

Society of Actuaries

RPEC Response to Comments on RP-2014 Mortality Tables Exposure Draft

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Section 1. Overview

In February 2014, the Society of Actuaries' Retirement Plans Experience Committee (RPEC or "the Committee") released the RP-2014 Mortality Tables report and the Mortality Improvement Scale MP-2014 report, both in exposure draft form. The SOA solicited comments on the exposure drafts through the end of May 2014. This report summarizes the comments received on the RP-2014 exposure draft, presents the Committee's formal responses to those comments,¹ and identifies any resulting changes reflected in the final report. Concurrent with the release of this report, RPEC has issued a separate report with responses to comments on the Scale MP-2014 Mortality Improvement exposure draft.

The SOA received comments from 25 individuals and organizations on the RP-2014 and Scale MP-2014 exposure drafts. Some of the comments were in the form of e-mail messages that focused on one specific topic and some replies contained comments on multiple topics in formal letter format.

Due to the number of comments received regarding the data used in the development of the RP-2014 tables, the SOA formed an independent RP-2014 Data Processing Review Team² (Data Review Team) to review (1) the procedures used by RPEC to collect, edit and process the data used to construct the RP-2014 tables and (2) the RPEC's responses to the comments received about the data exclusion process.

The Data Review Team:

- Concluded that RPEC followed appropriate actuarial procedures in the collection and processing of the dataset underlying the RP-2014 mortality tables.
- Agreed with RPEC that the exclusion of public/federal plan³ data from the final RP-2014 dataset was appropriate and that the SOA should undertake a separate mortality study for these plans.
- Agreed with RPEC that the possibility of receiving additional data from the PBGC (for distressed or involuntarily terminated pension plans) should not delay the release of a final RP-2014 report. If the PBGC dataset does eventually become available, RPEC recommends that a separate study be performed for those plans.
- Agreed with RPEC that the final RP-2014 dataset consisting of over 10.5 million life-years of exposure and 220,000 deaths is an appropriate representation of the mortality experience of private pension plans in the United States over the study's observation period.

¹ A number of the more narrowly-focused comments (each of which was raised by an individual commenter) were addressed directly through phone calls or e-mail responses with these commenters.

² The RP-2014 Data Processing Review Team was one of two independent teams assembled at the request of the SOA Leadership Team to evaluate certain processes used by RPEC in the development of the RP-2014 mortality tables and the Scale MP-2014 mortality improvement model. The members of the RP-2014 Data Processing Review Team were Tonya Manning (SOA Leadership Team Liaison), Kevin Binder, Thomas Edwalds, and Susan Sames.

³ For the remainder of this report, the term "public plans" should be understood to include both public and federal pension plans.

- Believes that RPEC’s responses to the comments received on the data inclusion/exclusion process (including related changes to the final RP-2014 report) adequately address the concerns of those commenters.

RPEC would like to thank those individuals and organizations that commented. The Committee would also like to express its gratitude to the members of the Data Review Team for their thorough examination of the processes used by RPEC in the development of the final RP-2014 dataset. The Committee believes that the changes that were prompted by the comments received during the exposure period, along with the very helpful suggestions made by the Data Review Team, resulted in an improved final report.

The remainder of this document is organized into the following sections:

- Section 2: Exclusion of Public Plan Data
- Section 3: Treatment of Pension Benefit Guaranty Corporation (PBGC) Data
- Section 4: Inclusion/Exclusion Process for Private Plan Data
- Section 5: Application of RP-2014 Tables
- Section 6: Separate Annuitant and Non-Annuitant Tables
- Section 7: Additional Annuity Comparisons
- Section 8: Amount-Weighted and Headcount-Weighted Mortality Rates
- Section 9: Other Comments

Each section (other than the last) is organized into four subsections:

1. A short background paragraph
2. A summary of the comments received
3. RPEC’s response to those comments
4. Changes, if any, made to the final RP-2014 Mortality Tables report

Section 2. Exclusion of Public Plan Data

2.1 Background

RPEC's original request for pension plan mortality data was sent in late 2009 to a number of actuarial consulting firms, the PBGC, and several sponsors of large public plans. Although the Committee's primary objective was to produce new mortality tables for private pension plans in the United States, RPEC was also interested in collecting public plan data, with the intention of comparing—and possibly combining, if appropriate—the two datasets.

RPEC ultimately received and processed mortality data from three sponsors of extremely large public plans.⁴ Multivariate analysis indicated that (1) the overall mortality experience for the combined public plans was significantly different from that of the combined private plans, and (2) the mortality experience for each of the three individual public plan sponsors was significantly different from that of the other two. Based on those statistical discrepancies and the original intent to produce mortality tables for private pension plans, RPEC concluded that it would be preferable to focus solely on the private plan datasets.

2.2 Summary of Comments Received

Three commenters made remarks in connection with the exclusion of public plan data from the study:

- One commenter felt that exclusion of the public plan data could potentially introduce a bias in the tables.
- One commenter requested additional detail on the observed differences between public and private plan mortality.
- One commenter questioned the exclusion of the public plan data given that many public sector plans currently use some version of RP-2000.

2.3 RPEC Response

The multivariate analysis performed by RPEC indicated statistically significant structural differences in the underlying mortality rates produced using the public and private plan datasets. These structural differences included:

- Gender-based differences: The odds ratio of age-specific male-to-female mortality was much higher for the private plan dataset than for the public plan dataset.
- Amount-based differences: The amount of variation between the bottom quartile and top quartile mortality was much greater for the private plan dataset than for the public plan dataset.

⁴ RPEC also received data that included a number of smaller public plans that were excluded due to “obviously incorrect dates of death”; see subsection 4.3 for additional details.

