Continuous Mortality Investigation Reports

Number 8

Institute of Actuaries

Faculty of Actuaries

Published by the Institute of Actuaries
and the Faculty of Actuaries
1986

THE EXECUTIVE COMMITTEE OF THE CONTINUOUS MORTALITY INVESTIGATION BUREAU

as on 29th October 1985

Institute Representatives

P.G. Moore, Ph.D. (President)
P.H. Bayliss, B.A.
C.D. Daykin, M.A.
H.J. Jarvis
R.H. Plumb, B.Sc.
A.D. Wilkie, M.A. (Chairman)

Faculty Representatives

J.M. Macharg, M.A. (President)
C. Berman, B.A.
D.O. Forfar, B.A.
C.G. Kirkwood
J.J. McCutcheon, M.A., Ph.D.

PERMANENT HEALTH INSURANCE SUB-COMMITTEE

Institute Representatives

P.H. Bayliss, B.A.
E.A. Hertzman, M.A.
A.R. Marshall, B.Sc.
F.W.G. Martin
G.C. Orros, B.A.
R.H. Plumb, B.Sc. (Chairman)
R.J. Sansom, B.Sc. (Econ)

Faculty Representatives

R. Garden, M.A.
A.E.J. Jefferies

INTRODUCTION

THE Executive Committee of the Continuous Mortality Investigation Bureau of the Institute of Actuaries and the Faculty of Actuaries has pleasure in presenting the eighth number of its Reports.

The main item in this number is the regular quadrennial report on the mortality experience of assured lives, pensioners and annuitants for the years 1979–1982. This is followed by a short note on the progress of the Impaired Assured Lives Investigation, which commenced in 1982.

The third item is a report on an investigation into the distribution of duplicate policies taken from the data supplied for the cause of death investigation for the years 1981 and 1982.

A review of the history of the CMI computerization process describing particularly the changes introduced into the computer system from the 1983 experience forms the subject of the next paper.

The number then contains two papers prepared by the P.H.I. Sub-committee, the first about the distribution of causes of disability in the Individual P.H.I experience for 1975–78, and the second reporting on the Group P.H.I. experience for 1975–78.

It is always a pleasure to see the results of research appearing in print, and the Executive Committee wishes to record its thanks for making this possible to all those in the staff of the Bureau and the associated consulting firms, as well as to all those in the contributing offices who prepare the data on which these reports are based.

A. D. Wilkie
Chairman of the Executive Committee

January, 1986.

CONTENTS

MORTALITY OF ASSURED LIVES, PENSIONERS AND ANNUITANTS
EXPERIENCES FOR 1979–82

THIS report covers the main mortality experiences for the quadrennium 1979–82. Previous such reports on these experiences related to the years 1975–78 and were published in *C.M.I.R.* **5**. This report discusses the following experiences:

1. *Policies of assurance issued in the United Kingdom*
   - 1.1 Whole-life and endowment assurances (males);
   - 1.2 Whole-life and endowment assurances (females);
   - 1.3 Temporary assurances (males);
   - 1.4 Linked contracts (males and females).
2. *Policies of assurance issued in the Republic of Ireland*
   - 2.1 Whole-life and endowment assurances (males).
3. *Pension and annuity policies issued in the United Kingdom*
   - 3.1 Pensioners under life office pension schemes;
   - 3.2 Retirement annuities issued under the provisions of the Finance Act 1956, now section 226 of the Income and Corporation Taxes Act 1970;
   - 3.3 Immediate annuity contracts.

After the passing of the Finance Act 1956, the immediate annuitant investigation was divided into two sections, one covering contracts issued before 1957, the other covering contracts issued after 1956. The 'pre-1957' section of the investigation was closed at the end of 1981. The report on the mortality experience of these lives, therefore, covers 3 years only. Investigations into whole-life and endowment assurances issued in the Republic of Ireland on female lives and linked life assurances issued in the Republic of Ireland were started in 1982, but in each case the statistics for the one year are too scanty to justify preparation of a report. There are no reports yet on the experiences under joint-life-first-death policies, and under whole-life and endowment assurances accepted with no selection (or with limited selection) and issued in connexion with mortgages, as the first year of experience for these investigations was 1983.

When studying the tables it is necessary to bear in mind the statistical significance of the results, particularly those shown in the form of the ratio $r = 100\ A/E$. A good approximation for the standard deviation of r is $10\sqrt{r}/\sqrt{A} = 100/\sqrt{E}$. A less accurate approximation is $100/\sqrt{A}$. When comparing different investigations, their relative sizes should be borne in mind; a comparison of the sizes of the various investigations may be made by reference to Table 1.

Table 1 shows the total sizes of the investigations in the quadrennium under review, together with the crude mortality rate per 1,000 of the exposed to risk in

Table 1. *C.M.I. investigations* 1979–82*: total sizes of investigations*

Assurances (combined, all durations)

Investigation	Sex	Exposed to risk	Actual deaths	Crude rate per 1,000
U.K. Whole-life and endowment	M	25,861,757	95,023	3·7
U.K. Whole-life and endowment	F	4,764,407	7,390	1·6
*R.I. Whole-life and endowment	M	989,874	4,702	4·8
*R.I. Whole-life and endowment	F	27,496	40	1·5†
U.K. Level temporary	M	1,208,908	1,514	1·3
U.K. Decreasing temporary	M	3,043,478	6,141	2·0
U.K. Linked	M	1,005,198	2,734	2·7
U.K. Linked	F	180,302	419	2·3
*R.I. Linked	M	161,836	280	1·7†
*R.I. Linked	F	42,544	38	0·9†
Total assurances		37,285,800	118,281	3·2

Annuities (lives, all durations)

Investigation	Sex	Exposed to risk	Actual deaths	Crude rate per 1,000
U.K. Pensioners normal and late	M	1,419,773	85,426	60·2
U.K. Pensioners normal and late	F	342,155	10,536	30·8
U.K. Pensioners early	M	527,215	23,717	45·0
U.K. Pensioners early	F	91,230	1,899	20·8
U.K. Pensioners spouses	M	335	10	29·9
U.K. Pensioners spouses	F	28,732	692	24·1
U.K. Retirement in deferment	M	3,003,540	12,328	4·1
U.K. Retirement in deferment	F	339,188	860	2·5
U.K. Retirement in payment	M	226,303	8,811	38·9
U.K. Retirement in payment	F	35,352	692	19·6
U.K. Immediate pre-1957	M	1,517	217	143·0**
U.K. Immediate pre-1957	F	13,862	1,758	126·8**
U.K. Immediate post-1956	M	66,883	4,893	73·2
U.K. Immediate post-1956	F	151,076	9,943	65·8
Total annuities		6,247,161	161,782	25·9
Grand total, assurances and annuities		43,532,961	280,063	6·4

* R.I. = Republic of Ireland.

† Investigation started as from 1 January 1982. The figures therefore relate to the experience of 1982 only.

** Investigation was closed as from the end of 1981. The figures therefore relate to 1979–1981 only.

each investigation. It should be remembered that each crude rate is dependent upon the age distribution of the investigation to which it relates. These rates, therefore, are not reliable indicators of the relative mortality levels in different investigations.

The Committee has under consideration the preparation of graduated tables of all these experiences where the volume of data justifies it, and will present the results to the profession in due course.

1. POLICIES OF ASSURANCE ISSUED IN THE UNITED KINGDOM

1.1. WHOLE-LIFE AND ENDOWMENT ASSURANCES (MALES)

Table 1.1.1a shows for the combined data, and Tables 1.1.1b and 1.1.1c show respectively for the medically examined and non-medical data, the actual deaths in 1979–82, which are then compared with the deaths expected by the A 1967–70 table by giving the ratios of actual to expected deaths, together with the corresponding ratios for 1975–78, 1971–74 and 1967–70. It should be remembered that although the expression 'assured lives' is used, the investigations are based on 'policies' rather than 'lives'.

Table 1.1.1a shows that for the combined data at durations 0 and 1 mortality overall fell between 1975–78 and 1979–82 although the changes varied from age group to age group. At durations 2 and over the fall in mortality is shown throughout all the quadrennial periods and for each age group, apart from the small rises from 1975–78 to 1979–82 up to age 25, a similar rise from 1967–70 to 1971–74 in the age group 26–30, and irregularities over age 100 where the statistics may be unreliable due to loss of contact with some of the policyholders. Mortality at all ages now appears to be substantially lower than that according to the A 1967–70 table, and the Committee repeats the reservation made in *C.M.I.R.* **5** that offices need to make whatever adjustments they consider appropriate if they use a table which appears to overestimate mortality.

Tables 1.1.1b and 1.1.1c show similar trends for the medically examined and non-medical data separately, apart from duration 0 medical where, after a rise from 1971–74 to 1975–78, overall mortality has remained about the same.

The practice for some years of giving a linear or quadratic relationship between the observed ultimate rates of mortality and the rates according to the standard table ran into some difficulty for the 1975–78 report when the best relationship was a fixed ratio which was, however, not high enough at the upper end of the age range. In a similar manner, the best relationship in 1979–82 would be given by

$$q_x\,(1979\text{–}82) = \cdot 82\; q_x\,(\text{A } 1967\text{–}70)$$

but with the same reservation at the high ages.

A comparison of trends between the experiences of whole-life and endowment

assurances (durations 2 and over, males) and of the population of Great Britain is given in Table 1.1.2. The percentage ratios of the 1979–82 experience to that in 1970–72 (the base period for E.L.T. No. 13) for the population are consistent with figures given by Daykin in 'The Recent Trend of Mortality in Great Britain' in *J.I.A.* **108,** 413; **109,** 447; **111,** 181 and **112,** 75, allowing for the revisions to base population reported in the most recent article. Interpolations have been made between the assured lives' experiences for 1967–70 and 1971–74 in order to arrive at estimated figures relating to 1970–72, to enable a valid comparison to be made. It will be seen from the table that the reductions in mortality since the base period have generally been more marked for the assured lives than for the population although at most ages under 50 the differences are not great.

Table 1.1.3 shows the central rates of mortality in quinary age groups for the whole-life and endowment assurance experience (males, durations 2 and over) for 1979–82, for the medical and non-medical sections separately and combined, alongside the corresponding central rates for three earlier quadrennia as well as the population rates. In 1979–82 the assured lives' rates of mortality were between 60% and 80% of the population rates. A similar comparison for female lives is given in Table 1.2.2.

Table 1.1.4 shows the central rates of mortality for the combined male data at durations 5 and over in individual years from 1948 to 1982 inclusive, and also for the combined female data at the same durations in individual years from 1975 to 1982 inclusive.

Table 1.1.1a. *Whole-life and endowment assurances, 1979–82, males; actual deaths and ratios of actual to expected deaths by the A 1967–70 table; medical and non-medical combined*

Age group (nearest ages)	Actual deaths 1979–82	100 A/E 1979–82	100 A/E 1975–78	100 A/E 1971–74	100 A/E 1967–70
Duration 0					
–20	101	92	119	104	103
21–25	166	103	98	105	100
26–30	134	94	97	103	96
31–35	155	90	93	110	99
36–40	171	89	105	94	105
41–45	190	81	100	88	102
46–50	269	94	90	105	95
51–55	246	82	102	80	105
56–60	185	100	82	92	91
61–65	73	76	104	74	117
66–70	60	96	83	90	78
71–	45	137	73	70	131
All ages	1,795	91	98	97	100
Duration 1					
–20	105	119	115	102	100
21–25	153	88	79	89	99
26–30	175	96	81	95	102
31–35	203	91	89	110	98
36–40	193	80	93	100	107
41–45	245	83	92	98	94
46–50	337	94	98	95	107
51–55	373	95	105	102	98
56–60	262	93	95	105	95
61–65	99	82	98	78	97
66–70	90	83	85	102	90
71–	52	98	105	127	146
All ages	2,287	91	93	98	100
Durations 2 and over					
–20	105	98	96	118	104
21–25	561	89	87	93	103
26–30	1,069	84	87	100	98
31–35	2,179	85	88	93	97
36–40	3,114	80	91	94	100
41–45	4,941	78	86	93	102
46–50	8,310	78	85	95	101
51–55	13,571	81	89	95	99
56–60	18,630	81	85	92	100
61–65	15,240	82	88	93	101
66–70	5,537	78	84	90	98
71–75	5,682	85	90	98	103
76–80	5,194	91	97	98	101
81–85	3,590	92	94	98	100
86–90	2,054	87	96	99	99
91–95	954	83	95	89	94
96–100	194	54	75	85	93
101–	16	39	39	37	N/A
–45	11,969	81	87	95	100
46–60	40,511	81	87	94	100
61–75	26,459	82	87	93	100
76–	12,002	89	95	97	99
All ages	90,941	82	88	94	100

Table 1.1.1b. *Whole-life and endowment assurances;* 1979–82, *males, medically examined; actual deaths and ratios of actual to expected deaths by the A* 1967–70 *table*

Age group (nearest ages)	Actual deaths 1979–82	100 A/E 1979–82	100 A/E 1975–78	100 A/E 1971–74	100 A/E 1967–70
Duration 0					
–20	3	164	122	150	73
21–25	5	87	113	90	81
26–30	12	152	118	94	102
31–35	12	106	74	93	119
36–40	18	138	112	103	133
41–45	16	82	101	89	68
46–50	18	82	60	92	78
51–55	28	69	91	64	89
56–60	32	84	70	61	62
61–65	11	45	93	56	96
66–70	15	74	50	44	70
71–	23	120	88	88	137
All ages	193	86	87	78	87
Duration 1					
–20	3	189	142	100	103
21–25	5	76	55	96	98
26–30	18	159	80	98	111
31–35	9	53	130	111	81
36–40	20	105	103	107	101
41–45	28	101	97	105	74
46–50	28	86	82	87	87
51–55	47	74	93	85	83
56–60	49	74	68	82	71
61–65	22	61	60	53	70
66–70	14	42	55	70	76
71–	35	118	67	106	94
All ages	278	81	83	88	83
Durations 2 and over					
–20	1	45	197	25	75
21–25	20	90	87	96	113
26–30	74	77	86	106	91
31–35	251	90	95	98	105
36–40	443	83	93	92	97
41–45	864	78	82	87	99
46–50	1,674	76	82	91	96
51–55	3,076	78	80	87	94
56–60	4,923	74	78	83	93
61–65	4,957	74	79	83	94
66–70	2,935	73	81	88	96
71–75	3,608	82	87	98	103
76–80	3,680	89	96	97	101
81–85	2,592	90	93	96	99
86–90	1,630	89	96	98	97
91–95	789	86	94	88	95
96–100	170	56	76	86	95
101–	15	41	37	34	N/A
–45	1,653	81	87	91	99
46–60	9,673	75	79	86	94
61–75	11,500	76	81	88	97
76–	8,876	88	94	95	99
All ages	31,702	79	84	89	96

Table 1.1.1c. *Whole-life and endowment assurances, 1979–82, males, non-medical data; actual deaths and ratios of actual to expected deaths by the A 1967–70 table*

Age group (nearest ages)	Actual deaths 1979–82	100 A/E 1979–82	100 A/E 1975–78	100 A/E 1971–74	100 A/E 1967–70
Duration 0					
–20	98	91	119	103	104
21–25	161	104	97	107	102
26–30	122	90	95	104	95
31–35	143	89	95	114	94
36–40	153	86	104	92	98
41–45	174	80	100	88	111
46–50	251	95	94	108	100
51–55	218	84	107	93	118
56–60	153	104	90	119	116
61–65	62	87	111	93	140
66–70	45	107	112	143	86
71–	22	161	45	0	118
All ages	1,602	91	100	102	104
Duration 1					
–20	102	118	115	102	100
21–25	148	88	81	88	99
26–30	157	92	81	95	101
31–35	194	94	83	109	103
36–40	173	77	92	98	109
41–45	217	81	91	97	99
46–50	309	95	101	97	113
51–55	326	99	110	112	108
56–60	213	98	114	125	117
61–65	77	90	132	104	127
66–70	76	103	111	129	104
71–	17	73	183	183	246
All ages	2,009	92	96	101	106
Durations 2 and over					
–20	104	99	94	122	106
21–25	541	89	87	93	102
26–30	995	84	87	99	99
31–35	1,928	85	87	92	95
36–40	2,671	80	90	95	101
41–45	4,077	78	86	96	103
46–50	6,636	79	86	96	104
51–55	10,495	82	92	99	102
56–60	13,707	84	89	98	105
61–65	10,283	87	93	101	107
66–70	2,602	83	90	94	104
71–75	2,074	90	97	100	101
76–80	1,514	93	98	103	103
81–85	998	99	98	103	103
86–90	424	81	98	102	110
91–95	165	72	98	99	90
96–100	24	43	66	69	48
101–	1	27	78	67	N/A
–45	10,316	81	87	95	101
46–60	30,838	82	90	98	103
61–75	14,959	87	93	100	106
76–	3,126	91	98	102	103
All ages	59,239	84	91	98	104

Table 1.1.2. *Ratios of actual deaths in the male whole-life and endowment assurance experience at durations* 2 *and over in* 1979–82 *to those expected on the experience of* 1970–72, *compared with ratios of actual deaths in the male population of Great Britain to those expected on the experience of* 1970–72

Whole-life and endowment assurances (males)		Male population of Great Britain	
Ages nearest birthday	100 A/E 1979–82	Ages last birthday	100 A/E 1979–82
21–25	92	20–24	91
26–30	85	25–29	97
31–35	90	30–34	88
36–40	83	35–39	85
41–45	81	40–44	83
46–50	80	45–49	83
51–55	84	50–54	89
56–60	85	55–59	92
61–65	85	60–64	88
66–70	84	65–69	86
71–75	85	70–74	88
76–80	92	75–79	93
81–85	93	80–84	98

Table 1.1.3. *Central rates of mortality in the years* 1979–82 *under whole-life and endowment assurances (males, durations 2 and over) compared with corresponding rates in three previous quadrennia and with rates experienced by the male population of Great Britain (shown in brackets)*

Ages last			1979–82		1975–78		1971–74		1967–70	
birthday	Med.	Non-Med.	Combined	(Pop.)	Combined	(Pop.)	Combined	(Pop.)	Combined	(Pop.)
20–24	·0007	·0007	·0007	(·0009)	·0007	(·0010)	·0007	(·0010)	·0008	(·0010)
25–29	·0005	·0006	·0006	(·0009)	·0006	(·0009)	·0007	(·0009)	·0007	(·0009)
30–34	·0006	·0006	·0006	(·0010)	·0006	(·0010)	·0007	(·0011)	·0007	(·0011)
35–39	·0009	·0009	·0009	(·0014)	·0010	(·0016)	·0010	(·0017)	·0011	(·0017)
40–44	·0015	·0015	·0015	(·0025)	·0016	(·0027)	·0017	(·0030)	·0019	(·0031)
45–49	·0026	·0027	·0027	(·0045)	·0030	(·0050)	·0032	(·0055)	·0034	(·0054)
50–54	·0048	·0050	·0050	(·0083)	·0054	(·0091)	·0057	(·0093)	·0061	(·0094)
55–59	·0080	·0089	·0086	(·0144)	·0089	(·0147)	·0099	(·0157)	·1040	(·0161)
60–64	·0131	·0151	·0144	(·0232)	·0153	(·0247)	·0162	(·0256)	·0175	(·0270)
65–69	·0216	·0243	·0229	(·0372)	·0245	(·0398)	·0258	(·0420)	·0284	(·0443)
70–74	·0395	·0427	·0406	(·0596)	·0420	(·0636)	·0464	(·0666)	·0488	(·0682)
75–79	·0681	·0709	·0689	(·0931)	·0710	(·0983)	·0751	(·0998)	·0777	(·1008)
80–84	·1068	·1185	·1098	(·1408)	·1075	(·1457)	·1101	(·1471)	·1128	(·1425)
85–89	·1640	·1489	·1607	(·2077)	·1701	(·2122)	·1799	(·2162)	·1818	N/A

Table 1.1.4. *Central rates of mortality experienced in individual years, whole-life and endowment assurances, durations 5 and over, medical and non-medical combined, males* 1948–82, *females* 1975–82; *values of* 10,000 m_x

Year of experience	Ages last birthday															
	20–24	25–29	30–34	35–39	40–44	45 49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85–89	90–94	95–99
Males																
1948	15	14	13	18	26	46	72	125	201	329	488	814	1,281	1,968	2,507	3,118
1949	13	12	14	18	24	45	78	125	216	325	521	865	1,419	2,116	3,127	3,371
1950	17	13	12	16	25	45	79	130	214	316	561	849	1,427	2,099	3,342	3,171
1951	12	11	13	15	24	44	83	133	227	362	595	938	1,458	2,316	3,100	4,101
1952	13	10	11	16	25	41	76	127	203	347	552	861	1,370	1,967	2,779	3,585
1953	11	9	11	14	22	39	77	129	201	318	527	868	1,369	2,124	2,929	3,748
1954	14	9	12	14	21	39	74	136	199	325	552	838	1,335	2,005	2,775	4,521
1955	14	10	10	13	22	39	73	123	204	319	518	854	1,409	2,261	3,441	3,843
1956	7	8	10	14	20	37	69	131	211	326	511	888	1,377	2,139	2,973	4,075
1957	7	8	9	13	20	38	70	124	208	323	516	860	1,271	2,028	2,878	4,478
1958	9	9	9	11	20	37	69	124	206	324	538	961	1,299	2,100	3,317	4,306
1959	12	7	9	13	21	36	69	122	210	332	528	850	1,294	2,072	2,644	3,870
1960	11	8	9	13	22	36	66	119	204	294	492	927	1,301	1,938	3,276	2,542
1961	12	8	9	13	21	36	62	117	201	322	423	894	1,387	1,994	3,019	3,352
1962	13	7	8	11	19	36	63	114	209	332	502	939	1,335	2,054	2,874	5,148
1963	9	9	8	12	20	38	67	120	204	324	529	855	1,332	2,125	2,976	3,843
1964	7	7	9	13	21	38	63	112	186	303	516	816	1,149	1,914	2,567	3,796
1965	11	10	9	12	20	36	66	114	205	305	500	779	1,239	1,952	2,719	3,297
1966	6	7	8	12	21	35	62	105	187	304	504	812	1,293	1,874	2,650	2,760
1967	9	8	7	12	18	34	62	107	175	280	483	711	1,189	1,657	2,244	3,729

Table 1.1.4 (*continued*)

1968	8	7	7	10	18	34	64	106	177	283	503	830	1,209	1,962	2,510	4,967
1969	8	8	8	11	19	37	62	109	182	297	479	807	1,218	1,922	2,426	2,601
1970	9	7	7	11	20	36	63	103	180	295	507	778	1,164	1,731	2,425	4,108
1971	7	8	7	10	18	36	59	98	169	258	470	717	1,133	1,777	2,553	3,775
1972	11	6	7	11	18	34	62	101	169	289	496	786	1,179	1,827	2,231	3,547
1973	7	7	7	10	18	34	57	101	164	270	456	821	1,216	1,794	2,366	3,582
1974	7	6	7	10	18	31	59	100	165	261	478	710	1,180	1,815	2,647	2,455
1975	7	6	6	9	17	31	58	91	158	252	447	720	1,203	1,838	2,894	3,313
1976	8	6	6	8	17	30	58	86	157	252	433	695	1,151	1,814	2,559	3,241
1977	6	6	6	10	16	29	54	92	157	236	428	712	1,089	1,693	2,323	3,050
1978	8	6	6	10	15	27	54	90	152	244	410	731	1,088	1,763	2,358	2,632
1979	9	6	6	8	15	28	52	86	145	229	417	682	1,054	1,604	2,500	2,742
1980	7	6	6	9	15	27	51	90	149	232	405	711	1,128	1,491	2,005	2,162
1981	7	6	6	8	14	25	49	89	141	219	417	648	1,090	1,578	2,302	2,081
1982	8	6	6	8	14	24	47	81	137	218	380	688	1,078	1,669	2,149	2,203
Females																
1975	0	1	4	8	8	16	25	29	54	100	181	319	555	735	1,211	1,418
1976	4	5	5	7	14	26	37	59	92	129	266	468	624	1,461	1,569	2,405
1977	4	7	7	9	22	31	44	59	91	130	278	474	921	1,427	2,507	3,724
1978	3	3	4	6	11	18	33	46	64	111	211	437	716	1,027	2,022	1,501
1979	4	5	6	8	11	20	41	50	66	120	239	283	723	1,347	2,036	1,684
1980	4	3	4	8	11	19	36	44	72	106	187	391	735	1,215	1,691	1,870
1981	2	3	4	5	14	21	34	55	62	116	197	346	890	1,380	2,349	2,911
1982	3	3	4	6	8	17	32	49	87	109	273	392	824	1,162	2,031	2,500

1.2. WHOLE-LIFE AND ENDOWMENT ASSURANCES (FEMALES)

Table 1.2.1a shows for the combined data and tables 1.2.1b and 1.2.1c show respectively for the medically examined and non-medical data, the actual deaths in 1979–82 and the ratios of actual to expected deaths according to the A 1967–70 table with a 4-year age deduction, and also according to the FA 1975–78 table, which had not been constructed when *C.M.I.R.* **5** was published. The corresponding ratios for 1975–78, where available, are also shown. Comparisons according to the English Life Tables have been discontinued now that a standard table for female assured lives is available.

Mortality rates generally decreased from 1975–78 to 1979–82 over the whole age range, and in both the medically examined and the non-medical data, with the exception of the duration 1 experience which showed an increase in mortality. The adjusted A 1967–70 table is clearly no longer appropriate, and there are also significant differences between the 1979–82 experience and the FA 1975–78 table.

Table 1.2.2 compares central rates of mortality in quinary age groups at durations 2 and over, for the medical and non-medical sections separately and combined, with central rates for the female population of Great Britain consistent with those given in the notes by Daykin (*cf.* Table 1.1.3). Figures for the 2 years 1973–74 are not reproduced from earlier reports as there were many fewer offices contributing data for those 2 years. The assured lives' rates of mortality in 1979–82 were, as in the case of males, generally between 60% and 80% of the population rates, apart from the youngest age group where the experience was based on a small amount of data, and the oldest age group where the ratio was 87%. Also, the oldest age group was the only one where rates of mortality were higher than in 1975–78. The female investigation has not been observed for sufficient years to enable a comparison of trends since a base period to be made along the lines of the comparison given for males in Table 1.1.2. Central rates of mortality for the combined female data at durations 5 and over in individual years from 1975 to 1982 are shown at the foot of Table 1.1.4.

Table 1.2.1a. *Whole-life and endowment assurances,* 1979–82, *females; actual deaths and ratios of actual to expected deaths by the A* 1967–70 *table with a 4-year age adjustment, and by the FA* 1975–78 *table; medical and non-medical combined*

Age group (nearest ages)	Actual deaths 1979–82	100 A/E by A 1967–70 (4-year age adjustment) 1979–82	1975–78	100 A/E by FA 1975–78 1979–82	1975–78
Duration 0					
–25	41	33	41	88	108
26–35	57	51	57	74	85
36–45	81	74	103	81	113
46–55	137	76	76	100	104
56–	105	62		74	87
All ages	421	61	68	84	99
Duration 1					
–25	44	37	42	113	127
26–35	72	54	50	91	88
36–45	102	79	94	94	111
46–55	183	85	72	117	100
56–65	130	89	69	128	98
66–	70	96		120	89
All ages	601	74	65	111	101
Durations 2 and over					
–20	6	19	79	44	
21–25	77	27	31	84	96
26–30	150	43	55	79	100
31–35	258	68	75	77	85
36–40	299	80	103	71	92
41–45	447	89	116	81	106
46–50	713	87	106	91	110
51–55	1,106	83	88	98	104
56–60	1,213	71	74	92	96
61–65	694	62	70	84	96
66–70	354	58	63	82	89
71–75	278	62	71	87	99
76–80	217	64	84	86	114
81–85	248	97	88	121	110
86–90	153	89	92	97	100
91–	155	62	91	77	90
–45	1,237	65	80	77	97
46–60	3,032	79	86	93	102
61–75	1,326	61	68	84	95
76–	773	82	88	95	105
All ages	6,368	72	81	88	100

Table 1.2.1b. *Whole-life and endowment assurances,* 1979–82, *females, medically examined; actual deaths and ratios of actual to expected deaths by the A* 1967–70 *table with a* 4*-year age adjustment, and by the FA* 1975–78 *table*

Age group (nearest ages)	Actual deaths 1979–82	100 A/E by A 1967–70 (4-year age adjustment) 1979–82	1975–78	100 A/E by FA1975–78 1979–82
Duration 0				
All ages	38	61	72	73
Duration 1				
All ages	71	85	59	116
Durations 2 and over				
-30	12	52	115	106
31–35	10	45	112	51
36–40	25	94	140	84
41–45	48	114	103	104
46–50	63	82	110	85
51–55	117	79	86	93
56–60	165	56	66	73
61–65	159	55	67	76
66–70	116	50	61	71
71–75	121	57	65	80
76–80	90	50	77	67
81–85	138	93	92	116
86–90	100	93	90	101
91-	93	80	88	67
-45	95	83	115	89
46–60	345	66	80	81
61–75	396	54	65	76
76-	421	76	87	86
All ages	1,257	66	79	81

Table 1.2.1c. *Whole-life and endowment assurances,* 1979–82, *females, non-medical data; actual deaths and ratios of actual to expected deaths by the A* 1967–70 *table with a* 4*-year age adjustment, and by the FA* 1975–78 *table*

Age group (nearest ages)	Actual deaths 1979–82	100 A/E by A 1967–70 (4-year age adjustment) 1979–82	1975–78	100 A/E by FA 1975–78 1979–82
Duration 0				
All ages	383	61	67	85
Duration 1				
All ages	527	72	66	110
Durations 2 and over				
–20	6	19	80	45
21–25	76	28	31	85
26–30	139	42	48	76
31–35	248	70	70	78
36–40	274	79	97	70
41–45	399	87	119	79
46–50	650	88	105	91
51–55	989	84	89	98
56–60	1,048	74	77	96
61–65	535	64	71	87
66–70	238	63	65	89
71–75	157	66	76	93
76–80	127	79	92	107
81–85	110	104	83	129
86–90	53	83	96	90
91–	62	115	97	100
–45	1,142	63	76	76
46–60	2,687	81	88	95
61–75	930	64	70	89
76–	352	91	91	108
All ages	5,111	73	81	90

Table 1.2.2. *Central rates of mortality in the years* 1979–82 *under whole-life and endowment assurances (females, durations* 2 *and over) compared with corresponding rates in* 1975–78 *and with rates experienced by the female population of Great Britain (shown in brackets)*

Ages last birthday	1979–82				1975–78	
	Med.	Non-med.	Combined	(Pop.)	Combined	(Pop.)
20–24	·0001	·0002	·0002	(·0004)	·0003	(·0004)
25–29	·0005	·0003	·0003	(·0004)	·0004	(·0005)
30–34	·0003	·0004	·0004	(·0006)	·0005	(·0007)
35–39	·0007	·0006	·0006	(·0010)	·0008	(·0011)
40–44	·0014	·0010	·0010	(·0017)	·0013	(·0019)
45–49	·0018	·0019	·0019	(·0029)	·0023	(·0032)
50–54	·0031	·0032	·0032	(·0050)	·0035	(·0053)
55–59	·0040	·0051	·0049	(·0078)	·0050	(·0079)
60–64	·0065	·0073	·0071	(·0123)	·0081	(·0125)
65–69	·0100	·0122	·0114	(·0191)	·0124	(·0198)
70–74	·0184	·0211	·0199	(·0315)	·0227	(·0330)
75–79	·0261	·0408	·0330	(·0532)	·0439	(·0565)
80–84	·0757	·0854	·0798	(·0916)	·0740	(·0983)
85–89	·1230	·1091	·1178	(·1537)	·1213	(·1594)

1.3. TEMPORARY ASSURANCES (MALES)

When comparing the 1979–82 experience with earlier quadrennia it must be remembered that the temporary assurance experience has grown rapidly. It must also be borne in mind that by the nature of the contracts the average duration of the data is lower than for the whole-life and endowment assurances. Certain types of contract excluded from the data were outlined in *C.M.I.R.* **5**, 13, and the experience is believed still to consist largely of policies providing mortgage protection or family income benefits. Table 1.3.1a shows for the combined data and Tables 1.3.1b and 1.3.1c show, respectively for the medically examined and non-medical data, the experience under level temporary assurances, and Tables 1.3.2a, 1.3.2b and 1.3.2c similarly show the experiences under decreasing temporary assurances. Each table shows actual deaths in 1979–82 and the ratios of actual to expected deaths according to the A 1967–70 (5) table, which are compared with the corresponding ratios in the two preceding quadrennia.

