DRAFT 26/02/2019

ACTUARIAL SOCIETY OF SOUTH AFRICA

REPORT of the
CONTINUOUS STATISTICAL INVESTIGATIONS COMMITTEE

LUMP SUM DISABILITY INVESTIGATION 1995-1999

1. INTRODUCTTION

1.1. Previous Investigation

There has been one previous investigation in respect of lump sum disability. The previous investigation covered the period from 1991 to 1994 and was presented to the Society in 1997.

1.2. Data

This investigation includes data from Old Mutual, Sanlam, Liberty, Metropolitan and Momentum. Not all of the companies were able to provide data for all the categories requested.

Companies are relied upon to do thorough checks on their data for reasonability prior to submission. However the committee does some reasonability checks on the data submitted.

Detailed analyses of some categories (Cause of Lump Sum Disability Claim and Waiting Period) were not possible due to lack of available data. Improved data collection should make these investigations possible in the future.

1.3. Exposed-to-Risk Calculation

The Exact Method of calculating the exposed-to-risk was used. This investigation is by number of policies and not by amounts to be paid out on disability.

1.4. Scope of Investigation

The investigation covers individual policies with lump sum disability riders, i.e. where lump sums are paid on the total and permanent disability of the policyholder, whether occupational, physical or frailty. Total exposure for this investigation is approximately 15.3 million and total disabilities 25,000.

1.5 Analyses

Comparisons have been made with the results of the previous investigation.

1.6 Progression over time

The progression over time of disabilities and exposed-to-risk is as follows:

Table 1

	Males			Females		
Years	**Claims**	**Exposure**	**Observed Rate**	**Claims**	**Exposure**	**Observed Rate**
1995	4,212	1,854,326	0.00227	1,056	1,021,487	0.00103
1996	3,724	1,962,523	0.00190	1,108	1,088,414	0.00102
1997	3,704	2,009,186	0.00184	1,199	1,132,176	0.00106
1998	4,271	2,018,363	0.00212	1,436	1,152,831	0.00125
1999	3,125	1,912,492	0.00163	1,108	1,107,006	0.00100
All	**19,036**	**9,756,890**	**0.00195**	**5,907**	**5,501,914**	**0.00107**

The annual exposure has more than doubled since the previous investigation for both males and females.

1.7. **Data Categories**

The data from individual companies was requested using the following breakdown of categories:

(a) Calendar Year
(b) Company Code
(c) Age
(d) Gender
(e) Type of Medical Underwriting
(f) HIV Testing / Exclusion Clause
(g) Smoking / Non-Smoking
(h) Level of Sum Assured
(i) Type of Disability Benefit Cover
(j) Cause of Lump Sum Disability Claim
(k) Occupation Code
(l) Waiting Period
(m) Duration

It was possible to analyze all categories to some degree, although several categories contained a large proportion of unspecified data. Improved data collection may allow analysis of these categories in the future.

The investigation concentrated on the following categories: Age, Gender, Duration, Smoking Status and Occupation, for Own or Similar Occupation and Own Occupation benefits. As a result the claims and exposure figures for the remainder of this report are lower than the total claims and exposure figures shown in Table 1 above.

2. **RESULTS**

2.1. **Males**

Chart 1 Experience over time

2.1.1. **Analysis by Age**

Table 2

	1995-1999		
Age Group	**Claims**	**Exposure**	**Crude Rates**
15-19	3	28,176	0.00011
20-24	93	369,597	0.00025
25-29	323	978,679	0.00033
30-34	937	1,263,693	0.00074
35-39	1,689	1,317,307	0.00128
40-44	2,631	1,129,342	0.00233
45-49	3,100	850,935	0.00364
50-54	3,229	560,928	0.00576
55-59	1,896	259,971	0.00729
60-64	263	38,783	0.00678
Grand Total	**14,164**	**6,797,411**	**0.00208**

Table 3

1991-1994		
Claims	**Exposure**	**Crude Rates**
10	51,792	0.00019
126	475,894	0.00026
283	829,199	0.00034
599	869,295	0.00069
832	710,753	0.00117
1,220	520,466	0.00234
1,444	343,423	0.00420
1,382	181,211	0.00763
788	63,009	0.01251
53	1,712	0.03096
6,737	**4,046,754**	**0.00166**

From the above tables we note that disability rates increase with increasing age. The 1995-1999 crude rates are very similar to the 1991-1994 rates for all ages with sufficient data up to age 44. From age 45 to age 64 the 1995-1999 rates are lower than the 1991-1994 rates. This is, however, not necessarily an indication of a lightening experience, but rather a very significant change of the mix of business by occupational class.

2.1.2. **Analysis by Occupation (Own/Similar)**

Table 4A Own and Similar1995-1999

1995-1999	Age Group	Claims	Exposure	Crude Rates
Professional	15-34	400	1,166,323	0.00034
	35-44	1,228	943,103	0.00130
	45-54	1,752	483,517	0.00362
	55-64	471	87,141	0.00541
	All	**3,851**	**2,680,084**	**0.00144**
Skilled	15-34	730	1,063,611	0.00069
	35-44	1,976	898,878	0.00220
	45-54	2,445	488,758	0.00500
	55-64	903	99,905	0.00904
	All	**6,054**	**2,551,152**	**0.00237**
Unskilled	15-34	128	198,307	0.00065
	35-44	376	150,688	0.00250
	45-54	560	67,428	0.00831
	55-64	124	11,938	0.01039
	All	**1,188**	**428,361**	**0.00277**
All		**11,093**	**5,659,597**	**0.00196**