- Age-based differences: The public plan mortality for annuitants under age 65 exhibited a number of distinct features relative to the private plan mortality at those ages.
- No collar information was submitted for the public plans, precluding a multivariate analysis based on collar (as was performed on the private plan data).

As stated in subsection 2.1 of the RP-2014 Mortality Tables exposure draft, an important motivation for the study was the requirement in IRC Section 430(h)(3) for the Secretary of the Treasury to review at least every 10 years the “applicable mortality rates” used for minimum funding and various other regulatory requirements. The fact that the final RP-2014 tables were based exclusively on data from uninsured private plans makes those tables more suitable as potential replacements for the applicable mortality rate structure currently in place.

Despite being of very high quality, the final public plan dataset represented the mortality experience of only three plan sponsors, albeit sponsors of extremely large plans. As RPEC stated in subsection 4.3 of the exposure draft, the mortality experience of the individual public plans was so disparate that it would not be appropriate to develop separate public plan retiree mortality tables based on the aggregated public plan dataset. The Committee recommends that the SOA initiate a separate study of public plan mortality experience, with the expectation that the study results would include separate tables for (1) public safety, (2) teachers and (3) other public entities.

See also Section 5 of this report for RPEC’s responses to comments regarding the applicability of RP-2014 tables to public plans.

2.4 Resulting Changes Reflected in Final Report

The final RP-2014 report includes additional information regarding the structural differences between public and private plan mortality rates.

Section 3. Treatment of PBGC Data

3.1 Background

RPEC requested data from the PBGC as part of the initial data collection process, but no data was submitted by the PBGC at that time⁵. Based on (1) the quantity of data received from other sources and (2) the fact that PBGC data were not included in the RP-2000 study, RPEC decided to proceed with the study without the PBGC dataset.

3.2 Summary of Comments Received

Three commenters questioned the absence of PBGC data from the final RP-2014 dataset. One of these commenters stated that the PBGC database includes a broader range of data than is currently represented in the exposure draft and that its use would increase confidence in the resulting mortality tables.

3.3 RPEC Response

RPEC believes that the final RP-2014 dataset accurately represents the current mortality experience of ongoing private pension plans in the United States.

The Committee has significant concerns regarding the overall consistency of the PBGC dataset relative to the final dataset used to construct the RP-2014 tables. There are three aspects of the PBGC data that are of particular concern to RPEC:

1. All of the plans included in the PBGC dataset went through either a sponsor-initiated distress termination or a PBGC-initiated involuntary termination. Additional analysis would be necessary to determine whether mortality patterns within plans sharing these traits differ significantly from those of ongoing plans. This analysis would be important because, whereas the dataset for ongoing plans is a sample, the PBGC dataset would contain the entire population of private plans terminated in distress/involuntary situations.
2. There is a strong possibility that the pattern of early benefit commencement for those in the PBGC dataset are significantly different (e.g., a much higher incidence of very early commencement of pension benefits) than that for similar plans of other comparable sponsors.
3. The PBGC is unable to provide explicit plan-specific collar classification information.

If mortality rates from plans trusteeed by the PBGC and ongoing plans were found to differ to a statistically significant extent, a determination of the sources of this difference would be an important area for further investigation. The absence of collar information from the PBGC's dataset would limit the opportunity for such analysis.

⁵Based on conversations between SOA and PBGC staff subsequent to the release of the exposure drafts report in February 2014, it was determined that while the SOA did send a request to the PBGC, the request was not sent to the right contact and consequently, PBGC actuaries responsible for the data never knew of the SOA's request.

Conversations with PBGC actuaries subsequent to the release of the RP-2014 exposure draft clarified that the PBGC is willing and able to share its pension data with RPEC. As of the publication of this report, the SOA has received some experience data from the PBGC. Because the data did not include a collar indicator, the SOA and the PBGC are currently working together to add collar indicators to a number of the larger plans included in the PBGC dataset.

3.4 Resulting Changes Reflected in Final Report

There were no changes in the final RP-2014 report that resulted from the comments received on this topic.

Section 4. Inclusion/Exclusion Process for Private Plan Data

4.1 Background

RPEC received approximately 20.4 million life-years of private pension plan exposure that fell within the study's observation period. Included in the 20.4 million life-years were two large data submissions that could not be used in the development of the RP-2014 mortality tables because they did not meet the study's data requirements:

- One data contributor submitted approximately 6.7 million life-years of private plan data without a consistent identifier (ID) that was necessary to produce "consolidated records" across all years of the study's observation period.
- One data contributor submitted approximately 0.8 million life-years of private plan data that had obviously incorrect dates of death.

SOA staff had a number of conversations with both of the organizations that submitted these two datasets, but the contributors were either unwilling to invest further resources or unable to correct their submissions. RPEC, therefore, had no choice but to exclude these datasets from the remainder of the study.

An additional 0.1 million life-years of private plan data was excluded due to unknown dates of birth or exposures outside of status-specific⁶ age ranges; e.g., retiree records at ages younger than 50. The dataset remaining at this point contained approximately 12.9 million life-years of private plan exposure. This was the dataset that underwent RPEC's in-depth actual-to-expected (A/E) ratio⁷ analysis.

This A/E analysis, performed on each plan/status combination, resulted in the exclusion of 2.4 million life-years of exposure (approximately 18 percent of the then-remaining 12.9 million) attributable to plans⁸ with outlier A/E ratios that could not be confirmed by the contributor. The resulting final RP-2014 dataset consisted of approximately 10.5 million life-years of exposure.

4.2 Summary of Comments Received

Five commenters expressed concern about either the amount of data excluded from the study or the process by which the data was excluded from the study:

⁶ Throughout this document, the word "status" is used to distinguish between the various types of participants; i.e., Employee, Healthy Annuitant, Beneficiary, and Disabled Retiree.

