Report of the Group Annuity Experience Committee
Mortality Experience for 2003 - 2006

Overview

The Group Annuity Experience Committee performs biennial mortality studies of insurance company annuity experience under group pension contracts issued primarily in the United States. Nine insurance companies and their volunteers, which are listed at the end of this report, supported this effort and contributed their experience for each of the experience years in this report. This experience is predominantly based on retired lives, which includes benefit payments made under ongoing pension plans, terminated plans ("pension closeouts") and partially guaranteed arrangements, such as certain Immediate Participation Guarantee contracts and non-guaranteed arrangements.

This report covers two biennial experience periods, 2003-2004 and 2005-2006. The most recent previous report by the Committee provided 2001-2002 results, which are also included for comparison.

The Actuarial and Statistical Research Group collects, validates and summarizes the data for this report. Since the 2001-02 report, their data management platform was migrated from a mainframe application to a database application. A key benefit of this new approach is the addition of an Income Groups field to the pivot table introduced last time. Future reports will also be able to access more granular groupings than were previously available.

This report shows mortality trends over for the six-year period 2001 – 2006. A/E Ratios and Mortality Improvement by Expected Basis are as follows:

Expected Basis	Actual-to-Expected Ratios		Annual Mortality Improvement	
	By Lives	By Income	By Lives	By Income
1983 GAM	102.9%	90.1%	2.9%	2.6%
1994 GAM Basic with Projection	113.6%	103.3%	2.5%	2.0%
1994 GAR	122.1%	111.1%	2.5%	2.0%

As shown by the mortality improvement results[1], these A/E ratios have improved 2.6% overall and 2.0% faster than provided by Scale AA. This rate of improvement is substantially higher than the 1.4% overall improvement and 0.5% improvement relative to projection Scale AA for the 1997-2002 period shown in the last report.

[1] Quoted results for mortality improvement are based on the loglinear regression of results over the six-year period. Results using Arithmetic Average Improvement are also available in the pivot table.

Format of the Data

All Experience is available by Lives and by Income. The data are available with the following breakdowns:

Experience Years (6):	2001, 2002, 2003, 2004, 2005, 2006
Experience Periods (3):	2001-2002, 2003-04, 2005-06
Gender:	Male, Female
Attained Age:[2]	0-54, 55-59, 60-64, 65-69, … , 90-94, 95+
Income Groups:[3]	0–4,999; 5,000–9,999; 10,000-24,999; 25,000-49,999; …
Retirement Date:	Before Normal Retirement Date, On/After NRD, Other
Certain Option:	Life-Only, Life and Certain Period, Cash Refund
Survivor Option:	0% Single Life, 1-50% J&S, 51-75% J&S, 76-100% J&S, Unknown
Guarantee Status:	Guaranteed, Non-Guaranteed
Duration:	0-1 years, 2-5 years, 6-10 years, Ultimate (11+)

To ensure reported deaths are reliable, the data reflects annuitants who are receiving life contingent payments or, in some cases, are past normal retirement date but not currently receiving payments. For Joint and Survivor annuities, only the person in payment status is counted in the exposure and death statistics. This creates some conservatism in the results, since spouses are only included to the extent that they outlive the participants. Data from trusteed/reimbursement contracts (where a Third Party Administrator maintains the benefit records) are included for some contributors but may not be for others.

The Committee believes that any lags in the reporting of deaths are minimal at this point and that results are generally credible in the formats provided. Results at the very low and very high ages may not be credible. Users who create their own pivot tables from the data should be careful to ensure there is adequate exposure in the resulting cells.

Expected Results and A/E ratios are available using the 1983 GAM and variants of the 1994 GAR, the two most recent group annuity valuation tables. All of these tables are applied on a sex-distinct basis. These tables may be downloaded from *http://mort.soa.org/*. The table below shows the five mortality bases that are available in the data.

Mortality Table	Valuation Margin	Projection
1983 GAM	**Included**	**None**
1994 GAM Basic	None	None
1994 GAM Static	Included	None
1994 GAM Basic with Projection	**None**	**Scale AA**
1994 GAR	**Included**	**Scale AA**

[2] Age is defined to be age nearest birthday as of January 1st of the calendar year of exposure.
[3] Breakdowns by Income Group are only available for 2003 and later years.