As in 1975–78, these experiences show actual deaths well below those expected by the A 1967–70 (5) table, with the ratios tending to become lower as duration increases. The ratios are generally lower than displayed in tables 1.1.1a, 1.1.1b and 1.1.1c for the whole-life and endowment assurances, and especially so for the level contracts, so that the A 1967–70 (5) table appears to be even more on the safe side for temporary contracts than is the A 1967–70 table for the permanent contracts.

The amount of data for temporary contracts is still much smaller than the main data for whole-life and endowment assurances. The Committee recommends that offices make appropriate adjustments if they wish to make use of A 1967–70 (5) for these contracts.

Table 1.3.1a. *Level temporary assurances,* 1979–82, *males; actual deaths and ratios of actual to expected deaths by the A* 1967–70 (5) *table; medical and non-medical combined*

Age group (nearest ages)	Actual deaths 1979–82	100 A/E 1979–82	100 A/E 1975–78	100 A/E 1971–74
Duration 0				
–30	41	119	131	78
31–45	111	92	87	77
46–60	101	87	78	58
61–	11	55	36	88
All ages	264	91	87	71
Duration 1				
–30	24	86	66	58
31–45	89	74	67	86
46–60	98	77	68	83
61–	16	65	87	50
All ages	227	76	69	76
Durations 2–4				
–30	39	88	74	111
31–45	187	66	75	78
46–60	255	74	82	53
61–	45	69	54	67
All ages	526	72	76	71
Durations 5 and over				
–30	19	102	101	200
31–45	191	70	89	155
46–60	227	55	55	74
61–	60	57	77	45
All ages	497	61	71	88

1.3.1b. *Level temporary assurances,* 1979–82, *males, medically examined; actual death and ratios of actual to expected deaths by the A* 1967–70 (5) *table*

Age group (nearest ages)	Actual deaths 1979–82	100 A/E 1979–82	100 A/E 1975–78	100 A/E 1971–74
Duration 0				
–30	5	134	154	100
31–45	24	104	126	58
46–60	32	76	75	58
61–	9	54	41	71
All ages	70	82	88	64
Duration 1				
–30	4	110	25	67
31–45	21	81	56	58
46–60	28	58	74	62
61–	12	60	92	45
All ages	65	66	70	58
Durations 2–4				
–30	9	145	43	200
31–45	46	72	85	65
46–60	88	70	78	50
61–	34	67	57	50
All ages	177	72	74	60
Durations 5 and over				
–30	3	123	240	N/A
31–45	54	74	78	200
46–60	88	55	55	60
61–	47	57	74	44
All ages	192	60	68	83

Table 1.3.1c. *Level temporary assurances, 1979–82, males, non-medical data; actual deaths and ratio of actual to expected deaths by the A 1967–70 (5) table*

Age group (nearest ages)	Actual deaths 1979–82	100 A/E 1979–82	100 A/E 1975–78	100 A/E 1971–74
Duration 0				
–30	36	117	127	74
31–45	87	90	74	85
46–60	69	93	80	56
61–	2	57	0	200
All ages	194	95	86	76
Duration 1				
–30	20	82	73	56
31–45	68	72	71	100
46–60	70	90	63	119
61–	4	86	52	100
All ages	162	80	68	93
Durations 2–4				
–30	30	78	80	93
31–45	141	65	71	85
46–60	167	77	86	58
61–	11	78	40	300
All ages	349	72	78	80
Durations 5 and over				
–30	16	98	76	100
31–45	137	68	94	117
46–60	139	55	55	92
61–	13	58	93	50
All ages	305	62	75	95

Table 1.3.2a. *Decreasing temporary assurances* 1979–82, *males; actual deaths and ratios of actual to expected deaths by the A* 1967–70 (5) *table; medical and non-medical combined*

Age group (nearest ages)	Actual deaths 1979–82	100 A/E 1979–82	100 A/E 1975–78	100 A/E 1971–74
Duration 0				
–30	31	85	96	72
31–45	80	72	88	113
46–60	119	82	85	72
61–	13	86	71	62
All ages	243	79	88	87
Duration 1				
–30	35	84	89	77
31–45	115	82	84	82
46–60	147	80	89	84
61–	15	62	78	69
All ages	312	80	87	81
Durations 2–4				
–25	11	54	84	46
26–30	64	75	68	80
31–35	120	83	60	90
36–40	136	79	69	79
41–45	159	77	83	78
46–50	217	94	79	89
51–55	180	76	77	81
56–60	138	69	77	91
61–65	68	84	65	72
66–	22	84	62	
–30	75	71	71	79
31–45	415	79	72	
46–60	535	80	78	86
61–	90	84	65	72
All ages	1,115	80	74	82
Durations 5 and over				
–30	36	78	50	67
31–35	176	77	70	85
36–40	286	67	86	85
41–45	530	77	80	114
46–50	740	75	80	89
51–55	949	79	78	86
56–60	1,020	83	75	87
61–65	563	78	71	81
66–	171	74	56	
–30	36	78	50	97
31–45	992	74	80	
46–60	2,709	79	78	90
61–	734	77	67	81
All ages	4,471	78	76	91

Table 1.3.2b. *Decreasing temporary assurances* 1979–82, *males; medically examined; actual deaths and ratios of actual to expected deaths by the A* 1967–70 (5) *table*

Age group (nearest ages)	Actual deaths 1979–82	100 A/E 1979–82	100 A/E 1975–78	100 A/E 1971–74
Duration 0				
–30	2	77	18	110
31–45	17	140	124	162
46–60	36	87	90	59
61–	11	93	67	71
All ages	66	97	88	87
Duration 1				
–30	3	90	100	90
31–45	13	77	98	50
46–60	43	73	92	76
61–	14	73	82	45
All ages	73	74	93	69
Durations 2–4				
–25	0	0	0	67
26–30	7	90	90	71
31–35	19	108	64	129
36–40	18	82	45	88
41–45	24	82	74	89
46–50	32	88	77	87
51–55	48	72	78	74
56–60	70	62	78	80
61–65	49	81	69	72
66–	21	89	62	
–30	7	78	79	92
31–45	61	89	62	
46–60	150	69	78	79
61–	70	83	67	72
All ages	288	76	73	82
Durations 5 and over				
–30	6	113	45	160
31–35	24	66	56	94
36–40	69	82	105	100
41–45	120	80	78	110
46–50	148	67	84	96
51–55	196	72	90	73
56–60	316	75	67	92
61–65	297	74	68	83
66–	137	78	53	
–30	6	113	45	107
31–45	213	79	82	
46–60	660	73	78	87
61–	434	75	64	83
All ages	1,313	74	74	90

Table 1.3.2c. *Decreasing temporary assurances* 1979–82, *males, non-medical data; actual deaths and ratios of actual to expected deaths by the A* 1967–70 (5) *table*

Age group (nearest ages)	Actual deaths 1979–82	100 A/E 1979–82	100 A/E 1975–78	100 A/E 1971–74
Duration 0				
–30	29	86	104	66
31–45	63	63	82	104
46–60	83	80	81	85
61–	2	63	95	0
All ages	177	74	88	87
Duration 1				
–30	32	83	87	75
31–45	102	83	81	88
46–60	104	84	87	90
61–	1	20	52	200
All ages	239	82	84	85
Durations 2–4				
–25	11	58	93	43
26–30	57	74	65	81
31–35	101	80	59	83
36–40	118	78	74	77
41–45	135	76	85	76
46–50	185	96	79	90
51–55	132	77	77	85
56–60	68	80	72	127
61–65	19	92	40	75
66–	1	37	65	
–30	68	71	70	77
31–45	354	78	74	
46–60	385	86	78	91
61–	20	85	44	75
All ages	827	79	74	82
Durations 5 and over				
–30	30	73	51	42
31–35	152	80	73	82
36–40	217	63	82	80
41–45	410	76	80	116
46–50	592	77	79	99
51–55	753	81	75	90
56–60	704	87	81	84
61–65	266	85	73	77
66–	34	59	66	
–30	30	73	51	95
31–45	779	72	79	
46–60	2,049	82	78	92
61–	300	81	72	77
All ages	3,158	79	77	92

1.4. LINKED CONTRACTS (MALES AND FEMALES)

The experience under linked contracts for 1979–82 caused some difficulty, because at the oldest ages much of the data at durations 0 and 1 was found to relate to contracts with a very restricted sum at risk, under which there was virtually no medical selection. Such cases are referred to in this report as 'restricted cover' contracts. It has been possible to eliminate much of the data which included restricted cover cases for 1979–82 but probably not all of them. No adjustment has been made to the data for 1976–78. The experiences of the adjusted data are shown in Tables 1.4.1 for males and 1.4.2 for females. Comparisons are made with A 1967–70 for males, and with both A 1967–70 (with a 4-year age adjustment) and FA 1975–78 for females. Actual to expected ratios are compared with those for the years 1976–78, 1976 having been the first year for which linked-life statistics were collected. The ratios for the earlier period according to FA 1975–78 are not available. The fact that some of the restricted cover cases have been removed from the 1979–82 data has masked the growth in the volume of business which has occurred since the earlier period.

Overall, mortality has generally been within that expected by the standard tables employed, except at the oldest ages where there are indications that the reduced statistics still include some restricted cover cases, and except also the experiences up to age 30.

When studying the tables it must be remembered that many of the offices submit data with medically examined and non-medical statistics combined, and the material from the remaining offices has been insufficient to justify separate analysis of the two sections; also that offices unable to keep records of duration have been permitted, for the linked investigation, to include all their statistics in durations 5 and over.

The Bureau is approaching the offices to find out whether it may be feasible, in future, to exclude the restricted cover policies reliably, while still gathering data for cases with a significant death risk.

Table 1.4.1. *Linked contracts of life assurance,* 1979–82, *males; actual deaths and ratios of actual to expected deaths by the A* 1967–70 *table; medical and non-medical combined*

Age group (nearest ages)	Duration 0 Actual deaths 1979–82	100 A/E 1979–82	100 A/E 1976–78	Duration 1 Actual deaths 1979–82	100 A/E 1979–82	100 A/E 1976–78	Durations 2 and over Actual deaths 1979–82	100 A/E 1979–82	100 A/E 1976–78
–20							3	174	60
21–25							39	153	134
26–30							62	127	85
31–35							72	90	81
36–40							98	82	101
41–45							152	74	89
46–50							284	74	80
51–55							496	71	73
56–60							667	67	63
61–65							429	67	59
66–70							40	43	71
71–75							14	49	77
76–							15	89	77
–30	26	88	108	28	112	104	104	137	98
31–45	33	86	110	50	134	104	322	80	91
46–60	85	99	51	61	78	79	1,447	70	70
61–75	21	75	119	23	93	72	483	64	69
76–	32	925	183	4	125	229	15	89	77
All ages	197	106	102	166	98	99	2,371	71	73

2. POLICIES OF ASSURANCE ISSUED IN THE REPUBLIC OF IRELAND

2.1 WHOLE-LIFE AND ENDOWMENT ASSURANCES (MALES)

The results of the investigation into the 1979–82 experience under policies issued in the Republic of Ireland are given in Table 2.1.1a for the combined data and in Tables 2.1.1b and 2.1.1c respectively for the medically examined and non-medical data. As in the report in *C.M.I.R.* **5**, 7, the actual deaths and ratios between actual and expected according to the A 1967–70 table are shown, with the corresponding percentages in broad age groups applicable to policies issued in the U.K. shown in brackets.

The ultimate experience has again been close to that expected by the A 1967–70 table, but the mortality at durations 0 and 1 was considerably higher than that expected according to the standard table, and also higher than in the previous quadrennium apart from the non-medical data at duration 1 where there was some improvement on the unfavourable experience in 1975–78. It was pointed out in *C.M.I.R.* **5** that up to age 50 the A 1967–70 ultimate rates of mortality are nearly 1·5 times the duration 0 rates and 1·2 times the duration 1 rates and, bearing this in mind, there is still evidence that selective forces are operating in the Republic of Ireland data, although not so strongly as in the two previous quadrennia and, in the medically examined section, apparently wearing off after 1 year. In 1975–78 it was in the non-medical section that selection appeared to wear off after 1 year. It must be remembered that the exposed to risk is smaller than that of the U.K. experience, and these results might not be of significance. A further factor affecting the results is the relative lack of new business, which may be due to the popularity of linked contracts.

Table 2.1.1a. *Whole life and endowment assurances,* 1979–82, *males, medical and non-medical combined, policies issued in the Republic of Ireland; actual deaths and ratios of actual to expected deaths by the A* 1967–70 *table (corresponding figures for policies issued in the U.K. shown in brackets)*

Age group (nearest ages)	Actual deaths 1979–82	100 A/E 1979–82	100 A/E 1975–78	100 A/E 1971–74
Duration 0				
All ages	81	139 (91)	105 (98)	103 (97)
Duration 1				
All ages	79	109 (91)	119 (93)	107 (98)
Durations 2 and over				
–25	29	132 (90)	154	
26–30	52	108 (84)	100	
31–35	87	102 (85)	97	
36–40	134	90 (80)	88	
41–45	241	94 (78)	99	
46–50	439	99 (78)	92	
51–55	676	103 (81)	120	
56–60	926	105 (81)	101	
61–65	878	95 (82)	97	
66–70	374	108 (78)	96	
71–75	246	108 (85)	98	
76–80	253	136 (91)	118	
81–85	130	99 (92)	113	
86–90	53	100 (87)	101	
91–	24	116 (75)	73	
–45	543	97 (81)	99 (87)	102 (95)
46–60	2,041	103 (81)	105 (87)	117 (94)
61–75	1,498	100 (82)	97 (87)	105 (93)
76–	460	118 (89)	112 (95)	113 (97)
All ages	4,542	103 (82)	102 (88)	110 (94)

Table 2.1.1b. *Whole life and endowment assurances,* 1979–82, *males, medically examined, policies issued in the Republic of Ireland; actual deaths and ratios of actual to expected deaths by the A* 1967–70 *table (corresponding figures for policies issued in the U.K. shown in brackets)*

Age group (nearest ages)	Actual deaths 1979–82	100 A/E 1979–82	100 A/E 1975–78	100 A/E 1971–74
Duration 0				
All ages	12	121 (86)	92 (87)	89 (78)
Duration 1				
All ages	19	123 (81)	82 (83)	89 (88)
Durations 2 and over				
–30	7	113 (79)	117	
31–35	10	59 (90)	104	
36–40	34	90 (83)	95	
41–45	69	90 (78)	106	
46–50	152	97 (76)	88	
51–55	293	106 (78)	121	
56–60	500	116 (74)	103	
61–65	497	95 (74)	102	
66–70	302	107 (73)	91	
71–75	211	106 (82)	97	
76–80	223	137 (89)	123	
81–85	110	99 (90)	113	
86–90	41	88 (89)	93	
91–	21	110 (78)	79	
–45	120	87 (81)	104 (87)	100 (91)
46–60	945	109 (75)	106 (79)	112 (86)
61–75	1,010	100 (76)	98 (81)	105 (88)
76–	395	116 (88)	114 (94)	112 (95)
All ages	2,470	105 (79)	104 (84)	108 (89)

Table 2.1.1c. *Whole life and endowment assurances, 1979–82, males, non-medical data, policies issued in the Republic of Ireland; actual deaths and ratios of actual to expected deaths by the A 1967–70 table (corresponding figures for policies issued in the U.K. shown in brackets)*

Age group (nearest ages)	Actual deaths 1979–82	100 A/E 1979–82	100 A/E 1975–78	100 A/E 1971–74
Duration 0				
All ages	69	142 (91)	110 (100)	100 (102)
Duration 1				
All ages	60	105 (92)	139 (96)	116 (101)
Durations 2 and over				
–25	24	113 (91)	161	
26–30	50	117 (84)	94	
31–35	77	112 (85)	95	
36–40	100	90 (80)	86	
41–45	172	96 (78)	95	
46–50	287	100 (79)	95	
51–55	383	101 (82)	118	
56–60	426	95 (84)	99	
61–65	381	94 (87)	87	
66–70	72	117 (83)	135	
71–75	35	123 (90)	108	
76–80	30	133 (93)	84	
81–85	20	104 (99)	116	
86–	15	190 (76)	127	
–45	423	100 (81)	97 (87)	102 (95)
46–60	1,096	99 (82)	105 (90)	122 (98)
61–75	488	99 (87)	93 (93)	105 (100)
76–	65	131 (91)	101 (98)	121 (102)
All ages	2,072	100 (84)	100 (91)	114 (98)

3. PENSION AND ANNUITY POLICIES ISSUED IN THE UNITED KINGDOM

3.1. PENSIONERS UNDER LIFE OFFICE PENSION SCHEMES

Tables 3.1.1a and 3.1.1b, on the basis of lives and amounts respectively, give the experience during 1979–82 of pensioners retiring at or after normal retiring age and show comparative figures for quadrennia stretching back to 1967–70. The comparison bases used are PA(90) for the quadrennia 1979–82 and 1975–78 and Peg 1967–70 (the experience rates for 1967–70 underlying PA(90)) for the quadrennia 1967–70, 1971–74 and 1975–78 (the latter being on both bases providing a link between the earlier quadrennia and 1979–82). It must be remembered when studying these results that, whereas Peg 1967–70 gives different mortality rates for 'lives' and 'amounts', the PA(90) tables and the projected rates published with them were based on 'amounts' only. Furthermore, it should also be remembered that PA(90) contains allowance for projected mortality up to the year 1990.

Table 3.1.1a. *Pensioners who retired at or after the normal age. Experience* 1979–82 *on the basis of 'lives'*

Age group (nearest ages)	Actual deaths 1979–82	100 A/E PA(90) 1979–82	100 A/E PA(90) 1975–78	100 A/E, Peg 1967–70 (lives tables) 1975–78	1971–74	1967–70
Males						
–60	64	127	111	88	97	106
61–65	1,188	107				
66–70	17,126	106	118	92	95	99
71–75	24,258	115	126	101	101	102
76–80	23,136	118	124	103	102	99
81–85	12,874	117	119	102	105	99
86–90	5,191	113	118	104	101	98
91–	1,589	105	105	96	103	105
All ages	85,426	114	121	99	100	100
Females						
–60	87	157	162	126	142	126
61–65	860	113	115	91	97	98
66–70	1,477	107	113	92	92	102
71–75	2,125	105	113	93	94	100
76–80	2,520	107	111	94	102	96
81–85	2,045	116	119	103	100	99
86–90	1,094	114	116	103	100	109
91–	328	103	106	97		
All ages	10,536	110	114	95	97	100

Table 3.1.1b. *Pensioners who retired at or after the normal age. Experience* 1979–82 *on the basis of 'amounts'*

Age group (nearest ages)	Actual deaths 1979–82 (£pa)	100 A/E PA(90) 1979–82	100 A/E PA(90) 1975–78	100 A/E, Peg 1967–70 (amounts tables) 1975–78	1971–74	1967–70
Males						
–60	31,263	60	97	88	101	105
61–65	646,492	81				
66–70	5,373,824	86	100	91	95	98
71–75	5,711,711	98	108	99	102	103
76–80	4,558,137	100	111	102	102	99
81–85	2,421,746	107	114	104	102	99
86–90	986,064	111	111	103	99	98
91–	291,797	103	101	93	191	102
All ages	20,021,034	96	107	97	99	100
Females						
–60	26,548	130	167	147	133	147
61–65	197,359	100	94	84	106	96
66–70	241,013	90	105	94	94	103
71–75	299,650	94	101	90	106	91
76–80	303,152	97	109	97	102	105
81–85	219,258	104	115	103	110	105
86–90	120,755	111	127	114	93	101
91–	38,061	89	103	94		
All ages	1,445,796	98	106	95	102	100

The tables show that, for all ages combined and for each sex, the mortality experienced was lighter in 1979–82 than in 1975–78 both on a 'lives' and on an 'amounts' basis, the difference being smaller for 'lives' than for 'amounts'. The reduction is quite marked compared with the changes over previous quadrennia, particularly in the case of males. There was no change in the list of offices contributing to the Pensioner investigations sufficient to explain a difference in the experience of this magnitude and the Bureau has not been informed by the contributing offices of any major changes to data returned in either quadrennium. The sudden overall improvement in male mortality after three quadrennia of relatively stable experience appears to be genuine, and is not caused by any artifice of the data. For males the lighter experience is exhibited in all but the highest age groups. This contrasts with the experience over the three previous quadrennia, noted in *C.M.I.R.* **5**, 27 where it was observed that in the age groups 76–90 no improvement seemed to have occurred. For females the lighter mortality in 1979–82 as compared to 1975–78 was observed in all age groups except one, 61–65 on the basis of 'amounts'. This continues the general

downward trend observed, with certain exceptions, mainly in the 1971–74 'lives' data, over the previous quadrennia.

It should be noted that, on an 'amounts' basis, the 100 A/E ratio for 1979–82 using PA(90) was, for all ages combined, less than 100 for both sexes. For males the lighter mortality than expected on PA(90) even though this table contains allowance for future improvements, occurred in all age groups up to 75, while for females it was observed in the age groups 66–80. This indicates that PA(90) cannot now be considered as containing any allowance for future mortality improvement and is therefore not suitable for calculating premium rates and setting up reserves for an average portfolio of business without appropriate adjustment.

Table 3.1.2 shows, for each year 1975 to 1982, a comparison, on an 'amounts' basis, of the actual experience compared with that expected if the projections underlying PA(90) had been fulfilled. For males the figures confirm the indications from Table 3.1.1b that there was, indeed, a marked change in the mortality experienced between the 1975–78 quadrennium and 1979–82, with a greater than expected improvement in the rates experienced up to age 80. Over

Table 3.1.2. *Pensioners who retired at or after the normal age. Actual deaths* 1975–82 *on the basis of amounts (£pa) expressed as a percentage of those expected on the PA*(90) *projected rates*

Age group (nearest age)	1975	1976	1977	1978	1979	1980	1981	1982
Males								
–60	76	86	96	107	67	52	91	32
61–65					83	86	71	87
66–70	97	97	95	94	81	83	86	79
71–75	101	108	105	99	95	97	91	93
76–80	103	109	101	109	102	94	93	97
81–85	107	116	106	108	96	102	106	105
86–90	107	109	100	109	100	115	106	105
91–	90	96	95	105	102	111	92	96
All ages	100	105	101	101	92	93	91	91
Females								
–60	179	305	85	80	131	101	31	198
61–65	103	97	80	81	94	116	53	84
66–70	95	95	102	101	113	74	62	80
71–75	96	99	90	88	88	93	95	80
76–80	115	101	102	96	88	85	140	95
81–85	104	96	119	113	94	114	176	90
86–90	89	149	105	124	107	103	181	123
91–	78	83	88	86	84	82	191	89
All ages	102	103	98	97	96	94	93	90

that age the projected improvements do not appear to have taken place. Taken together, the indications are that the shape of the underlying mortality curve may now be inappropriate. For females the ratios indicate that overall the experience has consistently improved at a rate greater than allowed for in the projections. Looking at the age groups individually the trends are more difficult to follow but there does seem to be a tendency for the improvement to be greatest in the 61–80 age groups, reinforcing the indications from Table 3.1.1b.

Table 3.1.3 gives the experience of pensioners who retired before the normal age, using PA(90) as the basis of comparison. The table also compares the experience of early retirement pensioners with that of the normal and late retirement pensioners. As would be expected, the early retirement pensioners have experienced the heavier mortality. The pattern observed in 1975–78 (*C.M.I.R.* **5**, 29) where the additional mortality tended to be greatest in the

Table 3.1.3. *Pensioners who retired before the normal age. Experience* 1979–82 *compared with PA*(90) *table and with pensioners who retired at or after the normal age*

	Lives			Amounts		
Age group (nearest ages)	Actual deaths 1979–82	100 A/E	100 A/E (early retirement) ÷ 100 A/E (normal or late retirement)	Actual deaths 1979–82 (£pa)	100 A/E	100 A/E (early retirement ÷ 100 A/E (normal or late retirement)
Males						
–55	308	391	2·75	163,873	388	7·46
56–60	1,247	188	1·49	541,851	145	2·42
61–65	4,155	147	1·37	1,924,226	113	1·40
66–70	6,993	128	1·20	2,486,718	102	1·19
71–75	6,542	129	1·12	1,837,302	112	1·15
76–80	3,183	125	1·06	694,591	109	1·08
81–85	968	123	1·05	171,415	113	1·05
86–90	248	109	·97	29,597	90	·81
91–	73	108	1·03	10,091	109	1·06
All ages	23,717	134	1·18	7,859,664	112	1·17
Females						
–55	90	366	1·79	19,202	290	·27
56–60	287	218	1.40	77,679	201	2·39
61–65	323	144	1·27	69,831	124	1·23
66–70	355	135	1·26	55,925	116	1·28
71–75	287	112	1·06	32,764	101	1·07
76–80	309	132	1·23	26,063	112	1·16
91–85	159	102	·88	12,047	104	·99
86–90	71	103	·93	3,661	87	·78
91–	18	97	·94	905	45	·50
All ages	1,899	138	1·26	298,077	133	1·36

youngest age group, the addition falling off with advancing age, has been repeated in 1979–82.

Table 3.1.4 shows the experience of 'all pensioners combined' irrespective of the time of retirement. A similar comparison was shown for the first time in *C.M.I.R.* **5**, 32, the rationale being that it was an aggregation of all those originally 'selected' as members in certain employments and now on pension. The experiences for normal and late retirements, shown in Tables 3.1.1a and 3.1.1b, and that for early retirements, shown in Table 3.1.3, show very different patterns and, as would be expected, these differences are reflected, to a lesser degree, in the combined experience. It is difficult to discern trends specific to this group as a whole except to note a fairly uniform fall in mortality experienced in 1979–82 as compared to 1975–78.

Table 3.1.5 shows the size of the data and the average pensions per annum on both a 'lives' and 'amounts' basis. For normal and late retirement pensioners the average pension decreased throughout fairly regularly with age, while among

Table 3.1.4. *Pensioners: normal, late and early retirements combined. Experience 1979–82 compared with PA(90) table*

	Lives			Amounts		
Age group (nearest ages)	Actual deaths 1979–82	100 A/E 1979–82	100 A/E 1975–78	Actual deaths 1979–82	100 A/E 1979–82	100 A/E 1975–78
Males						
–55	314	378		165,560	364	
56–60	1,305	184	160	571,427	135	128
61–65	5,343	136		2,570,718	103	
66–70	24,119	112	124	7,860,542	91	105
71–75	30,800	118	128	7,549,013	101	111
76–80	26,319	119	125	5,252,728	101	112
81–85	13,842	117	119	2,593,161	107	114
86–90	5,439	113	118	1,015,661	110	112
91–	1,662	105	105	301,888	103	99
All ages	109,143	118	126	27,880,698	100	111
Females						
–55	93	357	220	29,414	390	203
56–60	371	206		94,015	162	
61–65	1,183	120	125	267,190	106	106
66–70	1,832	111	116	296,938	94	110
71–75	2,412	106	115	332,414	95	103
76–80	2,829	109	113	329,215	98	108
81–85	2,204	115	119	231,305	104	114
86–90	1,165	113	118	124,416	110	126
91–	346	103	111	38,966	87	105
All ages	12,435	113	118	1,743,873	103	111

Table 3.1.5. *Pensioners* 1979–82. *Exposed to risk, deaths and average pensions*

Age group (nearest ages)	Exposed-to-risk Lives	Amounts (£pa)	Average pension (£pa)	Deaths Lives	Amounts (£pa)	Average pension (£pa)
Males, normal or late retirement:						
–60	4,057	4,010,770	989	64	31,263	488
61–65	48,319	36,394,012	753	1,188	646,492	544
66–70	512,164	200,985,617	392	17,126	5,373,824	314
71–75	441,361	123,418,726	280	24,258	5,711,711	235
76–80	274,096	63,603,002	232	23,136	4,558,137	197
81–85	103,674	21,390,587	206	12,874	2,421,746	188
86–90	29,516	5,715,547	194	5,191	986,064	190
91–	6,586	1,232,302	187	1,589	291,797	184
All ages	1,419,773	456,750,563	322	85,426	20,021,034	235
Females, normal or late retirement:						
–60	9,033	3,485,067	386	87	26,548	305
61–65	82,350	21,667,217	263	860	197,359	229
66–70	87,681	17,138,412	195	1,477	241,013	163
71–75	76,090	12,116,760	159	2,125	299,650	141
76–80	52,998	7,065,269	133	2,520	303,152	120
81–85	24,213	2,891,159	119	2,045	219,258	107
86–90	8,145	927,742	114	1,094	120,755	110
91–	1,645	213,213	130	328	38,061	116
All ages	342,155	65,504,839	191	10,536	1,445,796	137
Males, early retirement:						
–55	11,712	6,276,863	536	308	163,873	532
56–60	49,229	27,857,449	566	1,247	541,851	435
61–65	136,122	82,252,882	604	4,155	1,924,226	463
66–70	176,735	79,507,132	450	6,993	2,486,718	356
71–75	107,723	35,092,441	326	6,542	1,837,302	281
76–80	36,416	9,194,547	252	3,183	694,591	218
81–85	7,526	1,468,975	195	968	171,415	177
86–90	1,460	213,648	146	248	29,597	119
91–	292	39,067	134	73	10,091	138
All ages	527,215	241,903,004	459	23,717	7,859,664	331
Females, early retirement:						
–55	8,001	2,331,913	291	90	19,202	213
56–60	23,343	6,872,274	294	287	77,679	271
61–65	25,019	6,347,846	254	323	69,831	216
66–70	16,929	3,158,054	187	355	55,925	158
71–75	9,801	1,258,669	128	287	32,764	114
76–80	5,306	528,333	100	309	26,063	84
81–85	2,135	162,539	76	159	12,047	76
86–90	600	36,957	62	71	3,661	52
91–	96	7,727	80	18	905	50
All ages	91,230	20,704,312	227	1,899	298,077	157

early retirement pensioners a similar decreasing pattern was observed after age 65 for men and age 60 for women. With only one exception the average pension among those dying was smaller than the average amongst the exposed-to-risk. This is consistent with the results of Tables 3.1.1.a, 3.1.1.b and 3.1.3 where the ratios of actual to expected deaths in all sections were lower on the 'amounts' basis than on the 'lives' basis.