⁷ This ratio, which compares "actual" deaths to "expected" deaths (based on a preselected mortality table) is a typical high-level technique used in mortality studies to assess the relative level of mortality experience for a particular group. See also Section 4.3 (line f).

⁸ Two plans each consisted of a small number of Employees (each with an outlier A/E ratio) and much larger number of Healthy Annuitants (each with a very reasonable A/E ratio). For both plans, RPEC decided to exclude the Employees and include the Healthy Annuitants in the final dataset. A third plan had the reverse situation, and the small group of Healthy Annuitants was excluded while the larger Employee group was included.

- Four comment letters included a general concern that too much data was excluded and the resulting dataset was very limited.
- Three commenters felt that exclusion of records due to an inability to link records across the entire exposure period biased the study towards lower mortality rates, since death is a possible cause of an inability to link a participants' record from year to year.
- Three commenters were concerned about excluding plans with outlier A/E ratios. One of these commenters requested more detail regarding the effect that these exclusions might have had, while another suggested that removal of these plans lends an appearance of bias to the final dataset.
- Two commenters expressed concern that eliminating data due to gender change could bias the final dataset since those situations could have been unrecognized deaths.
- Two commenters replied that excluding participants with “obviously incorrect dates of death” could bias the study toward lower mortality rates since data preparation teams are more concerned with the status on the valuation date than the actual date of death.

4.3 RPEC Response

RPEC acknowledges that the data collection/validation process summarized in Section 3 and the data reconciliation in Appendix B of the RP-2014 exposure draft were not presented as clearly or as completely as they could have been. To that end, RPEC has substantially expanded Section 3 (Data Collection and Validation) in the final report.

The data reconciliation summaries presented in Appendix B of the exposure draft were unnecessarily confusing, primarily due to RPEC’s use of both “record” counts and “life-year” counts in the same table. A new reconciliation of the RP-2014 public and private plan datasets, based entirely on life-years of exposure, is presented in Table 1 below.

All Data Within Observation Period (Life-Years of Exposure)				
Data Processing		Total	Public Plans	Private Plans
(a)	Data originally received from contributors within study period	49,336,330	28,907,204	20,429,126
(b)	Data submitted without consistent IDs	6,682,090	-	6,682,090
(c)	Data with obviously incorrect dates of death	8,598,859	7,847,657	751,202
(d)	Data with either unknown ages or ages outside of age ranges	1,301,693	1,172,995	128,698
(e)	Data before in-depth A/E analysis; (a) - Sum[(b) through (d)]	32,753,688	19,886,552	12,867,136
(f)	Data for plans with outlier A/E ratios that could not be confirmed by the contributor	4,533,246	2,166,954	2,366,292
(g)	Final dataset, before public plan exclusion; (e) - (f)	28,220,442	17,719,598	10,500,844
(h)	Public plan exclusion	17,719,598	17,719,598	-
(i)	Final RP-2014 dataset, after public plan exclusion; (g) - (h)	10,500,844	-	10,500,844

Table 1

Note that the 49.3 million life-years of total exposure in line (a) above represents data that met RPEC’s data submission criteria and that fell within the study’s observation period. The 59.9 million total exposure figure shown in the exposure draft included data that fell outside of the study’s observation period.

Other than the approximately 0.1 million life-years of private plan exposure removed due to unknown ages or ages outside of status-specific ranges shown in line (d) of Table 1, and with the three exceptions described in footnote 10 below, all remaining private plan exclusions were made at the full plan level; i.e., individual records within plans were not excluded. All of the plan-wide exclusions were based on one of the following three reasons:

- ***Line (b); Data submitted without consistent IDs:*** Data for several plans submitted by one organization were submitted without the consistent IDs required for the record consolidation process described in subsection 3.4. Despite repeated efforts by SOA staff to have the dataset resubmitted with consistent IDs—and clear messages that RPEC would exclude that dataset if the consistent IDs were not provided—the contributor did not resubmit this data. Hence this entire dataset was excluded from further analysis.
- ***Line (c); Data with obviously incorrect dates of death:*** A preliminary inspection of the entire dataset submitted by one contributor indicated that there were obvious problems with the date of death field. After confirming the data problem, the contributor worked with SOA staff and Swiss Re⁹ to provide a subset of the original dataset with correct death information. That effort proved unsuccessful, and the contributor ultimately communicated that it would not be able to provide accurate data. Therefore, this contributor’s entire submission was excluded.
- ***Line (f); Data for plans with outlier A/E ratios that could not be confirmed by the contributor:*** Line (e) represents the total life-years of exposure that remained prior to the detailed A/E analysis performed by the Committee. RPEC’s next step was to calculate A/E ratios for each plan/status combination. The expected number of deaths—the “E” in the A/E ratios—was determined on a year-by-year basis for each remaining plan based on the applicable collar-adjusted RP-2000 mortality table, projected using Scale BB to the appropriate year in the observation period.

For each status/collar combination, a “normalized” A/E ratio was developed, effectively scaling all of the ratios in that subgroup so that the average A/E ratio for the entire subgroup was 100 percent. Next, 95 percent confidence intervals were created for the resulting normalized A/E ratios for each plan/status combination. If the low end of the 95 percent confidence interval was greater than 110 percent or if the high end was less than 90 percent, the plan was flagged for additional examination. For all of these flagged plans with more than a very small number of expected deaths,¹⁰ the data contributors were asked about the reasonableness of the submitted data. A plan was dropped from the study as a result of this analysis only if the contributing organization was unable to confirm that the observed A/E ratio was reasonable.¹¹

⁹ Swiss Re was selected to perform validation checks, initiate various statistical analyses, and, per approval by the Committee, impute missing information.