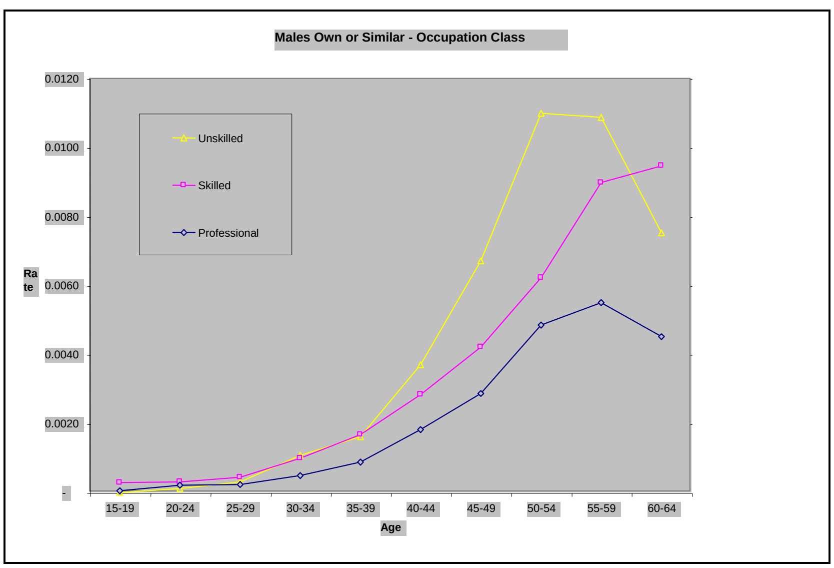
There is an increase in disability rates for increasing age and occupation with professionals having the lowest rates and unskilled workers having the highest. (The exception is the 15-34 age-band for unskilled occupational class, where the crude disability rate is lighter than for the skilled occupation class, possibly a result of the lack of data.) From the above table we note that in aggregate the rates for skilled and unskilled workers are approximately 165% and 192% respectively of professional occupation rates. Data from the unskilled occupation is very sparse (only 8% of total).

The rates for the professional, skilled and unskilled occupation classes are significantly higher than those from the 1991-1994 investigation with exception of the 55-64 age band where 1995-1999 rates are lower. The mix of occupation classes has changed significantly since the previous investigation. In 1991-1994 the mix of professional, skilled and unskilled was 9%, 29% and 62% respectively. This mix is now 47%, 45% and 8% respectively. It appears likely that both the mix of business by type of disability and the occupational definitions used by some or all of the companies involved have changed since the last investigation.

Table 4B Own and Similar1991-1994

1991-1994	Age Group	Claims	Exposure	Crude Rates
Professional	15-34	27	158,395	0.00017
	35-44	72	132,813	0.00054
	45-54	163	62,240	0.00262
	55-64	51	7,243	0.00704
	All	**313**	**360,692**	**0.00087**
Skilled	15-34	237	696,980	0.00034
	35-44	421	337,152	0.00125
	45-54	454	128,298	0.00354
	55-64	139	12,148	0.01144
	All	**1,251**	**1,174,578**	**0.00107**
Unskilled	15-34	753	1,364,456	0.00055
	35-44	1,537	744,707	0.00206
	45-54	2,149	322,100	0.00667
	55-64	622	43,306	0.01436
	All	**5,061**	**2,474,569**	**0.00205**
All		**6,625**	**4,009,839**	**0.00165**

Chart 2 Own and Similar



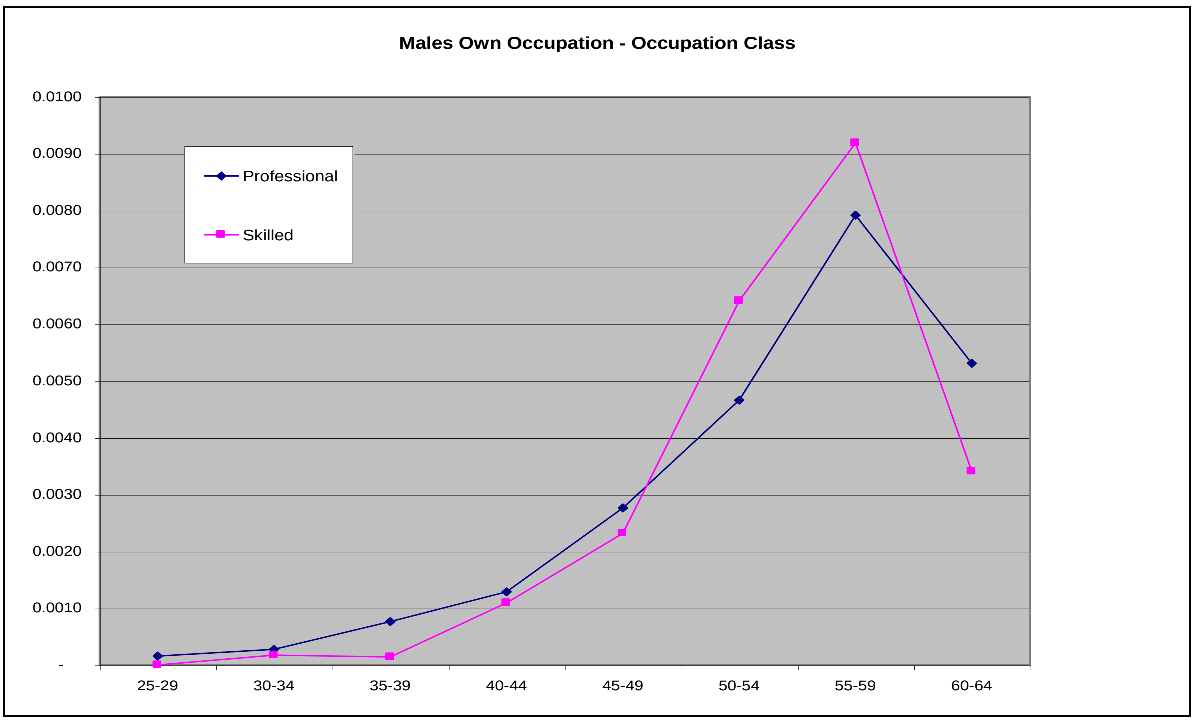
2.1.3. **Analysis by Disability Definition**

Table 5 Own Occupation – Professional 1995-1999

Age Group	Claims	Exposure	Crude Rates
15-34	50	222,567	0.00022
35-44	258	259,388	0.00099
45-54	371	108,595	0.00342
55-64	121	15,726	0.00769
Grand Total	**800**	**606,276**	**0.00132**

One would expect the crude rates for "own occupation" disability to be higher than those of "own and similar occupation" disability for professional occupation. However, this is not the case except for the 55-64 age band. The overall crude rate is 92% of that for own and similar occupation. A possible explanation is that the class of lives who purchase own occupation disability cover is a better risk class than those purchasing own or similar occupation disability cover although the occupational class is the same.