The mortality tables shown in bold font above are already present in each of the pivot tables. The 1983 GAM and 1994 GAR were selected as prescribed valuation bases. The 1994 GAM Basic with Projection was selected as a best-estimate version since valuation margin is not included and projection is included. The other 1994 GAR variants[4] may be easily added to any pivot table by any users who wish to see results on those bases.

Principal Observations

General Commentary

This section of the report will describe each of the pivot tables that have been provided and includes relevant observations. Each topic is referred to by the Tab Name and discussed in the order that they appear in the Excel file.

The discussion uses the 1994 GAM Basic Table with Projection Scale AA as the primary basis for expected deaths.

A/E ratios provide simple reference values for comparison of mortality experience data with established mortality tables. The exact reference values are quantitatively significant only to the extent that underlying exposure is similar for the current experience data and the tables. U.S. and Canadian population, workforce, retiree and beneficiary populations have undergone significant demographic changes since the experience data was originally obtained to construct the 1983 GAM and 1994 GAR tables. In addition, as noted earlier, data reported in this study was derived primarily from retirees in group annuity contracts in pay status. The 1983 GAM and 1994 GAR tables, in contrast, were derived from blended populations of active workers and retirees. However, blending was not significant at older ages. Interpretations of data in terms of A/E ratios below should nevertheless be adopted only with these factors taken into consideration.

Summary Tab

Exposures, actual deaths and A/E ratios are shown for each of the six years in the study period. Experience by Lives is on top; Experience by Income, below.

- Exposures: Male exposures by lives were relatively flat over the six-year period. However, Female exposures increased significantly between 2002 and 2003. A significant portion of this increase is believed to be due to including more spouses in the 2003 and later experience vs. the 2002 and prior experience. The detailed data from 2001-2002 that would be needed to test this hypothesis is no longer available. As previously noted, inclusion of spouse data generally lowers A/E ratios since it reflects only those spouses who outlive participants.

[4] IRS Revenue Ruling 2001-62 refers to a 1994 GAR variant that is projected to 2002. This version of the "IRS 1994 GAR" table is not present in the data.

- Trends: Within our six-year study period, overall A/E ratios dropped significantly on all bases, with the largest decreases occurring in 2004 and 2006. Similar decreases in those years have occurred in the general U.S. population, as indicated by a review of Social Security experience.
- Sufficiency: A/E Ratios by Lives dropped below 100% for the 1983 GAM for the first time, but remained above 100% for the 1994 GAM Basic with projection and the 1994 GAR. A/E Ratios by Income using the 1983 GAM dropped from 97.3% for the six years ending in 2002 to 90.1% for the six years ending in 2006. A/E Ratios by Income using the 1994 GAM Basic with Projection similarly dropped from 108.6% to 103.3%, ending with a 98.4% A/E ratio in 2006.
- Lives vs. Income: Consistent with prior studies, A/E Ratios by Lives are approximately 10% higher than the A/E Ratios by Income. This indicates that individuals with higher income exhibit increased longevity.
- Gender: Consistent with prior studies, female A/E ratios are generally higher than male A/E ratios. Both females and males show sharply decreasing A/E ratios over the six-year period. (In the prior six year study, female A/E ratios decreased slightly while male A/E ratios increased.)

In general, there seems to be increased volatility in the actual-to-expected results by year, so care should be exercised in extrapolating this experience to other situations.

Attained Age Tab

This tab shows attained age results for males and females individually and combined. Experience by Lives is on the left; by Income, on the right. Results are shown for all six years. Results for an individual experience year or experience period can be obtained by changing the Page items of the pivot table. Note that experience by Income Group is only available for the 2003 – 2006 data (select "Amount Indicator" = 1 in the pivot table). If you include 2001-2002 data, it will appear as a "blank" amount group.

- Results by Age: There is modest experience below age 55 and at ages 90 and above. In the main portions of the tables, A/E ratios tend to be high prior to age 65, which reflects impacts of early retirement for health reasons, and fairly flat thereafter.
- Gender: As noted earlier, A/E ratios tend to be higher for females than males. This occurs at virtually every age group. This disparity between male and female A/E ratios by income is consistent with past studies.
- Both patterns have been generally consistent over time.