¹⁰ Seven comparatively small plans were flagged and dropped from the study without a request for submitter confirmation.

¹¹ Two plans each consisted of a small number of Employees (each with an outlier A/E ratio) and much larger number of Healthy Annuitants (each with a very reasonable A/E ratio). For both plans, RPEC decided to exclude the Employees and include the Healthy Annuitants in the final dataset. A third plan had the reverse situation, and the small group of Healthy Annuitants was excluded while the larger Employee group was included.

RPEC's responses to the specific comments received are:

- Regarding the comment that too much data was excluded, RPEC believes that the procedures followed and actuarial techniques used in the validation process were unbiased and appropriate and the final dataset contains a sufficient and credible amount of data upon which to develop a new pension mortality table.¹² The final dataset used to develop RP-2014, consisting of 10.5 million life-years of private pension plan exposure, is comparable to the amount of data used to develop RP-2000.¹³
- Because the plans that failed to supply consistent IDs were excluded from the study in their entirety, no individual records or groups of records within a plan were excluded on this basis. Hence, no bias towards lower mortality rates was introduced through this decision.
- RPEC did not exclude any individual consolidated records due to "inconsistent gender" information. Each consolidated record with such an inconsistency was reviewed in an attempt to capture all deaths within the study's observation period.¹⁴
- Individual records were not removed due to "obviously incorrect dates of death". All of the data from the one organization that submitted the records with "obviously incorrect dates of death" were eliminated to avoid bias.

4.4 Resulting Changes Reflected in Final Report

The Data Collection and Validation section of the Final Report has been significantly revised from the exposure draft. In particular, clarity is provided around the fact that, with the exception of three small plans, all inclusion/exclusion decisions based on A/E ratios were made on a plan-wide basis. Also, the data reconciliation summaries were changed to be expressed solely in terms of life-years of exposure.

¹² The Data Review Team looked at these issues carefully, confirmed that the process was not biased and agreed with RPEC's conclusions.

¹³ RP-2000 was based on 10.9 million life-years of total exposure. The total Healthy Annuitant exposure for RP-2014 exceeds that for RP-2000.

¹⁴ See Section 3.4 of the RP-2014 report for more information.

Section 5. Application of RP-2014 Tables

5.1 Background

The RP-2014 exposure draft included the following language regarding the application of the RP-2014 mortality tables:

RPEC recommends that all pension actuaries in the United States carefully review the findings presented in this report and the companion Scale MP-2014 report. Subject to standard materiality criteria (including Actuarial Standard of Practice No. 35) and the user's specific knowledge of the covered group, the Committee recommends that the measurement of U.S. private retirement plan obligations be based on the appropriate RP-2014 Table projected generationally for calendar years after 2014 using Scale MP-2014 mortality improvement rates.

The exposure draft did not include any explicit guidance for the application of the RP-2014 mortality tables in connection with the measurement of public pension plan obligations.

5.2 Summary of Comments Received

Five commenters made remarks in connection with the application of the RP-2014 tables:

- One commenter strongly disagreed with “the breadth and forcefulness of the recommendations” made by the Committee. That same commenter went on to state that: “Any actuary or plan sponsor wishing to use a different table or projection combination for financial accounting purposes for example, will be forced to make a case to the plan sponsor’s auditors even where plan-specific experience or other expert opinion differs from the findings in the table.”
- One commenter requested that the RP-2014 report language allow for more actuarial judgment to be used to select mortality assumptions that fit a given situation, similar to a recent Canadian Institute of Actuaries’ mortality study.
- Two commenters requested guidance around tables to use for public plans in light of the decision to exclude public plan data.
- Two commenters wrote that the RP-2014 report should explicitly state that the new tables are not appropriate for public plans.
- One commenter suggested that new tables for public plans should be developed while another suggested a follow-up table should be developed based on private and public plan data combined.

5.3 RPEC Response

RPEC agrees that certain recommendations included in the RP-2014 exposure draft did not provide pension actuaries¹⁵ with enough flexibility. The Committee also agrees that it should provide some guidance on the applicability of RP-2014 mortality tables to public pension plans.

Based on the observed differences in mortality patterns between public and private plans as well as the differences among the public plans, RPEC agrees that there is a need for a separate mortality study of public pension plans. Ideally, such a study would develop mortality rates separately for public safety, teachers, and other public entities.

5.4 Resulting Changes to the Final Report

An entirely new section, entitled Application of RP-2014 Mortality Tables,¹⁶ has been added to the final RP-2014 report. The first subsection introduces the concept of “benchmark” mortality tables, which are standard tables that could be used without adjustment, with appropriate loads, or as the reference table for credibility-weighted blended mortality rates.

The second and third subsections include guidance for the application of RP-2014 mortality tables to private and public pension plans, respectively. RPEC has adopted a less prescriptive tone in those subsections; for example:

- “RPEC maintains that, as of their release date, the RP-2014 tables presented in this report represent the most current and complete benchmarks of U.S. private pension plan mortality experience, and the Committee recommends consideration of their use for the measurement of private pension plan obligations effective immediately.”
- “Despite the fact that RPEC’s analysis of three extremely large public plans indicated that there were statistically significant structural differences in underlying mortality rates between the public and private plan datasets, the Committee believes that it would not necessarily be inappropriate—or inconsistent—for actuaries to consider one or more of the RP-2014 tables as suitable mortality benchmarks for any individual public plan.”

With respect to private plans in particular, RPEC believes that the updated language, which “recommends consideration” of the RP-2014 tables as the “most current and complete benchmarks,” provides pension actuaries with the flexibility needed for all varieties of plan populations and applications.

¹⁵ The word “pension” used in the terms “pension actuary”, “pension actuaries”, or “pension-related” in this report should be understood to include both “pension” and “other postemployment benefits (OPEB).”