As from 1 January 1976 the Bureau has collected data by duration since retirement and an analysis of the experience over 1975–78 was published in *C.M.I.R.* **5,** 33. For reasons outside the control of the Bureau corresponding figures for 1979–82 are not yet available. It is hoped to include a short note on the durational experience over 1979–82 in a later number of *C.M.I.R.*

A new investigation into the experience of spouses receiving pensions from pension schemes was started in 1975. The experience over 1975–78 was too small to allow any useful analysis in *C.M.I.R.* **5.** Over 1979–82 the male experience is still very limited, with only 10 deaths. The female experience is set out in Table 3.1.6. The mortality experience is significantly heavier than the experience of women drawing pensions in their own right, the greatest differences being at ages up to 75, becoming less as age increases.

The main question raised by the experience over 1979–82 concerns the adequacy, or otherwise, of PA(90) as a standard table. The Committee has this under consideration. In the meantime, it is worth repeating once again the caveat in the preface to the PA(90) tables 'The Committee cannot stress too strongly that it is the responsibility of any life office or actuary using these tables to ensure that they are appropriate for the particular purpose to which they are put'.

Table 3.1.6. *Spouses of pensioners. Experience* 1979–82 *compared with PA*(90) *table*

Age group (nearest ages)	Lives		Amounts	
	Actual deaths	100 A/E	Actual deaths	100 A/E
Females (widows)				
–60	69	187	27,509	108
61–65	92	193	36,873	144
66–70	129	152	59,462	160
71–75	143	140	47,330	118
76–80	108	108	30,054	104
81–85	90	113	26,136	114
86–	61	115	11,074	92
All ages	692	137	238,438	124

3.2. RETIREMENT ANNUITIES ISSUED UNDER THE PROVISIONS OF THE FINANCE ACT 1956

(Now Section 226 of the Income and Corporation Taxes Act 1970)

Table 3.2.1 shows the experience of 1979–82 compared with the experience of 1975–78. In deferment the comparison basis for males is A 1967–70 (ultimate), while females are compared on E.L.T. No. 13 for both quadrennia and also, for 1979–82 only, on FA 1975–78. Annuities in the course of payment are compared, for both sexes, on $a(90)$ (ultimate).

It will be seen that mortality in deferment was, for both sexes, lighter in 1979–82 than it was in 1975–78. For males this lighter mortality was apparent for all ages up to 70. For females the pattern is not quite so clear but for the age range containing the bulk of the data (41–70) the downward trend is reasonably consistent.

For annuities in the course of payment the male experience shows no improvement in mortality between the two quadrennia: in fact the 1979–82 experience was heavier in all age groups except 66–70, 71–75 and 81–85. The female experience was heavier overall than that of 1975–78, the excess mortality being mainly concentrated at ages up to 70.

Over 1979–82, as in 1975–78 (*C.M.I.R.* **5**, 35), the mortality in deferment for both males and females was lighter than that for whole-life and endowment assurance policyholers at durations 2 and over. Mortality of retirement annuitants in the course of payment was again lighter than that experienced by immediate annuitants at durations 1 and over, in the case of females substantially so. For both sexes the mortality experienced overall was close to $a(90)$: it should be noted that this implies that the $a(90)$ standard table does not contain any margin for future mortality improvement in respect of this group.

Since retirement policyholders would normally progress from the 'In Deferment' section of the investigation to the 'In Payment' section it is valid to look at the experience of both groups combined. Table 3.2.2 shows the experience of the combined group, compared on $a(90)$ ultimate. For both sexes the experience overall is well below $a(90)$, the pattern for both being similar. The experience at the middle ages is very light compared to $a(90)$ with the 100 A/E ratios rising to over 100% at ages over 75. The size of the experience in this investigation has grown rapidly in recent years and this growth looks set to continue. For males the number of deaths among retirement annuitants is now considerably greater than the number among immediate annuitants.

Table 3.2.1. *Retirement annuity policies: actual deaths and ratios of actual deaths compared to those expected during* 1979–82

	Males			Females			
Age group (nearest age)	Actual deaths	100 A/E 1979–82 A 1967–70*	100 A/E 1975–78 A 1967–70*	Actual deaths	100 A/E 1979–82 FA 1975–78*	100 A/E 1979–82 E.L.T. No. 13	100 A/E 1975–78 E.L.T. No. 13
In deferment							
–25	22	65	77	5	102	152	150
26–30	83	92	92				
31–35	223	87	88	10	68	53	92
36–40	391	82	92	38	112	79	50
41–45	692	77	85	60	85	53	56
46–50	1,280	75	83	110	83	49	51
51–55	2,251	78	83	185	81	51	58
56–60	3,085	74	83	233	79	53	63
61–65	2,858	72	79	140	69	48	49
66–70	1,150	58	59	59	60	41	48
71–75	285	59	51	20	93	63	22
76–	8	113	0				
All ages	12,328	73	79	860	78	51	56

	Males			Females		
Age group (nearest ages)	Actual deaths	100 A/E 1979–82 $a(90)$*	100 A/E 1975–78 $a(90)$*	Actual deaths	100 A/E 1979–82 $a(90)$*	100 A/E 1975–78 $a(90)$*
In course of payment						
–55	33	1315	210	6	330	141
56–60	76	325		12	203	
61–65	600	123	116	77	123	97
66–70	2,252	95	101	161	102	90
71–75	2,886	98	100	195	92	90
76–80	2,050	108	101	163	100	103
81–85	706	104	104	68	101	63
86–	208	107	100	10	68	110
All ages	8,811	102	102	692	101	93

* Ultimate rates.

Table 3.2.2. *Retirement annuity policies* 1979–82, *in deferment and in payment combined. Actual deaths and ratios of actual deaths compared to those expected on* $a(90)$ *ult.*

Age group (nearest ages)	Males		Females	
	Actual deaths	100 A/E	Actual deaths	100 A/E
–25	22	61	5	105
26–30	84	91		
31–35	225	93	10	85
36–40	391	91	38	132
41–45	695	88	60	88
46–50	1,289	87	113	85
51–55	2,269	89	188	88
56–60	3,161	81	245	92
61–65	3,458	82	217	87
66–70	3,402	82	220	87
71–75	3,171	94	214	92
76–80	2,054	108	164	101
81–85	709	104	68	101
86–90	197	112	10	66
91–	12	59		
All ages	21,139	88	1,552	91

3.3. IMMEDIATE ANNUITY CONTRACTS

In previous reports the data for those annuities which were purchased before 1957 were kept separate to take account of the apparent change in the class of life purchasing annuities after the passing of the Finance Act 1956; this practice has been continued in the present report. With the passage of time the lives in the pre-1957 data have become increasingly concentrated in the oldest age groups and the exposed to risk has declined rapidly. The Committee, therefore, closed this section of the investigation as from the end of 1981. The figures for pre-1957 lives in this report relate, therefore, to 3 years' experience only.

Table 3.3.1a and 3.3.1b show for males and females respectively the percentages of actual to expected deaths, on both 'lives' and 'amounts' bases,

Table 3.3.1a. *Immediate annuitants experience* 1979–82, *males: ratios of actual to expected deaths according to the a*(55) *and a*(90) *tables (select for duration* 0, *ultimate for other durations) compared with ratios for the previous quadrennium, calculated on the basis of both 'lives' and 'amounts'.*

		a(55)				*a*(90)			
		Lives		Amounts		Lives		Amounts	
Age group (nearest ages)	Actual deaths	100 A/E 1979–82	100 A/E 1975–78	100 A/E 1979–82	100 A/E 1975–78	100 A/E 1979–82	100 A/E 1975–78	100 A/E 1979–82	100 A/E 1975–78
Duration 0									
–70	24	138	176	107	177	125	160	98	161
71–80	48	108	93	120	91	115	100	128	97
81–	50	88	83	82	84	117	110	110	112
All ages	122	102	143	97	99	117	120	115	115
Durations 1–4									
–60	8	190	124	153	38	211	136	168	42
61–65	31	124	87	147	64	128	90	152	66
66–70	104	81	92	81	86	89	100	88	93
71–75	103	66	84	87	82	76	97	103	94
76–80	134	72	91	80	100	88	111	97	122
81–85	111	62	86	63	95	78	109	80	121
86–90	94	67	87	56	85	86	112	73	110
91–95	43	52	65	51	50	66	83	64	64
96–	20	78	53	87	29	94	64	104	36
All ages	648	70	86	71	86	84	103	87	105
Durations 5 and over (annuties purchased after 1956)									
–60	8	216	159	101	192	238	174	113	207
61–65	20	121	145	66	150	125	150	68	155
66–70	140	105	99	99	120	115	108	108	131
71–75	545	89	91	91	96	102	105	105	110
76–80	912	82	88	82	95	100	107	100	116
81–85	1,031	88	93	97	95	111	117	122	121
86–90	881	90	88	84	91	116	113	108	117
91–95	442	85	92	77	97	107	117	98	124
96–	144	85	75	93	87	101	91	110	105
All ages	4,123	87	91	87	96	108	111	108	118
Durations 5 and over (annuities purchased before 1957)									
–75	15	143	139	67	88	161	157	75	99
76–90	95	82	104	76	113	82	133	97	144
91–	107	97	85	89	107	120	105	110	134
All ages	217	92	99	82	110	114	124	102	138

Table 3.3.1b. *Immediate annuitants experience* 1979–82, *females: ratios of actual to expected deaths according to the a*(55) *and a*(90) *tables (select for duration* 0, *ultimate for other durations) compared with ratios for the previous quadrennium, calculated on the basis of both 'lives' and 'amounts'*

		a(55)				*a*(90)			
		Lives		Amounts		Lives		Amounts	
Age group (nearest ages)	Actual deaths	100 A/E 1979–82	100 A/E 1975–78	100 A/E 1979–82	100 A/E 1975–78	100 A/E 1979–82	100 A/E 1975–78	100 A/E 1979–82	100 A/E 1975–78
Duration 0									
–70	12	132	133	95	124	195	196	139	180
71–80	52	119	110	115	87	151	140	145	110
81–	90	100	110	90	119	121	132	108	143
All ages	154	108	112	96	109	134	140	118	135
Durations 1–4									
–60	10	192	128	124	118	270	181	176	165
61–65	21	89	77	95	85	116	93	125	100
66–70	46	74	74	69	60	95	95	88	76
71–75	97	69	65	72	66	88	84	92	84
76–80	194	78	74	83	80	101	96	108	104
81–85	235	74	86	74	96	96	112	96	125
86–90	209	84	91	88	97	108	118	114	125
91–95	137	102	104	109	100	127	131	137	126
96–	39	103	98	84	112	121	115	98	132
All ages	988	81	83	84	88	104	106	108	114
Durations 5 and over (annuities purchased after 1956)									
–60	7	96	173	31	165	134	243	44	229
61–65	36	131	158	88	156	172	207	115	204
66–70	140	85	91	88	74	109	117	113	95
71–75	559	85	87	82	80	109	111	106	103
76–80	1,330	84	91	72	84	107	116	92	107
81–85	2,256	90	95	89	92	117	124	115	120
86–90	2,349	94	96	84	99	121	125	109	128
91–95	1,538	95	99	95	107	118	124	119	134
96–	586	102	102	94	108	120	120	110	127
All ages	8,801	91	95	86	94	116	122	110	121
Durations 5 and over (annuities purchased before 1957)									
–75	35	89	109	70	95	115	140	94	122
76–90	881	103	106	105	109	133	138	136	141
91–	842	97	100	91	99	117	122	110	121
All ages	1,758	100	104	97	105	125	131	122	132

using comparison bases of *a*(55) and *a*(90), together with corresponding ratios for 1975–78. The observed mortality was lighter overall in 1979–82 than in 1975–78 for each durational grouping. Once again there appears to be little difference between the ratios on a 'lives' and on an 'amounts' basis. For males at durations 1–4 and 5 and over (post-1956) the lighter experience is fairly evenly distributed over the whole age range, except at the extremes. For females the lighter experience is evenly distributed over the whole age range for durations 5 and over (post-1956) but at durations 1–4 the pattern is less clear. For both sexes *a*(90) still gives, at longer durations, an overall safety margin to allow for future improvement in mortality, but it should be noted that for males at durations 1–4 the A/E ratios are less than 100% at all but the youngest ages.

The feature noted in *C.M.I.R.* **5**, 24, that there appeared to be a persistent

tendency for annuitants' mortality to be high in the youngest age groups when compared with the standard tables, is again present in the 1979–82 quadrennium. This can now be traced back over a number of quadrennia and seems to be a genuine feature of the data of which account might be taken in any future graduation.

Table 3.3.2 compares for 1975–82 the post-1956 annuitants experience with the projected rates for those years published with the *a*(90) tables. Fluctuations in the experience, accentuated by the rather small number of deaths among the males, make it difficult to discern any clear pattern in the figures. It can perhaps be tentatively concluded that the *a*(90) projections for males have been about right; they may now be showing an inadequate degree of improvement. For females the projected rates may have been somewhat on the light side but are now beginning to come closer to the experience.

Table 3.3.3 shows the average amounts of annuity in both the exposed to risk and the deaths. The average amount in both the exposed to risk and the deaths increased fairly regularly with age except among pre-1957 females. For females it

Table 3.3.2. *Immediate annuitants, annuities purchased after* 1956 *only. Actual deaths* 1975–82 *at durations* 1 *and over on the basis of lives, expressed as a percentage of those expected on a*(90) *projected rates*

Age group (nearest ages)	1975	1976	1977	1978	1979	1980	1981	1982
Males								
–60	162	80	215	125	167	186	258	242
61–65	108	94	145	87	112	138	145	88
66–70	98	88	105	101	89	103	89	117
71–75	97	80	113	98	90	96	101	87
76–80	95	84	111	114	95	103	89	89
81–85	105	115	92	125	107	101	99	102
86–90	109	96	115	109	111	121	102	98
91–95	102	101	121	98	115	92	97	87
96–	108	88	60	82	97	103	113	101
All ages	101	94	108	109	102	104	98	88
Females								
–60	146	290	223	159	199	113	167	204
61–65	158	181	129	101	153	170	116	87
66–70	97	104	116	98	105	99	109	75
71–75	94	95	103	101	108	94	87	107
76–80	91	107	109	111	103	99	101	95
81–85	121	116	120	101	114	102	109	104
86–90	116	118	115	115	120	110	114	99
91–95	116	115	121	117	117	105	114	111
96–	123	121	103	107	123	116	96	118
All ages	110	113	114	109	114	104	107	103

Table 3.3.3. *Immediate annuitants, 1979–82, all durations combined; exposed to risk, deaths and average amounts of annuity*

Age group (nearest ages)	Exposed to risk: Lives	Exposed to risk: Amounts	Exposed to risk: Average amount (£pa)	Deaths: Lives	Deaths: Amounts	Deaths: Average amount (£pa)
Males						
Annuities purchased after 1956						
–60	1,099	651,328	593	21	9,648	459
61–65	2,600	1,559,694	600	56	34,204	611
66–70	9,176	5,886,378	641	258	151,614	588
71–75	16,298	11,428,523	701	675	512,032	759
76–80	17,081	13,147,705	770	1,067	831,750	780
81–85	11,388	9,376,213	823	1,168	1,022,046	875
86–90	6,262	5,655,672	903	991	798,238	805
91–95	2,413	2,489,580	1,032	490	453,332	925
96–	566	676,653	1,196	167	219,429	1,314
All ages	66,883	50,871,746	761	4,893	4,032,293	824
Annuities purchased before 1957						
–75	292	30,029	103	15	714	48
76–90	850	105,004	124	95	11,042	116
91–	376	46,955	125	107	11,973	112
All ages	1,518	181,988	120	217	23,729	109
Females						
Annuities purchased after 1956						
–60	2,540	1,393,809	549	18	5,609	312
61–65	4,842	2,522,615	521	62	25,960	419
66–70	12,649	6,849,376	541	192	101,583	529
71–75	26,592	14,707,611	553	672	364,399	542
76–80	37,385	20,641,536	552	1,560	769,975	494
81–85	34,657	20,473,816	591	2,517	1,436,881	571
86–90	21,237	12,917,191	608	2,593	1,441,000	556
91–95	9,003	5,610,356	623	1,697	1,066,509	628
96–	2,171	1,312,702	605	632	331,915	525
All ages	151,076	86,429,012	572	9,943	5,543,831	558
Annuities purchased before 1957						
–75	1,526	152,986	100	35	2,906	83
76–90	8,519	802,345	94	881	83,909	95
91–	3,817	355,244	93	842	73,192	87
All ages	13,862	1,310,575	95	1,758	160,007	91

was higher, at most ages, in the exposed to risk than in the deaths, although for males there was no clear pattern.

The Committee concludes that, on the basis of this report, the $a(90)$ table could continue to be used for the present but it is necessary to review over a longer period the accuracy of the projections on which that table was based.

IMPAIRED ASSURED LIVES INVESTIGATION

THE Committee has now been able to examine a tabulation of the Impaired Lives data submitted by 12 offices for the year 1982, which was the first year for which the Bureau received Impaired Lives statistics. The Committee considers that there are a number of reasons why the pattern shown may not be typical of that to be expected when the experience matures. For this reason they may wish to regard it as a 'trial run', with the first full report eventually being based on the period 1983–86.

Only about half the offices who sent representatives to the preliminary meetings arranged by the Impaired Lives Sub-Committee were able to submit data for 1982, and a greater volume of statistics is expected in subsequent years. Some offices experienced difficult initial problems, and although these are now being overcome a substantial proportion of the 1982 statistics were contributed by only one office. It is hoped that this office's predominance over the data may have diminished to some extent by the year 1984, when more offices will have joined the investigation.

For preliminary analysis the impairment codings were grouped in an attempt to produce cells containing a meaningful volume of data. In due course the 1983–86 data will be examined in those same groups, with further analysis of any sub-groups for which statistics are adequate. The sizes of the in-force (rather than the deaths, which might be expected to be few in the first year of assurance) indicate that it is likely that some of the groups will be too small for any conclusions to be drawn. The numbers of in-force on 1 January 1983, and of deaths in 1982, in impairment groups are shown in the table on page 48.

The Committee would like to put on record its thanks to those offices who have contributed data and those who are planning to do so in the near future. Now that the Bureau has a system which can be regarded as proven, offices who have hitherto felt unable to commit themselves to the project are encouraged to reconsider their position. Any such data from any office will be very welcome. Further details may be obtained from the Secretary of the Bureau.

Impaired Lives data, 1982

Impairment codes	Impairment	In force 1.1.1983 Males	In force 1.1.1983 Females	Deaths 1982 Males	Deaths 1982 Females
A0–A6, AA–AU	Hypertension	1,068	391	3	1
B0–B7	Ischaemic heart without surgery	457	74	3	1
BA–BH	Ischaemic heart with surgery	31	4	0	0
C0–C7	Cerebrovascular disease	29	8	1	0
D0–D5	Nervous disorders	869	966	0	0
DA–DF	Disseminated sclerosis	33	28	0	0
E0–E7	Peptic ulcer	768	82	2	0
EA–ED	Ulcerative colitis	78	50	0	0
EE–EH	Crohn's disease	37	26	0	0
F0–F4	Epilepsy	223	125	2	0
G0–G8, GA–GK	Diabetes mellitus	369	107	3	1
H0–H5, HA–HM	Respiratory disorders	937	437	2	0
J0–J7, JA–JH	Urinary disorders	172	87	0	0
K0–K2	Tumour	3	89	0	0
L0–L8	Overweight	1,945	1,413	0	0
	All impairment groups	7,019	3,887	16	3

AN INVESTIGATION INTO THE DISTRIBUTION OF POLICIES PER LIFE ASSURED IN THE CAUSE OF DEATH INVESTIGATION DATA

THE continuous investigation into the mortality of assured lives is based on policies and not lives. Consequently the death of a policyholder carrying n policies appears as n deaths in the data. In order to estimate the standard deviations needed to test differences between actual and expected deaths, information is required about the distribution of policies per life assured.

Following the work of previous authors (see references) and at the suggestion of Perks in the discussion on Beard (1951) the Joint Mortality Investigation Committee reported on an investigation into this problem in 1957. By considering special returns for deaths during 1954 duplicate policies within offices were identified and their distribution described.

In contrast to the assured lives investigation where information is returned to the Bureau in the form of schedules, information to the cause of death investigation is in the form of copy death certificates. For those offices that contribute to the cause of death investigation the deaths reported are those included in their returns to the assured lives investigation. Examination of these statistics led the Committee to believe that duplicate policies could be identified from the information on the death certificates independently of the additional information provided by the offices.

To this end the following fields were added to the cause of death data record held on file by the C.M.I.'s computer sytem.

(a) Registration district.
(b) Date of death.
(c) Initials.
(d) Surname.
(e) Sex.
(f) Date of birth.

All this information is taken from the death certificate and is assumed to be independent of the contributing office.

If a death certificate was incomplete or illegible the following defaults were assumed.

(a) The date of death is 1 January in the year of investigation.
(b) The date of birth is calculated to give the exact age at death as given by the office, working from the date of death.
(c) The sex is taken as male if the Christian name on the death certificate does not provide a clue.

In order to find duplicate records within the data file the records were sorted by the following fields.

(a) By date of death.
(b) By surname within date of death.
(c) By sex within the above order.
(d) By district of death within the above order.
(e) By initials within the above order.

Records were then read from the file in turn and each of the fields described earlier was compared with the corresponding field in the previous record. If they all matched, a duplicate was recorded. One default field per record was allowed, i.e. if five fields matched and the sixth field of either record contained a default value a duplicate was also recorded.

This investigation relates to the whole-life and endowment class of business-where information was available for the years of experience 1981 and 1982. The results have been compiled for each year separately and combined. Only male lives with policies of duration 2 years and over were included. When combining 1981 and 1982 duplicates that appeared in both years were recorded. There were 125 deaths with at least one policy recorded in each year.

Tables 1.1, 1.2 and 1.3 show the 'variance ratios' in quinary age groups and at all ages combined. This is the ratio of the variance of a deviation where there are duplicates to that of a straightforward binomial variance. The previous report (*J.I.A.* **83,** 34) showed that this ratio may be approximated by m_2/m_1 where m_1 and m_2 are the first and second moments about zero of the duplicates' distribution.

This investigation refers to duplicates within the entire assured lives (whole-life and endowment) experience. The previous investigation (*J.I.A.* **83,** 34) was restricted to duplicates within each office and consequently the results of the two investigations are not directly comparable. In the previous report the Committee felt that the combined all-office results understated the number of duplicates within the experience. In order to estimate the size of this understatement the Committee gave the variance ratios of a sub-division containing the large non-Industrial offices, who reported more than 300 deaths during 1954. They had established that this sub-division contained a higher incidence of duplicates than in the experience as a whole. These results were intended to be maximum estimates for the variance ratios applicable to the 1954 experience. Table 2 reproduces the variance ratios reported in *J.I.A.* **83,** 35.

To aid the comparison of Table 2 with Tables 1.1, 1.2 and 1.3, asterisks (*) have been placed against values in the latter tables where they are less than the equivalent all office result in Table 2. Similarly, dashes (—) have been placed against values that are less than the equivalent '300 and over' non-industrial office results. Apart from ages 65–79 and ages 45–49 the series of variance ratios shown in Tables 1.1, 1.2 and 1.3 are larger than the maximum values thought applicable at the time of the 1954 investigation.

Table 1.1. *First and second moments about zero together with variance ratios of the duplicates distribution in the cause of death data. (Assured lives (whole-life and endowment), males, U.K., durations 2 and over.)*

Year of investigation: 1981

Age group (nearest ages)	m_1	m_2	Variance ratio m_2/m_1	Number of lives	Number of policies
Under 25	1·122	1·400	1·25	115	129
25–29	1·187	1·608	1·35	171	203
30–34	1·259	1.895	1·51	352	443
35–39	1·361	2·456	1·80	515	701
40–44	1·385	2·675	1·93	727	1,007
45–49	1·384	2·530 (—)	1·83 (—)	1,166	1,614
50–54	1·412	2·717	1·92	2,078	2,935
55–59	1·370	2·555	1·86	3,104	4,255
60–64	1·248	1·925	1·54	3,174	3,961
65–69	1.148 (*—)	1.551 (*—)	1·35 (*—)	1,266	1,453
70–74	1·196 (*—)	1·795 (*—)	1·50 (*—)	1,122	1,342
75–79	1·186 (—)	1·708 (*—)	1·44 (*—)	1,042	1,236
80–84	1·153	1·544	1·34	870	1,003
85–89	1·154	1·541	1·34	449	518
90 and over	1·183	1·716	1·45	289	342
All ages	1·286	2·143	1·67	16,440	21,142

Note: For a description of the meaning of the symbols used see text.

Table 1.2. *First and second moments about zero together with variance ratios of the duplicates distribution in the cause of death data. (Assured lives (whole-life and endowment), males, U.K., durations 2 and over.)*

Year of investigation: 1982

Age group (nearest ages)	m_1	m_2	Variance ratio m_2/m_1	Number of lives	Number of policies
under 25	1·042 (*)	1·125 (*)	1·08 (*)	96	100
25–29	1·152	1·494	1·30	164	189
30–34	1·268	2·022	1·59	321	407
35–39	1·392	2·469	1·77	531	739
40–44	1·380	2·430	1·76	760	1,049
45–49	1·404	2·648	1·89 (—)	1,220	1,713
50–54	1·402	2·611	1·86	2,043	2,865
55–59	1·346	2·390	1·78	3,062	4,121
60–64	1·269	2·026	1·60	3,292	4,179
65–69	1·150 (*—)	1·584 (*—)	1·38 (*—)	1,218	1,401
70–74	1·169 (*—)	1·684 (*—)	1·44 (*—)	1,017	1,189
75–79	1·218	1·957	1·61	1,110	1,352
80–84	1·149	1·535	1·34	840	965
85–89	1·150	1·558	1·36	480	552
90 and over	1·119	1·485	1·33	295	330
All ages	1·286	2·128	1·65	16,449	21,151

Note: For a description of the meaning of the symbols used see text.

Table 1.3. *First and Second moments about zero together with variance ratios of the duplicates distribution in the cause of death data. (Assured lives, (whole-life and endowment), males, U.K. durations 2 and over.)*

Year of investigation: 1981 *and* 1982 *combined*

Age group (nearest ages)	m_1	m_2	Variance ratio m_2/m_1	Number of lives	Number of policies
Under 25	1·085	1·275	1·17	211	229
25–29	1·174	1·563	1·33	334	392
30–34	1·274	1·991	1·56	667	850
35–39	1·387	2·501	1·80	1,038	1,440
40–44	1·395	2·604	1·87	1,474	2,056
45–49	1·401	2·626 (—)	1·87 (—)	2,375	3,327
50–54	1·414	2·693	1·90	4,101	5,800
55–59	1·365	2·506	1·84	6,140	8,380
60–64	1·263	1·991	1·58	6,442	8,140
65–69	1·152 (*—)	1·577 (*—)	1·37 (*—)	2,479	2,854
70–74	1·186 (*—)	1·753 (*—)	1·48 (*—)	2,134	2,531
75–79	1·205 (—)	1·845 (—)	1·53 (—)	2,148	2,588
80–84	1·152	1·541	1·34	1,709	1,968
85–89	1·153	1·556	1·35	928	1,070
90 and over	1·151	1·599	1·39	584	672
All ages	1·291	2·157	1·67	32,764	42,293

Notes: (i) For a description of the meaning of the symbols used see text. (ii) Although the aggregate of the total number of policies from Tables 1.1 and 1.2 is equal to the total in this table, the totals for each age group do not necessarily agree. In order to maintain consistency with the main assured lives investigations the age at death for each policyholder is that recorded by the offices in their main returns. As approximation to age is allowed under the rules of the Bureau different offices may record different ages for the same life.

