

INTER-OFFICE COMPARISONS

A question frequently asked of the Bureau is whether any information can be provided on the variation of mortality experience between individual offices. In order to protect the confidentiality of the contributing offices, which the Bureau takes extremely seriously, requests of this nature have to be turned down. An individual office's results are provided only to the office itself – not even the Executive Committee has access to this information.

Nevertheless, the Committee recognises that it may be helpful, from time to time, to bring into the public domain some indication of the variability in mortality experience between individual offices. The Bureau has previously produced three such reports. The first appeared in *J.I.A.* 68, 54 and *T.F.A.* 15, 315 and was based on the statistics underlying the A1924–29 table. The second investigation was carried out with the publication of the A1949–52 table, and the results published in *J.I.A.* 85, 57 and *T.F.A.* 26, 122. The last such report appeared in *C.M.I.R.* 13, 117 (1993) after publication of the “80” Series tables, and covered the three years 1987, 1988 and 1989. Readers are referred to those earlier reports for further results and commentaries.

With the publication of the “92” Series of standard mortality tables the Committee has decided that an updated investigation is now appropriate. This study, presented below, follows the same format as the previous (*C.M.I.R.* 13) report, but covers the years 1996, 1997 and 1998. As with that previous report, more detailed calculations are carried out for the middle year, 1997. Figures for 1996 and 1998 are also provided to highlight not only the variation between offices in a given year, but also the variation for a particular office over a series of years.

The investigation looks at the experience of male permanent (whole life and endowment) assurance policyholders at durations 2 and over. The comparison basis is AM92. There are 23 offices in the study. The previous investigation contained 34 offices. The fall in the number of offices is due to a number of reasons, including recent mergers in the insurance market and some offices no longer contributing data, however the Bureau believes that there is still a sufficient number of offices to make this exercise worthwhile.

The offices have been allocated to groups according to the number of expected deaths in 1997, as it was thought that the size of the office might be a factor in the variation. Group A contains offices with more than 700 expected deaths in 1997, Group B contains offices with between 400 and 700 expected deaths, and Group C contains offices with less than 400 expected deaths.

The results are shown in Tables 1 and 2. Table 1 shows the statistic 100A/E (all ages) for each office for each year of the study. Also shown for each office is the statistic (100A/E office \div 100A/E all offices combined). This shows at a glance whether an office is heavy or light compared to all offices combined. Within each group (A, B or C) offices are ranked in descending order of 100A/E in 1997; this is intended to obviate any possibility of identification of an office by reference to its position in the table. A plus (+) or minus (-) by the 100A/E for 1997 indicates that the difference (positive or negative) between the 100A/E office and 100A/E all offices combined is significant. The criterion is that the difference is more than twice the standard deviation (calculated as $100 \div \sqrt{\text{expected deaths}}$) of the observed office value.

Table 2 ranks the offices by the percentage variation of the experience of individual offices from that of all offices combined for the year 1997. Also shown are comparative figures for the CMI 1988 and 1924-29 experiences. (When the CMI 1949-52 experience was being studied, although offices were grouped according to whether their experience was heavy or light, unfortunately no individual office comparisons were published.)

The two tables show a similar pattern of results to those previously observed for 1988, which reinforces the main conclusion drawn then that there was, and still is, a very wide variation between the mortality experiences of the contributing offices.

The comments made on the 1988 experience are also relevant to the 1997 experience. From Table 1 it can be seen that in 1997 the mortality suffered in the experience of the heaviest office was slightly more than double that of the lightest office. Furthermore, using the 2 standard deviation test, in 1997 about half the variations were significant. Taking the table as whole, there remains no evidence that the size of offices has any bearing on the variation in experience, and there does still appear to be a fair degree of consistency from year to year in individual offices.

Table 1. Permanent assurances, males, durations 2 and over: ratios of actual deaths to those expected using the AM92 table for individual offices for the years 1996, 1997 and 1998: also shown are ratios showing the individual office experience as a proportion of the 'All Offices' experience.

Office Ranking	100A/E using AM92 Ult			100A/E Office ÷ 100A/E 'All Offices'		
	1996	1997	1998	1996	1997	1998
Group A						
1	102	99(+)	99	1.13	1.11	1.11
2	93	89	96	1.03	1.00	1.08
3	82	88	71	0.91	0.99	0.80
4	64	83	72	0.71	0.93	0.81
5	86	80(-)	78	0.95	0.90	0.88
6	79	75(-)	78	0.88	0.84	0.88
All Group A	90	90	88	1.00	1.01	0.99
Group B						
1	100	88	82	1.11	0.99	0.92
2	84	84	85	0.93	0.94	0.96
3	93	82	87	1.03	0.92	0.98
4	85	80(-)	108	0.94	0.90	1.22
All Group B	90	83(-)	91	1.00	0.93	1.02
Group C						
1	110	130	82	1.22	1.46	0.92
2	130	112(+)	99	1.44	1.25	1.11
3	100	106(+)	96	1.11	1.19	1.08
4	115	105	111	1.28	1.18	1.25
5	89	102(+)	107	0.99	1.14	1.20
6	99	102(+)	105	1.10	1.14	1.18
7	89	95	90	0.99	1.06	1.01
8	83	84	77	0.92	0.94	0.87
9	81	80	84	0.90	0.90	0.95
10	82	77(-)	83	0.91	0.86	0.93
11	75	73	65	0.83	0.82	0.73
12	63	62	58	0.70	0.69	0.65
13	69	61(-)	60	0.77	0.68	0.68
All Group C	89	91	90	0.99	1.02	1.01
'All Offices'	90	89	89	1.00	1.00	1.00

Note: a (+) or (-) by the ratio for 1997 indicates that the difference between the 100A/E for the individual office and the 100A/E for 'All Offices' is more than twice the standard deviation of the individual office value.

Table 2. Permanent assurances, males, durations 2 and over: distribution of offices by percentage variation (positive or negative) from the experience of all offices combined, together with comparative figures for other experiences.

Percentage variation from all offices experience d	CMI 1997		CMI 1988	CMI 1924-29
	Number of offices	Proportion of total exposure	Number of offices	Number of offices
$0 \leq d < 5$	3	14%	7	22
$5 \leq d < 10$	5	17%	3	17
$10 \leq d < 15$	7	54%	9	13
$15 \leq d < 20$	4	14%	7	2
$20 \leq d < 25$	0	0%	0	0
$d \geq 25$	4	1%	8	0
Total	23	100%	34	54