Mortality Improvement Tabs

There are two tabs – one by lives and one by income. Results are available for males, females or both. Annual rates of mortality improvement discussed below use the loglinear regression slope of the results using the 1994 GAM Basic with Projection as the

expected basis. The arithmetic average of the mortality improvement is also shown in the pivot tables for convenience.

The mortality improvement factors provide an indication of how closely Scale AA reflects the actual annual improvement in mortality. These factors show rates of improvement in actual mortality relative to improvement in the expected mortality basis. If these factors are positive, this indicates the actual mortality is improving faster than assumed by Scale AA. If these factors are negative, actual mortality is improving at a slower rate than assumed by Scale AA.

- By Lives for males and females combined, overall mortality improved by 2.5% faster than Scale AA during 2001-06 compared to -0.6% mortality improvement during 1997-2002. Males improved by 2.5% and females improved by 2.7%. The rates of improvement generally decrease by attained age.
- By Income for males and females combined, overall mortality improvement of 2.0% shows that mortality is improving faster than projection Scale AA. However, males improved by 2.0% while females improved by 2.5%. The rates of improvement generally decrease by attained age.

Note: The five remaining tabs show results by Income only since these generally represent mortality experience under various options. A Gender selector was added in addition to the Experience Year and Experience Period selectors to allow users to examine male vs. female experience separately, if desired.

Income Group Tab

This tab shows the experience grouped according to the amount of income each annuitant receives. This may not be representative of the total income from all sources for any given annuitant, but still provides some insight into the variation of results across different amounts of income. Note that income groups are only available for the 2003-2006 experience years.

- Overall Results: In total, the results show a consistent pattern of declining A/E ratios as income amounts increase. The A/E ratio for the lowest income group ($0-$4,999) is 112.9%, compared to 107.7% for the $5,000 - $9,999 group. Approximately 45% of the exposure is in these two income groups. The middle-income group of $10,000 - $24,999, with approximately 31% of the exposure, had an A/E ratio of 97.7%. The remaining income group of $25,000 and over has approximately 24% of the exposure and an A/E ratio of 80.1%.
- Impact of Income on Age Results: The variance in A/E ratios by attained age groupings appears to be driven by the income grouping exposure within each age grouping. For core ages from 55–84, more than half of the exposure is for incomes of $10,000 and higher, where the A/E ratios are less than 100%. For

ages 85 and higher, most of the exposure is for incomes under $10,000, where the A/E ratios are higher than 100%.

Retirement Class by Attained Age Tab

This tab shows the experience resulting from the first of three annuitant choices – the decision of when to retire. However, this decision may be driven by factors beyond their control, such as health-related conditions or corporate downsizing. It compares those who retire early to those who retire on or after the normal retirement date. Also included are lives for which a retirement date was not applicable (e.g., surviving spouse) or unknown.

- Early Retirement: More than half of the annuitants (by income) retired early. For males, females and both at every attained age group (except ages 55–59 and males ages 95+), those who retire early show higher mortality than those who retire on or after their normal retirement date. Overall, those who retired early showed an A/E ratio of 107.6% vs. 98.3% for those who retired on or after their normal retirement date. Interestingly, this result would seem to indicate that the impacts of subsidized early retirement factors may be somewhat offset by higher mortality for those that retire early. It should be noted that this study includes disabled lives, which may have a significant impact on the early retirement results.
- Normal Retirement: For those who retire on or after their normal retirement date, overall A/E ratios were 98.3%. However, mortality for ages 65–84 appears to be much lower than average, while results for younger and older attained ages tend to be higher than average.
- Other: This experience seems overall to be closer to the large, early retirement block than to the normal retirement block – 102.4% for Other vs. 107.6% for early retirements. However, younger attained ages generally have significantly higher A/E mortality ratios while older attained ages tend to have significantly lower A/E mortality ratios.
- These patterns have been generally consistent over time.