¹⁶ See Section 11 in the final RP-2014 Mortality Tables report.

Section 6. Absence of “Combined Healthy” Tables

6.1 Background

In addition to separate mortality tables for Employees and Healthy Annuitants, the RP-2000 report included a “Combined Healthy” table, which blended the two sets of mortality rates between ages 50 and 70. The gender-/age-specific blending in the RP-2000 study reflected the approximate pattern of retirement derived from the total RP-2000 dataset.

The RP-2014 exposure draft did not include any corresponding combined healthy tables.

6.2 Summary of Comments Received

Three commenters requested that the SOA produce a single combined healthy table as an alternative to the separate annuitant and non-annuitant tables.

One commenter requested that the SOA include in the report non-prescriptive guidance on how to transition from non-annuitant to annuitant rates, in the absence of a combined table.

One commenter disagreed with the recommendation to blend the RP-2014 Employee and Healthy Retiree tables based on the plan-specific retirement rate assumptions, stating that plan provisions such as early retirement benefit reduction factors affect retirement rates more than the health of the individual participant.

6.3 RPEC Response

Although the Committee understands the desire of many pension actuaries to have access to standardized combined healthy RP-2014 tables, RPEC is of the opinion that the development of one such table to be used for all covered groups and in all situations would be unnecessarily simplistic and often inappropriate. It would be unnecessarily simplistic because virtually all modern pension valuation software can accommodate separate pre- and post-retirement mortality assumptions. It would often be inappropriate because any such combined table would almost certainly be inconsistent with the assumed long-term non-annuitant/annuitant distribution of the covered group.

With respect to the request for guidance on how to transition from non-annuitant to annuitant rates, RPEC suggests, in the case of a mature plan, taking into account the current composition, on a benefits-weighted basis, of the participant group at each age in the age range for which there is a significant overlap between employees and annuitants and blending the Employee and Healthy Annuitant rates accordingly. It may be desirable to smooth any irregularities in the observed age-by-age composition of employees and annuitants and then determine the blended rates from the smoothed results.

This approach is likely to be inappropriate if the non-annuitant/annuitant mix is expected to change significantly in the future.¹⁷ Determining whether an appropriate combined table can be developed for a particular plan may prove difficult. The use of separate non-annuitant and annuitant tables avoids this complication.

Finally, it is RPEC's understanding that the development and release of the "Combined Healthy" tables in the RP-2000 report was intended to be an interim measure to help pension actuaries transition from an era of "one column of mortality rates per gender" to an era of separate annuitant and non-annuitant tables. The Committee believes that sufficient time has now elapsed for that transition.

6.4 Resulting Changes to the Final Report

As a result of the comments, RPEC has modified the methodology that could be considered in connection with the development of plan-specific combined healthy tables. That change notwithstanding, the Committee continues to strongly encourage the use of separate annuitant and non-annuitant tables.

¹⁷ The fact that certain measurements, such as for an annuity purchase involving a subset of the annuitant population, or for the sale of a segment of the business, may not be acceptably accurate if made with the combined table reinforces RPEC's position that the use of separate non-annuitant and annuitant tables is a superior methodology.

Section 7. Additional Annuity Comparisons

7.1 Background

Tables 1.1 and 11.2 in the RP-2014 exposure draft present a comparison of various 2014 deferred-to-age-62 annuity values, along with the percentage increase of adopting the RP-2014 tables projected with Scale MP-2014. Those tables do not include annuity values based on the mortality tables typically used for IRS minimum funding purposes.

7.2 Summary of Comments Received

One commenter requested an illustration of the differences between the RP-2014 tables and the IRS prescribed tables used for minimum funding valuations under the Pension Protection Act (PPA).

One commenter noted that the annuity value comparisons to those produced by RP-2000 in the exposure draft are on an inconsistent basis, since RP-2000 uses a combined healthy table and RP-2014 uses separate tables for employees and annuitants.

7.3 RPEC Response

The 2014 deferred-to-age-62 annuity values compared in the exposure draft were all calculated using an interest rate of 6.0 percent and all assumed generational projection of future mortality increases. There are a number of factors that complicate any comparison of annuity values calculated using PPA-type mortality assumptions:

- The earliest calendar year that any new basis for “applicable mortality tables”¹⁸ could be prescribed is 2016, and official PPA mortality rates for 2016 are not yet available.
- The methodology the Treasury Department intends to adopt for developing post-2015 “applicable mortality tables” has not been disclosed.
- The interest rates for PPA liability calculations are based on a three-term “segment rates” structure, and future segment rates cannot be known with exact precision.

Despite these complications, RPEC concluded that it would be instructive to estimate segment rates for 2016 [4.75 percent for the first five years, 6.00 percent for the subsequent 15 years, and 6.75 percent thereafter] and calculate 2016 deferred-to-age-62 annuity values based on two different mortality assumptions.

1. “IRS 2016” table: The expected “applicable mortality table” for 2016 assuming no change in the current IRS methodology; i.e., separate non-annuitant and annuitant tables based on RP-2000 tables projected statically with Scale AA in accordance with IRS Notice 2013-49.

¹⁸ “Applicable mortality tables” are specified in IRC Section 430(h)(3) for minimum funding and certain other regulatory purposes.

2. RP-2014 tables first projected to 2016 with Scale MP-2014 and subsequently projected with Scale MP-2014 generationally beyond 2016.

In both cases, non-annuitant/Employee rates are assumed through age 61 and annuitant/Healthy Annuitant rates are assumed for ages 62 and older. The two sets of 2016 deferred-to-age-62 annuity values, along with the percentage increase of moving from the estimated “IRS 2016” mortality basis to the new “RP-2014/Scale MP-2014” mortality basis is displayed in Table 2.

