

ACTUARIAL NOTE

NUMBER 51
APRIL 1969

U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
SOCIAL SECURITY ADMINISTRATION

MORTALITY OF THE AGED BEFORE AND AFTER MEDICARE

by Robert J. Myers and William D. Ritchie
Office of the Actuary

A question which has been raised in recent months is "Has Medicare resulted in reduced mortality among the aged?" To try to answer it, the death rates of persons aged 65 and over in the United States have been analyzed for the fiscal years immediately preceding and following July 1, 1966, the date that Medicare became effective. From that analysis, the answer is "No". That is, it can be concluded that there has been no downward trend in the death rates of the aged since Medicare began. In the remainder of this note, there will be discussed how this conclusion was reached.

The first problem in undertaking this study was deciding what data to use. Two possible sources were considered: (1) the Old-Age, Survivors, Disability, and Health Insurance records and (2) the death rates published by the National Center for Health Statistics in the *Monthly Vital Statistics Report*. Some of the arguments for and against using each of these sources are discussed below.

An argument in favor of using the OASDHI records is that they contain more accurate age-data. One reason is that, since eligibility for OASDHI benefits is dependent on the age of the applicant, the OASDHI records contain dates of birth that have been compared to basic documents (such as birth certificates). The NCHS age-data, however, have not been so verified. A second reason is that, since the NCHS age-data for decedents come from death certificates, they are acquired from a secondary source (that is, the individual himself is not the source of the information). Instead, the source is usually a relative or friend of the decedent. Therefore, it is not uncommon that the resulting age-data are faulty, since the person who is the source of such data occasionally has inaccurate information himself.

On the other hand, there are also several arguments against using OASDHI records. One is that

death rates would have to be developed from basic data. That development would be time-consuming and would involve costly computer operations. The NCHS data, by contrast, are already available in the form of death rates. Therefore, by using those data, we would minimize the effort required to acquire the information needed for this analysis.

A second, and probably the most important, argument against using OASDHI records is that, for the pre-Medicare years, these records reflect only that segment of the aged population which had applied for, and been found entitled to, Social Security benefits. Hence, a sizeable proportion (for example, more than 20% as of January 1, 1966) of the aged population is missing. In particular, the pre-Medicare records do not reflect those people who never filed for benefits because they were continuing in full-time employment. Since it is reasonable to assume that the general level of health of this group of people is higher than that of retirees of the same age, their absence from the data would result in overstated death rates.

After considering each of these factors, it was decided to use the NCHS data published in the *Monthly Vital Statistics Report*. By doing so, the possibility of errors due to less accurate age-data was thereby accepted in order to avoid a known bias, as well as to save time and expense.

After having chosen the NCHS data, a second problem arose—namely, that those data are expressed as calendar-year rates rather than fiscal-year rates. To convert them to fiscal-year rates, the following formula was used for each of the several age groups involved:

$$f r_x = c r_{x-1} + \frac{1}{2} (r_x - r_{x-1})$$

where $f r_x$ = the annual death rate for fiscal year x .

$c r_x$ = the annual death rate for calendar year x .

r_x = the annualized death rate for the first six months of calendar year x.

The rates which were thereby calculated are shown in Table 1. They reveal several pertinent points.

First, although the death rates decreased between FY 1966 (the year before the Medicare program began operations) and FY 1967, the decreases are not unusually large when compared with previous fluctuations. For example, consider the death rates for the total population aged 65-74. The rate for FY 1967 reflects a decrease of 1.0 per thousand from the FY 1966 rate. However, the rates for two of the prior three years also reflect decreases. In particular, the decrease of 0.9 per thousand represented in the FY 1964 rate as compared with the FY 1963 rate is very similar in magnitude to the one reflected in the FY 1967 rate. An analysis of the rates for the total population aged 75-84 yields similar results.

However, similar remarks cannot be made about the FY 1967 death rate for the population aged 85 and over. That rate reflects a decrease from the FY 1966 rate of 13.8 per thousand, more than twice the magnitude of any one-year decrease for the other years shown. But neither can it be inferred from this decrease that mortality of this

age group had significantly improved. The reasons for not making such an inference are based on factors that pertain to all three age groups.

The first factor is that an analysis of the death rates by cause indicates higher mortality in FY 1966 than in FY 1967 due to influenza and pneumonia. From this, it could be inferred that the lower death rates in FY 1967 are due, in part, to the absence of an influenza epidemic. Therefore, it would not be expected that they represent the start of a significant downward trend.

The data for FY 1968 substantiate this expectation, because between FY 1967 and FY 1968, the death rates increased for all three age groups. For ages 65-74, 75-84, and 85 and over, the death rates increased 0.4, 1.2, and 11.7 per thousand, respectively. These increases, together with the high level of influenza in FY 1966, tend to minimize the importance of the decreases in FY 1967.

Therefore, based on the above analysis, it is concluded that, as yet, there has been no evidence of any significant improvement in the mortality of the aged since the advent of Medicare. It will be of great interest and importance to study this subject in the future as more experience becomes available.

Table 1

DEATH RATES FOR TOTAL POPULATION AGED 65 AND OVER,
BY AGE AND FISCAL YEAR, 1961-68

Fiscal Year	Death Rates per Thousand, by Age		
	65-74	75-84	85 and Over
1961	36.8	85.0	194.5
1962	36.4	84.0	197.0
1963	38.9	85.9	208.8
1964	38.0	82.4	202.8
1965	37.7	81.7	200.2
1966	38.5	82.1	204.4
1967	37.5	79.2	190.6
1968	37.9	80.4	202.3

Source: Computed from the death rates published in the *Monthly Vital Statistics Report*.