Table 2. *First and Second moments about zero together with the variance ratios of the duplicates distribution for death claims in* 1954 *as reported in* J.I.A. **83.** *(Assured lives, all sections, durations* 3 *and over).*

All offices				'300 and over' non-industrial offices			
Age group (nearest ages)	m_1	m_2	Variance ratio m_2/m_1	Age group	m_1	m_2	Variance ratio m_2/m_1
Under 25	1·051	1·154	1·10				
25–29	1·093	1·280	1·17				
30–34	1·155	1·534	1·33	Under 35	1·103	1·462	1·33
35–39	1·182	1·612	1·36	35–39	1·189	1·642	1·38
40–44	1·217	1·799	1·48	40·44	1·205	1·882	1·56
45–49	1·258	2·097	1·67	45–49	1·324	2·733	2·06
50–54	1·222	1·887	1·54	50–54	1·268	2·277	1·80
55–59	1·197	1·730	1·45	55–59	1·275	2·275	1·78
60–64	1·172	1·656	1·41	60–64	1·189	1·692	1·42
65–69	1·176	1·676	1·43	65–69	1·270	2·092	1·65
70–74	1·198	1·835	1·53	70–74	1·248	1·934	1·55
75–79	1·178	1·727	1·47	75–79	1·246	2·009	1·61
80–84	1·147	1·533	1·34	80–84	1·140	1·493	1·31
85–89	1·101	1·342	1·22	85 and over	1·116	1·376	1·23
90 and over	1·106	1·380	1·25				
All ages	1·186	1·725	1·45	All ages	1·223	1·937	1·58

This table embraces some 21,470 policies.

Tables 3.1, 3.2 and 3.3 show the number of deaths with n policies in the experience examined, in quinary age groups, for each period. Tables 4.1, 4.2 and 4.3 show the percentage of deaths with n policies in the same groupings. When comparing results, the differences between this and the *J.I.A.* **83** investigation must be borne in mind. However, the shape of the distributions in Tables 4.1–4.3 is broadly similar to that reported in *J.I.A.* **83,** 36.

Table 3.1. *Numbers of deaths with* n *policies in the* 1981 *cause of death investigation. (Assured lives (whole-life and endowment), males, U.K., durations* 2 *and over.)*

Age group (nearest ages)	Number of policies (n)										Total number of lives
	1	2	3	4	5	6	7	8	9	10+	
20–24	103	10	2	0	0	0	0	0	0	0	115
25–29	143	24	4	0	0	0	0	0	0	0	171
30–34	277	63	9	2	1	0	0	0	0	0	352
35–39	385	91	30	6	2	0	0	0	0	1	515
40–44	547	129	24	15	7	2	2	0	1	0	727
45–49	862	212	59	19	9	5	0	0	0	0	1,166
50–54	1,526	369	107	48	15	10	1	2	0	0	2,078
55–59	2,358	504	142	64	25	6	1	1	0	3	3,104
60–64	2,583	447	110	26	4	1	2	0	0	1	3,174
65–69	1,117	126	16	3	2	1	0	1	0	0	1,266
70–74	968	114	26	8	3	2	0	0	1	0	1,122
75–79	900	109	19	11	1	2	0	0	0	0	1,042
80–84	766	82	16	5	1	0	0	0	0	0	870
85–89	395	42	9	3	0	0	0	0	0	0	449
90–94	198	22	4	2	1	0	0	0	0	0	227
95–99	46	5	2	0	1	0	0	0	0	0	54
100–104	8	0	0	0	0	0	0	0	0	0	8
All ages	13,182	2,349	579	212	72	29	6	4	2	5	16,440

Table 3.2. *Numbers of deaths with* n *policies in the* 1982 *cause of death investigation. (Assured lives (whole-life and endowment), males, U.K., durations* 2 *and over.)*

Age group (nearest ages)	Number of policies (n)										Total number of lives
	1	2	3	4	5	6	7	8	9	10+	
20–24	92	4	0	0	0	0	0	0	0	0	96
25–29	141	22	0	1	0	0	0	0	0	0	164
30–34	258	48	10	3	1	1	0	0	0	0	321
35–39	387	92	42	8	2	0	0	0	0	0	531
40–44	554	144	46	12	3	1	0	0	0	0	760
45–49	892	222	72	21	5	5	2	1	0	0	1,220
50–54	1,488	381	112	43	11	7	0	0	0	1	2,043
55–59	2,320	542	137	36	11	12	1	1	0	2	3,062
60–64	2,648	476	120	31	9	7	0	1	0	0	3,292
65–69	1,080	111	17	6	3	0	0	0	1	0	1,218
70–74	894	92	21	7	2	0	0	0	0	1	1,017
75–79	954	114	19	12	5	4	1	0	1	0	1,110
80–84	743	77	13	6	1	0	0	0	0	0	840
85–89	427	39	11	1	2	0	0	0	0	0	480
90–94	199	16	3	0	0	1	0	0	0	0	219
95–99	62	3	0	0	1	0	0	0	0	0	66
100–104	9	1	0	0	0	0	0	0	0	0	10
All ages	13,148	2,384	623	187	56	38	4	3	2	4	16,449

Table 3.3. *Numbers of deaths with* n *policies in the* 1981 *and* 1982 *cause of death investigation. (Assured lives (whole-life and endowment), males, U.K., durations* 2 *and over.)*

Age group (nearest ages)	Number of policies (n)										Total number of lives
	1	2	3	4	5	6	7	8	9	10+	
20–24	195	14	2	0	0	0	0	0	0	0	211
25–29	282	47	4	1	0	0	0	0	0	0	334
30–34	523	117	19	5	2	1	0	0	0	0	667
35–39	757	190	71	15	4	0	0	0	0	1	1,038
40–44	1,082	275	71	30	10	3	2	0	1	0	1,474
45–49	1,734	443	131	40	13	10	2	2	0	0	2,375
50–54	2,985	752	223	94	26	17	1	2	0	1	4,101
55–59	4,639	1,051	283	100	38	20	2	2	0	5	6,140
60–64	5,192	935	232	58	13	8	2	1	0	1	6,442
65–69	2,187	242	32	10	5	1	0	1	1	0	2,479
70–74	1,854	207	49	15	5	2	0	0	1	1	2,134
75–79	1,847	226	37	24	6	6	1	0	1	0	2,148
80–84	1,507	160	29	11	2	0	0	0	0	0	1,709
85–89	821	80	21	4	2	0	0	0	0	0	928
90–94	397	38	7	2	1	1	0	0	0	0	446
95–99	108	8	2	0	2	0	0	0	0	0	120
100–104	17	1	0	0	0	0	0	0	0	0	18
All ages	26,127	4,786	1,213	409	129	69	10	8	4	9	32,764

Table 4.1. *Percentage of deaths with* n *policies in the* 1981 *cause of death investigation. (Assured lives (whole-life and endowment), males, U.K., durations* 2 *and over.)*

Age group (nearest ages)	Number of policies (*n*) 1	2	3	4	5	6	7	8	9	10+	Total number of lives
20–24	89·57	8·70	1·74	—	—	—	—	—	—	—	115
25–29	83·63	14·04	2·34	—	—	—	—	—	—	—	171
30–34	78·69	17·90	2·56	·57	·28	—	—	—	—	—	352
35–39	74·76	17·67	5·83	1·17	·39	—	—	—	—	·19	515
40–44	75·24	17·74	3·30	2·06	·96	·28	·28	—	·14	—	727
45–49	73·93	18·18	5·06	1·63	·77	·43	—	—	—	—	1,166
50–54	73·44	17·76	5·15	2·31	·72	·48	·05	·10	—	—	2,078
55–59	75·97	16·24	4·57	2·06	·81	·19	·03	·03	—	·10	3,104
60–64	81·38	14·08	3·47	·82	·13	·03	·06	—	—	·03	3,174
65–69	88·23	9·95	1·26	·24	·16	·08	—	·08	—	—	1,266
70–74	86·27	10·16	2·32	·71	·27	·18	—	—	·09	—	1,122
75–79	86·37	10·46	1·82	1·06	·10	·19	—	—	—	—	1,042
80–84	88·05	9·43	1·84	·57	·11	—	—	—	—	—	870
85–89	87·97	9·35	2·00	·67	—	—	—	—	—	—	449
Over 90	87·20	9·34	2·08	·69	·69	—	—	—	—	—	289

Table 4.2. *Percentage of deaths with* n *policies in the* 1982 *cause of death investigation. (Assured lives (whole-life and endowment), males, U.K. durations* 2 *and over.)*

Age group (nearest ages)	Number of policies (*n*) 1	2	3	4	5	6	7	8	9	10+	Total number of lives
20–24	95·83	4·17	—	—	—	—	—	—	—	—	96
25–29	85·98	13·41	—	·61	—	—	—	—	—	—	164
30–34	80·37	14·95	3·12	·93	·31	·31	—	—	—	—	321
35–39	72·88	17·33	7·91	1·51	·38	—	—	—	—	—	531
40–44	72·89	18·95	6·05	1·58	·39	·13	—	—	—	—	760
45–49	73·11	18·20	5·90	1·72	·41	·41	·16	·08	—	—	1,220
50–54	72·83	18·65	5·48	2·10	·54	·34	—	—	—	·05	2,043
55–59	75·77	17·70	4·47	1·18	·36	·39	·03	·03	—	·07	3,062
60–64	80·44	14·46	3·65	·94	·27	·21	—	·03	—	—	3,292
65–69	88·67	9·11	1·40	·49	·25	—	—	—	·08	—	1,218
70–74	87·91	9·05	2·06	·69	·20	—	—	—	—	·10	1,017
75–79	85·95	10·27	1·71	1·08	·45	·36	·09	—	·09	—	1,110
80–84	88·45	9·17	1·55	·71	·12	—	—	—	—	—	840
85–89	88·96	8·13	2·29	·21	·42	—	—	—	—	—	480
Over 90	91·53	6·78	1·02	—	·34	·34	—	—	—	—	295

Table 4.3. *Percentage of deaths with* n *policies in the* 1981 *and* 1982 *cause of death investigation. (Assured lives (whole-life and endowment), males, U.K., durations* 2 *and over.)*

Age group (nearest ages)	Number of policies (n) 1	2	3	4	5	6	7	8	9	10+	Total number of lives
20–24	92·42	6·64	·95	—	—	—	—	—	—	—	211
25–29	84·43	14·07	1·20	·30	—	—	—	—	—	—	334
30–34	78·41	17·54	2·85	·75	·30	·15	—	—	—	—	667
35–39	72·93	18·30	6·84	1·45	·39	—	—	—	—	·10	1,038
40–44	73·41	18·66	4·82	2·04	·68	·20	·14	—	·07	—	1,474
45–49	73·01	18·65	5·52	1·68	·55	·42	·08	·08	—	—	2,375
50–54	72·79	18·34	5·44	2·29	·63	·41	·02	·05	—	·02	4,101
55–59	75·55	17·12	4·61	1·63	·62	·33	·03	·03	—	·08	6,140
60–64	80·60	14·51	3·60	·90	·20	·12	·03	·02	—	·02	6,442
65–69	88·22	9·76	1·29	·40	·20	·04	—	·04	·04	—	2,479
70–74	86·88	9·70	2·30	·70	·23	·09	—	—	·05	·05	2,134
75–79	85·99	10·52	1·72	1·12	·28	·28	·05	—	·05	—	2,148
80–84	88·18	9·36	1·70	·64	·12	—	—	—	—	—	1,709
85–89	88·47	8·62	2·26	·43	·22	—	—	—	—	—	928
Over 90	89·38	8·05	1·54	·34	·51	·17	—	—	—	—	584

REFERENCES

REDINGTON F. M. & MICHAELSON R. L. (1940). An aspect of the *a priori* probability theory of mortality. Transactions of the 12th International Congress of Actuaries, 225.

DAW R. H. (1945). On the validity of statistical tests of the graduation of a mortality table. *J.I.A.* **72,** 174.

SOLOMON L. (1948). The analysis of heterogeneous mortality data. *J.I.A.* **74, 94.**

BEARD R. E. & PERKS W. (1949). The relation between the distribution of sickness and the effect of duplicates on the distribution of deaths. *J.I.A.* **75,** 75.

BEARD R. E. (1951). Some notes on graduation. *J.I.A.* **77,** 382.

CONTINUOUS INVESTIGATION INTO THE MORTALITY OF ASSURED LIVES (1957) Memorandum on a special inquiry into the distribution of duplicate policies. *J.I.A.* **83,** 34.

THE C.M.I. BUREAU: A NOTE ON THE HISTORY OF THE COMPUTERIZATION OF THE WORK OF THE BUREAU AND THE DEVELOPMENT OF IMPROVED SERVICES TO CONTRIBUTING OFFICES

ONE of the prime functions of the C.M.I. Bureau, under the direction of the Executive Committee, is the production of standard tables for use by the actuarial profession. Allied to this is the continuous monitoring of experience to determine whether new tables are necessary and whether forecasts made are being borne out. The Committee is conscious of the tremendous contribution of the participating offices to this enterprise over the years. In the early days the constraints of the computational process itself made it difficult to perform much in the way of analysis other than on an All-Offices basis, although, for whole-life and endowment assurances only, some limited individual office results were laboriously produced annually. The advent of modern data processing techniques has, in recent years, made it possible to begin to offer some more specific return to the contributing offices in consideration for their assistance. This note traces the development of the service that can be offered to offices. It is the hope of the Committee that participation by offices in the work of the Bureau can now be regarded in terms of a partnership rather than merely as a tiresome duty undertaken for the benefit of the profession and the insurance and pensions industry as a whole.

For just over 50 years all collation and calculation within the Bureau was done manually. A small staff checked in the data from the contributing offices and collated it on to schedules in order to produce All-Offices totals. They then calculated the exposed to risk and the expected deaths on the bases required by the Committee. Once this process was completed, the results were prepared for printing and distribution to the offices—schedules showing the in force and deaths for the investigation year in question, together with a comparison of actual and expected deaths in broad age groups as well as by duration.

The staff involved saw the whole process through from beginning to end. They were in direct contact with the offices and could therefore liaise easily with them and, working directly on the data, were in a position to pick up at an early stage any detectable irregularities which may have crept in. The system worked quietly and unobtrusively and served the Committee well for over half a century.

Data year 1975 saw major changes in the way the Bureau operated; computerization had arrived! The services of a computer bureau had been retained and a suite of programmes commissioned to take over the tasks of collation and analysis previously done manually. This, of course, relieved the staff of many hours of scheduling and calculation and their rôle changed. They now checked in the data, sent in on specially designed punching documents,

punched cards or computer listings, maintaining detailed records of what had been returned. The data was then stored until all the expected returns for a given year were in, at which point it was sent to the computer bureau in one large batch for punching, vetting and all further processing.

As well as relieving the staff of the hard grind of manual calculation, computerization meant that the analyses of results distributed to the contributing offices could be expanded. The All-Offices results were shown in detail and certain statistical tests were added. For certain investigations results were shown on more than one comparison basis where it was felt that offices might find this useful. Also, for the first time, offices received an analysis of their own experience for *every* investigation to which they contributed. In addition the Committee has been able to add new investigations in response to market changes much more quickly and without straining the resources of the Bureau.

Following initial teething problems (a familiar song to anyone who has ever been involved in a computerization exercise!) the system settled down and has so far produced eight sets of annual results plus two sets of quadrennial analyses. It has proved robust and secure and has fulfilled well the functions expected of it. However, solving the computational problem almost inevitably led to difficulties in other areas which required attention and considerations of this nature have led to further changes in the Bureau's *modus operandi.*

As described already, following computerization, the Bureau staff checked in all data and stored it until the returns for the year were complete when it was sent in one large batch to the computer bureau. However, the Bureau currently runs 12 different sets of investigations with two more starting as from data year 1985. Further, each investigation is run separately for males and females, several of the assurance investigations are classified by medical type, while the annuity and pensioner investigations are run on both lives and amounts bases. With over 50 offices contributing data, well over 2,000 data schedules a year come into the Bureau, the majority on manually completed forms. This meant that complex data control systems had to be set up to ensure that all data sent to the computer Bureau from the C.M.I.B. was accounted for, punched, vetted and agreed. Data queries thrown up at the punching or vetting stage were routed from the computer bureau via the C.M.I.B. to the offices and back again—a lengthy process requiring control at every stage. The practice of storing the data until the last returns were in and then processing in one large batch often meant that the Bureau was raising queries on material that had originally been submitted many months before. Even where there were no queries (and it is only fair to point out that the vast majority of schedules go through with no problems at all) offices which had submitted their returns early had to wait a significant time before receiving any results at all. These considerations prompted the Committee to look at ways in which the service to offices provided by the C.M.I.B. might be improved.

The main difficulties arose at the data vetting stage, as returns were being put on file during what are known as the 'Front End' procedures. Once 'clean' files

had been achieved, further processing normally ran through without any major problems. Accordingly, the Committee requested the firm of consulting Actuaries in whose offices the C.M.I.B. is located to design a new 'Front End' system by means of which office returns could be punched and vetted as they came in and from which 'clean' files could be built up which would then be transferred to magnetic tape and passed to the computer bureau for the remaining processing procedures and the results runs.

Under the new system, first used for experience year 1983, the data comprising an office return is checked in on arrival and immediately logged into a comprehensive housekeeping procedure designed to keep track of all material which comes into the Bureau. It is then punched and checked as soon as possible after receipt. Any queries arising at this stage can easily be taken up directly with the office concerned and, usually, quickly sorted out. As the system is 'on line' putting through amendments received after the submission of the original schedules is a simple task.

At the request of the Committee, a further system was developed to produce an analysis of the experience of an individual office which would be returned to it shortly after its data had been received in the Bureau rather than having to wait until all the expected office returns were in as had been the case previously. At the same time, offices were given the option of requesting analyses on comparison bases other than those recommended by the Committee for the All-Offices experience and some have availed themselves of this facility. It was hoped that the faster turn-round of data returns and the additional facilities offered would prove useful to offices and, in the event, the changes have been generally welcomed.

It goes without saying that the All-Offices results can only be produced as quickly as the slowest of the contributing offices. In order to produce the results timeously, the Bureau has now instituted a procedure under which a closing date is imposed each year, after which data received will not be included in the All-Offices analyses for the year in question.

When designing the Individual Office Results system the opportunity was taken to build in certain statistical tests on the data, year on year. The first is a simple consistency test based on the premise that the 'In-Force' at age $x+1$, duration, $t+1$ at the end of the year should not normally be greater than the 'In-Force' at age x, duration t at the start of the year. The second is the Kolmogorov–Smirnov test. This is designed to test whether two distributions could have been drawn from the same parent population. A description of its basic features, with a resumé of its application to C.M.I. data, is given as an appendix to this note.

The area of data testing is a relatively new one for the Bureau and the effectiveness of the results in picking up errors is being kept under review. The Bureau would welcome comments on the tests used as well as further suggestions as to how this activity might be extended. All this is not to imply that erroneous returns are a serious problem in the Bureau. It is quite clear that the vast majority of schedules are carefully and accurately compiled. It has to be recognized,

however, that in an enterprise of this size and complexity errors will creep in from time to time. It is in the interest of everybody that such errors are isolated at the earliest opportunity before they become embedded in the system where they are more difficult to detect and, once detected, are expensive and time consuming to sort out.

The new 'Front End' procedures allied to the subsequent service supplied by the computer bureau provide an overall system which makes the best use of the hardware available in the separate parts. The Committee is confident that, with the systems at its disposal, the Bureau is now able to offer a real service to contributing offices.

Note: The systems described in this note apply only to the Assurance, Annuitant and Pensioner mortality investigations undertaken by the Bureau. The Impaired lives investigation, for which no individual office results are produced, is run under the old system whereby data is checked into the Bureau and is sent in one large batch to the computer bureau for processing. The P.H.I. investigation, which has been fully computerized from the start, has always been operated by the computer bureau which, under the auspices of the P.H.I. Sub-Committee, deals directly with the contributing offices.

APPENDIX: THE KOLMOGOROV–SMIRNOV TEST

The Kolmogorov–Smirnov test can be used to compare the distributions of two random variables, or to compare the distribution of one random variable with a theoretical distribution. It is used for the former purpose in the analysis of the C.M.I. data. A full explanation of the theory of the test is found in Durbin (1973). We limit ourselves here to a description of the test.

Consider two samples of observations of two random variables, A and B, which can take discrete values in the range $r, \ldots, s$. An example is the integral ages of lives in force at two successive year-ends. Let $m(x)$ be the number of cases in the sample of A in which A takes the value x in the range $r, \ldots, s$, and let $M = \Sigma m(x)$ be the total number of observations of A, e.g. the total number of cases in force. Let $n(x)$ and $N = \Sigma n(x)$ be defined similarly for B.

Let $f(x) = m(x)/M$ and $g(x) = n(x)/N$ be the proportion of cases in the two samples that have the value x.

Let

$$F(x) = \sum_{t \leqslant x} f(t)$$

and

$$G(x) = \sum_{t \leqslant x} g(t)$$

be the cumulative observed distributions of A and B, i.e. the proportion of cases of A and B that are less than or equal to x.

Let

$$D = \max | F(x) - G(x) |$$

be the maximum absolute difference between the two observed distributions.

Then

$$L = \sqrt{\frac{M \cdot N}{M + N}} \; D$$

is called the Smirnov statistic.

If the samples of A and B are from the same distribution, or their underlying distributions are identical, then L is a random variable with a known limiting distribution function, the Smirnov distribution, i.e. for M and N large enough the distribution of L converges to the Smirnov distribution. It is therefore possible to calculate the probability, on the hypothesis that A and B are identically distributed, of a value of L as large or larger being observed. This therefore gives

a test as to whether it is reasonable to assume that A and B are identically distributed.

The convergence of L is such that it is not appropriate to use the test if either M or N is less than about 80.

The method used by the Bureau to calculate the distribution function of the Smirnov statistic is that given in subroutine SMIRN from the IBM Scientific Subroutine Package.

The purpose of the test in the context of investigating data submitted by offices to the Bureau is that, if there is a gross error in the data submitted, then the test will show that, for example, the in-forces for two successive year-ends are unlikely to have come from the same distribution, or that the deaths in two successive years are unlikely to have come from the same distribution. While the distribution by age of an office's business may well vary from year to year, a substantial change in the data submitted may be treated in the first place as being more likely to be an error than a real change.

Two comparisons have been made for the data submitted by each office for each investigaion. Both of these relate to the in-force at successive year-ends. The first compares the data at the same ages and durations for each year. Thus the data for age x, duration t at one year end is compared with the data for age x, duration t at the next year end. Changes in these distributions at early durations may indicate changes in the distribution by age of the new business of the office in successive years. We would therefore expect a number of significant results from this cause.

The second test compares the data for age x, duration t at one year end with the data for age $x+1$, duration $t+1$ at the next year end. Since these are essentially the same data, any differences reflecting only movements, including lapses, surrenders, maturities and deaths over the year, it is to be expected that rather few significant results would be found. Differences in the proportion of movements at each age will cause the distributions to differ; however, at early durations, where the data are kept separate by duration, lapses probably account for the largest number of movements in those classes where they can occur. Whether lapse rates vary substantially by age at entry is outwith the remit of the Committee to examine.

At the ultimate durations, 5 and over for the assured lives investigations, the second comparison is made between the data for age x, durations 4 and 5 and over combined at one year end and the data for age $x+1$, duration 5 and over at the next year end.

REFERENCES

DURBIN, J. (1973). Distribution Theory for Tests Based on the Sample Distribution Function. Society for Industrial and Applied Mathematics, Philadelphia, Pa.

IBM (1970). System/360 Scientific Subroutine Package (Fifth edition).

CAUSE OF DISABILITY EXPERIENCE INDIVIDUAL P.H.I. POLICIES 1975–78

1. INTRODUCTION

1.1 The experience of Individual P.H.I. policies was last reported in 'Sickness Experience 1975–78 for Individual P.H.I. Policies', *Continuous Mortality Investigation Reports* 7, 1 (1984), (referred to as *C.M.I.R.* 7). The claims which arose from the experience of those policies have now been investigated to ascertain the distribution of claims by cause of disability.

1.2. Since 1972 all claims have been classified according to the *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death*, Eighth Revision, World Health Organization, 1967. To simplify the task, ensure continuity and standardize the results, the Eighth Revision was used although there is now a Ninth Revision. An appropriate simple but comprehensive classification, List C, was chosen from this Manual and the Offices were instructed to use the CE classification for Injuries and to ignore the CN classification.

1.3. Trial runs were made using the P.H.I. claim data to determine the likely distribution of Cause of Disability. From these it was apparent that it would be advisable to present results in a simplified form by the amalgamation of claim classifications for similar causes of disability and the results would need to be examined for each deferred period in respect of each sex. The age groupings used are the same as those used in other investigations.

1.4. The study of claims according to cause of disability does not in itself give rise to any specific actuarial table which can be used for the calculation of premium rates or the determination of valuation reserves on a P.H.I. portfolio. It was designed to give underwriters some indication of the relative importance of the various conditions giving rise to claims and those concerned with claims control and administration an indication of the average length of claim according to cause.

1.5. Although initial research showed that the inclusion of claims arising from 'duplicate' policies had little effect on the overall distribution, in these investigations the claim data used excludes any claims which arose from second or subsequent policies. Some indication of the numbers of duplicate policies held by claimants is given in *C.M.I.R.* 7, 94.

1.6. It was decided to group the claims into 14 Sickness Categories. Initial research indicated which Cause Groups could be considered to be of little importance and these were amalgamated. Any group which at any stage produced at least 5% of the total experience was included as a specific category. The results were very much as expected although the Sub-Committee were surprised at the high level of Road Transport Accident and Other Injuries. A full

description of the Sickness Categories amalgamated from the List C classification appears in Appendix 1.

1.7. Three sets of tables were produced. In the first two sets of tables the number of inceptions and total weeks of sickness were investigated by Sickness Category, according to sex and deferred period, in age groups. The results appear in Tables A1–A10 and B1–B10. Only claims which had terminated were considered in the third set of tables which record average duration in weeks by Sickness Category subdivided by mode of termination for each deferred period. The results appear in Tables C1–C10.

2. NUMBERS OF INCEPTIONS (TABLES A1–A10)

2.1. In these tables, the distribution of inceptions has been tabulated for males and females in respect of deferred periods of 1, 4, 13, 26 and 52 weeks. The total number of inceptions for each age group has been included to give a guide to the comparative importance of each set of figures. Inceptions reported with an age x next birthday age definition have been allocated as ·5 to each of ages x and $x-1$.

2.2. The total numbers of inceptions for each table are tabulated below.

Deferred Period in weeks	Number of Inceptions	
	Males	Females
1	8,135	602
4	3,431	205
13	828	79
26	395	58
52	54	6

As with other investigations from this experience the results for males under contracts with the shorter deferred periods are more reliable than the remainder.

2.3. The percentages shown in this and the following set of tables illustrate the importance of the various Sickness Categories within each age group. The comparison between age groups is not straightforward because the figures for any one Sickness Category are dependent upon what is happening in all the other Sickness Categories. For example, a condition which was completely independent of age could appear to reduce in importance as age increases due entirely to the increasing incidence of impairments in other categories. This could account for the decreasing trends shown in Table A1 for Sickness Categories 1 and 7, i.e. Other Infective and Acute Respiratory, as although some small degree of immunity may develop with age there is little doubt that the increasing trends, which are not unexpected, in Sickness Categories 4, 6, 9 and 11, i.e. Mental, Circulatory, Digestive and Musculoskeletal, have had more effect.

2.4. In Table A2 we see the effect of the imposition of a 4-week deferred period in reducing the importance of the Acute Respiratory and Other Infective Categories. At the younger ages Injuries now feature prominently, whereas, at ages over 50, the Circulatory Category assumes major importance. The surprise in tabulating these results was the high incidence of Road Transport Accident

and Other Injuries in the youngest male age group where as much as 38% of the claims are accounted for by these Categories.

2.5. A similar pattern emerges for the longer deferred periods, where it is also of interest to note the rising proportions in the Mental, Nervous and Musculoskeletal Categories, as the deferred period lengthens, particularly at the older ages.

2.6. The corresponding results for female lives are shown in Tables A6–A10, and, although the smaller number of inceptions means that the results must be treated more cautiously, three features of the tables for females which may be worth noting are:

(a) The markedly lower importance of the Circulatory Category;
(b) the persistently higher proportions in the Mental Category;
(c) the lower rates of Road Transport Accident and Other Injuries Categories for young lives.

3. DURATION OF CLAIM (TABLES B1–B10)

3.1. The tables in this set are similar to Tables A1–A10 but record the distribution of sickness by reference to the weeks of claim. This set therefore contrasts with the previous set in that the results are now weighted in terms of duration of claim rather than claim inceptions.

3.2. The total weeks of claim for each table are tabulated below.

Deferred Period in weeks	Total Number of Weeks of Claim	
	Males	Females
1	73,750	4,482
4	70,510	3,671
13	48,600	5,872
26	42,538	3,682
52	7,168	535

These figures cannot be related to the numbers of inceptions as the weeks of claim recorded take into account all P.H.I. claims for which payments were made during the period under review and so include cases where claims were in force at the beginning of the period of investigation.

3.3. Examining the two sets of tables for male lives we see that similar patterns emerge. Differences which can be considered of significance reflect the variations in time taken to recover. For instance Sickness Categories 1, 7, 8, 12 and 13, i.e. Other Infective, Acute and Chronic Respiratory, Road Transport Accident and Other Injuries, have less importance on the second set of tables than on the first whereas Sickness Categories 4, 5, 6 and 11, i.e. Mental, Nervous, Circulatory and Musculoskeletal, assume greater significance when duration of claim has an impact.

3.4. The figures for female lives are less than 10% of the total but it is worth noting the significance of Sickness Categories 4 and 11, i.e. Mental and

Musculosketal. On a small sample, these complaints do appear to play a substantial role in P.H.I. claims.

3.5. It will be interesting to monitor in future papers the significance of the Circulatory Category for both sexes and the effect of modern medical treatment on the Digestive Category.

4. AVERAGE DURATION OF CLAIM AT TERMINATION (TABLES C1–C10)

4.1. The final set of tables records the average duration in weeks from the onset of disability (i.e. including the deferred period) for all claims which ceased during the period under investigation. These figures also include claims which were in force at the beginning of the period. The number of claims involved is also recorded. The mode of cessation has been split into three sections, Death, Recovery or Termination of the policy by Expiry.