		2016 Estimated Monthly Deferred-to-62 Annuity Due Values		Percentage Change
Basic Rates		"IRS 2016"	RP-2014	
Proj. Scale		(Static Projection)	MP-2014 (Gen.)	
Age				
Males	25	0.9423	1.0346	9.8%
	35	1.8181	1.9611	7.9%
	45	3.6426	3.8390	5.4%
	55	7.3238	7.5898	3.6%
	65	10.9688	11.4582	4.5%
	75	8.0670	8.8555	9.8%
	85	4.8413	5.6596	16.9%
Females	25	0.9740	1.0892	11.8%
	35	1.8755	2.0679	10.3%
	45	3.7403	4.0514	8.3%
	55	7.5025	7.9997	6.6%
	65	11.3685	12.0297	5.8%
	75	8.8256	9.5313	8.0%
	85	5.7444	6.3616	10.7%

Table 2

Given (1) the uncertainties inherent in predicting future minimum funding assumptions alluded to previously and (2) the different calendar year and interest rate basis used to develop the annuity values displayed above relative to those shown elsewhere in the RP-2014 report, RPEC has decided to not reproduce Table 2 in the final RP-2014 report.

RPEC acknowledges that there is an extremely slight inconsistency in its comparisons of annuity values based on RP-2000 combined healthy tables and a combination of Employee and Healthy Annuitant RP-2014 tables. RPEC’s objective in developing the annuity comparison tables was to highlight the order of magnitude change that an actuary might expect from the adoption of the new RPEC mortality assumptions. The Committee believes that using the Combined Healthy version of RP-2000 for those comparisons makes it easier for users to match those annuity values on their own.

7.4 Resulting Changes to the Final Report

Although RPEC decided not to include anticipated minimum funding annuity comparisons in the final report, the Committee changed one of the columns in the primary annuity comparison displays (Tables 1.1 and 12.2) of the final report. The column that previously contained 2014

annuity values based on the RP-2000 table projected with Scale BB-2D has been replaced by a column of 2014 annuity values based on the RP-2000 table projected with Scale MP-2014. This new column of annuity values was added to emphasize the large-scale consistency of the RP-2000 and RP-2014 tables, when RP-2000 is projected to 2014 with Scale MP-2014.

Section 8. Implications on RP-2014 Base Mortality Rates¹⁹

8.1 Background

The central year of the dataset that formed the basis for the RP-2014 base mortality rates is 2006. Before they were graduated, these raw mortality rates were first projected to 2014 using the Scale MP-2014 mortality improvement rates for years 2007 through 2014.

As a result, all of the RP-2014 base tables implicitly reflect the committee-selected assumption set for mortality improvement between years 2007 through 2014. It is possible that an actuary who believes that an alternate set of assumptions for the RPEC_2014 model is more appropriate than the committee-selected set might consider adjusting the RP-2014 mortality tables to reflect the resulting differences in the two sets of projected mortality improvement rates after 2006.

8.2 Summary of Comments Received

One commenter remarked that a table with a 2006 base year should be published either instead of, or in addition to, the table with the 2014 base year. The rationale is that using 2014 as a base year implies that the underlying table reflects data through 2014 and that the mortality improvement rates in the scale are certain through that year. This approach could cause confusion, and since applying mortality improvements is now standard practice, it creates no additional difficulty to project future mortality rates from a 2006 table rather than a 2014 table.

8.3 RPEC Response

It is common practice for pension mortality tables to be projected from the central year of the observation period to the release date of the final set of tables. The only difference now is that the RP-2014 tables have been projected using Scale MP-2014 mortality improvement rates that reflect certain committee-selected assumptions that the user might want to modify.

The RP-2014 report contains a total of 22 separate tables. Instead of publishing 22 new “2006” versions of those tables (which would increase the chances of wrong tables inadvertently getting picked up), RPEC believes it is more efficient for those who wish to start their projections as of 2006 to “factor out” the Scale MP-2014 rates for years 2007 through 2014. This factoring out process is accomplished by dividing all of the rates in the selected RP-2014 table by the product of eight factors of the form $(1 - f(x,y))$ [for $y = 2007, 2008, \dots, 2014$], where $f(x,y)$ is the gender-specific Scale MP-2014 factor at age x and calendar year y . RPEC has confirmed that this methodology produces base mortality rates that are extremely close to those that would have been produced by graduating the raw 2006 mortality rates.²⁰

Based on these considerations, RPEC will not be producing separate sets of “2006” tables.

¹⁹ Given the relevance of this comment to both the RP-2014 and Scale MP-2014 reports, this response has been included in both “Response to Comments” reports.

²⁰ The extremely small differences are the result of switching between the “first project from 2006 to 2014, then graduate the resulting rates” methodology of Scale MP-2014 and the “first graduate 2006 raw rates, then project to 2014” methodology implicit in the “factoring out” approach described above.

8.4 Resulting Changes Reflected in Final Report

The final Scale MP-2014 report contains a description of the “factoring out” methodology described above. Otherwise, there are no other changes in the final RP-2014 or Scale MP-2014 reports that resulted from the comments received on this topic.

Section 9. Amount-Weighted and Headcount-Weighted Mortality Rates

9.1 Background

All of the final mortality rates in the RP-2014 exposure draft were amount-weighted. The Employee rates were weighted by salary, while all of the annuitant rates were weighted by benefit amount.

9.2 Summary of Comments Received

One commenter pointed out that for certain retirement-related applications, headcount-weighted rates might be more appropriate than amount-weighted rates.

One commenter felt that more clarification was needed around how amount-weighted mortality rates and headcount-weighted mortality rates were used in determining the final tables.