Chart 3 Own Occupation – Professional



2.1.4. **Analysis by Duration**

Table 6A Claims and exposure by duration and age bands (1991 – 1994)

Duration	Age Band	Claims	Exposure	Crude Rates	Ratios
0 - 1	15-34	51	491,261	0.00010	14%
	35-44	46	186,510	0.00025	11%
	45-54	64	63,975	0.00100	15%
	55-64	10	3,760	0.00266	18%
0 – 1 Total	All	171	745,507	0.00023	8%
1 - 2	15-34	147	400,727	0.00037	49%
	35-44	217	165,233	0.00131	61%
	45-54	228	60,098	0.00379	56%
	55-64	42	4,523	0.00929	63%
1 – 2 Total	All	634	630,581	0.00101	35%
2 – 3	15-34	182	350,347	0.00052	70%
	35-44	255	155,008	0.00165	76%
	45-54	317	58,724	0.00540	80%
	55-64	59	5,277	0.01118	75%
2 – 3 Total	All	813	569,356	0.00143	50%
3 – 4	15-34	149	290,035	0.00051	69%
	35-44	290	145,798	0.00199	92%
	45-54	316	57,968	0.00545	81%
	55-64	84	6,137	0.01369	92%
3 - 4 Total	All	839	499,939	0.00168	58%
4 - 5	15-34	138	220,617	0.00063	84%
	35-44	281	130,942	0.00215	100%
	45-54	372	56,317	0.00661	98%
	55-64	82	7,001	0.01171	79%
4 – 5 Total	All	873	414,877	0.00210	73%
5+	15-34	351	473,192	0.00074	100%
	35-44	963	447,727	0.00215	100%
	45-54	1,529	227,552	0.00672	100%
	55-64	564	38,023	0.01483	100%
5+ Total	All	3,407	1,186,494	0.00287	100%
All		**6,737**	**4,046,754**	**0.00166**	

Table 6B Claims and exposure by duration and age bands (1995 – 1999)

Duration	Age Band	Claims	Exposure	Crude Rates	Ratios
0 - 1	15-34	50	414,053	0.00012	17%
	35-44	56	182,738	0.00031	15%
	45-54	44	64,096	0.00069	14%
	55-64	5	3,643	0.00137	19%
0 – 1 Total	All	155	664,530	0.00023	8%
1 - 2	15-34	125	379,814	0.00033	45%
	35-44	205	193,899	0.00106	51%
	45-54	184	74,831	0.00246	50%
	55-64	27	6,467	0.00418	57%
1 – 2 Total	All	541	655,011	0.00083	29%
2 – 3	15-34	170	343,754	0.00049	68%
	35-44	311	200,497	0.00155	75%
	45-54	333	83,861	0.00397	81%
	55-64	51	9,684	0.00527	72%
2 – 3 Total	All	865	637,796	0.00136	47%
3 – 4	15-34	161	307,921	0.00052	72%
	35-44	364	204,659	0.00178	86%
	45-54	427	92,217	0.00463	95%
	55-64	88	13,058	0.00674	92%
3 - 4 Total	All	1,040	617,855	0.00168	59%
4 - 5	15-34	177	272,060	0.00065	89%
	35-44	383	205,824	0.00186	90%
	45-54	459	99,133	0.00463	95%
	55-64	158	15,973	0.00989	135%
4 – 5 Total	All	1,177	592,990	0.00198	69%
5 +	15-34	673	922,543	0.00073	100%
	35-44	3,001	1,459,032	0.00206	100%
	45-54	4,882	997,725	0.00489	100%
	55-64	1,830	249,929	0.00732	100%
5 + Total	All	10,386	3,629,229	0.00286	
All		**14,164**	**6,797,411**	**0.00208**	

There is a logical progression of disability rates for age and duration. From the table above it can be noted that in aggregate rates for duration 0 vary between 14% and 19% of the ultimate rates for different age bands. Although the above table clearly indicates the existence of positive selection we would caution against taking these percentages as accurate. It is likely that the very low duration 0 rates are as a result of a lack of correspondence between claims and exposure. (A similar pattern existed with the 1991-1994 investigation). The CSI committee is investigating the possibility that some of the participating life offices may have measured the date of claim from the end of the waiting period rather than from the actual date the disability event occurred. Reference to the aggregate rates should be made cautiously as the average age increases significantly over the different durations. The total increase from duration 0 to duration 5+ is approximately 7 years.

2.1.5. Analysis by Smoking Status

Table 7 Claims and exposure by smoking status and age bands

	Own/Similar Occupation						
	Non-Smoking			Smoking			
Age Band	**Claims**	**Exposure**	**Rates**	**Claims**	**Exposure**	**Rates**	**Ratio**
15-24	49	239,070	0.00020	29	98,005	0.00030	144%
25-29	129	479,203	0.00027	109	261,259	0.00042	155%
30-34	353	528,360	0.00067	352	319,255	0.0011	165%
35-39	619	502,002	0.00123	608	322,576	0.00188	153%
40-44	996	440,557	0.00226	900	252,892	0.00356	157%
45-49	1206	339,407	0.00355	956	171,802	0.00556	157%
50-54	1266	233,943	0.00541	887	101,484	0.00874	162%
55-59	794	115,858	0.00685	420	40,322	0.01042	152%
60-64	122	18,087	0.00675	54	2,751	0.01963	291%
Grand Total	**5,534**	**2,896,487**	**0.00191**	**4,315**	**1,570,346**	**0.00275**	**144%**

Approximately 28% of the data is unspecified. It is clear that smokers' disability rates exceed those of the non-smokers' at all ages. Looking at ages between 25 and 59 where the majority of the data is, the smoker/non-smoker ratio remains relatively constant, varying between 152% and 165%.

Table 8 Smokers/Non-Smokers

	Own and Similar Occupation			Own Occupation
Age Band	**Professional**	**Skilled**	**Unskilled**	**Professional**
15-34	195%	146%	397%	271%
35-44	179%	148%	137%	156%
45-54	183%	180%	152%	206%
55-64	170%	149%	110%	216%
Grand Total	**198%**	**164%**	**124%**	**205%**

The above data is very sparse for the unskilled occupation, as well as for the 15-34 age group for Own Occupation professional disability.