4.2. Two points stand out from these tables: the number of recoveries which form the major part of the experience and the large numbers of claims of short duration. This has particular relevance for P.H.I. Offices in that a small variation in claim recovery time can substantially alter their profitability. Winston Fowler in a paper entitled '*Some Thoughts on P.H.I. Claims Handling*', Proceedings of the Mercantile and General P.H.I. Seminar (1977), stated that 'one week difference in recovery time can make the difference between profit and loss'. The results in these tables reinforce this view, as such an increase applied to the figures in the tables in Set C would increase the total cost of claims by about 7%.

Number of inceptions as percentage of totals for each age group

Table A1. *Males—Deferred period* 1 *week*

Sickness Category	Age Group 18–39	40–49	50–59	60–65	All ages
1 Other Infective	16·2	8·4	5·9	4·4	10·0
2 Neoplasms	·9	1·4	3·0	3·6	1·9
3 Endocrine and Metabolic	·3	1·3	·7	·7	·7
4 Mental	2·9	4·4	5·1	3·0	3·9
5 Nervous	1·8	2·9	2·9	3·0	2·5
6 Circulatory	1·7	6·1	12·9	17·8	7·7
7 Acute Respiratory	27·3	21·3	18·0	14·1	21·7
8 Chronic Respiratory	6·9	6·8	5·0	6·7	6·3
9 Digestive	5·8	9·4	10·7	11·6	8·7
10 Genito-Urinary	1·3	3·3	5·0	8·4	3·6
11 Musculoskeletal	8·6	11·9	11·5	12·7	10·7
12 R.T.A. Injuries	2·1	1·9	1·3	·7	1·7
13 Other Injuries	17·3	12·3	9·0	5·6	12·5
14 All Others	6·9	8·6	9·0	7·7	8·1
All Categories	100·0	100·0	100·0	100·0	100·0
Total number of Inceptions	2,900·0	2,117·5	2,232·0	885·5	8,135·0

Table A2. *Males—Deferred period* 4 *weeks*

Sickness Category	Age Group 18–39	40–49	50–59	60–65	All ages
1 Other Infective	5·6	4·2	2·5	1·3	4·4
2 Neoplasms	1·6	3·8	4·5	3·3	2·9
3 Endocrine and Metabolic	·6	·9	1·5	1·3	·9
4 Mental	6·1	8·2	8·8	2·7	7·1
5 Nervous	3·3	2·7	4·0	2·7	3·2
6 Circulatory	3·9	12·8	22·8	35·1	11·6
7 Acute Respiratory	2·8	3·6	2·8	3·3	3·1
8 Chronic Respiratory	2·0	2·6	3·7	2·7	2·5
9 Digestive	10·8	13·0	16·1	18·1	12·8
10 Genito-Urinary	2·4	2·7	3·6	6·7	2·9
11 Musculoskeletal	15·1	13·9	10·8	11·4	13·8
12 R.T.A. Injuries	8·2	4·6	2·8	·7	5·7
13 Other Injuries	29·8	19·0	8·6	2·7	21·2
14 All Others	7·8	8·0	7·5	8·0	7·9
All Categories	100·0	100·0	100·0	100·0	100·0
Total number of Inceptions	1,581·0	1,031·0	669·5	149·5	3,431·0

Number of inceptions as percentage of totals for each age group

Table A3. *Males—Deferred period* 13 *weeks*

Sickness Category	Age Group 18–39	40–49	50–59	60–65	All ages
1 Other Infective	4·8	2·6	1·9	3·1	3·3
2 Neoplasms	4·5	6·0	8·5	10·2	6·4
3 Endocrine and Metabolic	·3	·7	1·9	·0	·8
4 Mental	10·0	9·0	10·2	7·9	9·5
5 Nervous	1·7	4·1	2·9	14·2	3·7
6 Circulatory	9·3	22·0	31·7	24·4	20·2
7 Acute Respiratory	1·0	·7	1·5	3·1	1·2
8 Chronic Respiratory	1·0	1·9	1·9	1·6	1·6
9 Digestive	9·7	10·4	6·8	6·3	8·9
10 Genito-Urinary	1·0	1·5	3·4	1·6	1·8
11 Musculoskeletal	18·7	14·9	11·6	18·9	15·8
12 R.T.A. Injuries	11·9	4·7	3·4	·0	6·5
13 Other Injuries	18·9	16·8	6·1	·0	13·5
14 All Others	7·2	4·7	8·2	8·7	6·8
All Categories	100·0	100·0	100·0	100·0	100·0
Total number of Inceptions	290·0	268·0	206·5	63·5	828·0

Table A4. *Males—Deferred period* 26 *weeks*

Sickness Category	Age Group 18–39	40–49	50–59	60–65	All ages
1 Other Infective	·0	3·4	·7	·0	1·0
2 Neoplasms	6·3	11·2	4·7	14·8	8·1
3 Endocrine and Metabolic	3·2	1·1	·7	1·7	1·5
4 Mental	11·6	21·2	17·9	5·0	15·2
5 Nervous	4·2	8·9	8·6	6·6	7·3
6 Circulatory	6·3	20·2	34·6	26·3	23·3
7 Acute Respiratory	·0	·0	·7	·0	·3
8 Chronic Respiratory	1·1	2·2	3·3	8·3	3·3
9 Digestive	9·0	5·0	5·2	3·3	5·8
10 Genito-Urinary	3·3	1·1	3·3	1·7	2·5
11 Musculoskeletal	11·6	8·9	8·3	19·0	10·9
12 R.T.A. Injuries	14·8	6·7	2·0	3·3	6·3
13 Other Injuries	24·3	6·7	4·0	5·0	9·6
14 All Others	4·3	3·4	6·0	5·0	4·9
All Categories	100·0	100·0	100·0	100·0	100·0
Total number of Inceptions	94·5	89·5	150·5	60·5	395·0

Number of inceptions as percentage of totals for each age group

Table A5. *Males—Deferred period* 52 *weeks*

Sickness Category	Age Group 18–39	40–49	50–59	60–65	All ages
1 Other Infective	·0	6·9	3·9	·0	3·6
2 Neoplasms	33·3	6·9	3·9	12·5	9·3
3 Endocrine and Metabolic	·0	·0	·0	·0	·0
4 Mental	16·7	20·7	15·7	·0	14·8
5 Nervous	·0	27·6	11·8	12·5	14·8
6 Circulatory	·0	6·9	31·4	50·0	24·1
7 Acute Respiratory	·0	·0	·0	·0	·0
8 Chronic Respiratory	·0	·0	·0	·0	·0
9 Digestive	·0	6·9	7·8	·0	5·6
10 Genito-Urinary	·0	·0	·0	·0	·0
11 Musculoskeletal	·0	13·8	15·7	12·5	13·0
12 R.T.A. Injuries	16·7	6·9	·0	12·5	5·6
13 Other Injuries	33·3	3·4	2·0	·0	5·6
14 All Others	·0	·0	7·8	·0	3·6
All Categories	100·0	100·0	100·0	100·0	100·0
Total number of Inceptions	6·0	14·5	25·5	8·0	54·0

Table A6. *Females—Deferred period* 1 *week*

Sickness Category	Age Group 18–39	40–49	50–59	60–65	All ages
1 Other Infective	15·3	10·7	8·5	·0	12·6
2 Neoplasms	1·8	5·4	7·7	·0	3·8
3 Endocrine and Metabolic	1·2	1·3	·0	·0	1·0
4 Mental	5·2	8·4	8·1	11·8	6·6
5 Nervous	·6	·0	6·0	·0	1·5
6 Circulatory	1·8	1·3	3·4	·0	2·0
7 Acute Respiratory	21·7	18·5	20·0	23·5	20·6
8 Chronic Respiratory	11.3	8·1	6·8	·0	9·5
9 Digestive	4·9	4·0	1·7	·0	4·0
10 Genito-Urinary	8·0	8·7	6·8	·0	7·8
11 Musculoskeletal	7·6	11·4	10·2	35·3	9·5
12 R.T.A. Injuries	2·2	·7	·8	·0	1·5
13 Other Injuries	7·3	12·1	9·8	5·9	9·0
14 All Others	11·1	9·4	10·2	23·5	10·6
All Categories	100·0	100·0	100·0	100·0	100·0
Total number of Inceptions	327·0	149·0	117·5	8·5	602·0

Number of inceptions as percentage of totals for each age group

Table A7. *Females—Deferred period* 4 *weeks*

Sickness Category	Age Group 18–39	40–49	50–59	60–65	All ages
1 Other infective	10·9	3·1	·0	·0	6·8
2 Neoplasms	3·6	14·8	15·8	·0	8·8
3 Endocrine and Metabolic	·9	1·6	3·5	·0	1·5
4 Mental	11·8	9·3	·0	·0	9·3
5 Nervous	3·6	1·6	3·5	·0	2·9
6 Circulatory	1·8	1·6	7·0	·0	2·4
7 Acute Respiratory	2·7	1·6	3·5	·0	2·4
8 Chronic Respiratory	1·8	1·6	·0	·0	1·5
9 Digestive	9·0	10·9	14·0	50·0	10·7
10 Genito-Urinary	6·8	14·8	21·1	·0	11·2
11 Musculoskeletal	11·8	14·1	3·5	·0	11·2
12 R.T.A. Injuries	4·5	·0	3·5	50·0	3·4
13 Other Injuries	16·3	10·9	7·0	·0	13·2
14 All Others	14·5	14·1	17·6	·0	14·5
All Categories	100·0	100·0	100·0	100·0	100·0
Total number of Inceptions	110·5	64·0	28·5	2·0	205·0

Table A8. *Females—Deferred period* 13 *weeks*

Sickness Category	Age Group 18–39	40–49	50–59	60–65	All ages
1 Other Infective	4·3	7·3	3·9	·0	5·1
2 Neoplasms	13·1	7·3	7·8	33·3	10·1
3 Endocrine and Metabolic	4·3	3·6	·0	·0	2·5
4 Mental	13·1	38·2	9·8	·0	20·3
5 Nervous	8·7	·0	3·9	·0	3·8
6 Circulatory	8·7	7·3	19·7	·0	11·4
7 Acute Respiratory	·0	3·6	3·9	·0	2·5
8 Chronic Respiratory	4·3	3·6	·0	·0	2·5
9 Digestive	4·3	0·0	3·9	33·3	3·8
10 Genito-Urinary	4·3	3·6	3·9	·0	3·8
11 Musculoskeletal	8·7	14·6	19·7	33·3	15·2
12 R.T.A. Injuries	13·1	·0	·0	·0	3·8
13 Other Injuries	4·3	3·6	15·7	·0	7·6
14 All Others	8·8	7·3	7·8	·0	7·6
All Categories	100·0	100·0	100·0	100·0	100·0
Total number of Inceptions	23·0	27·5	25·5	3·0	79·0

Number of inceptions as percentage of totals for each age group

Table A9. *Females—Deferred period* 26 weeks

Sickness Category	Age Group 18–39	40–49	50–59	60–65	All ages
1 Other Infective	5·9	·0	·0	·0	1·7
2 Neoplasms	11·8	4·4	25·8	·0	12·1
3 Endocrine and Metabolic	·0	4·4	·0	33·3	3·4
4 Mental	23·5	31·2	·0	33·3	20·7
5 Nervous	·0	·0	19·2	·0	5·2
6 Circulatory	5·9	20·0	3·2	·0	10·3
7 Acute Respiratory	·0	4·4	12·9	·0	5·2
8 *Chronic Respiratory*	·0	4·4	6·5	·0	3·4
9 Digestive	17·6	·0	12·9	·0	8·6
10 Genito-Urinary	5·9	4·4	0·0	·0	3·4
11 Musculoskeletal	17·6	8·9	6·5	·0	10·3
12 R.T.A. Injuries	·0	·0	6·5	·0	1·7
13 Other Injuries	·0	·0	· 0	·0	·0
14 All Others	11·8	17·9	6·5	33·3	14·0
All Categories	100·0	100·0	100·0	100·0	100·0
Total number of Inceptions	17·0	22·5	15·5	3·0	58·0

Table A10. *Females—Deferred period* 52 *weeks*

Sickness Category	Age Group 18–39	40–49	50–59	60–65	All ages
1 *Other Infective*	·0	·0	·0	—	·0
2 Neoplasms	·0	·0	·0	—	·0
3 Endocrine and Metabolic	·0	·0	·0	—	·0
4 Mental	100·0	33·3	·0	—	33·3
5 Nervous	·0	·0	·0	—	·0
6 Circulatory	·0	33·3	·0	—	16·7
7 Acute Respiratory	·0	·0	·0	—	·0
8 Chronic Respiratory	·0	·0	50·0	—	16·7
9 Digestive	·0	·0	·0	—	·0
10 Genito-Urinary	·0	·0	·0	—	·0
11 Musculoskeletal	·0	·0	50·0	—	16·7
12 R.T.A. Injuries	·0	·0	·0	—	·0
13 Other Injuries	·0	·0	·0	—	·0
14 All Others	·0	33·3	·0	—	16·7
All Categories	100·0	100·0	100·0	—	100·0
Total number of Inceptions	1·0	3·0	2·0	·0	6·0

Weeks of claim as percentage of totals for each age group

Table B1. *Males—Deferred period* 1 *week*

Sickness Category		Age Group 18–39	40–49	50–59	60–65	All ages
1	Other Infective	10·5	3·1	2·7	·8	3·2
2	Neoplasms	2·8	4·6	4·2	4·0	4·1
3	Endocrine and Metabolic	·6	·9	2·2	1·9	1·7
4	Mental	7·3	22·6	13·5	7·6	12·8
5	Nervous	3·7	5·7	8·8	7·3	7·1
6	Circulatory	9·7	15·5	29·2	44·7	28·7
7	Acute Respiratory	9·0	4·4	3·9	1·7	3·9
8	Chronic Respiratory	3·4	1·9	3·0	2·5	2·7
9	Digestive	8·3	7·7	5·9	6·4	6·7
10	Genito-Urinary	1·3	1·5	3·6	2·4	2·6
11	Musculoskeletal	12·7	15·2	12·9	10·4	12·6
12	R.T.A. Injuries	5·3	2·2	1·6	1·0	2·0
13	Other Injuries	19·4	9·6	4·0	4·0	6·9
14	All Others	6·0	5·1	4·5	5·3	5·0
All Categories		100·0	100·0	100·0	100·0	100·0
Total weeks of Claim		8,724	14,407	28,825	21,794	73,750

Table B2. *Males—Deferred period* 4 *weeks*

Sickness Category		Age Group 18–39	40–49	50–59	60–65	All ages
1	Other Infective	3·9	2·2	·5	·1	1·9
2	Neoplasms	2·0	4·9	5·9	3·6	4·2
3	Endocrine and Metabolic	·5	·4	4·1	·4	1·6
4	Mental	8·3	15·6	16·4	9·4	13·0
5	Nervous	5·6	3·2	9·8	1·8	5·8
6	Circulatory	5·5	17·5	26·4	48·0	20·2
7	Acute Respiratory	1·2	1·3	1·0	·8	1·1
8	Chronic Respiratory	2·2	3·0	3·2	5·4	3·1
9	Digestive	6·7	6·5	6·7	3·9	6·3
10	Genito-Urinary	1·9	1·1	1·3	1·3	1·4
11	Musculoskeletal	16·9	17·1	11·3	14·0	14·9
12	R.T.A. Injuries	10·7	4·9	2·0	·5	5·2
13	Other Injuries	24·9	15·4	4·4	6·5	13·8
14	All Others	9·7	6·9	7·0	4·3	7·5
All Categories		100·0	100·0	100·0	100·0	100·0
Total weeks of Claim		20,439	20,348	21,566	8,157	70,510

Weeks of claim as percentage of totals for each age group

Table B3. *Males—Deferred period* 13 *weeks*

Sickness Category	Age Group 18–39	40–49	50–59	60–65	All ages
1 Other Infective	4·1	3·4	·9	1·5	2·4
2 Neoplasms	3·3	4·2	2·8	3·2	3·4
3 Endocrine and Metabolic	·1	3·4	2·1	1·0	1·8
4 Mental	18·3	18·4	23·8	17·3	19·9
5 Nervous	3·9	10·8	11·6	12·6	10·0
6 Circulatory	9·9	18·7	31·1	32·6	23·7
7 Acute Respiratory	·1	·2	1·2	·9	·7
8 Chronic Respiratory	·2	·7	3·6	5·2	2·4
9 Digestive	4·1	3·2	2·5	1·8	2·9
10 Genito-Urinary	·4	1·0	·7	2·0	1·0
11 Musculoskeletal	21·4	14·8	9·6	15·5	14·7
12 R.T.A. Injuries	12·6	7·2	1·5	2·0	5·4
13 Other Injuries	14·7	9·4	2·5	·0	6·4
14 All Others	6·9	4·6	6·1	4·4	5·3
All Categories	100·0	100·0	100·0	100·0	100·0
Total weeks of Claim	10,179	12,927	15,279	10,215	48,600

Table B4. *Males—Deferred period* 26 *weeks*

Sickness Category	Age Group 18–39	40–49	50–59	60–65	All ages
1 Other Infective	·5	1·4	1·0	4·0	1·9
2 Neoplasms	9·9	1·5	3·6	3·1	3·8
3 Endocrine and Metabolic	2·5	·4	·0	2·4	1·0
4 Mental	17·1	32·0	21·4	14·9	20·6
5 Nervous	4·6	10·6	11·2	8·4	9·6
6 Circulatory	2·2	14·4	38·8	35·3	30·4
7 Acute Respiratory	·0	·0	1·7	·0	·8
8 Chronic Respiratory	·1	·9	2·3	4·4	2·5
9 Digestive	7·4	2·2	5·4	3·0	4·4
10 Genito-Urinary	3·2	·4	1·6	·3	1·2
11 Musculoskeletal	10·4	11·3	6·1	19·5	11·3
12 R.T.A. Injuries	11·0	13·1	·8	·5	3·6
13 Other Injuries	21·7	4·4	1·7	1·1	3·9
14 All Others	9·4	7·4	4·4	3·1	5·0
All Categories	100·0	100·0	100·0	100·0	100·0
Total weeks of Claims	4,342	6,251	19,388	12,557	42,538

Weeks of claim as percentage of totals for each age group

Table B5. *Males—Deferred period* 52 *weeks*

Sickness Category	Age Group 18–39	40–49	50–59	60–65	All ages
1 Other Infective	·0	1·6	·3	·0	·5
2 Neoplasms	12·7	5·7	2·7	3·8	4·0
3 Endocrine and Metabolic	·0	·0	·0	3·7	1·3
4 Mental	3·6	24·5	31·5	·0	20·3
5 Nervous	·0	20·3	17·5	7·4	14·7
6 Circulatory	·0	8·6	16·7	34·2	19·1
7 Acute Respiratory	·0	·0	·0	·0	·0
8 Chronic Respiratory	·0	·0	·0	·0	·0
9 Digestive	·0	6·2	6·1	·0	4·2
10 Genito-Urinary	·0	·0	·0	·0	·0
11 Musculoskeletal	·0	8·7	12·0	32·2	16·2
12 R.T.A. Injuries	38·5	16·8	6·4	5·3	9·6
13 Other Injuries	45·2	1·4	4·6	13·4	7·6
14 All Others	·0	6·2	2·2	·0	2·5
All Categories	100·0	100·0	100·0	100·0	100·0
Total weeks of Claim	252	1,668	3,275	1,973	7,168

Table B6. *Females—Deferred period* 1 *week*

Sickness Category	Age Group 18–39	40–49	50–59	60–65	All ages
1 Other Infective	9·2	2·5	3·2	·0	4·8
2 Neoplasms	1·1	3·9	9·5	·0	5·0
3 Endocrine and Metabolic	1·9	6·0	·0	50·3	5·1
4 Mental	22·6	6·3	18·9	21·7	17·5
5 Nervous	4·2	·0	14·2	3·9	7·2
6 Circulatory	5·2	·6	·5	·0	2·0
7 Acute Respiratory	4·7	8·4	3·1	1·0	4·6
8 Chronic Respiratory	2·5	1·2	1·5	·0	1·7
9 Digestive	4·8	1·2	9·4	·0	5·5
10 Genito-Urinary	3·1	9·2	15·3	·0	9·1
11 Musculoskeletal	7·7	27·3	11·2	1·4	13·0
12 R.T.A. Injuries	13·0	·7	·7	·0	4·6
13 Other Injuries	3·6	18·4	2·5	3·5	6·4
14 All Others	16·4	14·3	10·0	18·2	13·5
All Categories	100·0	100·0	100·0	100·0	100·0
Total weeks of Claim	1,438	987	1,772	285	4,482

Weeks of claim as percentage of totals for each age group

Table B7. *Females—Deferred period* 4 *weeks*

Sickness Category	Age Group 18–39	40–49	50–59	60–65	All ages
1 Other Infective	7·7	4·8	5·4	·0	5·9
2 Neoplasms	4·4	18·5	15·2	·0	12·5
3 Endocrine and Metabolic	1·9	1·7	1·7	·0	1·8
4 Mental	20·5	24·9	28·3	·0	24·0
5 Nervous	2·9	6·5	1·3	·0	3·8
6 Circulatory	2·1	8·2	4·7	34·3	5·4
7 Acute Respiratory	·2	·4	·3	·0	·3
8 Chronic Respiratory	1·3	·7	·0	·0	·7
9 Digestive	11·4	3·9	·8	22·9	5·9
10 Genito-Urinary	4·4	4·2	3·4	·0	4·0
11 Musculoskeletal	18·3	21·0	7·8	·0	16·4
12 R.T.A. Injuries	2·3	·0	·9	42·8	1·5
13 Other Injuries	9·3	1·7	21·7	·0	9·6
14 All Others	13·3	3·5	8·5	·0	8·2
All Categories	100·0	100·0	100·0	100·0	100·0
Total weeks of Claim	1,286	1,384	966	35	3,671

Table B8. *Females—Deferred period* 13 *weeks*

Sickness Category	Age Group 18–39	40–49	50–59	60–65	All ages
1 Other Infective	2·8	·9	·4	·0	·7
2 Neoplasms	39·2	1·5	5·2	2·5	7·3
3 Endocrine and Metabolic	2·8	2·0	6·1	·0	3·8
4 Mental	5·7	37·3	14·7	26·3	21·5
5 Nervous	25·7	·0	18·6	·8	11·8
6 Circulatory	3·2	15·2	11·2	13·0	11·7
7 Acute Respiratory	·0	3·1	·5	·0	1·1
8 Chronic Respiratory	1·0	4·2	·0	·0	1·3
9 Digestive	4·7	·0	1·1	21·3	3·9
10 Genito-Urinary	0·8	·1	9·2	·0	4·6
11 Musculoskeletal	3·2	28·1	19·4	9·8	18·9
12 R.T.A. Injuries	3·7	·0	·0	·0	·4
13 Other Injuries	5·5	·8	12·8	·0	7·0
14 All Others	1·7	6·8	·8	26·3	6·0
All Categories	100·0	100·0	100·0	100·0	100·0
Total weeks of Claim	600	1,618	2,857	797	5,872

Weeks of claim as percentage of totals for each age group

Table B9. *Females—Deferred period* 26 *weeks*

Sickness Category	Age Group 18–39	40–49	50–59	60–65	All ages
1 Other Infective	6·2	·0	·0	·0	1·2
2 Neoplasms	3·7	·4	10·5	·0	4·1
3 Endocrine and Metabolic	·0	3·9	·0	6·0	2·1
4 Mental	7·7	23·4	·0	7·4	12·0
5 Nervous	6·9	3·4	20·3	26·1	11·1
6 Circulatory	1·9	17·8	24·0	·0	15·3
7 Acute Respiratory	·0	1·4	3·4	·0	1·6
8 Chronic Respiratory	·0	4·1	4·6	·0	3·2
9 Digestive	15·2	8·4	5·3	·0	8·0
10 Genito-Urinary	3·0	5·9	17·6	·0	8·5
11 Musculoskeletal	47·4	14·5	7·0	52·1	21·5
12 R.T.A. Injuries	·0	·0	2·6	·0	·8
13 Other Injuries	·0	·0	·0	·0	·0
14 All Others	8·0	16·8	4·7	8·4	10·6
All Categories	100·0	100·0	100·0	100·0	100·0
Total weeks of Claim	699	1,550	1,134	299	3,682

Table B10. *Females—Deferred period* 52 *weeks*

Sickness Category	Age Group 18–39	40–49	50–59	60–65	All ages
1 Other Infective	·0	·0	·0	—	·0
2 Neoplasms	·0	·0	40·8	—	19·4
3 Endocrine and Metabolic	·0	·0	·0	—	·0
4 Mental	100·0	73·5	·0	—	43·6
5 Nervous	·0	·0	·0	—	·0
6 Circulatory	·0	17·5	·0	—	5·8
7 Acute Respiratory	·0	·0	·0	—	·0
8 Chronic Respiratory	·0	·0	17·6	—	8·4
9 Digestive	·0	·0	·0	—	·0
10 Genito-Urinary	·0	·0	·0	—	·0
11 Musculoskeletal	·0	·0	41·6	—	19·8
12 R.T.A. Injuries	·0	·0	·0	—	·0
13 Other Injuries	·0	·0	·0	—	·0
14 All Others	·0	9·0	·0	—	3·0
All Categories	100·0	100·0	100·0	—	100·0
Total weeks of Claim	103	177	255	—	535

Table C1. *Males—Deferred period* 1 *week—All ages*

Sickness Category	Average Duration in weeks			Number of Claims		
	Death	Recovery	Expiry	Death	Recovery	Expiry
1 *Other Infective*	46·5	2·9	218·0	2	816	3
2 Neoplasms	43·3	9·6	164·5	32	112	4
3 Endocrine and Metabolic	126·0	8·0	210·5	2	62	2
4 Mental	219·8	9·3	228·3	5	297	17
5 Nervous	40·9	5·2	262·4	7	185	5
6 Circulatory	98·6	13·1	176·4	32	535	49
7 Acute Respiratory	7·8	2·3	207·5	4	1,773	2
8 Chronic Respiratory	19·5	3·8	170·3	4	501	3
9 Digestive	4·8	6·5	21·5	6	703	4
10 Genito-Urinary	15·3	4·7	8·3	4	282	3
11 Musculoskeletal	57·6	6·0	218·2	5	846	11
12 R.T.A. Injuries	—	7·8	174·0	0	134	1
13 Other Injuries	30·0	4·9	124·0	1	1,016	4
14 All Others	26·0	4·5	55·5	8	629	2
All Categories	62·5	5·1	179·9	112	7,891	110

Table C2. Males—Deferred period 4 *weeks—All ages*

Sickness Category	Average Duration in weeks			Number of Claims		
	Death	Recovery	Expiry	Death	Recovery	Expiry
1 Other Infective	15·0	12·8	—	1	149	0
2 Neoplasms	28·5	21·3	5·0	39	63	1
3 Endocrine and Metabolic	82·5	11·8	26·0	2	27	2
4 *Mental*	13·0	19·7	106·0	1	225	1
5 Nervous	333·0	12·7	—	7	85	0
6 Circulatory	134·1	19·6	121·2	14	339	14
7 Acute Respiratory	11·0	9·8	189·0	1	105	1
8 Chronic Respiratory	16·0	17·9	—	1	81	0
9 Digestive	11·0	12·7	32·0	2	444	4
10 Genito-Urinary	—	11·8	7·0	0	98	1
11 Musculoskeletal	—	18·0	171·4	0	442	7
12 R.T.A. Injuries	10·0	18·1	—	1	180	0
13 Other Injuries	5·0	13·8	61·3	1	695	3
14 All Others	51·0	14·3	265·5	7	246	2
All Categories	77·1	15·5	113·9	77	3,179	36

Table C3. *Males—Deferred period* 13 *weeks—All ages*

Sickness Category	Average Duration in weeks			Number of Claims		
	Death	Recovery	Expiry	Death	Recovery	Expiry
1 Other Infective	817·0	37·4	129·5	1	20	2
2 Neoplasms	34·7	28·0	228·0	34	21	1
3 Endocrine and Metabolic	131·0	74·0	666·0	1	2	1
4 Mental	245·3	62·0	366·7	6	57	6
5 Nervous	120·0	34·1	292·0	1	19	4
6 Circulatory	134·5	33·4	195·1	10	101	16
7 Acute Respiratory	25·5	23·3	413·0	2	7	1
8 Chronic Respiratory	24·0	26·8	73·0	1	9	1
9 Digestive	68·3	23·8	—	4	65	0
10 Genito-Urinary	21·0	47·8	67·0	1	13	1
11 Musculoskeletal	131·5	42·5	181·6	2	99	5
12 R.T.A. Injuries	—	40·2	174·0	0	55	1
13 Other Injuries	—	35·9	21·0	0	97	1
14 All Others	99·0	32·2	205·0	3	40	2
All Categories	90·8	37·7	231·2	66	605	42

Table C4. *Males—Deferred period* 26 *weeks—All ages*

Sickness Category	Average Duration in weeks			Number of Claims		
	Death	Recovery	Expiry	Death	Recovery	Expiry
1 Other Infective	—	52·7	179·0	0	3	1
2 Neoplasms	44·6	40·1	88·0	22	8	1
3 Endocrine and Metabolic	—	37·0	221·0	0	2	1
4 Mental	272·7	55·5	315·7	3	24	6
5 Nervous	429·3	140·5	258·7	4	8	3
6 Circulatory	167·3	68·4	206·0	17	24	21
7 Acute Respiratory	—	—	—	0	0	0
8 Chronic Respiratory	151·5	29·0	75·0	4	2	1
9 Digestive	89·0	67·9	62·0	2	16	1
10 Genito-Urinary	—	53·5	67·0	0	6	1
11 Musculoskeletal	—	91·6	282·3	0	23	10
12 R.T.A. Injuries	—	43·6	—	0	16	0
13 Other Injuries	30·0	47·4	79·0	1	26	1
14 All Others	43·5	120·7	—	2	9	0
All Categories	132·0	67·3	225·3	55	167	47

Table C5. *Males—Deferred period* 52 *weeks—All Ages*

Sickness Category	Average Duration in weeks			Number of Claims		
	Death	Recovery	Expiry	Death	Recovery	Expiry
1 Other Infective	—	—	—	0	0	0
2 Neoplasms	83·3	120·5	—	3	2	0
3 Endocrine and Metabolic	—	—	338·0	0	0	1
4 Mental	742·0	136·7	—	1	3	0
5 *Nervous*	—	154·0	248·0	0	1	1
6 Circulatory	119·5	—	112·0	2	0	1
7 Acute Respiratory	—	—	—	0	0	0
8 Chronic Respiratory	—	—	—	0	0	0
9 Digestive	—	—	—	0	0	0
10 *Genito-Urinary*	—	—	—	0	0	0
11 Musculoskeletal	—	96·5	—	0	2	0
12 R.T.A. Injuries	—	110·5	—	0	2	0
13 Other Injuries	—	80·0	—	0	1	0
14 All Others	—	87·5	—	0	2	0
All Categories	205·2	113·4	232·7	6	13	3