9.3 RPEC Response

The Committee agrees that headcount-weighted mortality rates could be helpful for many applications, including the calculation of average age at death, the projection of retirement plan populations, and the measurement of obligations for retirement programs with relatively flat benefit structures (such as those provided by many OPEB plans).

Raw mortality rates were calculated from the final RP-2014 dataset on both an amount-weighted and a headcount-weighted basis. Subsection 7.2 of the final report describes how both sets of rates were used to develop the final amount-weighted Employee mortality tables. The final amount-weighted Healthy Annuitant and Disabled Retiree tables were based exclusively on the corresponding amount-weighted raw rates.

9.4 Resulting Changes to the Final Report

The final RP-2014 report includes a new subsection 13.5 dealing with the potential uses of headcount-weighted mortality rates, along with some guidance on how such rates could be approximated using information contained in Appendix C of that report. That new subsection includes a statement that the Committee believes that it would not necessarily be inappropriate—or inconsistent—to use (amount-weighted) RP-2014 tables to measure pension plan obligations and the corresponding headcount-weighted versions of those RP-2014 tables to measure OPEB plan obligations, even when the two covered populations are identical.

Section 10. Other Comments

10.1 Projection of Mortality Improvement for Disabled Retirees

One commenter stated that a “relatively small dataset was used to support a significant departure from the existing default approach of no mortality projection for disabled retirees.”

10.1.1 RPEC Response

First, the total amount of Disabled Retiree exposure included in RPEC’s final dataset was almost exactly the same as that included in the RP-2000 study; both studies included just under 370,000 life-years of disabled life exposure from private pension plans.

RPEC believes that the arguments for projecting future disabled retiree mortality rates described in subsection 4.2 of the Scale MP-2014 exposure draft are persuasive, particularly the analysis performed by the Office of the Chief Actuary (OCACT) on SSA disabled mortality rates that indicated that recent mortality improvement trends for disabled lives in the United States have generally been similar to those for non-disabled lives. In addition, RPEC’s own comparison of the RP-2014 and RP-2000 Disabled Retiree mortality rates produced results that were consistent with those of the OCACT study.

RPEC acknowledges that the recommendation to project future mortality improvement for disabled lives represents a significant departure from past practice with potentially substantial cost implications. The Committee believes that it is important to reconsider past practice in this area and recommends this change, as recent data and analyses indicate the historical approach is not fully explaining observed mortality patterns and a practical alternative that is more consistent with recent data and studies is available.

10.1.2 Resulting Changes to Final Report

There were no changes to the final Scale MP-2014 report that resulted from this comment.

10.2 Impact of Lump Sum Distributions

One comment letter stated that the study is biased due to exclusion of participants who have taken lump sums, since these participants tend to have shorter life expectancies.

10.2.1 RPEC Response

The Committee recognizes that the incidence of lump sum distributions is an important factor influencing recent pension plan mortality experience, but disagrees with the idea that the resulting RP-2014 tables are “biased” in any way due to the exclusion of those participants who have taken lump sum distributions.

First, the Committee wants to clarify that exposures (and deaths) were counted for these individuals only while they were in active “Employee” status; i.e., no exposures or deaths were included in the study for any participants in “vested terminated” status. To the extent that the percentage of pension plans offering lump sums has been increasing, the current study appropriately captures those higher levels experienced during the observation period. Said somewhat differently, to the extent that the typical private pension plan in the United States has experienced somewhat lower levels of annuitant mortality due to the higher incidence of lump sum distributions, the process used in the RP-2014 study has properly captured that experience in both the Employee and Healthy Annuitant tables.

The above comments notwithstanding, actuaries for plans that do not permit lump sum distributions (or that only make mandatory distributions of small lump sums) might want to take that fact into consideration when comparing such a plan’s mortality experience to the RP-2014 tables. Equivalently, actuaries for plans that do offer lump sums may want to reflect that factor in their comparisons.

10.2.2 Resulting Changes Reflected in Final Report

There were no changes in the final RP-2014 report that resulted from the comments received on this topic.

10.3 Correlation between Collar-Based and Amount-Based Mortality Rates

One commenter requested that the final report include grids similar to those presented in Appendix F of the RP-2000 report, which showed mortality experience for each combination of collar type and benefit amount group. This commenter stressed that there is differentiation in mortality within each collar type based on benefit amount and pointed out that since collar and amount are correlated, applying both a collar and amount adjustment would likely overstate the effect of each.

10.3.1 RPEC Response

The Committee agrees that (1) there are clear correlations between the mortality rates reflecting collar color and those reflecting amount quartile and (2) it would generally be inappropriate to apply both a collar and amount adjustment simultaneously.

RPEC is currently considering options to make additional summaries of the final RP-2014 dataset (including information similar to that included in Appendix F of the RP-2000 report) available to interested users. Any such information that the Committee ultimately decides to release would likely be published as a supplement to the final RP-2014 report.

10.3.2 Resulting Changes Reflected in Final Report

The final report includes new language that emphasizes the correlation between mortality rates based on collar color and amount quartile, and discourages adjustments for both factors simultaneously.

10.4 Mortality Experience for Beneficiaries

Two commenters remarked that including beneficiaries in the study could bias the study because beneficiary health affects benefit form election. In addition, two commenters stated that mortality rates are likely understated for beneficiaries, particularly for females, because those who predeceased the primary participant are not reflected in the study and no adjustment was made for this.

10.4.1 RPEC Response

RPEC disagrees with the comments that implied the study was biased based on the Committee's handling of Beneficiary mortality experience. Since reliable exposure and death data for designated beneficiaries are generally unavailable while the primary annuitant is alive, Beneficiaries were included in the study only after they began receiving annuity payments upon the death of the primary annuitant.

