

**TRANSACTIONS OF SOCIETY OF ACTUARIES
1995-96 REPORTS**

**REPORT OF THE SUBCOMMITTEE
ON GROUP LIFE AND HEALTH—
COMMITTEE ON EXPECTED EXPERIENCE OF THE
CANADIAN INSTITUTE OF ACTUARIES**

**GROUP MORTALITY STUDY: FINAL REPORT
FOR THE 1989 EXPERIENCE YEAR**

This is the final version of the 1989 report on the annual CIA study of group mortality experience in Canada. The study is conducted under the direction of the Subcommittee on Group Life and Health of the CIA Committee on Expected Experience by the Institute of Insurance and Pension Research at the University of Waterloo.

The eight companies whose data were used to compile these reports are listed at the end of this report. The committee thanks them for their submissions and cooperation in the editing and correction of their files. It is hoped that they will continue to contribute to subsequent studies.

The data are submitted as four distinct files: data on each insured group, certificate data on each active insured life, death claim data, and data on waiver of premium claims. The study was conducted on a seriatim basis and grouping of results by age group, group size, province or industry was done at the final stage of creating the reports. The data underwent numerous checking procedures on individual files and between files as outlined in the study specifications.

Since it was possible to conduct the study on a seriatim basis, it was decided to use the “constant force of mortality in each year of age” assumption in place of the Balducci assumption. The constant force assumption produces a smaller error than the Balducci assumption and is well suited to seriatim studies. Under this assumption, lives who die in the study year receive exposure in the study from the entry date or the beginning of the year (whichever is later) until the exact date of death. Thus, the ratio of deaths to exposure years is the maximum likelihood estimator of the force of mortality.

The above result, D/E , is used in calculating the mortality rate $l-exp$ ($-D/E$). The tables show both this and the actual/expected percentage. The expected tables used are the Canadian Basic Group Life Tables, 1968–72 with waiver of premium adjustment. Results are calculated both by lives and by amounts and are given by sex, five-year age group, group size, province and industry.

The column entitled S.D. provides estimates of the standard deviation of the ratios of actual to expected numbers of deaths. These numbers measure

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the degree of confidence which may be placed in the ratios experienced. The formula used to calculate the standard deviation is the same used in the individual mortality study and is as follows:

$$S.D. = \frac{(\text{actual number of deaths})^{1/2}}{\text{expected number of deaths}}$$

Data were submitted using two different industry code classifications: the Standard Industrial Classification of Statistics Canada, and the Dunn & Bradstreet classification. Since both systems are too detailed to allow a meaningful analysis within the study, the committee devised a simplified classification which is described below. As part of the data checking process, industry codes submitted were converted into these classifications.

The categories are as follows:

| Category | Industries |
|----------|--|
| 0 | Unclassified |
| 1 | Mining and smelting |
| 2 | Heavy industry; police |
| 3 | Building products; heavy construction |
| 4 | Food processing; textiles; general manufacturing; transportation |
| 5 | Agriculture; light manufacturing; wholesale trade; government services |
| 6 | Communications; retail trade; financial, educational, health and business services |
| 7 | Professional services |

In general, the categories are arranged in order of decreasing mortality.

In order to have a credible amount of data in the provincial study, the provinces have been grouped into Eastern Provinces, Western Provinces, Ontario, Québec and other (for unclassified data).

The preliminary report was on a cash claims paid basis. This final report includes late reported deaths from 1989 and deaths from those on disability who died within a year of becoming disabled in 1989, and consequently is on a claims incurred basis. Therefore, the q_x 's represent the probability of an active life dying or becoming disabled and then dying within a year of disablement.

Contributing Companies

| | |
|--------------------------|--------------------|
| Confederation Life | Manufacturers Life |
| Croix Bleue Canassurance | Mutual Life |
| Equitable Life | La Sauvegarde |
| London Life | Sun Life |

This report was prepared by, and the study was conducted under the general direction of, Allan Brender, R.L. Brown, and Virginia Borchert.

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TABLE 1

1989 EXPERIENCE RESULT BY GROUP SIZE
 EXPECTED TABLES ARE THE CANADIAN BASIC GROUP LIFE TABLES, 1968-72, WITH WAIVER ADJUSTMENT (75%)
 COMPANY : TOTAL COMBINED
 (MALES ONLY)