Table C6. *Females—Deferred period* 1 *Week—All ages*

Sickness Category	Average Duration			Number of Claims		
	Death	Recovery	Expiry	Death	Recovery	Expiry
1 Other Infective	—	3·6	—	0	77	0
2 Neoplasms	29·0	7·5	—	4	21	0
3 Endocrine and Metabolic	—	15·3	—	0	6	0
4 Mental	—	12·5	390·0	0	44	1
5 Nervous	—	5·3	128·0	0	8	1
6 Circulatory	—	3·2	—	0	11	0
7 Acute Respiratory	46·0	2·2	—	1	122	0
8 Chronic Respiratory	—	2·2	—	0	58	0
9 Digestive	—	4·5	—	0	23	0
10 Genito-Urinary	—	3·4	—	0	45	0
11 Musculoskeletal	—	5·1	—	0	54	0
12 R.T.A. Injuries	—	9·8	—	0	9	0
13 Other Injuries	—	4·2	—	0	53	0
14 All Others	—	7·0	—	0	64	0
All Categories	32·4	4·8	259·0	5	595	2

Table C7. *Females—Deferred period* 4 *weeks—All ages*

Sickness Category	Average Duration in weeks			Number of Claims		
	Death	Recovery	Expiry	Death	Recovery	Expiry
1 Other Infective	—	11·2	—	0	13	0
2 Neoplasms	63·4	12·7	—	5	13	0
3 Endocrine and Metabolic	—	63·8	—	0	4	0
4 Mental	22·0	21·3	—	1	15	0
5 Nervous	159·0	19·7	—	2	7	0
6 Circulatory	—	22·0	—	0	5	0
7 Acute Respiratory	—	6·0	—	0	5	0
8 Chronic Respiratory	—	16·0	—	0	3	0
9 Digestive	—	13·3	—	0	23	0
10 Genito-Urinary	—	10·1	—	0	23	0
11 Musculoskeletal	—	17·3	—	0	20	0
12 R.T.A. Injuries	—	10·2	—	0	5	0
13 Other Injuries	—	12·5	—	0	25	0
14 All Others	—	11·4	—	0	28	0
All Categories	82·1	14·7	—	8	189	0

Table C8. *Females—Deferred period* 13 *weeks—All ages*

Sickness Category	Average Duration in weeks			Number of Claims		
	Death	Recovery	Expiry	Death	Recovery	Expiry
1 Other Infective	—	23·5	—	0	4	0
2 Neoplasms	48·0	25·4	—	1	5	0
3 Endocrine and Metabolic	—	97·5	—	0	2	0
4 Mental	—	25·6	—	0	7	0
5 Nervous	—	32·0	113·0	0	1	1
6 Circulatory	—	27·3	—	0	3	0
7 Acute Respiratory	—	44·5	—	0	2	0
8 Chronic Respiratory	—	24·0	—	0	2	0
9 Digestive	—	44·0	187·0	0	1	1
10 Genito-Urinary	—	77·8	—	0	4	0
11 Musculoskeletal	—	33·5	—	0	4	0
12 R.T.A. Injuries	—	17·0	—	0	2	0
13 Other Injuries	—	37·0	—	0	5	0
14 All Others	—	28·9	—	0	7	0
All Categories	48·0	35·8	150·0	1	49	2

Table C9. *Females—Deferred period 26 weeks—All ages*

Sickness Category	Average Duration in weeks			Number of Claims		
	Death	Recovery	Expiry	Death	Recovery	Expiry
1 Other Infective	—	69·0	—	0	1	0
2 Neoplasms	54·6	28·0	—	5	1	0
3 Endocrine and Metabolic	44·0	86·0	—	1	1	0
4 Mental	—	50·2	—	0	6	0
5 Nervous	—	122·0	—	0	1	0
6 Circulatory	—	45·0	39·0	0	1	1
7 Acute Respiratory	46·0	—	45·0	1	0	1
8 Chronic Respiratory	—	—	—	0	0	0
9 Digestive	—	58·7	—	0	3	0
10 Genito-Urinary	—	188·0	—	0	2	0
11 Musculoskeletal	—	28·0	—	0	1	0
12 R.T.A. Injuries	—	55·0	—	0	1	0
13 Other Injuries	—	—	—	0	0	0
14 All Others	—	58·7	—	0	3	0
All Categories	51·9	69·6	42·0	7	21	2

Table C10. *Females—Deferred period 52 weeks—All ages*

Sickness Category	Average Duration in weeks			Number of Claims		
	Death	Recovery	Expiry	Death	Recovery	Expiry
1 Other Infective	—	—	—	0	0	0
2 Neoplasms	—	—	—	0	0	0
3 Endocrine andMetabolic	—	—	—	0	0	0
4 Mental	—	—	—	0	0	0
5 Nervous	—	—	—	0	0	0
6 Circulatory	—	—	—	0	0	0
7 Acute Respiratory	—	—	—	0	0	0
8 Chronic Respiratory	—	—	—	0	0	0
9 Digestive	—	—	—	0	0	0
10 Genito-Urinary	—	—	—	0	0	0
11 Musculoskeletal	—	—	—	0	0	0
12 R.T.A. Injuries	—	—	—	0	0	0
13 Other Injuries	—	—	—	0	0	0
14 All Others	—	68·0	—	0	1·0	0
All Categories	—	68·0	—	0	1·0	0

APPENDIX 1

Definition of Sickness Categories

Sickness Category	*Description of Disorder*	*Cause Groups*
1	Other Infective	1 to 19 incl.
2	Neoplasms	20, 21
3	Endocrine and Metabolic	22 to 26 incl.
4	Mental	27
5	Nervous	31
6	Circulatory	34 to 38 incl.
7	Acute Respiratory	39, 40, 41
8	Chronic Respiratory	42 to 45 incl.
9	Digestive	47 to 51 incl.
10	Genito-Urinary	52 to 55 incl.
11	Musculoskeletal	61, 62
12	R.T.A. Injuries*	66
13	Other Injuries	67 to 70 incl.
14	All Others	28–30, 32, 33, 46, 56–60, 63–65

* R.T.A. denotes Road Transport Accident

APPENDIX 2

List C of the Eighth Revision* of the 'Manual of the International Statistical Classification of Diseases, Injuries and Causes of Death'.

ABRIDGED LIST OF DISEASES

(Reprinted with kind permission of the World Health Organization)

List of 70 Causes for Tabulation of Morbidity

Cause Groups		*Detailed List Numbers*
C 1	Typhoid, paratyphoid fever, other salmonella infections	001-003
C 2	Bacillary dysentery and amoebiasis	004,006
C 3	Enteritis and other diarrhoeal diseases	008,009
C 4	Tuberculosis of respiratory system	010-012
C 5	Other tuberculosis, including late effects	013-019
C 6	Brucellosis	023
C 7	Diphtheria	032
C 8	Whooping cough	033
C 9	Streptococcal sore throat and scarlet fever	034
C10	Smallpox	050
C11	Measles	055
C12	Viral encephalitis	062-065
C13	Infectious hepatitis	070
C14	Typhus and other rickettsioses	080-083
C15	Malaria	084
C16	Syphilis and its sequelae	090-097
C17	Gonococcal infections	098
C18	Helminthiases	120-129
C19	All other infective and parasitic diseases	Remainder of 000-136
C20	Malignant neoplasms, including neoplasms of lymphatic and haematopoietic tissue	140-209
C21	Benign neoplasms and neoplasms of unspecified nature	210-239
C22	Thyrotoxicosis with or without goitre	242
C23	Diabetes mellitus	250
C24	Avitaminoses and other nutritional deficiency	260-269

* The Eighth Revision has been superseded in general use by the Ninth Revision.

Cause Groups		*Detailed List Numbers*
C25	Other endocrine and metabolic diseases	240,241 243-246 251-258 270-279
C26	Anaemias	280-285
C27	Psychoses and non psychotic mental disorders	290-309
C28	Inflammatory diseases of eye	360-369
C29	Cataract	374
C30	Otitis media and mastoiditis	381-383
C31	Other diseases of nervous system and sense organs	320-358 370-373 375-380 384-389
C32	Active rheumatic fever	390-392
C33	Chronic rheumatic heart disease	393-398
C34	Hypertensive disease	400-404
C35	Ischaemic heart disease	410-414
C36	Cerebrovascular disease	430-438
C37	Venous thrombosis and embolism	450-453
C38	Other diseases of circulatory system	420-429 440-448 454-458
C39	Acute respiratory infections	460-466
C40	Influenza	470-474
C41	Pneumonia	480-486
C42	Bronchitis, emphysema and asthma	490-493
C43	Hypertrophy of tonsils and adenoids	500
C44	Pneumoconioses and related diseases	515, 516
C45	Other diseases of respiratory system	501-514 517-519
C46	Diseases of teeth and supporting structures	520-525
C47	Peptic ulcer	531-533
C48	Appendicitis	540-543
C49	Intestinal obstruction and hernia	550-553 560
C50	Cholelithiasis and cholecystitis	574,575

Cause Groups		*Detailed List Numbers*
C51	Other diseases of digestive system	526-530 534-537 561-573 576,577
C52	Nephritis and nephrosis	580-584
C53	Calculus of urinary system	592, 594
C54	Hyperplasia of prostate	600
C55	Other diseases of genito-urinary system	590, 591 593 595-599 601-629
C56	Abortion	640-645
C57	Other complications of pregnancy, childbirth and the puerperium	630-639 651-678
C58	Delivery without mention of complication	650
C59	Infections of skin and subcutaneous tissue	680-686
C60	Other diseases of skin and subcutaneous tissue	690-709
C61	Arthritis and spondylitis	710-715
C62	Other diseases of musculoskeletal system and connective tissue	716-738
C63	Congenital anomalies	740-759
C64	Certain causes of perinatal morbidity	760-779
C65	Other specified and ill-defined diseases	286-289 310-315 780-796
	External Cause of Injury	
CE66	Road transport accidents	E810-E819 E825-E827
CE67	All other accidents	E800-E807 E820-E823 E830-E949
CE68	Attempted suicide and self-inflicted injuries	E950-E959
CE69	Attempted homicide and injury purposely inflicted by other persons; legal intervention	E960-E978
CE70	All other external causes	E980-E999

APPENDIX 3

List of Offices which contributed data

Canada Life
Clerical Medical and General
Commercial Union
Crusader
Eagle Star
Friends' Provident
Guardian Royal Exchange
Legal & General
Medical Sickness Group
N.E.L. Britannia
Norwich Union
Phoenix
Prudential
Scottish Mutual
Yorkshire General

SICKNESS EXPERIENCE 1975–78 FOR GROUP P.H.I. POLICIES

1. INTRODUCTION

1.1. The experience for Group P.H.I. policies during the years 1973–76 was described in *Continuous Mortality Investigation Reports* **5,** 51 (1981). A detailed analysis of the experience for Individual policies during the years 1975–78 was given in *Continuous Mortality Investigation Reports* **7,** 1 (1984). This report describes the experience for Group P.H.I. policies during the same period. The overlap of 2 years with the earlier 1973–76 investigation is due to a decision by the Permanent Health Insurance Sub-Committee to bring the quadrennial periods for the Group and Individual investigations into line.

1.2. The volume of data on which this report is based is only about 25% of that for Individual policies as measured by total weeks of claim. In Group business there was not such an established element of 'in-force' business at the start of the investigation as there was for Individual business, and the rapid expansion in Group business since then has been largely in schemes which are described as simplified administration or unit costed schemes, which are not included in this investigation. The data consists of a mixture of level annual premium business and growing amounts of recurrent single premium business.

1.3. The excluded unit costed schemes mentioned above are costed in detail less frequently than once a year—usually at intervals of 3 or 5 years. They do not, therefore, fit a system designed to cope with Individual policies which has been extended to encompass annually costed Group schemes. A separate investigation is in progress to examine rates of claim inception and termination for schemes of this type and the results will be reported in due course.

1.4. The method of calculating the exposed to risk is described in *C.M.I.R.* **5,** 52.

1.5. Readers should exercise caution in interpreting the results given in this report. The amount of business is relatively small and it is possible that bias has been introduced as a result of the presence of a few large schemes which may have either very light or very heavy morbidity.

1.6. Following the conclusions drawn from previous investigations the Sub-Committee decided to examine the experience separately for business arising from the United Kingdom and from the Republic of Ireland.

1.7. The special problems of Group business as outlined in *C.M.I.R.* **5,** 51 also apply in this report. It should also be noted that the exposed to risk in this report includes both lives accepted on 'actively at work' criteria and those accepted after considering medical evidence. Rated cases are included, as are those where a declinature has been made for benefit in excess of the non-selection limit.

1.8. Analysis is by numbers of lives rather than by numbers of policies or

amounts. The date of entry is the date of joining the scheme and, as far as possible, medical and other codes are determined at that date and remain unchanged.

1.9. Much of the Group business in the U.K. and the Republic of Ireland is costed by the single premium or current cost method commonly used for Group life insurance business rather than by the level annual premium method used for most Individual policies. These premiums are calculated to insure benefits arising from disability which commences during the following scheme year. Therefore, rates of claim inception and termination will be even more relevant to Group business than to Individual business. Until claim termination tables have been developed, the Manchester Unity AHJ Table continues to provide a general basis for comparison and this has been used in the tables in Appendices A and B. Alternative comparisons, against the graduated rates of 1975–78 Individual Standard Experience, as set out in *C.M.I.R.* **7**, 99 are discussed later in this report.

2. VOLUME OF DATA

2.1. Table 2.1 shows the number of lives in force at various dates during the investigation and Table 2.2 shows the number of claims.

2.2. As may be seen from Tables A1–A6, about two-thirds of the total exposed to risk for U.K. males arises from schemes with a 26 weeks deferred period, and there is very little from schemes with deferred periods of 1 week or 4 weeks.

2.3. It was felt that, with the limited amount of data, the inclusion in this report of full data tabulations for single ages, in addition to tables of data in quinquennial age groups, would not be justified, but they are available on request to members who may be interested.

2.4. No analysis has been performed on any of the attributes in view of the limited volume of data. Some of these attributes will be analysed in future as the size of the investigation grows to a suitable level. However, the Individual business results published in *C.M.I.R.* **7**, 35 indicated a marked difference in sickness experience between the U.K. and the Republic of Ireland and for that reason the results for the two countries are shown separately.

2.5. It was felt that the variability in the rates exhibited in the tables in Appendices A and B would make it difficult to interpret the Group 1975–78 experience in isolation, but that useful comparisons should be possible with the larger, extensively researched, Individual experience of 1975–78 which was the subject of *C.M.I.R.* 7. It seemed more sensible to use as a basis of comparison the graduated Individual Standard rates in *C.M.I.R.* **7**, 99 rather than the underlying crude rates.

3. U.K. MALE LIVES

3.1. One factor to be borne in mind when comparing the Group experience with the Individual Standard experience is the relative immaturity of the former

Table 2.1. *Number of lives in force during the investigation, analysed by various attributes*

Attribute	Number of lives at start of investigation year				Number of lives at end of 1978
	1975	1976	1977	1978	
Total	48,875	57,365	58,842	98,527	123,399
Males	43,754	50,579	51,120	84,206	103,162
Females	5,121	6,786	7,722	14,321	20,237
U.K.	41,521	48,658	49,822	88,933	112,647
Republic of Ireland	7,312	8,677	8,959	9,523	10,669
Others	42	30	61	71	83
Not rated for occupation	46,851	53,340	55,051	95,638	119,858
Others	2,024	4,025	3,791	2,889	3,541
Level Benefit	36,075	40,502	40,391	51,311	60,321
Increasing Benefit	12,781	16,847	18,437	47,202	63,064
Unknown	19	16	14	14	14
Non-selection limit	23,590	29,304	29,458	71,425	96,172
Unknown medical evidence	10,260	10,181	9,348	5,847	5,191
Others	15,025	17,880	20,036	21,255	22,036
Costed by annual premium	32,031	35,116	29,271	27,004	27,799
Costed by single premium	16,376	21,216	28,876	70,053	93,891
Others	468	1,033	695	1,470	1,709
Underwriting impairments:					
No exclusion	38,172	45,842	47,761	52,420	60,206
Unknown whether exclusion exists	10,126	10,929	10,488	45,447	62,412
Others	577	594	593	660	781

Table 2.2. *Numbers of claims during each year, analysed by various attributes*

Attribute	Investigation Year			
	1975	1976	1977	1978
Total	340	357	426	793
Males	313	315	387	705
Females	27	42	39	88
U.K.	297	305	359	704
Republic of Ireland	43	52	67	89
Not rated for occupation	324	336	400	758
Others	16	21	26	35

Table 2.2 (*continued*)

Attribute	Investigation Year 1975	1976	1977	1978
Level Benefit	292	287	326	498
Increasing Benefit	43	66	98	294
Others	5	4	2	1
Non-selection limit	121	163	191	524
Unknown medical evidence	117	108	109	107
Others	102	86	126	162
Costed by annual premium	257	171	219	287
Costed by single premium	83	186	198	496
Others	0	0	9	10
Underwriting impairments:				
No exclusion	83	186	198	496
Unknown whether exclusion exists	110	81	103	89
Others	147	90	125	208
Mode of commencement:				
Continuation from previous record year	142	193	239	455
New claim	185	159	159	315
New claim following interruption of sickness in deferred period	0	1	8	4
Revival of claim following interruption	4	1	4	1
Continuation of claim but benefit rate change	9	3	16	18
Rate of benefit:				
Full rate being paid	323	347	408	774
Reduced rate being paid	17	10	18	19
Mode of cessation:				
No cessation at end of year	191	235	306	535
Policy expired or void	4	4	6	25
Death	20	17	19	53
Recovery	110	92	60	158
Lump sum paid	0	0	1	0
Ex gratia commutation	0	0	0	0
Benefit rate altered but claim continues	8	3	19	12
Lump sum paid not terminating contract with Employer	0	1	1	0
Membership expired or void	7	5	14	10

and the consequent predisposition for the Group experience to appear the lighter at longer sickness durations, especially in respect of 104/all, under the Manchester Unity form of analysis. A measure of the relative maturity of the two experiences is obtained by dividing the exposed to risk in sickness period 104/all

by the exposed to risk in the sickness period immediately following the end of the deferred period. For U.K. males the ratios are as follows:

Deferred period	Group	Individual Standard
1 week	·90	·85
4 weeks	·81	·79
13 weeks	·61	·81
26 weeks	·62	·85
52 weeks	·81	·88

Except for deferred periods 1 week and 4 weeks, where there is very little Group business, it appears that there is a greater proportion of recent entrants in the Group data.

3.2. The following table summarizes the ratios of the actual to expected numbers of inceptions, based on the graduated Individual Standard 1975–78 central claim inception rates, *C.M.I.R.* **7**, 105.

	Age group									
	25–34		35–44		45–54		55–64		Totals	
Deferred period	Actual number	100 A/E	Actual number	100 A/E	Actual number	100 A/E	Actual number	100 A/E	Actual number	100 A/E
1 week	5	49	5	25	11·5	49	8·5	75	30	46
4 weeks	14	89	22·5	120	22·5	102	27	133	86	112
13 weeks	13	81	26	86	50	122	53	125	142	109
26 weeks	14	76	27·5	91	91	130	159	133	291·5	122

As a broad conclusion, ignoring the results for deferred period 1 week where the numbers were particularly small, it appears that the Group rates were relatively light at the youngest ages, but rose to around 130% of the individual Standard rates at the upper ages. Overall, the Group rates were some 10–20% heavier. No figures are given for deferred period 52 weeks, in the absence of corresponding Individual Standard graduated experience rates. The inception rates are based on an exposed to risk which includes both claiming and non-claiming policies calculated in the manner described in *C.M.I.R.* **7**, 5.

3.3. Although the numbers of inceptions might be considered inadequate for graduation, it was found, perhaps fortuitously, that quite reasonable graduations could be made of the deferred 4, 13 and 26 weeks rates using the same procedure and type of formula as were used to graduate the Individual Standard data, as described in *C.M.I.R.* **7**, 17. The formula was log-cubic:

$$\ln i_x = a + bx + cx^2 + dx^3$$

Details of the fitted coefficients, and full tables of the graduated rates, are given in Appendix C. An examination of the respective numbers of positive and negative

deviations, and of the number of runs of the same sign, proved entirely satisfactory. These statistics, relating, for each deferred period, to a sequence of 40 values, are as follows:

	Number of positive deviations	Number of runs of same sign
Deferred 4 weeks	18	25
Deferred 13 weeks	20	22
Deferred 26 weeks	20	21

Not surprisingly, an acceptable graduation was not obtained in the case of the very sparse data for deferred period 1 week. The general relationships between the Group and Individual Standard graduated rates is indicated by the following table of specimen values:

Graduated claim inception rates per 1,000

	Deferred 4 weeks		Deferred 13 weeks		Deferred 26 weeks	
Age	Group	Individual Standard	Group	Individual Standard	Group	Individual Standard
30	94	107	13	17	4	5
40	208	171	28	33	8	9
50	248	250	74	60	29	23
60	661	509	181	143	105	78

3.4. Sickness rates are expressed in terms of the number of weeks of claim per annum per unit of exposure. In view of the small quantity of data, the numbers of actual and expected weeks of claim have been aggregated across broad age ranges for presentation in Table 3.1. It is noteworthy that for all four deferred periods the ratios of the actual to expected weeks of claim are distinctly lower for sickness period 104/all than for the earlier sickness periods. Since this is as true for deferred periods 1 week and 4 weeks as for the other deferred periods, its interpretation in the light of paragraph 3.1 is perhaps uncertain. It would seem wise in practice to assume that the rates to be experienced in future for sickness period 104/all will tend towards much higher levels than those of the 1975–78 experience. Leaving aside the rates for sickness period 104/all and discounting the results of the limited experience of deferred period 1 week, it may be broadly concluded from Table 3.1 that the Group experience is around 10–20% heavier than the corresponding Individual Standard experience. In the case of the business with deferred periods of 13 and 26 weeks this heavier claims experience is clearly located at the higher ages.

3.5. As in the case of *C.M.I.R.* **7**, no figures are shown for business with deferred period 52 weeks, but calculations showed the actual overall group sickness in sickness period 52/52 to be 113% of that expected by reference to the graduated Individual rates for deferred period 26 weeks. For sickness period 104/all the overall ratio was 68%.

Table 3.1. *U.K. Males: actual and ratios of actual to expected weeks of claim by the Individual Standard* 1975–78 *graduated rates*

	Age Group							
	25–44		45–54		55–64		Totals	
	Actual weeks	100 A/E	Actual weeks	100 A/E	Actual weeks	100 A/E	Actual weeks	100 A/E
Deferred 1 week								
Sickness period:								
1/3	20	50	28	69	22	95	70	67
4/9	24	114	58	171	40	154	122	151
13/13	18	207	12	77	40	235	70	169
26/26	19	221	8	45	52	236	79	163
52/52	19	311	33	159	46	136	98	162
104/all	0	0	104	234	18	21	122	88
All periods	100	109	243	140	218	104	561	118
Deferred 4 weeks								
Sickness period:								
4/9	205	111	164	125	157	15	526	116
13/13	103	118	119	175	61	60	283	110
26/26	120	204	127	174	50	49	297	117
52/52	52	120	113	138	179	105	344	116
104/all	184	352	222	128	243	53	649	95
All periods	664	156	745	141	690	70	2,099	108
Deferred 13 weeks								
Sickness period:								
13/13	362	91	501	122	577	128	1,440	114
26/26	255	70	470	95	931	155	1,656	113
52/52	199	72	481	87	1,450	132	2,130	110
104/all	322	110	906	86	2,869	105	4,097	101
All periods	1,138	85	2,358	94	5,827	120	9,323	107
Deferred 26 weeks								
Sickness period:								
26/26	771	93	1,844	132	3,302	120	5,917	119
52/52	746	106	1,926	113	5,638	144	8,310	131
104/all	887	108	2,804	79	10,733	104	14,424	98
All periods	2,404	102	6,574	99	19,673	116	28,651	110

3.6. Trial graduations of the sickness rates were made, again by fitting log-cubic curves by the method described in *C.M.I.R.* 7, 17. Whilst fairly reasonable graduations were obtained for sickness periods up to 52 weeks, the results for sickness periods 52/52 and 104/all were not considered satisfactory. The Sub-Committee has concluded that these graduations are not suitable for publication, and that further work to try to produce more acceptable formulae is not justified.

4. U.K. FEMALE LIVES

4.1. The overall exposed to risk for U.K. females is in the region of 15% of that for U.K. males. It is even more concentrated, than in the case of males, in policies

with a deferred period of 13 or 26 weeks. Indeed, the exposed to risk for deferred period 1 week policies amounts to only 45 for all ages in the whole quadrennium. The limited data generally will support, at best, only broad inferences.

4.2. Expressing the exposed to risk in sickness period 104/all as a ratio of that for the sickness period immediately following the deferred period brings out the following comparisons:

Deferred period	Group		Individual Standard (1975–78)
	Females	Males	Females
1 week	·80	·90	·73
4 weeks	·76	·81	·68
13 weeks	·44	·61	·72
26 weeks	·47	·62	·76
52 weeks	·68	·81	·82

The above table suggests that the Group female experience is considerably less mature than the others cited.

4.3. There are too few recorded inceptions to warrant detailed comparison with Individual Standard 1975–78 male graduated rates, but the totals for all ages 25–64 are as follows:

Deferred period	Actual number	Expected	100 A/E
1 week	4	5·5	73
4 weeks	23	6·9	333
13 weeks	20	12·0	167
26 weeks	41	28·3	145

The aggregate experience for females thus tends to be heavier than that for males.

Table 4.1. *U.K. Females: actual and ratios of actual to expected weeks of claim by the Individual Standard 1975–78 male graduated rates*

	Deferred period					
	4 weeks		13 weeks		26 weeks	
Sickness period	Actual weeks of claim	100 A/E	Actual weeks of claim	100 A/E	Actual weeks of claim	100 A/E
4/9	157	391				
13/13	116	552	173	152		
26/26	194	928	120	94	785	140
52/52	296	1,261	87	64	1,181	183
104/all	342	671	217	90	1,245	100
All periods	1,105	706	597	97	3,211	131

4.4. A comparison of actual weeks of sickness claim against what would have been expected by the Individual Standard 1975–78 male graduated rates yielded the totals shown in Table 4.1 for all ages 25–64. No results are quoted for deferred period 1 week policies as the data are too sparse for meaningful comparison.

Analysis of the totals for all sickness periods shows the following distribution in age groups:

	Deferred period					
	4 weeks		13 weeks		26 weeks	
Age group	Actual weeks *of claim*	100 A/E	Actual weeks *of claim*	100 A/E	Actual weeks *of claim*	100 A/E
25–44	234	609	266	203	625	196
45–54	603	997	312	111	1,744	167
55–64	268	466	19	9	842	77
All ages	1,105	706	597	97	3,211	131

Although one should be careful not to attach undue significance to any particular feature of the above tables, the relatively heavy experience from policies with deferred period 4 weeks may be noted, and also the generally lightening trend with increasing age.

5. REPUBLIC OF IRELAND

5.1. The volume of data for male lives in the Republic of Ireland is similar to that for female lives in the U.K. and the scope for analysis is likewise limited. It is considered that there is too little data on female lives in the Republic of Ireland for meaningful analysis.

5.2. For male lives, the ratios of exposed to risk in sickness period 104/all to the exposed to risk in the sickness period immediately following the deferred period are ·88, ·77, ·69 and ·79 respectively for deferred periods 1, 4, 13 and 26 weeks. This suggests that the experience in Ireland is at least as mature as that for males in the U.K. Group investigation.

5.3. The numbers of actual inceptions are compared in the following table with the numbers expected by the Individual Standard 1975–78 male graduated rates in the age range 25–64.

Deferred period	Actual number	Expected number	100 A/E
1 week	25	9·3	269
4 weeks	8	9·1	88
13 weeks	16	16·2	99
26 weeks	59	33·3	177

The experience in respect of inceptions for deferred period 26 weeks business is clearly heavier than that for the corresponding U.K. category. No firm conclusions are drawn for the other deferred periods, in view of the smaller numbers involved, and no distinctive age patterns were discerned.

5.4. With only 118 total weeks of claim in the quadrennium at ages 25–64 under deferred period 1 week policies, and 72 weeks under deferred period 4 weeks policies, no detailed comparisons would be meaningful. The expected weeks of claim, by the Individual Standard 1975–78 male graduated rates, are 51 and 182 respectively. For deferred period 13 and 26 weeks policies, the comparisons of actual with expected weeks of claim for ages 25–64 are as follows:

	Deferred period			
	13 weeks		26 weeks	
Sickness period	Actual weeks of claim	100 A/E	Actual weeks of claim	100 A/E
13/13	162	105		
26/26	247	142	1,346	203
52/52	342	163	1,708	204
104/all	250	58	2,351	121
All periods	1,001	103	5,405	157

The comparatively low ratios for sickness period 104/all should be noted. Recalculation of the 'all periods' ratios, omitting claims for sickness period 104/all, suggests that the overall sickness levels for practical purposes might be put at 140% for deferred period 13 weeks and 200% for deferred period 26 weeks of those which would be expected by the Individual Standard graduated rates. As in the case of the inception rates, an analysis of the ratios by age did not reveal any clear trends.

6. CONTRIBUTING OFFICES

The following Offices have contributed data to this investigation:

Eagle Star
Friends' Provident
Guardian Royal Exchange
Life Association of Scotland
N.E.L. Britannia
Norwich Union
Prudential
Scottish Amicable
Scottish Widows
Standard Life

7. APPENDICES

The following appendices appear on the ensuing pages:

Appendix A—Tables A1–A14 United Kingdom.
Appendix B—Tables B1–B14 Republic of Ireland.
Appendix C—Graduated claim inception rates.