With respect to the influence of beneficiary health on the selection of benefit form, RPEC believes that the distribution of benefit payment forms included in the final RP-2014 annuitant datasets was representative of that for the entire U.S. private pension population. Therefore, even though beneficiary health likely plays a significant role in the selection of a particular benefit payment form, the resulting impact of those elections on mortality rates are appropriately captured in the RP-2014 mortality rates. The above comments notwithstanding, actuaries for plans with particularly high or low utilization of forms of payment with a contingent annuitant might want to take that fact into consideration when comparing such a plan's mortality experience to the RP-2014 tables.

Regarding the relatively large concentration of female Beneficiary data included in the female Healthy Annuitant dataset, RPEC maintains that most pension actuaries will likely apply these postretirement mortality tables to populations of annuitants that include some combination of annuitants and surviving beneficiaries. Hence, assuming RPEC's dataset is representative of the typical private plan's combination of annuitants and surviving beneficiaries, the Committee believes that it is completely appropriate to develop "Healthy Annuitant" mortality tables that reflect the experience of the combined datasets.

If additional insights related to the mortality differences between Healthy Annuitants and Beneficiaries are desired, RPEC suggests comparing the respective tables in Appendix C of the final RP-2014 report. That said, the Committee reminds users that the total amount of male Beneficiary exposure is too small to be fully credible on its own.

10.4.2 Resulting Changes Reflected in Final Report

In an effort to emphasize the fact that exposures and deaths for beneficiaries were included in the study only after the death of the primary annuitant, a footnote was added clarifying that the term "Beneficiary" as used throughout the final RP-2014 report should be interpreted as "surviving beneficiary." In addition, a sentence on page 18 of the RP-2014

exposure draft (dealing with the lack of mortality information for beneficiaries while the primary annuitant is receiving payments) was determined to be unintentionally misleading and has been removed.

10.5 Amount-Based Quartiles

One commenter inquired about the central year of the data for amount-based quartile breakpoints shown in Table 3.2 of the exposure draft. This commenter also mentioned that adjustments to these percentiles would be expected to determine if using the amount-weighted tables would be suitable in years after 2014 and that it would be helpful if the final report provided guidance on how to make these adjustments.

10.5.1 RPEC Response

The amount-based quartile breakpoints in Table 3.2 were based on averages over all the years of experience included in the final study. Hence the “central year” for the quartile breakpoints should be considered to be 2006.

Given the potential for wide variations in the patterns of salary increases (by industry, for example) and in the size of retirement benefit amounts (due to the possibilities of plan-specific “freezes” of ongoing benefit accruals and/or interim cost-of-living increases, for example), RPEC is reluctant to provide any general guidance in connection with projecting future quartile breakpoints. This is the primary reason why the report contains the statement that “while statistical analyses ... continue to confirm that both collar and amount quartile are statistically significant indicators of differences in base mortality rates for nondisabled lives, RPEC believes that the use of collar-based tables will generally be more practical than the use of amount-based tables.” In fact, RPEC believes that with a few exceptions,²¹ the amount-based tables are more useful in demonstrating the magnitude of mortality rate differences between the highest and lowest quartile groups, rather than tables to be used in the measurement of pension plan obligations.

10.5.2 Resulting Changes Reflected in Final Report

There were no changes in the final RP-2014 report that resulted from the comments received on this topic.

10.6 Mortality Rates for Males over Age 55

One commenter requested an explanation for why RP-2014 mortality rates for males over age 55 are higher than those produced by projecting the RP-2000 rates to 2014 using Scale MP-2014.

²¹ One possible exception is in connection with the measurement of obligations for pension plans consisting primarily of highly-compensated participants.

10.6.1 RPEC Response

Despite taking a closer look at the Employee and Healthy Annuitant mortality rates for males between the ages of 55 and 75, RPEC was unable to develop a conclusive explanation for why those RP-2014 rates ended up higher than the projected RP-2000 rates. Although it is possible that the higher RP-2014 rates are to some degree attributable to the higher Blue Collar concentration in the RP-2014 study than that in the RP-2000 study, the Committee believes that the observed phenomenon is very likely the natural consequence of constructing new mortality tables from a more current dataset. The fact that individual mortality rates do not follow predicted improvement rates exactly is precisely why tables of base mortality rates need to be updated periodically.

10.6.2 Resulting Changes Reflected in Final Report

There were no changes in the final RP-2014 report that resulted from the comments received on this topic.

10.7 Concentration Risk

Three commenters pointed out that the results are subject to concentration risk because two-thirds of retiree experience came from just five plans.

10.7.1 RPEC Response

As described in Section 3 of the RP-2014 exposure draft, the current pension mortality study relied on private plan data voluntarily submitted by large actuarial consulting firms. In almost all cases, the datasets submitted by those firms consisted of a range of plan sizes; some including a handful of participants and others containing tens of thousands of participants. It is not hard to envision how a dataset composed of a small number of very large plans along with a large number of small-to-medium size plans can produce the sort of concentrations found in the final RP-2014 dataset.

The RP-2000 report does not contain directly comparable exposure/death statistics on a “plan” basis. That report does disclose, however, that 56 percent of all exposures included in the RP-2000 study came from private plans in only two industries (Transportation and Electronics Equipment), and that 39.8 percent of all annuitant exposures (and 44.0 percent of annuitant deaths) came from the automobile industry. Given the composition of that industry, it would not be at all surprising if a substantial percentage of that exposure came from a few very large plans.

Despite the data exclusions described in Section 4 of this report, the SOA was able to confirm that the final RP-2014 dataset satisfied the SOA’s internal concentration guidelines and RPEC was able to confirm that the final dataset was large enough—and diverse enough—to produce reliable mortality tables.

10.7.2 Resulting Changes Reflected in Final Report

There were no changes in the final RP-2014 report that resulted from the comments received on this topic.