As expected, smoking appears to have the greatest effect on the professional occupation which has the lightest morbidity experience, and the least effect on the unskilled occupation which has the heaviest morbidity experience. Consequently, the smoker/non-smoker ratios for each occupation are in descending order: professional, skilled and unskilled. Although the data is sparse the smoker/non-smoker ratio for Own Occupation professionals is even greater than that for Own and Similar Occupation professionals.

Chart 4 Smoker Status - Own and Similar Occupation

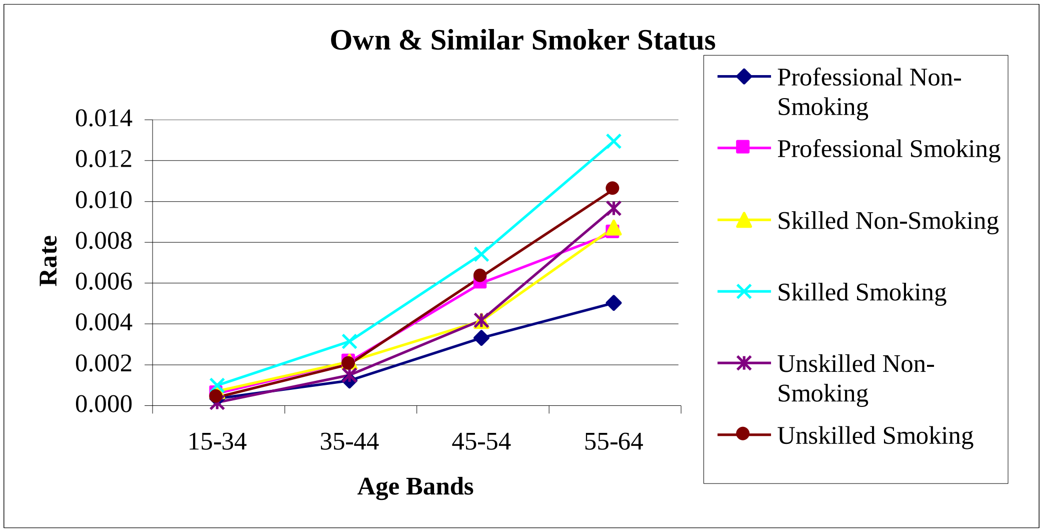
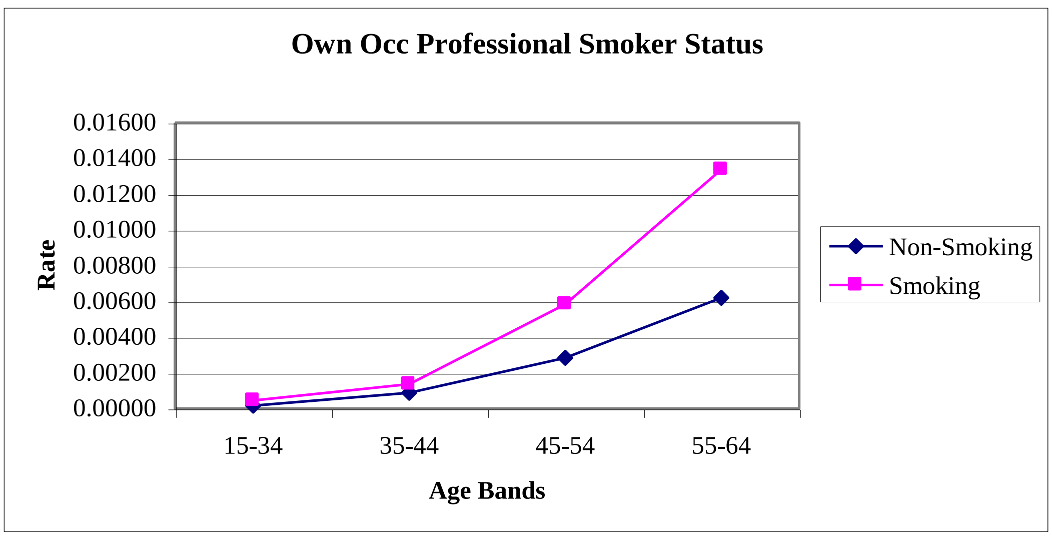
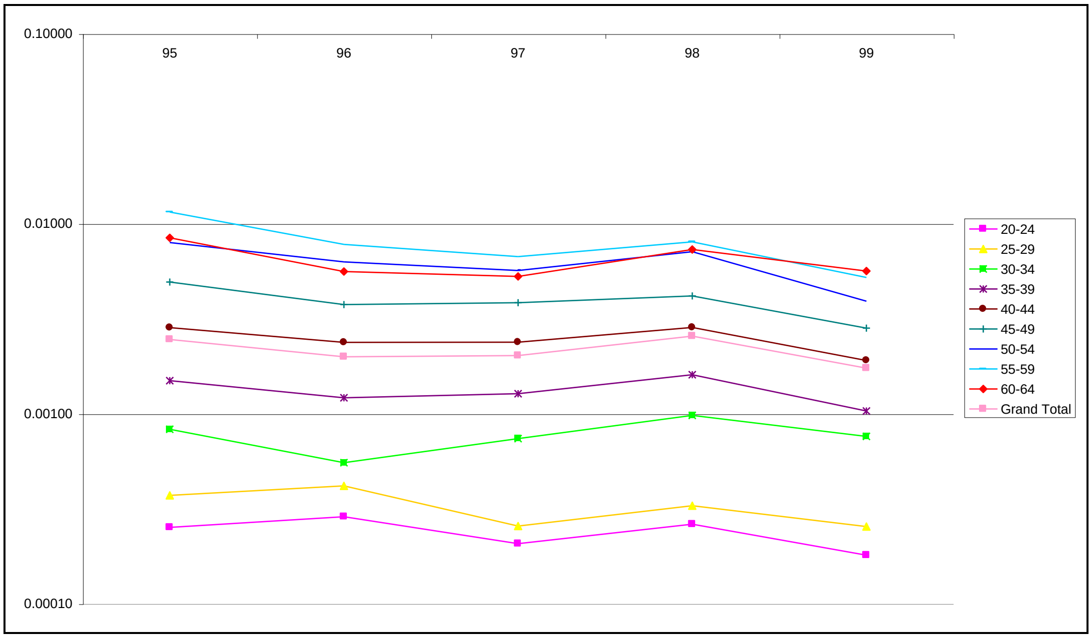


Chart 5 Smoker Status - Own Occupation



2.1.6. Progression of Rates over Time (Own/Similar)

Chart 6 Progression of rates over time (Own/Similar)



The chart above uses a log scale to show the trend in rates by age band over time for Own and Similar disability. As can be seen there is no clear pattern of rates over time. In general the two years with the worst experience are 1995 and 1998. It is possible that the 1999 results are lower as a result of claims which have been incurred but not yet reported.