APPENDIX A
(pages 100–121)

APPENDIX A

Group P.H.I. Policies 1975–78

United Kingdom—All Offices sickness experience

Table A1. *Males—Deferred period* 1 *week*

Age group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	All ages
Sickness period 1/3											
Exposed to risk	0	3	29	55	67	88	95	83	45	27	492
Actual weeks of sickness	0	0	0	8	5	7	16	12	11	11	70
Expected weeks of sickness	0	0	14	26	33	46	53	51	30	19	272
Actual rate of sickness		·000	·000	·145	·075	·080	·168	·145	·244	·407	
Actual/expected %			·0	30·8	15·2	15·2	30·2	23·5	36·7	57·9	25·7
Sickness period 4/9											
Exposed to risk	0	0	25	54	66	87	95	82	44	27	480
Actual weeks of sickness	0	0	0	2	4	18	30	28	23	17	122
Expected weeks of sickness	0	0	5	9	16	24	33	37	24	19	167
Actual rate of sickness			·000	·037	·061	·207	·316	·341	·523	·630	
Actual/expected %			·0	22·2	25·0	75·0	90·9	75·7	95·8	89·5	73·1
Sickness period 13/13											
Exposed to risk	0	0	24	54	66	87	95	82	44	27	479
Actual weeks of sickness	0	0	0	4	0	14	10	2	26	14	70
Expected weeks of sickness	0	0	2	5	9	14	20	23	17	15	105
Actual rates of sickness			·000	·074	·000	·161	·105	·024	·591	·519	
Actual/expected %			·0	80·0	·0	100·0	50·0	8·7	152·9	93·3	66·7

Table A1 (*continued*)

Age group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60 64	All ages
Sickness period 26/26											
Exposed to risk	0	0	24	52	66	87	94	82	43	27	475
Actual weeks of sickness	0	0	0	0	0	19	8	0	26	26	79
Expected weeks of sickness	0	0	1	5	7	10	16	21	17	17	94
Actual rate of sickness			·000	·000	·000	·218	·085	·000	·605	·963	
Actual/expected %			·0	·0	·0	190·0	50·0	·0	152·9	152·9	84·0
Sickness period 52/52											
Exposed to risk	0	0	22	49	64	87	94	82	43	27	468
Actual weeks of sickness	0	0	0	0	0	19	33	0	0	46	98
Expected weeks of sickness	0	0	0	3	4	9	13	18	16	18	81
Actual rate of sickness			·000	·000	·000	·218	·351	·000	·000	1·704	
Actual/expected %				·0	·0	211·1	253·8	·0	·0	255·6	121·0
Sickness period 104/all											
Exposed to risk	0	0	17	40	59	85	94	80	41	26	442
Actual weeks of sickness	0	0	0	0	0	0	104	0	0	18	122
Expected weeks of sickness	0	0	0	5	10	23	39	58	50	59	244
Actual rate of sickness			·000	·000	·000	·000	1·106	·000	·000	·692	
Actual/expected %				·0	·0	·0	266·7	·0	·0	30·5	50·0

Group P.H.I. Policies 1975–78

United Kingdom—All Offices sickness experience

Table A2. *Males—Deferred period* 4 *weeks*

Age group	18–19	20–24	25–29	30 34	35–39	40–44	45–49	50–54	55–59	60–64	All ages
Sickness period 4/9											
Exposed to risk	14	201	630	844	617	519	540	366	284	149	4164
Actual weeks of sickness	0	8	29	51	64	61	88	76	81	76	534
Expected weeks of sickness	2	28	107	161	137	145	186	163	161	109	1199
Actual rate of sickness	·000	·040	·046	·060	·104	·118	·163	·208	·285	·510	
Actual/expected %	0	28·6	27·1	31·7	46·7	42·1	47·3	46·6	50·3	69·7	44·5
Sickness period 13/13											
Exposed to risk	13	196	617	834	610	514	536	365	284	149	4118
Actual weeks of sickness	0	0	18	28	26	31	82	37	30	31	283
Expected weeks of sickness	1	15	53	81	74	81	109	104	114	88	720
Actual rate of sickness	·000	·000	·029	·034	·043	·060	·153	·101	·106	·208	
Actual/expected %	·0	·0	34·0	34·6	35·1	38·3	75·2	35·6	26·3	35·2	39·3

Table A2 (*continued*)

Age group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	All ages
Sickness period 26/26											
Exposed to risk	11	184	595	815	598	504	530	361	284	148	4030
Actual weeks of sickness	0	0	0	69	23	28	74	53	15	35	297
Expected weeks of sickness	0	10	35	58	54	63	87	90	114	99	610
Actual rate of sickness	·000	·000	·000	·085	·038	·056	·140	·147	·053	·236	
Actual/expected %		·0	·0	119·0	42·6	44·4	85·1	58·9	13·2	35·4	48·7
Sickness period 52/52											
Exposed to risk	7	161	554	772	572	484	515	355	278	147	3845
Actual weeks of sickness	0	0	0	52	0	0	56	57	123	56	344
Expected weeks of sickness	0	4	22	41	37	47	71	78	111	110	521
Actual rate of sickness	·000	·000	·000	·067	·000	·000	·109	·161	·442	·381	
Actual/expected %		·0	·0	126·8	·0	·0	78·9	73·1	110·8	50·9	66·0
Sickness period 104/all											
Exposed to risk	4	108	451	661	511	431	479	335	264	142	3386
Actual weeks of sickness	0	0	0	19	87	78	182	40	150	93	649
Expected weeks of sickness	0	2	23	55	76	113	191	243	337	327	1367
Actual rate of sickness	·000	·000	·000	·029	·170	·181	·380	·119	·568	·655	
Actual/expected %		·0	·0	34·5	114·5	69·0	95·3	16·5	44·5	28·4	47·5

Group P.H.I. Policies 1975–78

United Kingdom—All Offices sickness experience

Table A3. *Males—Deferred period* 13 *weeks*

Age group	18–19	20–24	25–29	30 34	35–39	40–44	45–49	50–54	55–59	60–64	All ages
Sickness period 13/13											
Exposed to risk	99	1,114	3,897	5,584	4,813	4,496	3,892	3,175	2,169	1,116	30,355
Actual weeks of sickness	0	25	19	108	103	132	237	264	234	343	1465
Expected weeks of sickness	5	85	334	540	587	711	792	912	867	661	5494
Actual rate of sickness	·000	·022	·005	·019	·021	·029	·061	·083	·108	·307	
Actual/expected %	·0	29·4	5·7	20·0	17·5	18·6	29·9	28·9	27·0	51·9	26·7
Sickness period 26/26											
Exposed to risk	76	976	3,566	5,223	4,547	4,277	3,724	3,042	2,094	1,085	28,610
Actual weeks of sickness	0	23	2	28	85	140	241	229	270	661	1,679
Expected weeks of sickness	2	48	216	370	415	533	620	755	835	719	4,513
Actual rate of sickness	·000	·024	·001	·005	·019	·033	·065	·075	·129	·609	
Actual/expected %	·0	47·9	0·9	7·6	20·5	26·3	38·9	30·3	32·3	91·9	37·2
Sickness period 52/52											
Exposed to risk	42	713	2891	4,473	4,002	3,834	3,379	2,768	1,928	1,017	25,047
Actual weeks of sickness	0	41	0	0	115	84	216	265	321	1,129	2,171
Expected weeks of sickness	0	21	115	238	273	378	469	609	756	762	3,621
Actual rate of sickness	·000	·058	·000	·000	·029	·022	·064	·096	·166	1·110	
Actual/expected %		195·2	·0	·0	42·1	22·2	46·1	43·5	42·5	148·2	60·0
Sickness period 104/all											
Exposed to risk	13	319	1,708	3,051	2,951	2,956	2,678	2,239	1,588	882	18,385
Actual weeks of sickness	0	11	52	26	168	76	191	715	688	2,181	4,108
Expected weeks of sickness	0	7	88	256	443	766	1,076	1,623	2,008	2,055	8,322
Actual rate of sickness	·000	·034	·030	·009	·057	·026	·071	·319	·433	2·473	
Actual/expected %		157·1	59·1	10·2	37·9	9·9	17·8	44·1	34·3	106·1	49·4

Group P.H.I. Policies 1975–78

United Kingdom—All Offices sickness experience

Table A4. *Males—Deferred Period* 26 *weeks*

Age group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	All ages
Sickness period 26/26											
Exposed to risk	197	4,530	14,424	20,025	17,194	17,154	16,329	15,027	11,228	6,188	122,296
Actual weeks of sickness	0	0	72	218	201	280	746	1,098	1,539	1,763	5,917
Expected weeks of sickness	6	220	874	1,418	1,568	2,137	2,721	3,738	4,493	4,075	21,250
Actual rate of sickness	·000	·000	·005	·011	·012	·016	·046	·073	·137	·285	
Actual/expected %	·0	·0	8·2	15·4	12·8	13·1	27·4	29·4	34·3	43·3	27·8
Sickness period 52/52											
Exposed to risk	95	3,096	11,449	16,928	14,877	15,098	14,510	13,423	10,142	5,664	105,282
Actual weeks of sickness	0	6	72	186	137	351	607	1,319	2,778	2,860	8,316
Expected weeks of sickness	1	91	454	900	1,019	1,491	2,017	2,963	3,996	4,196	17,128
Actual rate of sickness	·000	·002	·006	·011	·009	·023	·042	·098	·274	·505	
Actual/expected %	·0	6·6	15·9	20·7	13·4	23·5	30·1	44·5	69·5	68·2	48·6
Sickness period 104/all											
Exposed to risk	22	1,366	6,731	11,485	10,711	11,413	11,218	10,500	8,092	4,623	76,161
Actual weeks of sickness	0	72	26	3	254	604	612	2,192	4,112	6,621	14,496
Expected weeks of sickness	0	34	345	962	1,615	2,957	4,519	7,650	10,264	10,648	38,994
Actual rate of sickness	·000	·053	·004	·000	·024	·053	·055	·209	·508	1·432	
Actual/expected %		211·8	7·5	0·3	15·7	20·4	13·5	28·7	40·1	62·2	37·2

Group P.H.I. Policies 1975–78

United Kingdom—All Offices sickness experience

Table A5. *Males—Deferred period 52 weeks*

Age Group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50 54	55 59	60 64	All ages
Sickness period 52/52											
Exposed to risk	13	280	1,210	2,823	3,327	3,766	3,759	3,709	2,784	1,305	22,976
Actual weeks of sickness	0	0	21	1	15	15	116	410	619	587	1,784
Expected weeks of sickness	0	8	49	151	229	373	523	819	1,097	949	4,198
Actual rate of sickness	·000	·000	·017	·000	·005	·004	·031	·111	·222	·450	
Actual/expected %		·0	42·9	·7	6·6	4·0	22·2	50·1	56·4	61·9	42·5
Sickness period 104/all											
Exposed to risk	4	161	788	2,078	2,652	3,066	3,120	3,129	2,415	1,142	18,555
Actual weeks of sickness	0	0	0	0	104	0	115	321	728	1,420	2,688
Expected weeks of sickness	0	3	41	177	402	795	1,259	2,283	3,061	2,577	10,598
Actual rate of sickness	·000	·000	·000	·000	·039	·000	·037	·103	·301	1·243	
Actual/expected %		·0	·0	·0	25·9	·0	9·1	14·1	23·8	55·1	25·4

APPENDIX A—*continued*

(Table A6 on page 108)

Group P.H.I. Policies 1975–78

United Kingdom—*All Offices sickness experience*

Table A6. *Males—All deferred periods combined*

Age group	18–19	20–24	25–29	30 34	35–39	40–44	45–49	50–54	55–59	60–64	All ages
Sickness period 1/3											
Exposed to risk	0	3	29	55	67	88	95	83	45	27	492
Actual weeks of sickness	0	0	0	8	5	7	16	12	11	11	70
Expected weeks of sickness	0	0	14	26	33	46	53	51	30	19	272
Actual rate of sickness		·000	·000	·145	·075	·080	·168	·145	·244	·407	
Actual/expected %			·0	30·8	15·2	15·2	30·2	23·5	36·7	57·9	25·7
Sickness period 4/9											
Exposed to risk	14	203	656	899	684	605	636	449	330	176	4,652
Actual weeks of sickness	0	8	29	53	68	78	115	104	103	92	650
Expected weeks of sickness	2	30	112	173	152	169	219	199	186	127	1,369
Actual rate of sickness	·000	·039	·044	·059	·099	·129	·181	·232	·312	·523	
Actual/expected %	·0	26·7	25·9	30·6	44·7	46·2	52·5	52·3	55·4	72·4	47·5
Sickness period 13/13											
Exposed to risk	112	1,310	4,540	6,470	5,487	5,096	4,524	3,621	2,496	1,292	34,948
Actual weeks of sickness	0	25	38	140	129	174	329	301	291	385	1,812
Expected weeks of sickness	7	100	388	626	668	808	921	1,040	1,000	766	6,324
Actual rate of sickness	·000	·019	·008	·022	·024	·034	·073	·083	·117	·298	
Actual/expected %	·0	25·0	9·8	22·4	19·3	21·5	35·7	28·9	29·1	50·3	28·7

Table A6 (*continued*)

Age group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	All ages
Sickness period 26/26											
Exposed to risk	284	5,692	18,611	26,114	22,403	22,019	20,677	18,513	13,647	7,447	155,407
Actual weeks of sickness	0	23	75	316	311	467	1,068	1,378	1,851	2,484	7,973
Expected weeks of sickness	8	276	1,128	1,847	2,043	2,741	3,444	4,602	5,459	4,909	26,457
Actual rate of sickness	·000	·004	·004	·012	·014	·021	·052	·074	·136	·334	
Actual/expected %	·0	8·3	6·6	17·1	15·2	17·0	31·0	29·9	33·9	50·6	30·1
Sickness period 52/52											
Exposed to risk	159	4,250	16,126	25,043	22,841	23,263	22,257	20,334	15,175	8,157	157,605
Actual weeks of sickness	0	47	93	239	267	468	1,028	2,051	3,842	4,678	12,713
Expected weeks of sickness	1	124	640	1,332	1,565	2,298	3,095	4,487	5,976	6,035	25,553
Actual rate of sickness	·000	·011	·006	·010	·012	·020	·046	·101	·253	·573	
Actual/expected %	·0	37·9	14·5	17·9	17·1	20·4	33·2	45·7	64·3	77·5	49·8
Sickness period 104/all											
Exposed to risk	44	1,954	9,696	17,311	16,880	17,951	17,588	16,281	12,400	6,811	116,916
Actual weeks of sickness	0	83	78	48	613	757	1,205	3,267	5,678	10,331	22,060
Expected weeks of sickness	0	47	499	1,453	2,545	4,652	7,085	11,856	15,721	15,666	59,524
Actual rate of sickness	·000	·042	·008	·003	·036	·042	·069	·201	·458	1·517	
Actual/expected %		176·6	15·6	3·3	24·1	16·3	17·0	27·6	36·1	65·9	37·1

Group P.H.I. Policies 1975–78

United Kingdom—All Offices sickness experience

Table A7. *Females—Deferred period* 1 *week*

Age Group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	All ages
Sickness period 1/3										
Exposed to risk	0	4	8	4	3	3	8	9	6	45
Actual weeks of sickness	0	0	0	0	4	0	4	2	0	10
Expected weeks of sickness	0	1	3	0	0	1	5	5	2	17
Actual rate of sickness		·000	·000	·000	1·333	·000	·500	·222	·000	
Actual/expected %		·0	·0		·0	·0	80·0	40·0	·0	58·8
Sickness period 4/9										
Exposed to risk	0	4	6	3	3	3	8	9	6	42
Actual weeks of sickness	0	0	0	0	4	0	4	6	0	14
Expected weeks of sickness	0	0	0	0	0	0	3	4	2	9
Actual rate of sickness		·000	·000	·000	1·333	·000	·500	·667	·000	
Actual/expected %					·0		133·3	150·0	·0	155·6
Sickness period 13/13										
Exposed to risk	0	4	6	3	3	3	8	9	6	42
Actual weeks of sickness	0	0	0	0	0	0	0	0	0	0
Expected weeks of sickness	0	0	0	0	0	0	0	2	2	4
Actual rate of sickness		·000	·000	·000	·000	·000	·000	·000	·000	
Actual/expected %								·0	·0	·0

Table A7 (*continued*)

Age Group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	All ages
Sickness period 26/26										
Exposed to risk	0	3	6	3	3	3	8	9	6	41
Actual weeks of sickness	0	0	0	0	0	0	0	0	0	0
Expected weeks of sickness	0	0	0	0	0	0	0	0	2	2
Actual rate of sickness		·000	·000	·000	·000	·000	·000	·000	·000	
Actual/expected %									·0	·0
Sickness period 52/52										
Exposed to risk	0	3	6	2	3	3	8	9	6	40
Actual weeks of sickness	0	0	0	0	0	0	0	0	0	0
Expected weeks of sickness	0	0	0	0	0	0	0	0	2	2
Actual rate of sickness		·000	·000	·000	·000	·000	·000	·000	·000	
Actual/expected %									·0	·0
Sickness period 104/all										
Exposed to risk	0	1	6	1	2	3	8	9	6	36
Actual weeks of sickness	0	0	0	0	0	0	0	0	0	0
Expected weeks of sickness	0	0	0	0	0	0	3	5	6	14
Actual rate of sickness		·000	·000	·000	·000	·000	·000	·000	·000	
Actual/expected %							·0	·0	·0	·0

Group P.H.I. Policies 1975–78

United Kingdom—All Offices sickness experience

Table A8. *Females—Deferred period* 4 *weeks*

Age group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	All ages
Sickness period 4/9										
Exposed to risk	6	23	40	49	55	69	60	43	33	378
Actual weeks of sickness	0	0	4	0	15	51	44	32	11	157
Expected weeks of sickness	0	3	7	10	12	19	20	18	19	108
Actual rate of sickness	·000	·000	·100	·000	·273	·739	·733	·744	·333	
Actual/expected %		·0	57·1	·0	125·0	268·4	220·0	177·8	57·9	145·4
Sickness period 13/13										
Exposed to risk	6	22	37	46	53	68	60	43	33	368
Actual weeks of sickness	0	0	0	0	7	28	41	27	13	116
Expected weeks of sickness	0	1	5	5	6	11	12	13	13	66
Actual rate of sickness	·000	·000	·000	·000	·132	·412	·683	·628	·394	
Actual/expected %		·0	·0	·0	116·7	254·5	341·7	207·7	100·0	175·8

Table A8 (*continued*)

Age group	18 19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	All ages
Sickness period 26/26										
Exposed to risk	5	22	36	45	52	66	60	42	33	361
Actual weeks of sickness	0	0	0	0	0	38	94	36	26	194
Expected weeks of sickness	0	0	2	5	5	8	9	11	12	52
Actual rate of sickness	·000	·000	·000	·000	·000	·576	1·567	·857	·788	
Actual/expected %			·0	·0	·0	475·0	1,044·4	327·3	216·7	373·1
Sickness period 52/52										
Exposed to risk	3	18	31	41	46	62	59	42	33	335
Actual weeks of sickness	0	0	0	0	0	52	128	59	57	296
Expected weeks of sickness	0	0	0	1	4	7	8	8	12	40
Actual rate of sickness	·000	·000	·000	·000	·000	·839	2·169	1·405	1·727	
Actual/expected %				·0	·0	742·9	1,600·0	737·5	475·0	740·0
Sickness period 104/all										
Exposed to risk	1	14	21	31	39	55	55	39	32	287
Actual weeks of sickness	0	0	0	0	0	39	109	33	161	342
Expected weeks of sickness	0	0	0	3	6	14	20	29	40	112
Actual rate of sickness	·000	·000	·000	·000	·000	·709	1·982	·846	5·031	
Actual/expected %				·0	·0	278·6	545·0	113·8	402·5	305·4

Group P.H.I. Policies 1975–78

United Kingdom—All Offices sickness experience

Table A9. *Females—Deferred period* 13 *weeks*

Age group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	All ages
Sickness period 13/13										
Exposed to risk	80	441	722	596	409	439	476	389	170	3,722
Actual weeks of sickness	0	17	20	0	33	45	43	15	11	184
Expected weeks of sickness	4	32	61	58	51	68	97	111	66	548
Actual rate of sickness	·000	·039	·028	·000	·081	·103	·090	·039	·065	
Actual/expected %	·0	53·1	32·8	·0	64·7	66·2	44·3	13·5	16·7	33·6
Sickness period 26/26										
Exposed to risk	60	373	646	542	375	407	443	363	160	3,369
Actual weeks of sickness	0	17	2	0	9	43	57	7	1	136
Expected weeks of sickness	2	18	39	39	34	52	74	90	62	410
Actual rate of sickness	·000	·046	·003	·000	·024	·106	·129	·019	·006	
Actual/expected %		94·4	5·1	·0	26·5	82·7	77·0	7·8	1·6	33·2
Sickness period 52/52										
Exposed to risk	30	250	494	440	312	342	381	315	143	2,707
Actual weeks of sickness	0	0	0	0	0	15	34	38	0	87
Expected weeks of sickness	0	7	18	23	21	33	52	69	54	277
Actual rate of sickness	·000	·000	·000	·000	·000	·044	·089	·121	·000	
Actual/expected %		·0	·0	·0	·0	45·5	65·4	55·1	·0	31·4
Sickness period 104/all										
Exposed to risk	7	96	257	251	197	234	270	230	111	1,653
Actual weeks of sickness	0	0	0	0	0	99	52	66	0	217
Expected weeks of sickness	0	2	13	21	30	60	109	167	134	536
Actual rate of sickness	·000	·000	·000	·000	·000	·423	·193	·287	·000	
Actual/expected %		·0	·0	·0	·0	165·0	47·7	39·5	·0	40·5

Group P.H.I. Policies 1975–78

United Kingdom—All Offices sickness experience

Table A10. *Females—Deferred period* 26 *weeks*

Age group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	All ages
Sickness period 26/26										
Exposed to risk	232	3,125	4,041	2,761	2,007	2,393	2,739	2,602	1,568	21,468
Actual weeks of sickness	0	7	50	0	97	94	84	262	198	792
Expected weeks of sickness	6	147	241	194	183	299	458	649	612	2,789
Actual rate of sickness	·000	·002	·012	·000	·048	·039	·031	·101	·126	
Actual/expected %	·0	4·8	20·7	·0	53·0	31·4	18·3	40·4	32·4	28·4
Sickness period 52/52										
Exposed to risk	111	2,094	3,051	2,174	1,593	1,966	2,315	2,223	1,383	16,910
Actual weeks of sickness	0	0	66	0	127	51	226	395	268	1,133
Expected weeks of sickness	1	58	119	115	109	196	324	493	527	1,942
Actual rate of sickness	·000	·000	·022	·000	·080	·026	·098	·178	·194	
Actual/expected %	·0	·0	55·5	·0	116·5	26·0	69·8	80·1	50·9	58·3
Sickness period 104/all										
Exposed to risk	20	823	1,571	1,247	968	1,272	1,558	1,558	1,019	10,036
Actual weeks of sickness	0	0	0	0	109	31	337	440	315	1,232
Expected weeks of sickness	0	19	77	101	146	332	637	1,141	1,265	3,718
Actual rate of sickness	·000	·000	·000	·000	·113	·024	·216	·282	·309	
Actual/expected %		·0	·0	·0	74·7	9·3	52·9	38·6	24·9	33·1

Group P.H.I. Policies 1975–78

United Kingdom—All Offices sickness experience

Table A11. *Females—Deferred period 52 weeks*

Age group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	All ages
Sickness period 52/52										
Exposed to risk	8	129	233	216	200	281	269	264	172	1,772
Actual weeks of sickness	0	0	0	0	0	0	0	4	0	4
Expected weeks of sickness	0	4	10	11	13	27	37	58	68	228
Actual rate of sickness	·000	·000	·000	·000	·000	·000	·000	·015	·000	
Actual/expected %		·0	·0	·0	·0	·0	·0	6·9	·0	1·8
Sickness period 104/all										
Exposed to risk	2	53	147	134	148	207	195	194	126	1,206
Actual weeks of sickness	0	0	0	0	0	0	156	200	0	356
Expected weeks of sickness	0	1	8	11	23	53	79	140	161	476
Actual rate of sickness	·000	·000	·000	·000	·000	·000	·800	1·031	·000	
Actual/expected %		·0	·0	·0	·0	·0	197·5	142·9	·0	74·8

APPENDIX A—*continued*

(Table A12 on page 118)

Group P.H.I. Policies 1975–78

United Kingdom—All Offices sickness experience

Table A12. *Females—All deferred periods combined*

Age group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	All ages
Sickness period 0/4										
Exposed to risk	0	4	8	4	3	3	8	9	6	45
Actual weeks of sickness	0	0	0	0	4	0	4	2	0	10
Expected weeks of sickness	0	1	3	0	0	1	5	5	2	17
Actual rate of sickness		·000	·000	·000	1·333	·000	·500	·222	·000	
Actual/expected %		·0	·0			·0	80·0	40·0	·0	58·8
Sickness period 4/9										
Exposed to risk	6	27	46	53	57	71	68	52	38	418
Actual weeks of sickness	0	0	4	0	19	51	47	38	11	170
Expected weeks of sickness	0	3	8	10	14	19	24	23	21	122
Actual rate of sickness	·000	·000	·087	·000	·333	·718	·691	·731	·289	
Actual/expected %		·0	50·0	·0	135·7	268·4	195·8	165·2	52·4	139·3
Sickness period 13/13										
Exposed to risk	85	467	767	646	464	508	544	441	206	4,128
Actual weeks of sickness	0	17	20	0	40	73	83	42	24	299
Expected weeks of sickness	5	36	64	63	56	81	111	127	81	624
Actual rate of sickness	·000	·036	·026	·000	·086	·144	·153	·095	·117	
Actual/expected %	·0	47·2	31·3	·0	71·4	90·1	74·8	33·1	29·6	47·9

Table A12 (*continued*)

Age group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	All ages
Sickness period 26/26										
Exposed to risk	297	3,521	4,730	3,350	2,437	2,867	3,249	3,016	1,765	25,232
Actual weeks of sickness	0	24	52	0	107	175	236	303	224	1,121
Expected weeks of sickness	8	165	283	235	223	358	544	750	688	3,254
Actual rate of sickness	·000	·007	·011	·000	·044	·061	·073	·100	·127	
Actual/expected %	·0	14·5	18·4	·0	48·0	48·9	43·4	40·4	32·6	34·4
Sickness period 52/52										
Exposed to risk	152	2,494	3,817	2,870	2,154	2,653	3,031	2,849	1,735	21,755
Actual weeks of sickness	0	0	66	0	127	118	389	497	326	1,523
Expected weeks of sickness	1	70	147	152	148	263	424	630	665	2,500
Actual rate of sickness	·000	·000	·017	·000	·059	·044	·128	·174	·188	
Actual/expected %	·0	·0	44·9	·0	85·8	44·9	91·7	78·9	49·0	60·9
Sickness period 104/all										
Exposed to risk	29	985	2,001	1,663	1,351	1,767	2,084	2,028	1,291	13,199
Actual weeks of sickness	0	0	0	0	109	169	654	740	476	2,148
Expected weeks of sickness	0	22	99	136	206	461	847	1,484	1,606	4,861
Actual rate of sickness	·000	·000	·000	·000	·081	·096	·314	·365	·369	
Actual/expected %		·0	·0	·0	52·9	36·7	77·2	49·9	29·6	44·2

Group P.H.I. Policies 1975–78

United Kingdom—All Offices sickness experience

Table A13. *Males—Central claim inception rates per* 10,000 *exposed to risk*

Age Group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	All ages
Deferred Period 1 week											
Exposed to risk	0	3	29	55	67	88	95	83	45	27	492
Number of claim inceptions	0	0	0	5	3	2	7	4·5	4·5	4	30
Claim inception rate		0	0	909	448	227	737	542	1,000	1,481	610
Deferred Period 4 weeks											
Exposed to risk	14	201	630	844	617	519	540	366	284	149	4,164
Number of claim inceptions	0	1	5	9	11	11·5	11·5	11	13	14	87
Claim inception rate	0	50	79	107	178	222	213	301	458	940	209
Deferred Period 13 weeks											
Exposed to risk	99	1,114	3,897	5,584	4,813	4,496	3,892	3,175	2,169	1,116	30,355
Number of claim inceptions	0	3	2	11	13	13	23·5	26·5	24	29	145
Claim inception rate	0	27	5	20	27	29	60	83	111	260	48
Deferred Period 26 weeks											
Exposed to risk	197	4,530	14,424	20,025	17,194	17,154	16,329	15,027	11,228	6,188	122,296
Number of claim inceptions	0	0	7	7	10	17·5	35·5	55·5	74	85	291·5
Claim inception rate	0	0	5	3	6	10	22	37	66	137	24
Deferred Period 52 weeks											
Exposed to risk	13	280	1,210	2,823	3,327	3,766	3,759	3,709	2,784	1,305	22,976
Number of claim inceptions	0	0	1	0	1	1	2	11	15·5	13·5	45
Claim inception rate	0	0	8	0	3	3	5	30	56	103	20

Group P.H.I. Policies 1975–78

United Kingdom—All Offices sickness experience

Table A14. *Females—Central claim inception rates per* 10,000 *exposed to risk*

Age Group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	All ages
Deferred Period 1 week											
Exposed to risk	0	4	8	4	3	3	8	9	6		45
Number of claim inceptions	0	0	0	1	1	0	1	1	0		4
Claim inception rate		0	0	2,500	3,333	0	1,250	1,111	0		889
Deferred Period 4 weeks											
Exposed to risk	6	23	40	49	55	69	60	43	33		378
Number of claim inceptions	0	0	1	0	3	8	5	4	2		23
Claim inception rate	0	0	250	0	545	1,159	833	930	606		608
Deferred Period 13 weeks											
Exposed to risk	80	440	722	596	409	439	476	389	170		3,721
Number of claim inceptions	0	2	3	0	3	5	5	1·5	2		21·5
Claim inception rate	0	45	42	0	73	114	105	39	118		58
Deferred Period 26 weeks											
Exposed to risk	232	3,125	4,041	2,761	2,007	2,393	2,739	2,602	1,568		21,468
Number of claim inceptions	0	1	2	0	5	7	6	11	10		42
Claim inception rate	0	3	5	0	25	29	22	42	64		20
Deferred Period 52 weeks											
Exposed to risk	8	129	233	216	200	281	269	264	172		1,772
Number of claim inceptions	0	0	0	0	0	0	0	1	0		1
Claim inception rate	0	0	0	0	0	0	0	38	0		6