Retirement Class by Income Group Tab

This tab is a variation on the prior two tabs and shows the combined effect of income group and the annuitant's decision on when to retire. The exposure is weighted toward incomes of $10,000 and over across all three retirement categories of Early, Normal and Other, which is consistent with the overall weighting. Results within each retirement class are consistent with the overall pattern of A/E ratios declining as incomes increase. Note that income groups are only available for the 2003-2006 experience years.

- Early Retirement: This class has the highest percentage (63%) of exposure in the income groups of $10,000 and over, with almost 35% in the $10,000 - $24,999 group. This indicates that annuitants choosing to retire early generally receive higher benefits than those who retire on or after their normal retirement date.

This retirement class has A/E ratios above 100% for incomes below $25,000, whereas the breakpoint appears to be at $10,000 of income across all retirement classes. The higher A/E ratio of 105.0% for the $10,000 - $24,999 income group appears to be mostly due to the male exposure within this retirement/income category.

- Normal/Other Retirement: Both of these retirement classes follow the overall pattern of A/E ratios declining as income increases, with ratios declining below 100% beginning with incomes of $10,000 or higher.

Certain Options Tab

- This tab shows the experience resulting under the type of certain option selected. It compares experience under a life-only benefit, a life with a certain period and an annuity with a cash refund.

- 80% of the exposure by income reflects a life-only annuity option. There are a few possible reasons for this. One possibility is that it shows a preference for the annuity form that generates the highest possible monthly income amount (compared to a life with a certain period or annuity with cash refund). Another possibility is that it reflects plan design rather than choice. Many plans use the life-only annuity form as the normal form at retirement for unmarried participants. The plan may or may not offer any other single life option. The data in this study does not contain information on plan design. Lastly, some companies may report a life-only annuity after the certain period or cash refund period has expired.

- The life-only option has an A/E ratio overall of 103.8%. It is the highest of the options, but it is not significantly higher.

- Approximately 7% of the exposure reflects a life with certain period option, and overall, the A/E ratio of this group is 101.7%.

- Approximately 11% of the annuitants (by income) have cash refund annuities. These are typically the result of employee contributions. The overall A/E ratio for this group is 100.0% - the lowest of the three forms.

- If annuitants intend to select the most valuable overall benefit, then the healthiest lives should select a life-only option, while those with health issues should prefer a life with certain period or cash refund option. In aggregate, the results do not seem to support this.

- When the data is segregated into income groups (available for experience years 2003-2006 only), each income group shows an A/E ratio that is higher for the life with certain period than for the life-only. This could indicate that those who select an annuity with a certain period are selecting that form for its death benefit attribute.

- Over time, the life-only option shows steady improvement in mortality starting with an A/E ratio of 111.5% in 2001 and declining to an A/E ratio of 98.5% in 2006. However, the life with certain period form shows a deterioration in mortality. The A/E ratio starts at 98.1% in 2001 and increases to 103.0% in 2006.

Survivor Options Tab

- The tab compares experience under single-life annuity forms to various forms of Joint and Survivor annuities. For convenience, the J&S benefits have been grouped into 1-50%, 51-75% and 76-100% options.

- Single Life: The A/E ratios for this form are significantly higher than those for the joint-life forms – 108.4% overall. This result is consistent with other studies indicating greater longevity for married individuals. Some amount of joint-life experience may be reclassified as single life after the first life dies.

- 1% - 50%: This group, which includes the prescribed 50% J&S benefit for married couples, shows the lowest A/E ratio – 89.3% overall. By income group (for experience years 2003-2006 only), the A/E ratios are under 100% for incomes of at least $10,000 annually.

- 51% - 75%: This group, which includes the 2/3 and 3/4 J&S benefit options, features the highest A/E ratios among the joint-life forms – 103.4% overall. By income group (for experience years 2003-2006 only), the A/E ratios are under 100% for incomes of at least $25,000 annually. The higher A/E ratio for this survivor option may indicate a participant in poorer health desiring to pass along more retirement income to a spouse.

- 76% - 100%: This group shows results in the middle of the other two joint-life options – 97.4% overall. Additionally, this group contains the smallest amount of exposure – 6% overall compared with 11% each for the 1% - 50% group and the 51% - 75% group.