2.1.7. Other Analyses

Table 9 Company Comparisons

Age Group	Co A RATES	Co B RATES	Co C RATES	Co D RATES
15 – 34	0.00036	0.00040	0.00048	0.0061
35 – 44	0.00118	0.00101	0.00183	0.00228
45 – 54	0.00347	0.00214	0.00699	0.00543
55 – 64	0.00564	0.00513	0.01673	0.00800
Grand Total	**0.00152**	**0.00130**	**0.00290**	**0.00249**

The table above and graph below show the variability of the crude disability rates between companies. It must be remembered that different companies sell to different target markets and there are differences by definition of disability, occupation class, claims and underwriting practices and policy wording amongst others.

Chart 7 Company Comparisons

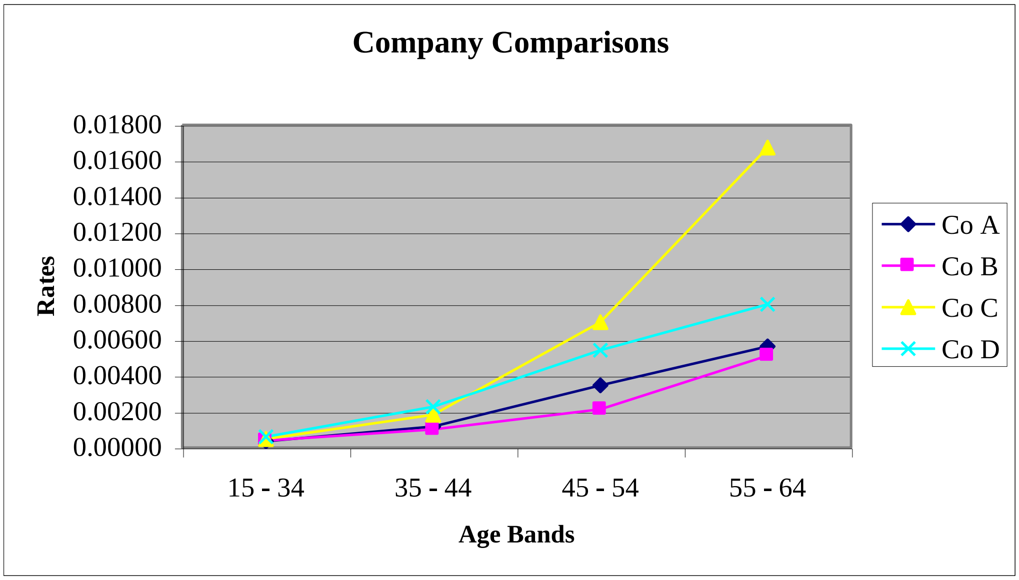
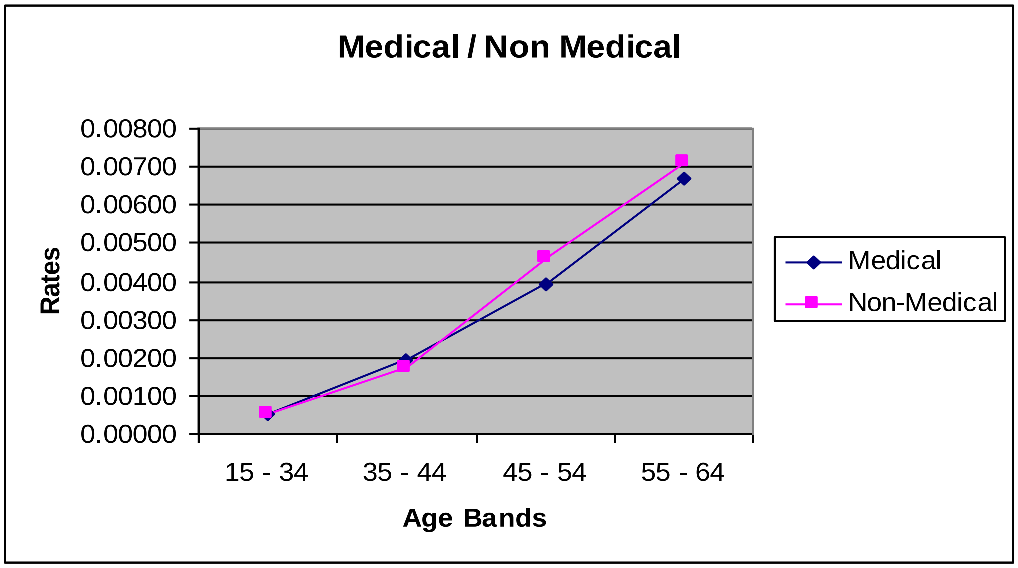
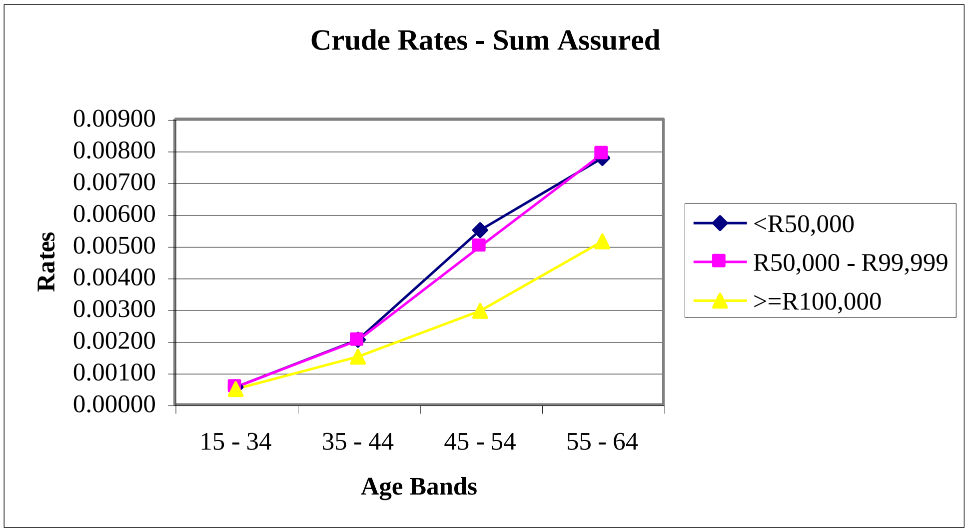