| Age Group | Exposed | | Total Claims | | Actual/Expected % | | S.D. % Lives | Mortality Rate | |
|--------------------|---------|-------------------|--------------|-------------------|-------------------|--------|-----------------|----------------|---------|
| | Lives | Amount (\$1,000s) | Lives | Amount (\$1,000s) | Lives | Amount | | Lives | Amount |
| Group Size : 0-30 | | | | | | | | | |
| 0-19 | 1,942 | 40,115 | 1 | 10 | 27.27 | 13.22 | 27.271 | .000514 | .000249 |
| 20-24 | 16,160 | 416,556 | 13 | 234 | 55.05 | 38.69 | 15.268 | .000804 | .000561 |
| 25-29 | 28,278 | 902,568 | 8 | 175 | 24.42 | 16.79 | 8.6336 | .000282 | .000193 |
| 30-34 | 26,592 | 1,005,181 | 24 | 623 | 78.49 | 53.76 | 16.022 | .000902 | .000619 |
| 35-39 | 22,667 | 985,764 | 20 | 440 | 52.40 | 26.37 | 11.716 | .000881 | .000445 |
| 40-44 | 18,796 | 883,188 | 30 | 984 | 54.81 | 38.16 | 10.006 | .001594 | .001112 |
| 45-49 | 13,667 | 636,374 | 26 | 695 | 37.63 | 21.64 | 7.3793 | .001900 | .001090 |
| 50-54 | 10,387 | 461,781 | 39 | 1,296 | 44.32 | 33.13 | 7.0974 | .003747 | .002801 |
| 55-59 | 8,367 | 341,848 | 69 | 1,923 | 56.37 | 38.52 | 6.7867 | .008212 | .005608 |
| 60-64 | 5,247 | 196,426 | 53 | 1,603 | 40.97 | 33.29 | 5.6280 | .010049 | .008127 |
| 65-69 | 1,492 | 35,420 | 38 | 747 | 86.91 | 72.42 | 14.098 | .025148 | .020869 |
| 70 and over | 892 | 9,415 | 72 | 393 | 98.18 | 67.48 | 11.571 | .077554 | .040916 |
| Total | 154,488 | 5,914,636 | 393 | 9,121 | 55.40 | 35.54 | 2.7944 | .002540 | .001540 |
| Group Size : 30-99 | | | | | | | | | |
| 0-19 | 2,492 | 53,230 | 5 | 101 | 106.07 | 100.42 | 47.434 | .002004 | .001895 |
| 20-24 | 16,960 | 467,972 | 18 | 538 | 72.39 | 79.02 | 17.062 | .001060 | .001148 |
| 25-29 | 27,554 | 964,878 | 19 | 669 | 59.49 | 59.97 | 13.648 | .000689 | .000692 |
| 30-34 | 25,388 | 1,100,833 | 22 | 725 | 75.43 | 57.17 | 16.081 | .000866 | .000658 |
| 35-39 | 20,614 | 1,036,539 | 26 | 1,917 | 74.85 | 109.28 | 14.678 | .001260 | .001847 |
| 40-44 | 16,792 | 911,496 | 26 | 1,302 | 53.12 | 48.90 | 10.416 | .001547 | .001426 |
| 45-49 | 12,228 | 666,944 | 35 | 2,040 | 56.62 | 60.56 | 9.5700 | .002858 | .003054 |
| 50-54 | 9,409 | 489,843 | 45 | 2,172 | 56.38 | 52.40 | 8.4039 | .004771 | .004423 |
| 55-59 | 7,865 | 374,796 | 58 | 2,982 | 50.31 | 54.43 | 6.6061 | .007347 | .007924 |
| 60-64 | 5,239 | 215,605 | 75 | 2,510 | 57.84 | 47.40 | 6.6787 | .014212 | .011572 |
| 65-69 | 1,927 | 50,043 | 35 | 602 | 62.27 | 41.66 | 10.525 | .018002 | .011947 |
| 70 and over | 1,569 | 16,008 | 81 | 535 | 68.77 | 55.88 | 7.6416 | .050305 | .032862 |
| Total | 148,038 | 6,348,187 | 445 | 16,091 | 60.55 | 56.92 | 2.8702 | .003001 | .002531 |

TABLE 1—Continued

| Age Group | Exposed | | Total Claims | | Actual/Expected % | | S.D. % Lives | Mortality Rate | |
|---------------------------|---------|-------------------|--------------|-------------------|-------------------|--------|-----------------|----------------|---------|
| | Lives | Amount (\$1,000s) | Lives | Amount (\$1,000s) | Lives | Amount | | Lives | Amount |
| Group Size : 100 and over | | | | | | | | | |
| 0-19 | 3,520 | 75,320 | 4 | 32 | 60.13 | 22.53 | 30.063 | .001135 | .000424 |
| 20-24 | 27,304 | 821,085 | 33 | 813 | 82.75 | 68.39 | 14.405 | .001207 | .000989 |
| 25-29 | 49,309 | 1,949,137 | 39 | 1,076 | 68.35 | 47.81 | 10.944 | .000790 | .000551 |
| 30-34 | 49,762 | 2,389,608 | 49 | 1,588 | 85.56 | 57.61 | 12.223 | .000984 | .000664 |
| 35-39 | 44,840 | 2,435,750 | 50 | 1,818 | 65.71 | 43.82 | 9.2933 | .001114 | .000746 |
| 40-44 | 39,736 | 2,371,580 | 52 | 2,704 | 44.82 | 38.89 | 6.2154 | .001307 | .001139 |
| 45-49 | 30,221 | 1,849,433 | 84 | 3,907 | 54.96 | 41.81 | 5.9964 | .002775 | .002110 |
| 50-54 | 24,196 | 1,378,392 | 108 | 4,943 | 52.39 | 42.27 | 5.0409 | .004453 | .003579 |
| 55-59 | 22,229 | 1,075,761 | 163 | 6,481 | 49.74 | 41.13 | 3.8955 | .007305 | .006006 |
| 60-64 | 17,448 | 674,059 | 233 | 6,892 | 53.50 | 41.58 | 3.5050 | .013265 | .010172 |
| 65-69 | 9,474 | 148,528 | 223 | 2,741 | 78.64 | 63.37 | 5.2658 | .023262 | .018283 |
| 70 and over | 10,828 | 81,028 | 772 | 4,143 | 98.16 | 78.10 | 3.5330 | .068817 | .049843 |
| Total | 328,867 | 15,249,681 | 1,810 | 37,136 | 71.11 | 46.17 | 1.6715 | .005488 | .002432 |

TABLE 2
 1989 EXPERIENCE RESULT BY GROUP SIZE
 EXPECTED TABLES ARE THE CANADIAN BASIC GROUP LIFE TABLES, 1968-72, WITH WAIVER ADJUSTMENT (75%)
 COMPANY : TOTAL COMBINED
 (FEMALES ONLY)

