Work Ability of the Aged under Conditions of Improving Mortality*

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The designation of a normal retirement age has been linked to the age at which people are no longer “sufficiently healthy to function in their jobs.” This linkage was accepted by both the proponents and the opponents of raising the retirement age in the March 1981 report of the National Commission on Social Security. The majority position was: “The Commission anticipates that increased longevity will be accompanied by a corresponding increase in active life. . . . Expert opinion in the field of research on aging holds that the period of ‘diminished vigor’ associated with aging will decrease so that ‘chronic disease will occupy a smaller proportion of the typical life span’ ” (National Commission on Social Security 1981, 126). On the other hand, a minority of the commission contended that “the evidence does not support any claims that longer life is equivalent to longer years of good health. . . . The evidence certainly does not support speculation that the incidence of good health is increasing” (National Commission on Social Security 1981, 331). Unfortunately, the current state of knowledge does not permit a definitive resolution of this controversy. I shall attempt, however, to clarify some of the issues.

We shall focus on the populations in the age groups between 50

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and 69 years of age because the experiences of these groups are most relevant to the issue of retirement age. As can be seen from figure 1, the death rates for women in this age range have been declining rather steadily since 1950. In fact, death rates for women of this age began to decline rapidly and steadily in about 1935, so this trend has been operative for nearly 50 years (Moriyama 1964). We can see from figure 2, on the other hand, that the rapid downward trend in death rates for men between 50 and 69 years of age has been in effect only for the past 15 years. We should also note that at each age in this range, the death rate for men is twice as high as the death rate for women.

It has been suggested that the decline of death rates for this age segment is tantamount to improved health or to a reduction in the prevalence of ill health and work incapacity (Clark and Barker 1981; Fibiger 1980). What light do the data shed as to the validity of this supposition? While definitive long-term trend data bearing on health status are not available, figure 3 permits us to examine short-term trends. We see there that the proportion of men in the 50 to 69 age segment reported as being unable to work because of illness increased between 1970 and 1980. Remember, this was the period of the rapid decline in death rates for men of that age. Furthermore, the fragments

![Graph showing death rates for different age groups from 1950 to 1980.](image_url)

**FIG. 1.** Death rates for women have been declining for a long time (Deaths per 1,000 population: United States, 1950–78).

Source: Division of Vital Statistics, National Center for Health Statistics.
FIG. 2. Death rates for men have been declining since the late 1960s (Deaths per 1,000 population: United States, 1950–78).
Source: Division of Vital Statistics, National Center for Health Statistics.

FIG. 3. Work disability rates for men have been increasing during the past decade (Percent unable to work: United States, 1970, 1975, and 1980).
Source: National Health Interview Survey, National Center for Health Statistics.
of available evidence regarding work-disability rates during earlier periods suggest even somewhat lower levels in the more distant past. For instance, for men aged 55 to 64, the rate of reported work disability in 1949 was about 10 percent (Woolsey 1950, 170, 178). [Approximately 12 percent of men aged 55 to 64 were reported as having been kept from working because of illness on the day of the interview. Since the data presented here for the recent period pertain to relatively long-term disability, the 1949 statistics must be adjusted. About three-fourths of those reported as disabled had been, by the day of the interview, disabled for 3 months or longer. This means that approximately 9 percent of all men in the age group had been disabled for 3 months or longer. The estimate of 10 percent in the text includes an additional correction for men with a disabling chronic condition that had its onset within 3 months prior to the interview.] The rate was apparently even lower in 1935 (Woolsey 1950, 183). Thus, rather than the predicted decline in the prevalence of work disability, we appear to have been experiencing an increase.

Some definitions are in order at this point. We are here defining a disabled person as one who is reported as not being able to work at all because of one or more chronic conditions. Examples of such chronic conditions would be coronary heart disease, arthritis, a musculoskeletal impairment due to an accidental injury or a stroke, and blindness. We are not restricting our definition to the totally and permanently disabled. We are counting cases here, however, only if they are relatively longstanding. Total recovery or rehabilitation for the disabled in the relevant age groups tends to be relatively rare, although partial recovery does occur rather frequently (Schecter 1979; Treitel 1979).