Chart 8 Medical Underwriting



As has been the case for several other CSI investigations, the medical underwriting does not necessarily produce lower experience. Medical underwriting appears to be more effective at the older ages, with crude rates for medically underwritten policies lower than those for non-medically underwritten polices from age 45 to age 64.

Chart 9 Sum Assured

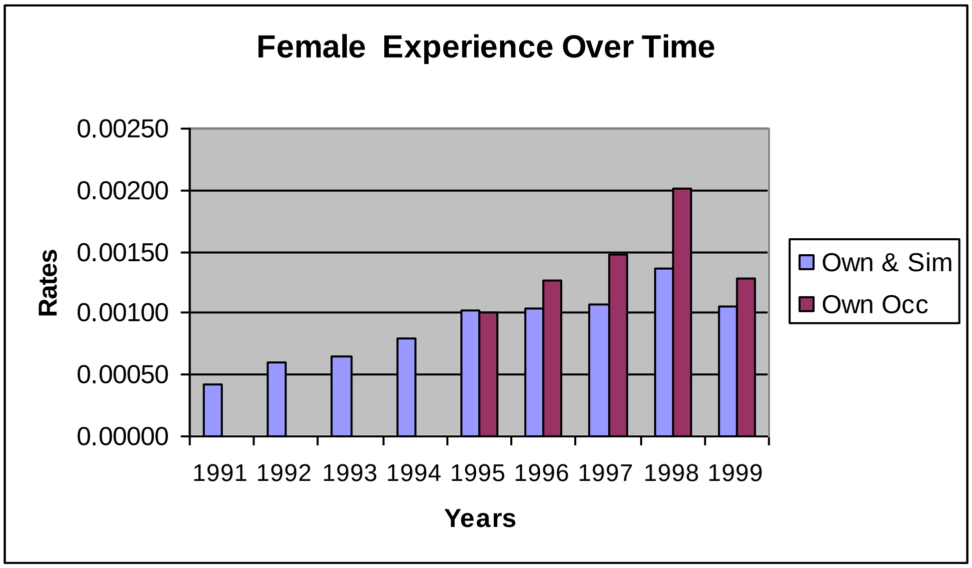


Policies with cover amounts greater than R100,000 clearly have significantly lighter experience than policies with lower cover. There is little difference between polices with sums assured less than R50,000 and those with sums assured between R50,000 and R100,000.

2.2. **Females**

Note: The data for females in this investigation is sparser than for males (exposure approximately 55% of the exposure for males).

Chart 10 Experience over time



2.2.1. **Analysis by Age**

Table 10

	1995-1999		
Age Group	**Claims**	**Exposure**	**Crude rates**
15-19	0	19,733	0
20-24	19	268,175	0.00007
25-29	119	631,879	0.00019
30-34	258	728,363	0.00035
35-39	481	695,682	0.00069
40-44	692	546,387	0.00127
45-49	842	374,853	0.00225
50-54	937	226,202	0.00414
55-59	600	98,294	0.00610
60-64	68	11,682	0.00582
All	**4,016**	**3,601,350**	**0.00112**

Table 11

1991-1994		
Claims	**Exposure**	**Crude rates**
2	31,591	0.00006
18	292,557	0.00006
58	451,615	0.00013
126	452,478	0.00028
193	349,923	0.00055
232	240,397	0.00097
282	150,096	0.00188
228	75,643	0.00301
148	23,757	0.00623
8	624	0.12820
1,295	**2,068,678**	**0.00063**

From the above tables we note that disability rates increase with increasing age. The 1995-1999 crude rates are higher than 1991-1994 crude rates at all ages where the data is significant except for the 55-59 age group. This is contrary to the pattern exhibited by males.

2.2.2. Analysis by Occupation

Table 12A Own and Similar 1995-1999

1995-1999	Age Group	Claims	Exposure	Crude Rates
Professional	15-34	265	1,232,434	0.00022
	35-44	703	860,297	0.00082
	45-54	1,044	385,698	0.00271
	55-64	361	63,952	0.00564
	All	**2,373**	**2,542,381**	**0.00093**
Skilled	15-34	101	298,390	0.00034
	35-44	301	239,251	0.00126
	45-54	468	129,051	0.00363
	55-64	210	25,034	0.00839
	All	**1,080**	**691,726**	**0.00156**
Unskilled	15-34	6	12,835	0.00047
	35-44	12	5,433	0.00221
	45-54	15	2,056	0.00730
	55-64	1	294	0.00340
	All	**34**	**20,618**	**0.00165**
	Total	**3,487**	**3,254,725**	**0.00107**

As expected, the rates from the skilled occupation are consistently higher than those of the professionals. The rates from the unskilled occupation are consistently higher than those for the skilled occupation, but these should be treated cautiously given the lack of data for unskilled occupation class.

Rates for all occupation classes and all ages, other than for the 55-64 age band for the professional and unskilled occupation classes, are significantly heavier for the 1995-1999 investigation than for 1991-1994 investigation. From the above table we note that in aggregate the rates for skilled and unskilled workers are approximately 168% and 177% respectively of professional occupation rates. It should be noted that the data for unskilled occupation class for 1995-1999 investigation is very sparse (less than 1%).