| Age Group | Exposed | | Total Claims | | Actual/Expected % | | S.D. % Lives | Mortality Rate | |
|--------------------|---------|-------------------|--------------|-------------------|-------------------|--------|-----------------|----------------|---------|
| | Lives | Amount (\$1,000s) | Lives | Amount (\$1,000s) | Lives | Amount | | Lives | Amount |
| Group Size : 0-30 | | | | | | | | | |
| 0-19 | 1,007 | 20,082 | 1 | 10 | 240.57 | 120.84 | 240.56 | .000992 | .000497 |
| 20-24 | 10,987 | 259,882 | 1 | 21 | 21.07 | 18.64 | 21.073 | .000091 | .000080 |
| 25-29 | 14,895 | 413,977 | 4 | 115 | 44.61 | 45.96 | 22.306 | .000268 | .000277 |
| 30-34 | 12,228 | 373,336 | 5 | 61 | 51.34 | 20.41 | 22.961 | .000408 | .000162 |
| 35-39 | 10,428 | 320,947 | 12 | 329 | 111.89 | 99.72 | 32.300 | .001150 | .001024 |
| 40-44 | 9,309 | 289,630 | 10 | 253 | 68.43 | 55.64 | 21.639 | .001073 | .000873 |
| 45-49 | 6,779 | 202,744 | 12 | 264 | 75.31 | 55.42 | 21.739 | .001768 | .001301 |
| 50-54 | 4,706 | 133,461 | 13 | 374 | 73.00 | 74.12 | 20.247 | .002758 | .002798 |
| 55-59 | 3,148 | 85,147 | 15 | 339 | 72.26 | 60.51 | 18.657 | .004753 | .003973 |
| 60-64 | 1,785 | 44,776 | 17 | 367 | 90.51 | 78.06 | 21.952 | .009478 | .008162 |
| 65-69 | 436 | 7,033 | 5 | 121 | 84.87 | 128.06 | 37.956 | .011390 | .017057 |
| 70 and over | 225 | 1,846 | 8 | 10 | 71.88 | 15.86 | 25.413 | .034871 | .005403 |
| Total | 75,933 | 2,152,860 | 103 | 2,264 | 73.83 | 62.49 | 7.2748 | .001355 | .001050 |
| Group Size : 30-99 | | | | | | | | | |
| 0-19 | 1,122 | 22,388 | 2 | 22 | 430.71 | 238.11 | 304.55 | .001781 | .000982 |
| 20-24 | 10,941 | 284,185 | 3 | 45 | 63.55 | 36.52 | 36.691 | .000274 | .000158 |
| 25-29 | 15,043 | 478,975 | 5 | 151 | 55.14 | 52.00 | 24.660 | .000332 | .000315 |
| 30-34 | 11,920 | 417,582 | 6 | 92 | 63.29 | 27.82 | 25.838 | .000503 | .000221 |
| 35-39 | 10,123 | 354,516 | 9 | 281 | 86.40 | 77.15 | 28.799 | .000888 | .000792 |
| 40-44 | 8,831 | 297,861 | 8 | 182 | 57.74 | 39.02 | 20.415 | .000905 | .000610 |
| 45-49 | 6,321 | 204,909 | 10 | 347 | 67.19 | 72.10 | 21.246 | .001580 | .001691 |
| 50-54 | 4,339 | 134,948 | 13 | 461 | 79.33 | 90.68 | 22.002 | .002991 | .003410 |
| 55-59 | 2,996 | 87,339 | 15 | 540 | 76.40 | 94.84 | 19.725 | .004994 | .006163 |
| 60-64 | 1,602 | 42,872 | 11 | 211 | 64.97 | 46.73 | 19.588 | .006843 | .004909 |
| 65-69 | 521 | 9,637 | 2 | 28 | 28.44 | 21.24 | 20.109 | .003829 | .002849 |
| 70 and over | 429 | 2,233 | 16 | 42 | 70.55 | 47.42 | 17.636 | .036649 | .018718 |
| Total | 74,187 | 2,337,447 | 100 | 2,402 | 68.70 | 62.97 | 6.8703 | .001347 | .001027 |

TABLE 2--Continued

| Age Group | Exposed | | Total Claims | | Actual/Expected % | | S.D. % Lives | Mortality Rate | |
|---------------------------|---------|-------------------|--------------|-------------------|-------------------|--------|-----------------|----------------|---------|
| | Lives | Amount (\$1,000s) | Lives | Amount (\$1,000s) | Lives | Amount | | Lives | Amount |
| Group Size : 100 and over | | | | | | | | | |
| 0-19 | 2,527 | 48,341 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 20-24 | 23,757 | 634,245 | 8 | 62 | 77.78 | 22.31 | 27.498 | .000336 | .000097 |
| 25-29 | 37,051 | 1,265,060 | 10 | 294 | 44.61 | 38.20 | 14.106 | .000269 | .000232 |
| 30-34 | 34,149 | 1,250,786 | 17 | 461 | 62.44 | 46.22 | 15.144 | .000497 | .000368 |
| 35-39 | 32,819 | 1,252,187 | 21 | 302 | 61.94 | 23.33 | 13.515 | .000639 | .000241 |
| 40-44 | 27,878 | 1,099,503 | 21 | 442 | 48.13 | 25.68 | 10.503 | .000753 | .000401 |
| 45-49 | 19,115 | 735,518 | 25 | 602 | 55.59 | 34.80 | 11.118 | .001307 | .000817 |
| 50-54 | 12,953 | 460,713 | 39 | 1,157 | 79.60 | 66.69 | 12.746 | .003006 | .002507 |
| 55-59 | 9,221 | 285,906 | 30 | 667 | 49.41 | 35.53 | 9.0205 | .003248 | .002329 |
| 60-64 | 5,676 | 151,579 | 39 | 1,092 | 64.64 | 68.53 | 10.351 | .006847 | .007176 |
| 65-69 | 2,591 | 26,682 | 30 | 197 | 83.43 | 54.96 | 15.232 | .011511 | .007358 |
| 70 and over | 3,058 | 14,271 | 104 | 335 | 68.15 | 53.86 | 6.6830 | .033439 | .023194 |
| Total | 210,793 | 7,224,790 | 344 | 5,609 | 63.46 | 43.18 | 3.4215 | .001630 | .000776 |