Some of the individuals who are here being counted as work disabled would probably, under the proper circumstances, be able to earn money at some type of employment; not all of them are totally disabled. However, these are individuals who are unable to perform the duties of a regular job of a type for which they appear suited.

Returning to the question at hand, how do we account for the increase in the prevalence of reported work disability that has been taking place concomitantly with the decline in mortality rates? While there are obviously a number of different factors at work (Wilson and Drury 1981), figure 4 can help us appreciate that a decline in mortality does not necessarily signify a decline in work disability. The schematic
represents what happens to a population cohort over a 10 year period, from age 55 to age 65. As one might expect, death rates among the disabled have generally been extremely high (Treitel 1979; Hennessey 1980; Croner and Haber 1974; Orcutt 1980). Thus, at earlier times, a substantial proportion of those disabled at age 55 would have died before reaching age 65. The pool of disabled at age 65 was limited in size because it was, in the main, composed only of individuals who had become disabled in the fairly recent past. This situation may very well have been changing since the late 1960s. The death rate from myocardial infarction (heart attacks) has been declining rapidly for both men and women in their fifties and sixties (Rosenberg and Klebba 1979). Myocardial infarctions are frequently the proximate cause of death, the coup de grâce, for individuals with other infirmities (Israel 1981). [On the basis of multiple cause-of-death tabulations, it is clear that most individuals who die of a myocardial infarction also have been suffering from other health impairments.] Reduced incidence and improved survival for myocardial infarction among the disabled would result in a major increase in the size of the pool of disabled at age 65, for instance. In terms of figure 4, it appears that what may have been happening is that the rate represented by stream 6 has been appreciably decreasing in size while the rate represented by stream 5 has been expanding, resulting in the marked accumulation
of disabled individuals at older ages (Fries and Crapo 1981). [Fries and Crapo predict that a period of "increase in the number of years of impaired health per person" will precede the anticipated "compression of infirmity."]

I should now like to turn to the current situation as represented by figure 5. The steady rise of the prevalence of work disability with age is striking if not surprising. The rates in this chart can, of course, be viewed two ways. Combining the three educational groups, we might observe that, for instance, 24 percent of all men aged 65 through 67 are too disabled to engage in any gainful employment. Alternately, we might observe that 76 percent of men of that age are still able to work to some extent. It should also be noted, however, that in addition to the 24 percent of the men aged 65 to 67 reported as not being able to work at all, another 13 percent are limited in the kind or amount of work they can perform; this leaves 63 percent being reported as fully ablebodied with respect to work.

The other striking fact conveyed by this figure is the wide differential in work-disability rates according to educational attainment. At ages

![Figure 5: Work disability rates for men increase sharply with age. The less educated experience the highest work disability rates. (Percent unable to work: United States, 1976–80). Source: National Health Interview Survey, National Center for Health Statistics.](image-url)
62 to 64, 29 percent of the men who had not been graduated from high school were unable to work because of a health problem; among men completing one or more years of college, only 8 percent had such a limitation due to health. Those with less education are likely to be in more physically demanding jobs than are those with more education. The less educated may also not have the skills necessary to be employed in a physically less demanding alternative job. There are a number of other explanations for these observed differences but they need not concern us here (Feldman 1982, 16). The central question facing this commission in this regard is whether the prevalence of work disability of people in their sixties will decline in the future as successively more highly educated generations pass through that age range. I know of no way to answer this question with any certainty. It would seem, however, that trends in the occupational and industrial structure of the economy would be as important as trends in educational attainment. It appears likely that there will remain in the future a substantial number of jobs that are physically or emotionally demanding. While service industries are projected to be the fastest growing employment sector, it should be kept in mind that strenuous work such as automobile repair and hospital nursing are expected to be rapidly growing components of the service sector. Similarly, rapid growth in employment opportunities is expected in eating and drinking establishments, jobs that also require considerable stamina (Personick 1981).

Differences in work-disability rates between men and women can be examined in figure 6. At each age, women are reported as having a higher prevalence of work disability than are men. As was pointed out in connection with figures 1 and 2, the death rates for men in this age range are twice as high as those for women. The discrepancy between the mortality and disability differentials confirms our contention that mortality rates are very poor indicators of work-disability prevalence rates across population groups or over time.