The mix of occupation classes has changed significantly since the previous investigation. In 1991-1994 the mix of professional, skilled and unskilled was 19%, 25% and 56% respectively. This mix is now 78%, 21% and 1% respectively. It appears likely that both the mix of business by type of disability and the occupational definitions used by some or all of the companies involved have changed since the last investigation.

Table 12B Own and Similar 1991-1994

1991-1994	Age Group	Claims	Exposure	Crude Rates
Professional	15-34	32	207,373	0.00015
	35-44	73	130,240	0.00056
	45-54	77	55,058	0.00140
	55-64	33	5,632	0.00586
	All	**215**	**398,303**	**0.00054**
Skilled	15-34	29	322,038	0.00009
	35-44	50	142,670	0.0035
	45-54	83	48,604	0.00171
	55-64	19	3,747	0.00507
	All	**181**	**517,058**	**0.00035**
Unskilled	15-34	143	696,898	0.00021
	35-44	301	315,961	0.00095
	45-54	347	121,400	0.00286
	55-64	104	14,908	0.00698
	All	**895**	**1,149,166**	**0.00078**
	Total	**1,291**	**2,064,527**	**0.00063**

2.2.3. **Analysis by Disability Definition**

Table 13 Own Occupation – Professional 1995-1999

Age Group	Claims	Exposure	Rates
15-34	48	180,000	0.00027
35-44	191	134,802	0.00142
45-54	212	44,598	0.00475
55-64	54	5,310	0.01017
All	**505**	**364,710**	**0.00138**

As expected, the Own Occupation disability definition has higher rates than the Own/Similar type for professionals. This is contrary to the experience for male lives. It should be noted that exposure from the Own Occupation disability is about 18% of the exposure from the Own/Similar disability definition. The aggregate crude rate for own occupation disability is 148% of that for Own/Similar occupation disability.

2.2.2. **Analysis by Duration**

2.2.4. **Analysis by Duration**

Table 14 A Claims and exposure by duration and age bands ***(1991 – 1994)***

Duration	Age Band	Claims	Exposure	Crude Rates	Ratios
0 - 1	15-34	11	284,075	0.00004	12%
	35-44	14	103,716	0.00013	12%
	45-54	11	32,123	0.00034	11%
	55-64	2	1,755	0.00114	13%
0 – 1 Total	All	38	421,669	0.00009	7%
1 - 2	15-34	29	234,497	0.00012	39%
	35-44	45	91,945	0.00049	44%
	45-54	39	30,778	0.00127	42%
	55-64	5	2,106	0.00237	28%
1 – 2 Total	All	118	359,325	0.00033	26%
2 – 3	15-34	40	203,983	0.00020	61%
	35-44	67	85,184	0.00079	72%
	45-54	78	30,347	0.00257	86%
	55-64	7	2,567	0.00273	32%
2 – 3 Total	All	192	322,080	0.00060	47%
3 – 4	15-34	32	168,560	0.00019	59%
	35-44	58	78,016	0.00074	68%
	45-54	65	29,207	0.00223	74%
	55-64	20	2,818	0.00710	83%
3 - 4 Total	All	175	278,602	0.00063	50%
4 - 5	15-34	25	127,203	0.00020	62%
	35-44	60	66,901	0.00090	82%
	45-54	88	26,924	0.00327	109%
	55-64	18	3,038	0.00592	69%
4 – 5 Total	All	191	224,067	0.00085	68%
5 - 6	15-34	67	209,923	0.00032	100%
	35-44	181	164,555	0.00110	100%
	45-54	229	76,360	0.00300	100%
	55-64	104	12,098	0.00860	100%
5 – 6 Total	All	581	462,935	0.00126	100%
All		**1,295**	**2,068,678**	**0.00063**	

Table 14 B Claims and exposure by duration and age bands (1995 – 1999)

Duration	Age Band	Claims	Exposure	Crude Rates	Ratios
0 - 1	15-34	12	255,886	0.00005	13%
	35-44	22	105,565	0.00021	18%
	45-54	17	32,548	0.00052	16%
	55-64	3	1,507	0.00199	33%
0 – 1 Total	All	54	395,506	0.00014	8%
1 - 2	15-34	26	238,119	0.00011	30%
	35-44	47	112,818	0.00042	36%
	45-54	53	38,406	0.00138	41%
	55-64	14	2,779	0.00504	84%
1 – 2 Total	All	140	392,122	0.00036	22%
2 – 3	15-34	50	220,353	0.00023	62%
	35-44	85	120,293	0.00071	61%
	45-54	115	44,531	0.00258	77%
	55-64	28	4,325	0.00647	109%
2 – 3 Total	All	278	389,502	0.00071	43%
3 – 4	15-34	55	199,254	0.00028	75%
	35-44	125	123,297	0.00101	88%
	45-54	149	49,947	0.00298	89%
	55-64	44	5,940	0.00741	124%
3 - 4 Total	All	373	378,438	0.00099	60%
4 - 5	15-34	47	174,295	0.00027	73%
	35-44	132	121,374	0.00109	94%
	45-54	156	52,781	0.00296	88%
	55-64	55	7,538	0.00730	122%
4 – 5 Total	All	390	355,988	0.00110	67%
5 - 6	15-34	206	560,343	0.00037	100%
	35-44	762	658,722	0.00116	100%
	45-54	1,289	382,842	0.00337	100%
	55-64	524	87,887	0.00596	100%
5 – 6 Total	All	2,781	1,689,794	0.00165	
All		**4,016**	**3,601,350**	**0.00112**	

There is a logical progression of disability rates for age and duration. From the table above it can be noted that in aggregate, rates for duration 0 vary between 13% and 33% of the ultimate rates. Although the above table clearly indicates the existence of positive selection we would caution against taking these percentages as accurate. It is possible that the very low duration 0 rates may be as a result of a lack of correspondence between claims and exposure. The CSI committee is investigating the possibility that some of the participating life offices may have measured the date of claim from the end of the waiting period rather than from the actual date the disability event occurred.

Reference to the aggregate rates should be made cautiously as the average age increases significantly over the different durations. The total increase from duration 0 to duration 5+ is approximately 7 years.

