

result in stationary or increasing death rates, it is true, but there are more cogent reasons which lead most actuaries to the conclusion that the only safe assumption is that the past trend will, in general, be continued, and perhaps accelerated.

Actuaries' opinions naturally differ considerably as to precisely how much allowance for possible future mortality improvement should be made in annuity premium rates. However, I believe it a fair statement that many actuaries think that an over-all average (over the years and ages) improvement in death rates of somewhere in the neighborhood of 1 per cent per year is a not unreasonable margin to assume in the fixing of such rates. More information on this question will be available later in 1949 when a study of the experience of United States life insurance company annuities, now in progress, is completed. But in the meantime, some very rough figures for the various kinds of annuities, assuming that the rate of decrease just mentioned applies at all ages and during all years, may be helpful.

Most deferred annuities continue in effect for much longer periods than do most immediate annuities. The latter, typically issued at ages 60-70, continue only for the life expectancies of persons of that age, which may average 15 years. Therefore, assuming the objective of over-all mortality equal to 100 per cent of tabular death rates, excess percentages in earlier years offsetting deficient percentages in later years, as initial margin for possible future mortality improvement of about 8 per cent of death rates would be needed for immediate annuities on the assumption of mortality decreasing at the rate of 1 per cent per annum. Because immediate annuities issued at younger ages continue in existence longer than those issued at ages 60 to 70, larger margins are suggested for them; and for immediate annuities issued over ages 60 to 70, smaller margins are permissible.

According to this admittedly imperfect criterion, the margins shown for immediate annuities in Tables 1 and 2 for all ages combined are indicated to be a little more than sufficient, but the margins were less at the younger ages and greater at the advanced ages, as already mentioned.

Deferred annuities, on the other hand, are typically issued at ages 25 or 30 to 40 or 45 and, therefore, begin to provide annuity payments only after about 30 years, on the average. These annuities, after payments begin, should continue in effect for periods comparable to those of immediate annuities. Since government deferred annuities during their deferred periods do not involve any mortality risk, the margin for possible future mortality decreases indicated for them is simply the margin appropriate for immediate annuities at ages 60 to 70 when deferred annuity payments presumably begin, plus an additional margin to cover mortality improvement assumed to occur between the date the contract was issued and the date annuity payments begin. For example, for a deferred annuity contract issued at age 35, mortality decreases during the 30 years to age 65 at the rate of 1 per cent per year would amount to approximately 26 per cent, which when combined with the 8 per cent immediate annuity margin mentioned above would indicate a total needed margin of 32 per cent of death rates. For ages at issue younger than 35, the calculations would, of course, produce larger margins than that just quoted, and for issue ages over 35 smaller margins.

These margins, as indicated for deferred annuities by the "1 per cent rule-of-thumb," are for the common ages at issue substantially larger than those shown in Tables 1 and 2 for ages 60-69. This suggests in a very approximate way that at most issue ages margins substantially greater than those shown by the 1943-8 mortality experience may be needed in order to avoid the possibility of financial losses in future years. These losses would be of the type now being incurred under deferred annuity contracts issued before 1938 and now entering the period of annuity payments, the amount of such payments being calculated from the sums of money now accumulated,