TABLE 3

1989 EXPERIENCE RESULT BY GROUP SIZE
 EXPECTED TABLES ARE THE CANADIAN BASIC GROUP LIFE TABLES, 1968-72, WITH WAIVER ADJUSTMENT (75%)
 COMPANY : TOTAL COMBINED
 (GROUP SIZE : ALL SIZES)

| Age Group | Exposed | | Total Claims | | Actual/Expected % | | S.D. % Lives | Mortality Rate | | |
|-------------|---------|-------------------|--------------|-------------------|-------------------|--------|-----------------|----------------|---------|--|
| | Lives | Amount (\$1,000s) | Lives | Amount (\$1,000s) | Lives | Amount | | Lives | Amount | |
| Males | | | | | | | | | | |
| 0-19 | 7,954 | 168,666 | 10 | 143 | 66.52 | 44.93 | 21.0349 | .001256 | .000847 | |
| 20-24 | 60,424 | 1,705,613 | 64 | 1,585 | 72.43 | 64.06 | 9.05402 | .001058 | .000928 | |
| 25-29 | 105,141 | 3,816,583 | 66 | 1,919 | 54.21 | 43.55 | 6.67223 | .000627 | .000502 | |
| 30-34 | 101,742 | 4,495,622 | 95 | 2,936 | 81.19 | 56.64 | 8.32973 | .000933 | .000652 | |
| 35-39 | 88,121 | 4,458,053 | 96 | 4,175 | 64.43 | 55.14 | 6.57605 | .001088 | .000935 | |
| 40-44 | 75,325 | 4,166,264 | 108 | 4,989 | 49.16 | 40.92 | 4.73005 | .001432 | .001196 | |
| 45-49 | 56,116 | 3,152,751 | 145 | 6,641 | 51.10 | 41.71 | 4.24356 | .002580 | .002104 | |
| 50-54 | 43,992 | 2,330,016 | 192 | 8,410 | 51.34 | 42.59 | 3.70523 | .004354 | .003603 | |
| 55-59 | 38,461 | 1,792,405 | 290 | 11,385 | 51.29 | 43.41 | 3.01184 | .007511 | .006331 | |
| 60-64 | 27,935 | 1,086,090 | 361 | 11,005 | 51.98 | 41.24 | 2.73570 | .012839 | .010081 | |
| 65-69 | 12,893 | 233,990 | 296 | 4,089 | 77.18 | 60.13 | 4.48605 | .022697 | .017324 | |
| 70 and over | 13,289 | 106,451 | 925 | 5,071 | 94.62 | 74.09 | 3.11124 | .067240 | .046520 | |
| Total | 631,392 | 27,512,504 | 2,648 | 62,348 | 66.37 | 46.40 | 1.28982 | .004185 | .002263 | |
| Female | | | | | | | | | | |
| 0-19 | 4,655 | 90,810 | 3 | 32 | 155.61 | 85.34 | 89.8415 | .000644 | .000352 | |
| 20-24 | 45,685 | 1,178,312 | 12 | 128 | 60.75 | 24.92 | 17.5383 | .000262 | .000108 | |
| 25-29 | 66,988 | 2,158,012 | 19 | 560 | 46.97 | 42.74 | 10.7761 | .000283 | .000259 | |
| 30-34 | 58,297 | 2,041,704 | 28 | 614 | 60.29 | 37.74 | 11.3934 | .000480 | .000300 | |
| 35-39 | 53,370 | 1,927,651 | 42 | 912 | 76.30 | 45.86 | 11.7729 | .000786 | .000473 | |
| 40-44 | 46,017 | 1,686,994 | 39 | 877 | 54.10 | 33.19 | 8.66218 | .000847 | .000519 | |
| 45-49 | 32,214 | 1,143,171 | 47 | 1,213 | 62.01 | 45.14 | 9.04580 | .001457 | .001060 | |
| 50-54 | 21,998 | 729,122 | 65 | 1,992 | 78.14 | 72.50 | 9.69176 | .002950 | .002727 | |
| 55-59 | 15,365 | 458,392 | 60 | 1,546 | 59.34 | 51.42 | 7.66079 | .003897 | .003366 | |
| 60-64 | 9,063 | 239,226 | 67 | 1,670 | 69.76 | 66.40 | 8.52236 | .007365 | .006955 | |
| 65-69 | 3,549 | 43,352 | 37 | 346 | 75.69 | 59.32 | 12.4440 | .010371 | .007939 | |
| 70 and over | 3,712 | 18,350 | 128 | 387 | 68.67 | 50.02 | 6.06939 | .033897 | .020875 | |
| Total | 360,913 | 11,715,096 | 547 | 10,275 | 66.13 | 50.30 | 2.82759 | .001514 | .000876 | |

TABLE 4
 1989 EXPERIENCE RESULT BY PROVINCE
 EXPECTED TABLES ARE THE CANADIAN BASIC GROUP LIFE TABLES, 1968-72, WITH WAIVER ADJUSTMENT (75%)
 COMPANY : TOTAL COMBINED
 (MALES ONLY)

