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## *RP-2000 Mortality Tables Report Executive Summary*

*Editor's Note: This is an excerpt from The RP-2000 Mortality Tables Report. It can be found on the SOA Web site: (www.soa.org).*

**T**he Retirement Protection Act of 1994 (RPA) established mortality assumptions to be used when calculating current liabilities for pension plans. This was the first time that standard tables had been mandated for this purpose. The Secretary of the Treasury has the authority to promulgate a new table in the year 2000. The Society of Actuaries (SOA) conducted this study of uninsured pension plan mortality in response to RPA and to ensure that the Treasury Department would have current and thorough information available when it considers updating the mandatory mortality table. The SOA charged the Retirement Plans Experience Committee (RPEC) with the responsibility for conducting this study.

The purpose of this report is to provide actuaries with all of the significant findings of the RPEC along with full explanation of when and how these should be used in reviewing or setting mortality rates for specific plans. The report does not recommend specific tables to the Secretary of Treasury to adopt in conformance to RPA. The SOA believes it is appropriately the role of the American Academy of Actuaries to recommend tables to the Secretary based on this mortality study and other pertinent information.

This report presents the RP-2000 Tables, new graduated basic amount-adjusted mortality tables projected to the year 2000, and explains how the tables were developed. Scale AA is recommended for projecting the proposed mortality rates beyond the year 2000. The report compares experience by type of employment, amount of annuity, and industry. Actuaries should keep in mind that these tables were developed from experience on mortality for uninsured pension plans and are only recommended for use for those types of plans.

The final database used for this study reflects nearly 11 million life-years of exposure and more than 190,000 deaths, all from uninsured pension plans subject to RPA Current Liability rules. More than 100 pension plans submitted data in response to the request from the RPEC for experience from plan years 1990 through 1994. The RPEC determined that this volume of data was sufficient to produce valid mortality tables.

The contributors were asked to provide data defined by several characteristics including Standard Industrial Classification (SIC) and amount. The contributors indicated whether the plan covered hourly or salaried workers, and whether the plan was collectively bargained or not. Based on this information, plans were categorized as blue collar, white collar, or mixed collar. The data contributors summarized their mortality experience

into cells by age, gender, and status (employees, retirees, disableds, and beneficiaries).

For each cell, the RPEC asked the submitter to provide the number of participants on the valuation date, the amounts of annual pay or annuities, the number of deaths during the year following the valuation date, and the amounts associated with those deaths. While all data contributors included the number of participants and the number of deaths, many did not provide information on amounts. About 60% of the exposed employee lives and 40% of the exposed annuitant lives included information about amounts. The RPEC used data from plans providing amounts to adjust the lives-based mortality for the entire database to an amount-adjusted basis.

The RPEC generated separate tables by gender for employees, healthy annuitants, and disabled retirees. The RPEC agreed that there was sufficient data for credible tables for these groups and that the mortality among the groups differed sufficiently to justify use of separate tables. Where unisex tables are desirable, the RPEC recommends that the actuary should construct blended tables based on the proportion of each gender in the plan population.

The healthy annuitant table combines experience of healthy retirees and beneficiaries. A combined employee and healthy annuitant table was also produced

as a more direct comparison to earlier tables and for actuaries to use if a combined table is needed. The RPEC encourages use of the separate employee and healthy annuitant tables.

Using the RP-2000 mortality table for healthy annuitants may overstate plan liabilities if used to value benefits for both healthy and disabled annuitants. However, the RP-2000 mortality table for disabled retirees may not be appropriate for valuing benefits of disabled annuitants in all cases. This table is based on the experience of all disabled annuitants whether or not they were eligible to receive Social Security disability benefits. Actuaries should use professional judgment when applying this table if the plan's definition of disability is particularly strict or liberal.

The central year of the data for these tables was estimated as 1992, and the tables were projected to the base year 2000. Three sources of data were reviewed to study recent trends in mortality. These were Social Security, Federal Civil Service, and the data collected for this study. The RPEC developed mortality improvement factors to project from 1992 to 2000 based on analysis of these sources. To study long-term trends in mortality, the RPEC examined data from four sources: Social Security, Federal Civil Service, the Railroad Retirement Board, and the SOA group annuity mortality studies. The RPEC decided to recommend the use of Scale AA for projecting mortality rates beyond the year 2000. Scale AA was developed for

use with the Group Annuity Reserving 1994 table. The RPEC recommends projection of mortality rates and encourages the use of generational mortality projection. In cases where it is not material or cost effective to incorporate generational mortality projection, the actuary should project mortality improvement on a comparable static basis.

Statistical analysis of the data showed that collar type and amount are both significant predictors of mortality for this data set. For example, for male annuitants age 65 to 69, the small amount mortality was 77% greater than the large amount mortality, and blue collar mortality was 43% greater than white collar mortality. By comparison, male annuitant mortality was 31% greater than female mortality at age 67. Collar type is defined as blue or white depending on the characteristics of the group. Amount is defined as low, medium, or high based on the individual's annuity. SIC was not found to be a consistently significant predictor of mortality.

The RPEC found that both collar and amount can bear a relationship to the underlying mortality characteristics of a retirement plan. The RPEC recommends that the individual characteristics and experience of a retirement plan be considered in selecting the mortality table. In certain cases either collar or amount may be appropriate factors to consider, subject to the theoretical concerns outlined in Chapter 5. While either factor was found to be a statistically significant indicator of differences in mortality, the

RPEC recognizes that for the majority of plans subject to RPA legislation, adjustment of the standard mortality tables in a manner consistent with the data collection method and results of this study will be considerably more practical if the collar factor is used.

An analysis of the variability of mortality experience among plans in the same industry showed that differences were statistically significant in most cases tested. Actual deaths by plan ranged from about 20% below industry average to 30% above industry average. Significant differences were found even after adjusting for collar type and annuity size group.

Annuity values based on the RP-2000 Tables were calculated and compared to annuity values based on the GAM-83 and UP-94 tables. In general, the RP-2000 values are between two and nine percent higher for males and between three and five percent lower for females than the GAM-83 values. The RP-2000 values for males under age 80 are within two percent of the values based on the UP-94 table projected to 2000. For males at ages 80 and 90, the RP-2000 values are substantially lower than the projected UP-94 values. For females, the RP-2000 values are lower than the projected UP-94 values by about two to four percent.

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