

Mortality Improvement in the USA: Analysis, Projections and Extreme Scenarios

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Abstract

Future mortality improvement is an important assumption for the pricing and valuation of annuity liabilities. The 1994 Group Annuity Mortality Table and 1994 Group Reserving Table published by the Society of Actuaries included a set of annual rates of mortality improvement by age and gender, known as Scale AA, with the recommendation that its continued use be reviewed around 2010. A task force was set up in 2010 to review the life tables for Group Annuity and the assumptions for mortality improvement associated with them.

This paper examines the trends of mortality improvement in the United States for the consideration of the task force, using more recent information from the Social Security Administration (SSA) life tables and data derived from the Human Mortality Database (HMD).

This paper seeks to:

1. Compare the mortality improvement trends used in the development of Scale AA (1977 to 1993);
2. Examine the historic performance of Scale AA since 1995 to its most recent period (subject to data availability); and
3. Using stochastic models, compare the projection of mortality improvement with figures from Scale AA (2010 to 2030).

We note that annuitants may experience different changes in mortality rates from that of the general (HMD) or SSA populations. However, our analyses should contribute to the debate over the continued implementation of Scale AA. We have found, for the recent past, the annual rates of improvement in mortality implied by SSA life tables to be higher than that of Scale AA. Historic and projected annual rates of improvement in mortality based upon the U.S. HMD population were also generally higher than those suggested by Scale AA. The analysis raises questions about the adequacy of Scale AA for use in the valuation of annuity liabilities.