| Age Group | Exposed | | Total Claims | | Actual/Expected % | | S.D. % Lives | Mortality Rate | |
|--------------------|---------|-------------------|--------------|-------------------|-------------------|--------|-----------------|----------------|---------|
| | Lives | Amount (\$1,000s) | Lives | Amount (\$1,000s) | Lives | Amount | | Lives | Amount |
| Province : Ontario | | | | | | | | | |
| 0-19 | 3,388 | 71,182 | 4 | 70 | 62.58 | 52.19 | 31.291 | .001179 | .000982 |
| 20-24 | 29,106 | 797,490 | 29 | 598 | 68.22 | 51.75 | 12.667 | .000995 | .000749 |
| 25-29 | 49,390 | 1,749,090 | 25 | 775 | 43.65 | 38.29 | 8.7307 | .000506 | .000442 |
| 30-34 | 44,709 | 1,932,245 | 33 | 930 | 64.24 | 41.81 | 11.182 | .000737 | .000481 |
| 35-39 | 37,817 | 1,895,391 | 52 | 2,150 | 81.60 | 66.89 | 11.315 | .001374 | .001133 |
| 40-44 | 33,676 | 1,849,016 | 45 | 1,873 | 45.80 | 34.57 | 6.8278 | .001335 | .001012 |
| 45-49 | 25,373 | 1,424,018 | 63 | 2,381 | 49.09 | 33.08 | 6.1841 | .002479 | .001670 |
| 50-54 | 20,133 | 1,074,420 | 107 | 4,424 | 62.41 | 48.48 | 6.0330 | .005300 | .004108 |
| 55-59 | 17,916 | 834,686 | 143 | 5,764 | 54.29 | 47.18 | 4.5398 | .007949 | .006881 |
| 60-64 | 13,496 | 518,470 | 185 | 6,306 | 54.98 | 49.38 | 4.0424 | .013614 | .012089 |
| 65-69 | 6,495 | 121,020 | 152 | 2,214 | 78.51 | 62.54 | 6.3677 | .023132 | .018126 |
| 70 and over | 7,598 | 63,751 | 547 | 2,854 | 96.58 | 68.99 | 4.1294 | .069464 | .043784 |
| Total | 289,097 | 12,330,780 | 1,385 | 30,337 | 69.98 | 48.04 | 1.8803 | .004779 | .002457 |
| Province : Quebec | | | | | | | | | |
| 0-19 | 1,961 | 35,591 | 1 | 17 | 26.81 | 25.15 | 26.814 | .000509 | .000477 |
| 20-24 | 11,801 | 288,868 | 11 | 271 | 63.77 | 64.69 | 19.227 | .000931 | .000937 |
| 25-29 | 20,597 | 642,687 | 23 | 484 | 96.46 | 65.16 | 20.112 | .001116 | .000752 |
| 30-34 | 20,914 | 773,571 | 20 | 623 | 83.14 | 69.86 | 18.589 | .000955 | .000805 |
| 35-39 | 18,985 | 785,472 | 21 | 648 | 64.46 | 47.86 | 14.065 | .001105 | .000824 |
| 40-44 | 15,272 | 672,741 | 32 | 1,560 | 71.61 | 78.96 | 12.659 | .002093 | .002316 |
| 45-49 | 11,255 | 505,338 | 30 | 1,098 | 52.74 | 42.99 | 9.6288 | .002661 | .002169 |
| 50-54 | 8,683 | 379,122 | 31 | 1,097 | 41.99 | 34.12 | 7.5415 | .003563 | .002889 |
| 55-59 | 7,842 | 309,072 | 65 | 2,146 | 56.30 | 47.41 | 6.9827 | .008254 | .006920 |
| 60-64 | 5,605 | 184,360 | 75 | 1,550 | 53.98 | 34.31 | 6.2329 | .013292 | .008371 |
| 65-69 | 2,671 | 46,293 | 80 | 1,078 | 101.10 | 80.35 | 11.302 | .029502 | .023014 |
| 70 and over | 2,794 | 19,757 | 204 | 1,090 | 99.26 | 84.90 | 6.9497 | .070423 | .053677 |
| Total | 128,381 | 4,642,871 | 593 | 11,661 | 72.68 | 50.95 | 2.9846 | .004608 | .002508 |

TABLE 4 *Continued*

| Age Group | Exposed | | Total Claims | | Actual/Expected % | | S.D. % Lives | Mortality Rate | | |
|------------------|---------|-------------------|--------------|-------------------|-------------------|--------|-----------------|----------------|---------|--|
| | Lives | Amount (\$1,000s) | Lives | Amount (\$1,000s) | Lives | Amount | | Lives | Amount | |
| Province : Other | | | | | | | | | | |
| 0-19 | 224 | 5,342 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 20-24 | 1,754 | 62,960 | 3 | 141 | 117.96 | 155.71 | 68.103 | .001708 | .002237 | |
| 25-29 | 4,178 | 201,972 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 30-34 | 4,607 | 262,667 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 35-39 | 4,380 | 297,641 | 3 | 92 | 40.54 | 18.19 | 23.404 | .000684 | .000309 | |
| 40-44 | 4,181 | 322,222 | 2 | 144 | 16.41 | 15.25 | 11.601 | .000478 | .000446 | |
| 45-49 | 3,333 | 259,912 | 9 | 629 | 53.57 | 48.08 | 17.857 | .002697 | .002417 | |
| 50-54 | 2,656 | 188,798 | 6 | 725 | 26.57 | 45.31 | 10.847 | .002256 | .003832 | |
| 55-59 | 2,357 | 150,296 | 16 | 1,128 | 46.13 | 51.43 | 11.532 | .006766 | .007477 | |
| 60-64 | 1,626 | 90,458 | 18 | 1,063 | 44.58 | 47.72 | 10.508 | .011007 | .011682 | |
| 65-69 | 469 | 11,694 | 8 | 170 | 57.83 | 50.98 | 20.447 | .016920 | .014407 | |
| 70 and over | 373 | 3,568 | 21 | 172 | 79.88 | 76.14 | 17.431 | .054787 | .047128 | |
| Total | 30,137 | 1,857,530 | 86 | 4,264 | 45.93 | 42.75 | 4.9524 | .002849 | .002292 | |

TABLE 5
 1989 EXPERIENCE RESULT BY PROVINCE
 EXPECTED TABLES ARE THE CANADIAN BASIC GROUP LIFE TABLES, 1968-72, WITH WAIVER ADJUSTMENT (75%)
 COMPANY : TOTAL COMBINED
 (MALES ONLY)