In figure 7, we observe the rapid increase with age in the prevalence of certain functional impairments. For instance, about 22 percent of all women between 35 and 44 years of age experience some trouble standing for long periods; this prevalence nearly doubles by ages 55 to 64. Only four typical functional capacities are shown in the chart but the age patterning in prevalence is nearly identical for a wide variety of physical activities that are commonly required for jobs.

We can see from figure 8 that the age pattern for men is quite similar to that for women although the reported prevalence rate at
FIG. 6. Work disability rates are higher for women than for men (Percent unable to work: United States, 1976).
Source: Survey of Income and Education, Bureau of the Census.

each age for each particular impairment is generally somewhat lower for men. It should be understood that these physical limitation counts are based on a low threshold of limitation. We note, for instance, that 28 percent of men aged 55 to 64 report themselves as having some trouble lifting or carrying 25 pounds. Only a small minority of the men with the limitation are completely unable ever to lift or carry that much weight. Most of these men can handle 25 pounds during certain periods of time, for instance, while their bursitis or back conditions are in remission. There are other periods, however, when these same men find it quite painful or difficult to lift or carry 25 pounds. Some of the men can perform such a task occasionally with practically no difficulty, but would have trouble doing it repeatedly and frequently. For some individuals, the pain and discomfort of such exertion is noticeable but relatively mild; for others, it may be more severe but still bearable. Although the limitation categories presented here are extremely heterogeneous with regard to severity, we do need to recognize how rapidly the prevalence of functional limitations increases with age.

It is clear that some individuals could continue working despite a physical limitation if they could find a job that would permit them
FIG. 7. Routine acts may become difficult as one grows older (Percent of women having trouble when performing specified activities: United States, 1978).

FIG. 8. Routine acts may become difficult as one grows older (Percent of men having trouble when performing specified activities: United States, 1978).
to work intermittently, i.e., during periods of remission of their symptoms. Others could work part-time but not full-time. Still others could work at a physically less demanding job but not at their regular jobs. Such employment changes would, of course, generally result in an appreciable diminution of earnings. Before the advent of current social insurance and income maintenance programs, such employment shifts occurred with some frequency. Older workers left more physically demanding occupations and became night watchmen, guards, doormen, elevator operators, bootblacks, gardeners in private households, and real estate agents (Bogue 1959). In addition, the substantial proportion of older workers who were self-employed as farmers, shopkeepers, and craftsmen were able to adapt to their physical limitations by working intermittently or part-time or by selectively performing those of their former array of tasks that their impaired health permitted. Because of such changes in work activity, earnings declined appreciably for a segment of the aging population as they passed through what is now viewed as the retirement period. Present-day workers suffering physical impairments might not be as successful in obtaining suitable alternative employment as were their counterparts a half-century ago. There are probably fewer “old folks” jobs in the economy now and there may be greater institutional barriers to sporadic, occasional, or part-time employment (Durand 1948). [In a section of his monograph entitled “Contracting Field for Employment of Older Workers,” Durand indicates that the institutional barriers to employment were already a serious problem in the immediate post-World War II era.] The state of health and the requirements of the job for a majority of workers reaching their mid-sixties would permit them to continue in their regular line of work with only minimal, if any, job redesign. It is the sizable minority with a rather wide discrepancy between the demands of their regular jobs and their remaining functional capacity for whom there is a problem.

The concern of this commission is with future trends in work disability, a question I have addressed only tangentially. The problem is illustrated by the discussion in a recent Social Security Administration Actuarial Note (Bayo and Faber 1981) that projects equivalent retirement ages to the year 2050. Permit me to quote briefly from the note:

The measures of equivalence considered in this note take into account mortality, but do not take into account morbidity. That
is, they adjust for the expected length of life spent in retirement, but they ignore the question of whether that life is spent in a more or less healthy condition. One reason for ignoring that question in this note is that morbidity is much more difficult to quantify than is mortality. ... Another reason for ignoring morbidity is that we believe that mortality and morbidity are correlated. That is, when mortality improves, morbidity also tends to improve.