APPENDIX B

Group P.H.I. Policies 1975–78

Republic of Ireland—All Offices sickness experience

Table B1. *Males—Deferred period 1 week*

Age group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	All ages
Sickness period 1/3											
Exposed to risk	0	0	7	10	11	13	17	7	7	0	72
Actual weeks of sickness	0	1	5	2	6	1	1	9	11	4	40
Expected weeks of sickness	0	0	2	5	5	7	9	3	4	0	35
Actual rate of sickness			·714	·200	·545	·077	·059	1·286	1·571		
Actual/expected %			250·0	40·0	120·0	14·3	11·1	300·0	275·0		114·3
Sickness period 4/9											
Exposed to risk	0	0	7	9	11	12	17	7	7	0	70
Actual weeks of sickness	0	0	4	10	0	0	0	11	14	2	41
Expected weeks of sickness	0	0	0	0	2	3	5	2	4	0	16
Actual rate of sickness			·571	1·111	·000	·000	·000	1·571	2·000		
Actual/expected %					·0	·0	·0	550·0	350·0		256·3
Sickness period 13/13											
Exposed to risk	0	0	7	9	11	12	17	7	7	0	70
Actual weeks of sickness	0	0	0	2	0	0	0	10	14	0	26
Expected weeks of sickness	0	0	0	0	0	2	4	1	3	0	10
Actual rate of sickness			·000	·222	·000	·000	·000	1·429	2·000		
Actual/expected %						·0	·0	1,000·0	466·7		260·0

Table B1 (*continued*)

Age group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	All ages
Sickness period 26/26											
Exposed to risk	0	0	7	9	11	12	17	7	7	0	70
Actual weeks of sickness	0	0	0	0	0	0	0	0	18	0	18
Expected weeks of sickness	0	0	0	0	0	1	3	0	2	0	6
Actual rate of sickness			·000	·000	·000	·000	·000	·000	2·571		
Actual/expected %						·0	·0		900·0		300·0
Sickness period 52/52											
Exposed to risk	0	0	7	9	11	12	17	7	7	0	70
Actual weeks of sickness	0	0	0	0	0	0	0	0	0	0	0
Expected weeks of sickness	0	0	0	0	0	0	1	0	2	0	3
Actual rate of sickness			·000	·000	·000	·000	·000	·000	·000		
Actual/expected %							·0		·0		·0
Sickness period 104/all											
Exposed to risk	0	0	5	8	11	11	16	5	7	0	63
Actual weeks of sickness	0	0	0	0	0	0	0	0	0	0	0
Expected weeks of sickness	0	0	0	0	0	2	6	3	7	0	18
Actual rate of sickness			·000	·000	·000	·000	·000	·000	·000		
Actual/expected %						·0	·0	·0	·0		·0

Group P.H.I. Policies 1975–78

Republic of Ireland—All Offices sickness experience

Table B2. *Males—Deferred period* 4 *weeks*

Age group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	All ages
Sickness period 4/9											
Exposed to risk	0	29	67	87	107	88	71	56	21	5	531
Actual weeks of sickness	0	0	0	0	0	6	2	12	1	1	22
Expected weeks of sickness	0	4	12	18	23	25	25	25	11	3	146
Actual rate of sickness		·000	·000	·000	·000	·068	·028	·214	·048	·200	
Actual/expected %		·0	·0	·0	·0	24·0	8·0	48·0	9·1	33·3	15·1
Sickness period 13/13											
Exposed to risk	0	29	63	85	106	87	71	55	21	5	522
Actual weeks of sickness	0	0	0	0	0	0	4	8	0	0	12
Expected weeks of sickness	0	3	6	8	13	15	15	15	9	2	86
Actual rate of sickness		·000	·000	·000	·000	·000	·056	·145	·000	·000	
Actual/expected %		·0	·0	·0	·0	·0	26·7	53·3	·0	·0	14·0

Table B2 (*continued*)

Age group	18–19	20–24	25 29	30–34	35–39	40–44	45–49	50 54	55–59	60–64	All ages
Sickness period 26/26											
Exposed to risk	0	26	62	84	101	86	71	54	21	5	510
Actual weeks of sickness	0	0	0	0	0	0	13	0	6	0	19
Expected weeks of sickness	0	0	4	6	10	10	10	13	9	3	65
Actual rate of sickness		·000	·000	·000	·000	·000	·183	·000	·286	·000	
Actual/expected %			·0	·0	·0	·0	130·0	·0	66·7	·0	29·2
Sickness period 52/52											
Exposed to risk	0	24	54	80	95	83	69	53	21	5	484
Actual weeks of sickness	0	0	0	0	0	0	39	0	0	0	39
Expected weeks of sickness	0	0	2	5	6	9	10	12	9	3	56
Actual rate of sickness		·000	·000	·000	·000	·000	·565	·000	·000	·000	
Actual/expected %			·0	·0	·0	·0	390·0	·0	·0	·0	69·6
Sickness period 104/all											
Exposed to risk	0	13	38	67	81	72	64	49	19	5	408
Actual weeks of sickness	0	0	0	0	0	0	0	0	0	0	0
Expected weeks of sickness	0	0	1	6	11	18	26	35	24	9	130
Actual rate of sickness		·000	·000	·000	·000	·000	·000	·000	·000	·000	
Actual/expected %			·0	·0	·0	·0	·0	·0	·0	·0	·0

Group P.H.I. Policies 1975–78

Republic of Ireland—All Offices sickness experience

Table B3. *Males—Deferred period* 13 *weeks*

Age group	18–19	20–24	25–29	30–34	35–39	40–44	45 49	50–54	55–59	60–64	All ages
Sickness period 13/13											
Exposed to risk	15	193	664	874	778	740	549	340	200	92	4,445
Actual weeks of sickness	0	26	26	14	21	0	13	13	43	32	188
Expected weeks of sickness	0	15	57	85	94	116	111	97	78	52	705
Actual rate of sickness	·000	·135	·039	·016	·027	·000	·024	·038	·215	·348	
Actual/expected %		173·3	45·6	16·5	22·3	·0	11·7	13·4	55·1	61·5	26·7
Sickness period 26/26											
Exposed to risk	13	174	632	834	747	714	532	332	193	91	4,262
Actual weeks of sickness	0	33	31	16	36	0	6	13	74	71	280
Expected weeks of sickness	0	8	39	58	68	88	87	81	77	59	565
Actual rate of sickness	·000	·190	·049	·019	·048	·000	·011	·039	·383	·780	
Actual/expected %		412·5	79·5	27·6	52·9	·0	6·9	16·0	96·1	120·3	49·6
Sickness period 52/52											
Exposed to risk	9	137	558	748	682	658	492	316	178	85	3,863
Actual weeks of sickness	0	0	0	16	49	0	0	1	132	144	342
Expected weeks of sickness	0	4	22	40	46	64	67	68	70	60	441
Actual rate of sickness	·000	·000	·000	·021	·072	·000	·000	·003	·742	1·694	
Actual/expected %		·0	·0	40·0	106·5	·0	·0	1·5	188·6	240·0	77·6
Sickness period 104/all											
Exposed to risk	2	83	396	565	556	543	416	278	156	74	3,069
Actual weeks of sickness	0	0	0	0	32	0	52	0	2	164	250
Expected weeks of sickness	0	2	20	47	82	140	165	204	196	166	1022
Actual rate of sickness	·000	·000	·000	·000	·058	·000	·125	·000	·013	2·216	
Actual/expected %		·0	·0	·0	39·0	·0	31·5	·0	1·0	98·8	24·5

Group P.H.I. Policies 1975–78

Republic of Ireland—All Offices sickness experience

Table B4. *Males—Deferred period 26 weeks*

Age group	18–19	20 24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	All ages
Sickness period 26/26											
Exposed to risk	67	1,374	4,273	5,379	4,280	3,104	2,472	1,924	1,290	590	24,753
Actual weeks of sickness	0	49	88	35	165	132	65	444	225	192	1,395
Expected weeks of sickness	1	67	257	379	388	386	409	477	514	384	3,262
Actual rate of sickness	·000	·036	·021	·007	·039	·043	·026	·231	·174	·325	
Actual/expected %	·0	73·1	34·2	9·2	42·5	34·2	15·9	93·1	43·8	50·0	42·8
Sickness period 52/52											
Exposed to risk	42	1,215	3,947	5,009	4,004	2,907	2,339	1,817	1,225	556	23,061
Actual weeks of sickness	0	38	20	40	240	209	131	367	320	381	1,746
Expected weeks of sickness	0	36	155	266	271	286	321	401	481	406	2,623
Actual rate of sickness	·000	·031	·005	·008	·060	·072	·056	·202	·261	·685	
Actual/expected %		105·6	12·9	15·0	88·6	73·1	40·8	91·5	66·5	93·8	66·6
Sickness period 104/all											
Exposed to risk	10	937	3,316	4,203	3,392	2,472	2,023	1,573	1,059	472	19,457
Actual weeks of sickness	0	0	0	52	96	150	724	566	149	614	2,351
Expected weeks of sickness	0	23	167	350	501	639	803	1,142	1,337	1,066	6,028
Actual rate of sickness	·000	·000	·000	·012	·028	·061	·358	·360	·141	1·301	
Actual/expected %		·0	·0	14·9	19·2	23·5	90·2	49·6	11·1	57·6	39·0

Group P.H.I. Policies 1975–78

Republic of Ireland—All Offices sickness experience

Table B5. *Males—Deferred period 52 weeks*

Age group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50 54	55–59	60–64	All ages
Sickness period 52/52											
Exposed to risk	0	11	109	153	171	189	195	165	80	24	1,097
Actual weeks of sickness	0	0	0	0	0	0	0	14	14	20	48
Expected weeks of sickness	0	0	4	8	11	18	26	36	31	16	150
Actual rate of sickness		·000	·000	·000	·000	·000	·000	·085	·175	·833	
Actual/expected %			·0	·0	·0	·0	·0	38·9	45·2	125·0	32·0
Sickness period 104/all											
Exposed to risk	0	9	73	116	144	162	173	149	76	24	926
Actual weeks of sickness	0	0	0	0	0	0	0	142	246	32	420
Expected weeks of sickness	0	0	4	10	22	42	70	107	92	52	399
Actual rate of sickness		·000	·000	·000	·000	·000	·000	·953	3·237	1.333	
Actual/expected %			·0	·0	·0	·0	·0	132·7	267·4	61·5	105·3

APPENDIX B—*continued*

(Table B6 on page 130)

Group P.H.I. Policies 1975–78

Republic of Ireland—All Offices sickness experience

Table B6. *Males—All deferred periods combined*

Age group	18–19	20–24	25–29	30 34	35–39	40–44	45–49	50–54	55–59	60–64	All ages
Sickness period 0/4											
Exposed to risk	0	0	7	10	11	13	17	7	7	0	72
Actual weeks of sickness	0	1	5	2	6	1	1	9	11	4	40
Expected weeks of sickness	0	0	2	5	5	7	9	3	4	0	35
Actual rate of sickness			·714	·200	·545	·077	·059	1·286	1·571		
Actual/expected %			250·0	40·0	120·0	14·3	11·1	300·0	275·0		114·3
Sickness period 4/9											
Exposed to risk	0	29	72	95	118	100	88	62	27	6	597
Actual weeks of sickness	0	0	4	10	0	6	2	23	15	3	63
Expected weeks of sickness	0	4	13	19	26	28	30	27	16	3	166
Actual rate of sickness		·000	·056	·105	·000	·060	·023	·371	·556	·500	
Actual/expected %		·0	30·8	52·6	·0	21·4	6·7	85·2	93·8	100·0	38·0
Sickness period 13/13											
Exposed to risk	15	222	733	968	893	839	638	399	228	99	5,034
Actual weeks of sickness	0	26	26	16	21	0	17	30	55	32	223
Expected weeks of sickness	0	16	63	95	108	133	130	115	89	57	806
Actual rate of sickness	·000	·117	·035	·017	·024	·000	·027	·075	·241	·323	
Actual/expected %		162·5	41·3	16·8	19·4	·0	13·1	26·1	61·8	56·1	27·7

Table B6 (*continued*)

Age group	18–19	20–24	25–29	30–34	35 39	40–44	45–49	50–54	55–59	60–64	All ages
Sickness period 26/26											
Exposed to risk	80	1,574	4,973	6,304	5,140	3,916	3,092	2,315	1,510	683	29,587
Actual weeks of sickness	0	82	119	52	200	132	84	457	321	264	1,711
Expected weeks of sickness	3	76	300	445	465	487	510	574	601	445	3,906
Actual rate of sickness	·000	·052	·024	·008	·039	·034	·027	·197	·213	·387	
Actual/expected %	·0	107·9	39·7	11·7	43·0	27·1	16·5	79·6	53·4	59·3	43·8
Sickness period 52/52											
Exposed to risk	49	1,385	4,674	5,998	4,962	3,847	3,110	2,357	1,512	669	28,563
Actual weeks of sickness	0	38	20	56	288	209	169	382	465	547	2,174
Expected weeks of sickness	0	41	183	319	337	379	428	518	591	487	3,283
Actual rate of sickness	·000	·027	·004	·009	·058	·054	·054	·162	·308	·818	
Actual/expected %		92·7	10·9	17·6	85·5	55·1	39·5	73·7	78·7	112·3	66·2
Sickness period 104/all											
Exposed to risk	12	1,038	3,826	4,958	4,180	3,257	2,691	2,056	1,315	574	23,907
Actual weeks of sickness	0	0	0	52	129	150	776	708	397	812	3,024
Expected weeks of sickness	0	26	193	414	619	842	1,069	1,491	1,657	1,292	7,603
Actual rate of sickness	·000	·000	·000	·010	·031	·046	·288	·344	·302	1·415	
Actual/expected %		·0	·0	12·6	20·8	17·8	72·6	47·5	24·0	62·8	39·8

Group P.H.I. Policies 1975–78

Republic of Ireland—All Offices sickness experience

Table B7. *Females—Deferred period* 1 *week*

Age group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	All ages
Sickness period 1/3										
Exposed to risk	0	0	5	0	0	0	0	0	0	5
Actual weeks of sickness	0	0	0	0	0	0	0	0	0	0
Expected weeks of sickness	0	0	1	0	0	0	0	0	0	1
Actual rate of sickness			·000							
Actual/expected %			·0							·0
Sickness period 4/9										
Exposed to risk	0	0	5	0	0	0	0	0	0	5
Actual weeks of sickness	0	0	0	0	0	0	0	0	0	0
Expected weeks of sickness	0	0	0	0	0	0	0	0	0	0
Actual rate of sickness			·000							
Actual/expected %										
Sickness period 13/13										
Exposed to risk	0	0	5	0	0	0	0	0	0	5
Actual weeks of sickness	0	0	0	0	0	0	0	0	0	0
Expected weeks of sickness	0	0	0	0	0	0	0	0	0	0
Actual rates of sickness			·000							
Actual expected %										

Table B7 (*continued*)

Age group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	All ages
Sickness period 26/26										
Exposed to risk	0	0	5	0	0	0	0	0	0	5
Actual weeks of sickness	0	0	0	0	0	0	0	0	0	0
Expected weeks of sickness	0	0	0	0	0	0	0	0	0	0
Actual rate of sickness			·000							
Actual/expected %										
Sickness period 52/52										
Exposed to risk	0	0	5	0	0	0	0	0	0	5
Actual weeks of sickness	0	0	0	0	0	0	0	0	0	0
Expected weeks of sickness	0	0	0	0	0	0	0	0	0	0
Actual rate of sickness			·000							
Actual/expected %										
Sickness period 104/all										
Exposed to risk	0	0	5	0	0	0	0	0	0	5
Actual weeks of sickness	0	0	0	0	0	0	0	0	0	0
Expected weeks of sickness	0	0	0	0	0	0	0	0	0	0
Actual rate of sickness			·000							
Actual/expected %										

Group P.H.I. Policies 1975–78

Republic of Ireland—All Offices sickness experience

Table B8. *Females—Deferred period* 4 *weeks*

Age group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	All ages
Sickness period 4/9										
Exposed to risk	0	10	11	12	6	5	10	8	0	62
Actual weeks of sickness	0	0	3	3	0	0	0	0	0	6
Expected weeks of sickness	0	0	2	2	2	1	4	2	0	13
Actual rate of sickness		·000	·273	·250	·000	·000	·000	·000		
Actual/expected %			150·0	150·0	·0	·0	·0	·0		46·2
Sickness period 13/13										
Exposed to risk	0	10	11	12	6	5	10	8	0	62
Actual weeks of sickness	0	0	0	0	0	0	0	0	0	0
Expected weeks of sickness	0	0	0	0	0	0	2	2	0	4
Actual rate of sickness		·000	·000	·000	·000	·000	·000	·000		
Actual/expected %							·0	·0		·0
Sickness period 26/26										
Exposed to risk	0	10	11	11	6	5	10	8	0	61
Actual weeks of sickness	0	0	0	0	0	0	0	0	0	0
Expected weeks of sickness	0	0	0	0	0	0	0	1	0	1
Actual rate of sickness		·000	·000	·000	·00	·000	·000	·000		
Actual/expected %								·0		·0

Table B8 (*continued*)

Age group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	All ages
Sickness period 52/52										
Exposed to risk	0	9	11	11	6	5	10	8	0	60
Actual weeks of sickness	0	0	0	0	0	0	0	0	0	0
Expected weeks of sickness	0	0	0	0	0	0	0	0	0	0
Actual rate of sickness		·000	·000	·000	·000	·000	·000	·000		·000
Actual/expected %										
Sickness period 104/all										
Exposed to risk	0	8	10	8	5	5	7	7	0	50
Actual weeks of sickness	0	0	0	0	0	0	0	0	0	0
Expected weeks of sickness	0	0	0	0	0	0	3	4	0	7
Actual rate of sickness		·000	·000	·000	·000	·000	·000	·000		
Actual/expected %							·0	·0		·0

Group P.H.I. Policies 1975–78

Republic of Ireland—All Offices sickness experience

Table B9. *Females—Deferred period* 13 *weeks*

Age group	18–19	20–24	25–29	30 34	35 39	40–44	45–49	50–54	55–59	All ages
Sickness period 13/13										
Exposed to risk	2	31	35	50	50	45	46	39	41	339
Actual weeks of sickness	0	0	0	0	0	0	0	0	0	0
Expected weeks of sickness	0	2	3	5	6	7	10	11	16	60
Actual rate of sickness	·000	·000	·000	·000	·000	·000	·000	·000	·000	
Actual/expected %		·0	·0	·0	·0	·0	·0	·0	·0	·0
Sickness period 26/26										
Exposed to risk	2	27	32	47	47	44	46	37	41	323
Actual weeks of sickness	0	0	0	0	0	0	0	0	0	0
Expected weeks of sickness	0	0	1	4	5	5	9	9	16	49
Actual rate of sickness	·000	·000	·000	·000	·000	·000	·000	·000	·000	
Actual/expected %			·0	·0	·0	·0	·0	·0	·0	·0
Sickness period 52/52										
Exposed to risk	1	21	26	40	44	43	44	37	39	295
Actual weeks of sickness	0	0	0	0	0	0	0	0	0	0
Expected weeks of sickness	0	0	0	2	4	5	5	8	15	39
Actual rate of sickness	·000	·000	·000	·000	·000	·000	·000	·000	·000	
Actual/expected %				·0	·0	·0	·0	·0	·0	·0
Sickness period 104/all										
Exposed to risk	0	11	14	29	37	37	39	30	34	231
Actual weeks of sickness	0	0	0	0	0	0	0	0	0	0
Expected weeks of sickness	0	0	0	2	6	9	16	22	46	101
Actual rate of sickness		·000	·000	·000	·000	·000	·000	·000	·000	
Actual/expected %				·0	·0	·0	·0	·0	·0	·0

Group P.H.I. Policies 1975–78

Republic of Ireland—All Offices sickness experience

Table B10. *Females—Deferred period 26 weeks*

Age group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	All ages
Sickness period 26/26										
Exposed to risk	25	213	366	359	226	262	208	279	182	2,120
Actual weeks of sickness	0	12	0	0	0	0	20	39	78	149
Expected weeks of sickness	1	10	22	25	21	33	35	71	73	291
Actual rate of sickness	·000	·056	·000	·000	·000	·000	·096	·140	·429	
Actual/expected %	·0	120·0	·0	·0	·0	·0	57·1	54·9	106·8	51·2
Sickness period 52/52										
Exposed to risk	12	146	282	306	196	233	184	252	166	1,777
Actual weeks of sickness	0	0	0	0	0	0	0	0	135	135
Expected weeks of sickness	0	3	11	17	13	23	25	56	65	213
Actual rate of sickness	·000	·000	·000	·000	·000	·000	·000	·000	·813	
Actual/expected %		·0	·0	·0	·0	·0	·0	·0	207·7	63·4
Sickness period 104/all										
Exposed to risk	1	60	154	200	140	172	134	186	128	1,175
Actual weeks of sickness	0	0	0	0	0	0	0	0	68	68
Expected weeks of sickness	0	2	8	18	22	46	54	138	161	449
Actual rate of sickness	·000	·000	·000	·000	·000	·000	·000	·000	·531	
Actual/expected %		·0	·0	·0	·0	·0	·0	·0	42·2	15·1

Group P.H.I. Policies 1975–78

Republic of Ireland—All Offices sickness experience

Table B11. *Females—Deferred period* 52 *weeks*

Age group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	All ages
Sickness period 52/52										
Exposed to risk	0	3	16	40	22	25	30	24	23	183
Actual weeks of sickness	0	0	0	0	0	0	0	0	0	0
Expected weeks of sickness	0	0	0	2	0	3	4	5	9	23
Actual rate of sickness		·000	·000	·000	·000	·000	·000	·000	·000	
Actual/expected %				·0		·0	·0	·0	·0	·0
Sickness period 104/all										
Exposed to risk	0	2	12	38	19	25	25	22	22	165
Actual weeks of sickness	0	0	0	0	0	0	0	0	0	0
Expected weeks of sickness	0	0	0	4	3	6	11	15	27	66
Actual rate of sickness		·000	·000	·000	·000	·000	·000	·000	·000	
Actual/expected %				·0	·0	·0	·0	·0	·0	·0

APPENDIX B—*continued*

(Table B12 on page 140)

Group P.H.I. Policies 1975–78

Republic of Ireland—All Offices sickness experience

Table B12. *Females—All deferred periods combined*

Age group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	All ages
Sickness period 1/3										
Exposed to risk	0	0	5	0	0	0	0	0	0	5
Actual weeks of sickness	0	0	0	0	0	0	0	0	0	0
Expected weeks of sickness	0	0	1	0	0	0	0	0	0	1
Actual rate of sickness			·000							
Actual/expected %			·0							·0
Sickness period 4/9										
Exposed to risk	0	10	17	12	7	5	10	8	0	69
Actual weeks of sickness	0	0	3	3	0	0	0	0	0	6
Expected weeks of sickness	0	0	3	2	2	1	4	2	0	14
Actual rate of sickness		·000	·176	·250	·000	·000	·000	·000		
Actual/expected %			100·0	150·0	·0	·0	·0	·0		42·9
Sickness period 13/13										
Exposed to risk	2	42	50	61	57	50	58	45	41	406
Actual weeks of sickness	0	0	0	0	0	0	0	0	0	0
Expected weeks of sickness	0	4	5	5	7	9	12	13	16	71
Actual rate of sickness	·000	·000	·000	·000	·000	·000	·000	·000	·000	
Actual/expected %		·0	·0	·0	·0	·0	·0	·0	·0	·0

Table B12 (*continued*)

Age group	18-19	20–24	25–29	30–34	35–39	40-44	45–49	50–54	55–59	All ages
Sickness period 26/26										
Exposed to risk	26	251	414	419	281	311	265	325	223	2,515
Actual weeks of sickness	0	12	0	0	0	0	20	39	78	149
Expected weeks of sickness	1	12	24	30	26	39	44	83	89	348
Actual rate of sickness	·000	·048	·000	·000	·000	·000	·075	·120	·350	
Actual/expected %	·0	100·0	·0	·0	·0	·0	45·5	47·0	87·6	42·8
Sickness period 52/52										
Exposed to risk	12	178	337	399	268	305	266	318	228	2,311
Actual weeks of sickness	0	0	0	0	0	0	0	0	135	135
Expected weeks of sickness	0	4	13	21	17	30	36	70	91	282
Actual rate of sickness	·000	·000	·000	·000	·000	·000	·000	·000	·592	
Actual/expected %		·0	·0	·0	·0	·0	·0	·0	148·4	47·9
Sickness period 104/all										
Exposed to risk	1	78	192	276	201	239	204	243	185	1,619
Actual weeks of sickness	0	0	0	0	0	0	0	0	68	68
Expected weeks of sickness	0	2	9	23	29	62	82	179	234	620
Actual rate of sickness	·000	·000	·000	·000	·000	·000	·000	·000	·368	
Actual/expected %		·0	·0	·0	·0	·0	·0	·0	29·1	11·0

Group P.H.I. Policies 1975–78

Republic of Ireland—All Offices sickness experience

Table B13. *Males—Central claim inception rates per* 10,000 *exposed to risk*

Age group	18–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	All ages
Deferred Period 1 week											
Exposed to risk	0	0	7	10	11	13	17	7	7	0	72
Number of claim inceptions	0	1	3	3	2	·5	·5	4	3	1	18
Inception rate			4,286	3,000	1,818	385	294	5,714	4,286		2,500
Deferred Period 4 weeks											
Exposed to risk	0	29	67	87	107	88	71	56	21	5	531
Number of claim inceptions	0	0	0	0	0	1	2	3	1·5	·5	8
Inception rate		0	0	0	0	114	282	536	714	1,000	151
Deferred Period 13 weeks											
Exposed to risk	15	193	664	874	778	740	549	340	200	92	4,445
Number of claim inceptions	0	2	2	1	4	0	1	1·5	4	2·5	18
Inception rate	0	104	30	11	51	0	18	44	200	272	40
Deferred Period 26 weeks											
Exposed to risk	67	1,374	4,273	5,379	4,280	3,104	2,472	1,924	1,290	590	24,753
Number of claim inceptions	0	4	5·5	2·5	6·5	4·5	2·5	20	13	7·5	66
Inception rate	0	29	13	5	15	14	10	104	101	127	27
Deferred Period 52 weeks											
Exposed to risk	0	11	109	153	171	189	195	165	80	24	1,097
Number of claim inceptions	0	0	0	0	0	0	0	0	0	0	0
Inception rate		0	0	0	0	0	0	0	0	0	0

Group P.H.I. Policies 1975–78

Republic of Ireland—All Offices sickness experience

Table B14. *Females—Central claim inception rates per* 10,000 *exposed to risk*

Age Group	18–19	20 24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	All ages
Deferred Period 1 week											
Exposed to risk	0	0	5	0	0	0	0	0	0		5
Number of claim inceptions	0	0	0	0	0	0	0	0	0		0
Inception rate			0	0	0	0	0	0	0		0
Deferred Period 4 weeks											
Exposed to risk	0	10	11	12	6	5	10	8	0		62
Number of claim inceptions	0	0	·5	·5	0	0	0	0	0		1
Inception rate		0	455	417	0	0	0	0	0		161
Deferred Period 13 weeks											
Exposed to risk	2	31	35	50	50	45	46	39	41		339
Number of claim inceptions	0	0	0	0	0	0	0	0	0		0
Inception rate	0	0	0	0	0	0	0	0	0		0
Deferred Period 26 weeks											
Exposed to risk	25	213	366	359	226	262	208	279	182		2,120
Number of claim inceptions	0	1	0	0	0	0	1	2	3		7
Inception rate	0	47	0	0	0	0	48	72	165		33
Deferred Period 52 weeks											
Exposed to risk	0	3	16	40	22	25	30	24	23		183
Number of claim inceptions	0	0	0	0	0	0	0	0	0		0
Incepion rate		0	0	0	0	0	0	0	0		0

APPENDIX C

Group P.H.I. sickness experience 1975–78—*Graduated rates*
Male experience—Central claim inception rates
Graduated inception rates per 10,000—*Exposed to risk*

Age	Deferred period 4 weeks	13 weeks	26 weeks
25	32	11	4
26	42	11	4
27	53	11	4
28	66	12	4
29	79	13	4
30	94	13	4
31	109	14	4
32	124	15	4
33	138	16	4
34	152	17	5
35	165	19	5
36	176	20	4
37	186	22	6
38	195	24	6
39	202	26	7
40	208	28	8
41	213	31	9
42	216	34	10
43	220	37	11
44	222	41	13
45	225	45	15
46	228	50	17
47	231	55	19
48	235	61	22
49	241	67	26
50	248	74	29
51	258	81	34
52	271	90	39
53	287	98	45
54	308	108	51
55	335	118	58
56	371	129	66
57	416	141	75
58	476	154	84
59	555	167	94
60	661	181	105
61	804	195	116
62	1,002	209	127
63	1,280	224	138
64	1,679	239	149

Appendix C (*continued*)

Group P.H.I. sickness experience 1975–78—*Graduated rates*
Male experience—Central claim inception rates
Parameters of the graduation formula

Formula used: $\ln(i_x) = a + bx + cx^2 + dx^3$

Deferred period	Values of a	b	c	d
4 weeks	−7·503658	4·325973	−1·728174	0·236458
13 weeks	−6·913875	−0·0321409	0·366408	−0·0442876
26 weeks	−7·296396	−1·412903	0·9622078	−0·109397

Note: $x = (\text{Age} - 20)/10$

CORRIGENDA

C.M.I.R. **5,** 52 in line 24 substitute '144' for '124'.

C.M.I.R. **7,** 104 in line 12 substitute '1·35' for '1·13'.
in line 18 insert '$+2{\cdot}8^3\,d$' after '$2{\cdot}8^2\,c$'.
in line 21 substitute '$-2{\cdot}60249$' for '$-2{\cdot}60149$'.

C.M.I.R. **7,** 159 in line 25 substitute '572·5' for '582·5'.

CONTINUOUS MORTALITY INVESTIGATION REPORTS

NUMBER 8

Printed in Great Britain at the Alden Press, Oxford