| Age Group | Exposed | | Total Claims | | Actual/Expected % | | S.D. % Lives | Mortality Rate | |
|------------------------------|---------|-------------------|--------------|-------------------|-------------------|--------|-----------------|----------------|---------|
| | Lives | Amount (\$1,000s) | Lives | Amount (\$1,000s) | Lives | Amount | | Lives | Amount |
| Province : Western Provinces | | | | | | | | | |
| 0-19 | 2,047 | 48,225 | 5 | 56 | 129.66 | 61.73 | 57.984 | .002439 | .001160 |
| 20-24 | 14,678 | 459,432 | 16 | 484 | 74.20 | 72.29 | 18.548 | .001089 | .001052 |
| 25-29 | 24,895 | 991,883 | 15 | 521 | 52.10 | 45.56 | 13.451 | .000602 | .000525 |
| 30-34 | 24,842 | 1,223,882 | 35 | 1,197 | 122.44 | 84.74 | 20.696 | .001407 | .000977 |
| 35-39 | 20,560 | 1,161,784 | 17 | 832 | 49.26 | 42.49 | 11.947 | .000826 | .000715 |
| 40-44 | 16,471 | 1,014,786 | 22 | 917 | 45.93 | 31.01 | 9.7930 | .001334 | .000903 |
| 45-49 | 11,702 | 714,353 | 24 | 1,695 | 40.56 | 46.94 | 8.2798 | .002048 | .002369 |
| 50-54 | 9,101 | 515,454 | 34 | 1,718 | 44.05 | 39.44 | 7.5542 | .003728 | .003326 |
| 55-59 | 7,492 | 371,197 | 48 | 1,709 | 43.68 | 31.51 | 6.3049 | .006386 | .004593 |
| 60-64 | 5,144 | 215,128 | 59 | 1,600 | 46.30 | 30.43 | 6.0275 | .011404 | .007408 |
| 65-69 | 2,213 | 37,473 | 44 | 439 | 67.07 | 40.85 | 10.111 | .019687 | .011655 |
| 70 and over | 1,522 | 9,431 | 81 | 405 | 74.13 | 69.50 | 8.2362 | .051822 | .042029 |
| Total | 140,666 | 6,763,028 | 400 | 11,572 | 56.04 | 40.55 | 2.8020 | .002839 | .001709 |
| Province : Eastern Provinces | | | | | | | | | |
| 0-19 | 335 | 8,326 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 20-24 | 3,084 | 96,864 | 5 | 91 | 111.39 | 65.07 | 49.815 | .001619 | .000939 |
| 25-29 | 6,081 | 230,951 | 3 | 140 | 42.67 | 52.57 | 24.632 | .000493 | .000606 |
| 30-34 | 6,669 | 303,256 | 7 | 186 | 91.02 | 52.95 | 34.403 | .001049 | .000611 |
| 35-39 | 6,378 | 317,765 | 3 | 453 | 27.84 | 84.02 | 16.073 | .000470 | .001424 |
| 40-44 | 5,725 | 307,499 | 7 | 496 | 41.95 | 55.14 | 15.854 | .001221 | .001611 |
| 45-49 | 4,454 | 249,130 | 19 | 840 | 84.21 | 66.84 | 19.319 | .004256 | .003364 |
| 50-54 | 3,418 | 172,222 | 14 | 447 | 48.42 | 30.77 | 12.940 | .004087 | .002592 |
| 55-59 | 2,855 | 127,154 | 18 | 638 | 42.88 | 34.18 | 10.106 | .006285 | .005004 |
| 60-64 | 2,064 | 77,673 | 24 | 486 | 46.78 | 25.46 | 9.5493 | .011562 | .006237 |
| 65-69 | 1,045 | 17,511 | 12 | 189 | 38.30 | 36.89 | 11.055 | .011416 | .010712 |
| 70 and over | 1,003 | 9,944 | 72 | 550 | 102.71 | 89.42 | 12.104 | .069293 | .053763 |
| Total | 43,111 | 1,918,295 | 184 | 4,514 | 62.69 | 45.97 | 4.6217 | .004258 | .002350 |

TABLE 6

1989 EXPERIENCE RESULT BY PROVINCE
 EXPECTED TABLES ARE THE CANADIAN BASIC GROUP LIFE TABLES, 1968-72, WITH WAIVER ADJUSTMENT (75%)
 COMPANY : TOTAL COMBINED
 (FEMALES ONLY)

| Age Group | Exposed | | Total Claims | | Actual/Expected % | | S.D. % Lives | Mortality Rate | |
|--------------------|---------|-------------------|--------------|-------------------|-------------------|--------|-----------------|----------------|---------|
| | Lives | Amount (\$1,000s) | Lives | Amount (\$1,000s) | Lives | Amount | | Lives | Amount |
| Province : Ontario | | | | | | | | | |
| 0-19 | 1,976 | 40,117 | 1 | 17 | 122.30 | 102.69 | 122.29 | .000505 | .000423 |
| 20-24 | 20,179 | 539,399 | 5 | 61 | 57.27 | 25.97 | 25.613 | .000247 | .000113 |
| 25-29 | 29,046 | 962,501 | 5 | 81 | 28.55 | 13.88 | 12.767 | .000172 | .000084 |
| 30-34 | 23,497 | 851,098 | 17 | 420 | 90.88 | 61.90 | 22.042 | .000723 | .000492 |
| 35-39 | 21,449 | 819,452 | 17 | 353 | 76.88 | 41.72 | 18.646 | .000792 | .000430 |
| 40-44 | 19,731 | 755,286 | 17 | 361 | 54.97 | 30.52 | 13.331 | .000861 | .000477 |
| 45-49 | 14,103 | 519,363 | 22 | 543 | 66.20 | 44.46 | 14.114 | .001558 | .001044 |
| 50-54 | 10,259 | 348,051 | 32 | 1,006 | 82.61 | 76.83 | 14.603 | .003114 | .002884 |
| 55-59 | 7,151 | 216,258 | 30 | 897 | 63.65 | 63.20 | 11.620 | .004186 | .004136 |
| 60-64 | 4,333 | 117,067 | 38 | 1,012 | 82.85 | 82.34 | 13.440 | .008732 | .008609 |
| 65-69 | 1,614 | 19,571 | 16 | 126 | 71.86 | 47.66 | 17.964 | .009861 | .006409 |
| 70 and over | 2,010 | 10,949 | 69 | 233 | 63.68 | 47.39 | 7.6661 | .033743 | .021011 |
| Total | 155,348 | 5,199,111 | 269 | 5,108 | 68.21 | 53.92 | 4.1586 | .001730 | .000982 |
| Province : Quebec | | | | | | | | | |
| 0-19 | 997 | 16,299 | 1 | 10 | 241.31 | 147.97 | 241.30 | .001002 | .000613 |
| 20-24 | 11,102 | 221,801 | 3 | 12 | 62.38 | 12.13 | 36.012 | .000270 | .000052 |
| 25-29 | 16,647 | 394,088 | 6 | 116 | 59.70 | 48.60 | 24.373 | .000360 | .000294 |
| 30-34 | 15,693 | 388,680 | 5 | 66 | 39.96 | 21.16 | 17.871 | .000318 | .000168 |
| 35-39 | 14,970 | 366,897 | 12 | 289 | 77.48 | 76.22 | 22.366 | .000801 | .000787 |
| 40-44 | 11,200 | 280,128 | 9 | 172 | 51.39 | 39.33 | 17.131 | .000803 | .000613 |
| 45-49 | 7,355 | 179,026 | 5 | 220 | 28.99 | 52.42 | 12.963 | .000679 | .001228 |
| 50-54 | 4,547 | 106,232 | 10 | 236 | 58.13 | 58.83 | 18.382 | .002196 | .002219 |
| 55-59 | 3,081 | 69,430 | 10 | 142 | 49.49 | 31.16 | 15.649 | .003240 | .002043 |
| 60-64 | 1,591 | 34,025 | 10 | 190 | 59.66 | 53.07 | 18.865 | .006267 | .005553 |
| 65-69 | 640 | 8,333 | 9 | 44 | 102.02 | 39.50 | 34.005 | .013954 | .005320 |
| 70 and over | 779 | 3,624 | 39 | 113 | 96.30 | 76.14 | 15.419 | .048811 | .030725 |
| Total | 88,602 | 2,068,562 | 119 | 1,609 | 65.55 | 47.85 | 6.0093 | .001342 | .000777 |