I suggested earlier that a decline in mortality rates can be connected with an increase in morbidity rates. As can be seen in the top panel of figure 9, the prevalence rate of disabling heart disease has been increasing throughout the recent period of rapidly declining heart disease mortality rates. People with disabling heart disease may be surviving longer (Elveback, Connolly, and Kurland 1981). [The observed improvement in long-term survival for patients with angina pectoris is suggestive.] This could result in an increase in the size of the disabled population.

A second point of confusion involves the equating of life-threatening conditions with disabling conditions. While there is obviously some overlap between the two sets of conditions, a great deal of disability...
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is caused by conditions that are not lethal. Musculoskeletal conditions are the cause of a large proportion of work disability. Arthritis, for instance, does not appear to shorten one's life to any great extent. Figure 9 shows the upward trend in the prevalence of disabling arthritis during the past decade or so. While it is not clear why this prevalence has been increasing, there is no particular reason why reductions in mortality rates should result in a reduction in the prevalence of arthritis or of any of a number of other disabling conditions that are generally not lethal.

It has been suggested that the future trend will be markedly different from that depicted here. The concept of the "compression of infirmity" has been receiving wide currency (Fries 1980; Fries and Crapo 1981, 85–93). It is held by some that the age at which chronic diseases manifest themselves is largely under our control as individuals and as a society. The age of onset of disability could be delayed by attention to such personal health habits as exercise, cigarette smoking, alcohol abuse, obesity, and dietary intake as well as the management of high blood pressure and control over environmental pollution. Under this scenario, a widespread reform in personal health habits is taking place and will eventually result in the postponement of the age of onset of disability. The prevalence of work disability would certainly then be lowered in the age span of concern to us here. In terms of figure 4, the stock of disabled at age 55 would be much smaller and the flow of stream 2 would be much slower, thereby reducing the proportion of disabled at age 65 and, of course, at all intervening ages.

What the future holds in this regard is very much a matter of conjecture. The long-term impact of further mortality reductions on the health of the surviving population is difficult to gauge. What has been happening with regard to diabetes is instructive. Diabetes is a condition of which we do not as yet know how to retard the onset but for which the duration of survival subsequent to onset has improved tremendously. Before the use of insulin in the management of diabetes, very few patients lived more than 3 or 4 years after diagnosis. Diabetic comas caused very early deaths. Subsequent to the use of insulin and other advances in the management of diabetes, patients began to survive for far longer periods of time. Medicine became aware of a wide variety of late complications of the disease that arise only after an individual has lived with the disease for many years. When almost all patients died soon after onset, there was no way of knowing what
the late complications would be. The greatly improved survival of
 diabetic patients has resulted in an extremely large increase in the
 prevalence of the condition and such disabling complications as vision
 loss and cardiovascular problems (Marble 1976). The lesson to be
 learned from this is that we forecast the future course of disability
 prevalence at our own peril (Dubos 1959).

 The "compression of infirmity" is based on the anticipation of an
 imminent widespread reform of personal health habits. Certainly a
 lower proportion of the population smokes cigarettes now than was
 the case a decade or two ago. Some other health practices have also
 shown improvement, but there is no assurance that these trends will
 continue. Furthermore, it is not clear that the recent trends for alcohol
 and drug abuse have been particularly favorable. It is difficult to place
 a great deal of confidence in a forecast of future disability rates that
 is contingent on a widespread and permanent change in behavior.

 I have attempted in these remarks to inject a note of caution
 regarding the forecasts of a rapid decline, perhaps by the turn of the
 century, in the prevalence of work disability. On the other hand, we
 cannot extrapolate the recent increases in work-disability prevalence
 very far into the future; advances in the prevention, treatment, or
 rehabilitation of musculoskeletal conditions could be countervailing
 factors. In addition, jobs could be redesigned to accommodate the
 handicapped. Given the many intangibles, the commission's recom-
 mendations concerning the retirement age will undoubtedly have to
 be formulated in the face of considerable uncertainty regarding the
 future course of disability prevalence rates. "Increases in longevity
 in the past have generally been somewhat larger than the best-informed
 estimators had predicted" (Myers 1982). Disability prevalence may
 well be more difficult to predict than is longevity. Our relatively poor
 record in predicting the future course of mortality rates does not bode
 well for our prediction of disability prevalence trends.

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