalence and some indicators of risk. In this period presence of disease is not as closely linked to debilitation as it was a decade earlier. Thus, the most recent decade was generally one of improving health. The key to continued improvement in health is to delay the onset of risk factors, disease, and disability in older-aged individuals. However, the complex process of health change may result in future periods when population health appears to have deteriorated and years when it appears to have improved, depending on which phases of the disease and disability process are changing most rapidly.

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CONTENTS

PERSPECTIVES

- The Third Revolution in Health, *Lester Breslow* xiii

EPIDEMIOLOGY AND BIostatistics

- Can Dementia Be Prevented? Brain Aging in a Population-Based Context,
Mary N. Haan and Robert Wallace 1
- Public Health Surveillance of Low-Frequency Populations,
Elena M. Andresen, Paula H. Diehr, and Douglas A. Luke 25
- Statistical and Substantive Inferences in Public Health: Issues in the
Application of Multilevel Models, *Jeffrey B. Bingenheimer*
and Stephen W. Raudenbush 53
- Trends in the Health of the Elderly, *Eileen M. Crimmins* 79
- What Do We Do with Missing Data? Some Options for Analysis
of Incomplete Data, *Trivellore E. Raghunathan* 99

ENVIRONMENTAL AND OCCUPATIONAL HEALTH

- Emission Trading and Public Health, *Alexander E. Farrell*
and Lester B. Lave 119
- Genetic Testing in the Workplace: Ethical, Legal, and Social Implications,
Paul W. Brandt-Rauf and Sherry I. Brandt-Rauf 139
- Health Effects of Chronic Pesticide Exposure: Cancer and Neurotoxicity,
Michael C.R. Alavanja, Jane A. Hoppin, and Freya Kamel 155
- Implications of the Precautionary Principle for Primary Prevention
and Research, *Philippe Grandjean* 199
- Issues of Agricultural Safety and Health, *Arthur L. Frank,*
Robert McKnight, Steven R. Kirkhorn, and Paul Gunderson 225
- Time-Series Studies of Particulate Matter, *Michelle L. Bell,*
Jonathan Samet, and Francesca Dominici 247

PUBLIC HEALTH PRACTICE

- Developing and Using the *Guide to Community Preventive Services:*
Lessons Learned About Evidence-Based Public Health, *Peter A. Briss,*
Ross C. Brownson, Jonathan E. Fielding, and Stephanie Zaza 281

Modeling Infection Transmission, <i>Jim Koopman</i>	303
The Current State of Public Health in China, <i>Liming Lee</i>	327
The Public Health Workforce, <i>Hugh Tilson and Kristine M. Gebbie</i>	341
Lessons Learned from Public Health Mass Media Campaigns: Marketing Health in a Crowded Media World, <i>Whitney Randolph and K. Viswanath</i>	419
SOCIAL ENVIRONMENT AND BEHAVIOR	
Assuring the Health of Immigrants: What the Leading Health Indicators Tell Us, <i>Namratha R. Kandula, Margaret Kersey, and Nicole Lurie</i>	357
Harm Reduction Approaches to Reducing Tobacco-Related Mortality, <i>Dorothy K. Hatsukami, Jack E. Henningfield, and Michael Kotlyar</i>	377
Housing and Public Health, <i>Mary Shaw</i>	397
Lessons Learned from Public Health Mass Media Campaigns: Marketing Health in a Crowded Media World, <i>Whitney Randolph and K. Viswanath</i>	419
The Role of Culture in Health Communication, <i>Matthew W. Kreuter and Stephanie M. McClure</i>	439
HEALTH SERVICES	
Economic Implications of Increased Longevity in the United States, <i>Dorothy P. Rice and Norman Fineman</i>	457
International Differences in Drug Prices, <i>Judith L. Wagner and Elizabeth McCarthy</i>	475
Physician Gender and Patient-Centered Communication: A Critical Review of Empirical Research, <i>Debra L. Roter and Judith A. Hall</i>	497
The Direct Care Worker: The Third Rail of Home Care Policy, <i>Robyn Stone</i>	521
Developing and Using the <i>Guide to Community Preventive Services</i> : Lessons Learned About Evidence-Based Public Health, <i>Peter A. Briss, Ross C. Brownson, Jonathan E. Fielding, and Stephanie Zaza</i>	281
INDEXES	
Subject Index	539
Cumulative Index of Contributing Authors, Volumes 16–25	577
Cumulative Index of Chapter Titles, Volumes 16–25	581
ERRATA	
An online log of corrections to <i>Annual Review of Public Health</i> chapters may be found at http://publhealth.annualreviews.org/	