- When comparing the options by income group (for experience years 2003-2006 only), only 18% of the exposure (by income) falls under a joint-life option for incomes under $10,000 annually compared to 32% for incomes of at least $10,000 annually. This may reflect that for the lowest incomes, the reduction in benefit for a joint-life form is too great to choose. The relationship of A/E ratios for the various forms, however, remains fairly stable across all income groups.

Guaranteed vs. Non-Guaranteed Tab

This tab shows experience for guaranteed business compared to non-guaranteed business. Guaranteed business includes single-premium closeout business, which is usually non-participating, as well as some types of participating business. Contracts with an

immediate participation guarantee feature are considered as guaranteed by some insurers and non-guaranteed by others.

Two comments are noted with respect to the data. Some contributors provide only guaranteed data to the experience study and do not monitor non-guaranteed mortality. Among those who do contribute non-guaranteed data, some are not as diligent about confirming survivorship for non-guaranteed benefits, since the insurer has no obligation and reserves are not affected.

- About 62% of the aggregate exposure over all years is guaranteed, though the percentage is trending downward over time. For experience year 2006, the guaranteed exposure is down to 59.5%. The guaranteed exposure is significantly higher at the older attained age groups, likely reflecting the market trend that employers are less likely to opt for insurance company guarantees for new retirees under ongoing pension plans.
- For males, for all attained age groups, the guaranteed annuitants (by income) show lower mortality than the non-guaranteed. Females show the same results, with the only exception being the youngest ages (below 55). The overall A/E ratio for the guaranteed annuitants is 98.7% and for the non-guaranteed annuitants is 117.3%.
- The higher mortality results for non-guaranteed annuitants could indicate that plans have appropriately chosen when to guarantee benefits and when to "self insure," although most insurance contracts do not allow plan sponsors to selectively choose whom to guarantee.
- The results for guaranteed business compared to non-guaranteed business are consistent across all income bands, with higher mortality for non-guaranteed annuitants in all cases.

Duration Tab

The results under this tab are subject to limitations. Duration is intended to be measured as years since retirement. However, significant portions of these liabilities were in payment status prior to being purchased from the insurance company involved. In these cases, the annuity benefit commencement date is likely to be coded as the purchase date of the group annuity contract rather than the original retirement date of the annuitant.

- Durations 0–1: The initial year following retirement/purchase shows higher mortality than all other periods on an overall basis, though there is variation by age groupings. The higher mortality may reflect the impact of disability or health-related retirements at a time when mortality would otherwise be expected to be relatively low. The overall A/E ratio is 114.4%, driven primarily by the younger age groupings. Younger retirees are more likely to have retired due to disability.
- Durations 2–5: The overall A/E ratios drop in this period compared to the 0–1 duration for both males and females, but the drop is more pronounced for males. There is significant variation by attained age grouping, with the younger age groups tending to show a drop in A/E ratios as the duration increases. It may be more likely that duration truly represents time since retirement date for the younger ages, whereas

for the older ages with short durations, it may more likely be time since purchase date of the contract. The overall A/E ratio for this group is 99.0%.

- Durations 6–10: The overall A/E ratio is 95.9%. This duration grouping shows the lowest overall ratio for males and for both sexes combined. Females have a slightly higher ratio than the durations 2–5 group. Younger age groups up through age 74 follow the pattern described; at older ages, the A/E ratio increases compared to the 2–5 duration until the age 90–94 age group.
- Ultimate: The overall A/E ratio is 102.9%.
- The Duration results by income grouping are for the most part consistent with the overall results described above, for income of less than $100,000. At higher income amounts, Duration 0–1 has lower A/E ratios than some of the later durations, but the exposure is so limited that the experience is not credible.

Acknowledgements

Special thanks to the contributing companies, the Society of Actuaries and Knowledge Services Group for their valuable work in bringing this new report to fruition. We hope you find it and the accompanying pivot tables to be useful.

Contributing Companies

Aetna	AXA-Equitable	Manufacturers Life
Metropolitan	Mutual of Omaha	Nationwide
New York Life	Principal Financial	Prudential

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