TABLE 6—Continued

| Age Group | Exposed | | Total Claims | | Actual/Expected % | | S.D. % Lives | Mortality Rate | |
|------------------|---------|-------------------|--------------|-------------------|-------------------|--------|-----------------|----------------|---------|
| | Lives | Amount (\$1,000s) | Lives | Amount (\$1,000s) | Lives | Amount | | Lives | Amount |
| Province : Other | | | | | | | | | |
| 0-19 | 166 | 4,157 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 20-24 | 1,563 | 58,990 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 25-29 | 3,008 | 162,178 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 30-34 | 2,598 | 161,749 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 35-39 | 2,447 | 171,819 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 40-44 | 2,566 | 177,365 | 2 | 123 | 49.77 | 44.34 | 35.194 | .000779 | .000693 |
| 45-49 | 1,655 | 110,758 | 2 | 45 | 51.46 | 17.36 | 36.390 | .001207 | .000406 |
| 50-54 | 1,019 | 60,400 | 4 | 273 | 103.80 | 120.20 | 51.901 | .003919 | .004512 |
| 55-59 | 698 | 37,121 | 3 | 87 | 65.64 | 35.83 | 37.895 | .004288 | .002340 |
| 60-64 | 434 | 20,144 | 2 | 98 | 43.27 | 46.03 | 30.597 | .004599 | .004853 |
| 65-69 | 123 | 2,591 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 70 and over | 100 | 627 | 3 | 13 | 72.47 | 57.70 | 41.839 | .029644 | .019733 |
| Total | 16,375 | 967,900 | 16 | 639 | 47.20 | 37.39 | 11.801 | .000976 | .000659 |

TABLE 7
 1989 EXPERIENCE RESULT BY PROVINCE
 EXPECTED TABLES ARE THE CANADIAN BASIC GROUP LIFE TABLES, 1968-72, WITH WAIVER ADJUSTMENT (75%)
 COMPANY : TOTAL COMBINED
 (FEMALES ONLY)

| Age Group | Exposed | | Total Claims | | Actual/Expected % | | S.D. % | Mortality Rate | |
|------------------------------|---------|-------------------|--------------|-------------------|-------------------|--------|--------|----------------|---------|
| | Lives | Amount (\$1,000s) | Lives | Amount (\$1,000s) | Lives | Amount | Lives | Lives | Amount |
| Province : Western Provinces | | | | | | | | | |
| 0-19 | 1,305 | 26,230 | 1 | 5 | 185.42 | 46.24 | 185.42 | .000766 | .000190 |
| 20-24 | 9,518 | 263,139 | 4 | 55 | 97.76 | 48.34 | 48.878 | .000420 | .000208 |
| 25-29 | 12,431 | 435,141 | 8 | 363 | 106.62 | 137.25 | 37.694 | .000643 | .000833 |
| 30-34 | 10,543 | 418,630 | 4 | 75 | 47.62 | 22.47 | 23.807 | .000379 | .000179 |
| 35-39 | 9,085 | 373,732 | 10 | 255 | 106.99 | 66.33 | 33.834 | .001100 | .000682 |
| 40-44 | 7,697 | 311,467 | 9 | 208 | 74.70 | 42.71 | 24.899 | .001168 | .000667 |
| 45-49 | 5,431 | 208,622 | 11 | 248 | 86.10 | 50.40 | 25.958 | .002023 | .001185 |
| 50-54 | 3,654 | 132,316 | 10 | 318 | 72.24 | 63.64 | 22.845 | .002732 | .002400 |
| 55-59 | 2,603 | 81,244 | 6 | 118 | 34.98 | 22.20 | 14.281 | .002302 | .001451 |
| 60-64 | 1,589 | 38,656 | 8 | 117 | 47.32 | 28.86 | 16.729 | .005023 | .003022 |
| 65-69 | 714 | 6,527 | 6 | 135 | 61.16 | 151.88 | 24.968 | .008372 | .020395 |
| 70 and over | 314 | 1,702 | 8 | 16 | 64.50 | 28.48 | 22.805 | .025145 | .009356 |
| Total | 64,883 | 2,297,408 | 85 | 1,912 | 68.10 | 52.14 | 7.3862 | .001309 | .000831 |
| Province : Eastern Provinces | | | | | | | | | |
| 0-19 | 212 | 4,007 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 20-24 | 3,323 | 94,983 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 25-29 | 5,857 | 204,104 | 0 | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 30-34 | 5,966 | 221,546 | 2 | 54 | 42.02 | 30.56 | 29.716 | .000335 | .000243 |
| 35-39 | 5,419 | 195,751 | 3 | 15 | 53.81 | 7.45 | 31.067 | .000553 | .000076 |
| 40-44 | 4,823 | 162,747 | 2 | 13 | 26.35 | 4.88 | 18.635 | .000414 | .000076 |
| 45-49 | 3,670 | 125,402 | 7 | 157 | 80.98 | 53.26 | 30.606 | .001905 | .001252 |
| 50-54 | 2,519 | 82,123 | 9 | 159 | 94.22 | 51.19 | 31.407 | .003566 | .001932 |
| 55-59 | 1,831 | 54,339 | 11 | 302 | 91.29 | 84.48 | 27.526 | .005989 | .005545 |
| 60-64 | 1,118 | 29,335 | 9 | 253 | 75.69 | 81.63 | 25.230 | .008021 | .008586 |
| 65-69 | 458 | 6,330 | 6 | 41 | 94.61 | 48.71 | 38.625 | .013024 | .006420 |
| 70 and over | 508 | 1,447 | 9 | 13 | 42.84 | 22.86 | 14.279 | .017547 | .008942 |
| Total | 35,704 | 1,182,114 | 58 | 1,006 | 62.70 | 45.43 | 8.2335 | .001623 | .000851 |

TABLE 8
1989 EXPERIENCE RESULT BY INDUSTRY CODE
EXPECTED TABLES ARE THE CANADIAN BASIC GROUP LIFE TABLES,
1968-72, WITH WAIVER ADJUSTMENT (75%)
COMPANY : TOTAL COMBINED

| Industry Code | Exposed | | Total Claims | | Actual/Expected % | | S.D. % Lives | Mortality Rate | |
|---------------|---------|----------------------|--------------|----------------------|-------------------|--------|-----------------|----------------|---------|
| | Lives | Amount (\$1,000s) | Lives | Amount (\$1,000s) | Lives | Amount | | Lives | Amount |
| | Male | | | | | | | | |
| 0 | 221,795 | 9,182,186 | 809 | 22,623 | 64.71 | 51.50 | 2.2752 | .003640 | .002460 |
| 1 | 12,994 | 460,866 | 105 | 1,129 | 84.21 | 46.69 | 8.2179 | .008047 | .002446 |
| 2 | 23,171 | 1,199,635 | 210 | 4,280 | 97.84 | 65.64 | 6.7519 | .009022 | .003561 |
| 3 | 43,887 | 1,511,985 | 350 | 3,384 | 84.40 | 44.43 | 4.5114 | .007943 | .002235 |
| 4 | 98,601 | 3,494,449 | 402 | 8,420 | 66.36 | 50.49 | 3.3095 | .004068 | .002406 |
| 5 | 105,261 | 4,528,739 | 412 | 10,732 | 61.64 | 48.85 | 3.0366 | .003906 | .002366 |
| 6 | 111,636 | 5,972,206 | 339 | 9,961 | 52.13 | 33.28 | 2.8313 | .003032 | .001666 |
| 7 | 14,046 | 1,162,437 | 21 | 1,819 | 34.45 | 34.24 | 7.5180 | .001493 | .001563 |
| Total | 631,392 | 27,512,504 | 2,648 | 62,348 | 66.37 | 46.40 | 1.2898 | .004185 | .002263 |
| Female | | | | | | | | | |
| 0 | 150,448 | 4,485,242 | 176 | 3,566 | 58.17 | 46.51 | 4.3848 | .001169 | .000794 |
| 1 | 1,100 | 41,651 | 2 | 162 | 49.34 | 218.87 | 34.887 | .001816 | .003881 |
| 2 | 4,325 | 175,699 | 23 | 237 | 108.41 | 61.22 | 22.605 | .005303 | .001347 |
| 3 | 7,493 | 216,696 | 27 | 198 | 105.14 | 49.65 | 20.234 | .003596 | .000914 |
| 4 | 30,985 | 814,785 | 55 | 755 | 63.93 | 52.77 | 8.6200 | .001773 | .000926 |
| 5 | 54,410 | 1,750,238 | 94 | 2,037 | 76.21 | 67.54 | 7.8603 | .001726 | .001162 |
| 6 | 100,479 | 3,756,010 | 162 | 3,140 | 65.22 | 46.03 | 5.1245 | .001610 | .000835 |
| 7 | 11,673 | 474,776 | 8 | 179 | 50.37 | 28.38 | 17.808 | .000685 | .000376 |
| Total | 360,913 | 11,715,096 | 547 | 10,275 | 66.13 | 50.30 | 2.8275 | .001514 | .000876 |

TABLE 9
1989 EXPERIENCE RATIO BY DEPARTURE FROM
INTERCOMPANY EXPERIENCE RATIO BY AMOUNT
EXPECTED TABLES ARE THE CANADIAN BASIC GROUP LIFE TABLES 1968-72,
WITH WAIVER ADJUSTMENT

| Percentage Departure | Number of Companies | Actual Claims (\$1,000s) | Percentage of Claims |
|----------------------|---------------------|--------------------------|----------------------|
| Within 5% | 0 | \$ 0 | 0.0 % |
| 5% to 10% | 3 | 30,403 | 41.9 |
| 10% to 15% | 2 | 7,008 | 9.7 |
| 15% to 20% | 2 | 10,353 | 14.2 |
| 20% and over | 1 | 24,859 | 34.2 |
| Total | 8 | \$ 72,623 | 100.0 % |