2.2.5. **Analysis by Smoking Status**

Table 15 Claims and exposure by smoking status and age bands

	Own/Similar						
	Non-Smoking			Smoking			
Age Group	Claims	Exposure	Rates	Claims	Exposure	Rates	Ratio
15-24	16	204,984	0.00008	1	36,276	0.00003	35%
25-29	72	389,471	0.00018	14	79,942	0.00018	95%
30-34	146	397,846	0.00037	44	89,378	0.00049	134%
35-39	246	356,419	0.00069	102	91,869	0.00111	161%
40-44	322	272,370	0.00118	162	72,216	0.00227	192%
45-49	388	182,952	0.00212	183	47,335	0.00387	182%
50-54	421	109,204	0.00386	159	26,435	0.00601	156%
55-59	259	48,006	0.00540	91	9,657	0.00942	175%
60-64	35	4,311	0.00812	9	651	0.01382	170%
Grand Total	**1,905**	**1,965,563**	**0.00097**	**765**	**452,759**	**0.00169**	**174%**

It is clear that the rates for smokers are greater than those of non-smokers as expected (except between ages 15 and 29 where the data is relatively insignificant). Approximately 29% of the data is unspecified.

Table 16 Smokers/Non-Smokers

	Own and Similar Occupation			Own Occupation
Age Band	Professional	Skilled	Unskilled	Professional
15-34	125%	111%	n/a	108%
35-44	180%	190%	n/a	228%
45-54	189%	137%	n/a	177%
55-64	171%	143%	n/a	162%
Grand Total	**198%**	**151%**	n/a	**212%**

There is not enough data to provide any analysis for the unskilled occupation and the data is very sparse for the 15-34 and 55-64 age groups for Own Occupation professional disability.

As expected, smoking appears to have the greatest effect on the professional occupation which has the lightest morbidity experience, and the least effect on the skilled occupation which has the heaviest morbidity experience. Consequently, the smoker/non-smoker ratios for each occupation are in descending order: professional and skilled. Although the data is sparse the smoker/non-smoker ratio for Own Occupation professionals is even greater than that for Own and Similar Occupation professionals.

Chart 11 Smoker Status – Own and Similar Occupation

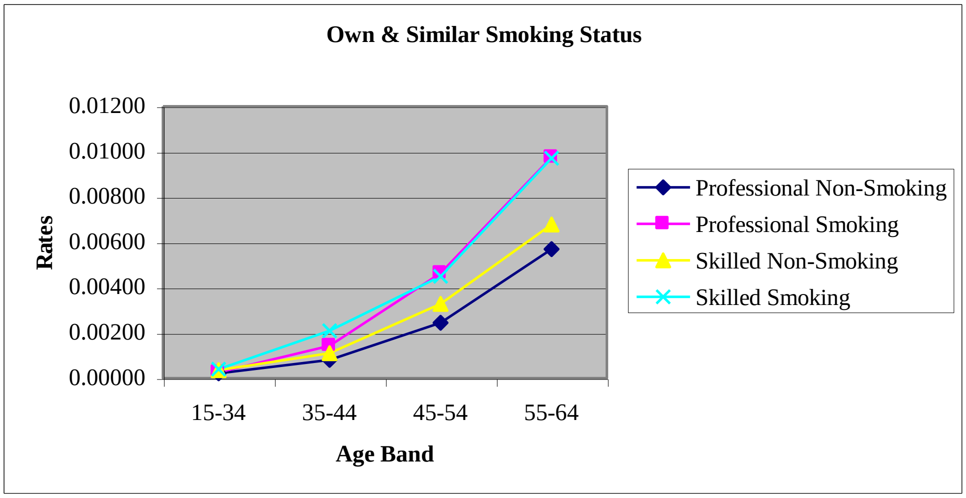
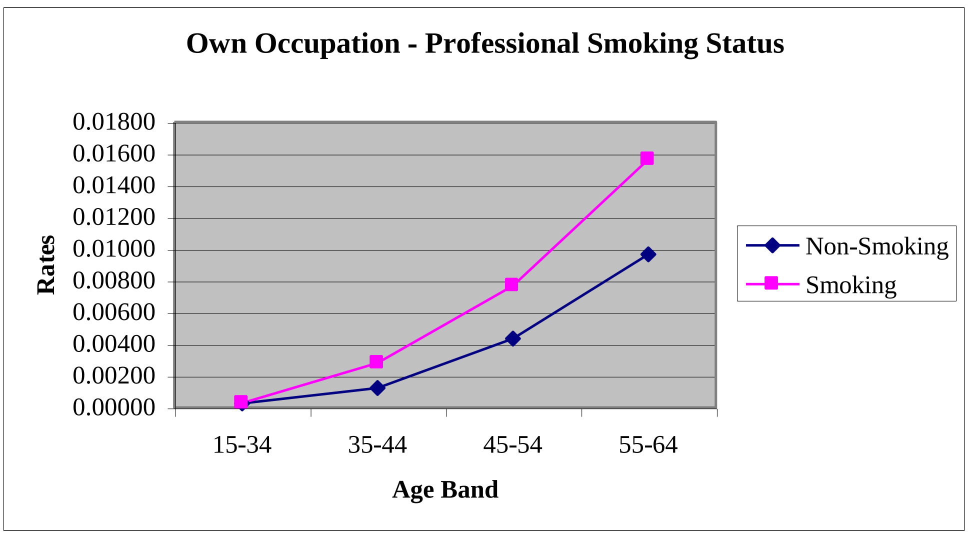


Chart 12 Smoker Status – Own Occupation



2.2.6. **Other Analyses**

Table 17 Company Comparisons

Age Group	Co A RATES	Co B RATES	Co C RATES	Co D RATES
15 – 34	0.00012	0.00027	0.00027	0.00029
35 – 44	0.00047	0.00104	0.00083	0.00122
45 – 54	0.00201	0.00236	0.00290	0.00357
55 – 64	0.00413	0.00542	0.01673	0.00669
Grand Total	**0.00065**	**0.00110**	**0.00117**	**0.00113**

The table above and graph below show a relatively similar pattern to that observed for males but with significantly less variability. As for males, Company C appears to have the highest crude rates. It must, however, be remembered that different companies sell to different target markets and there are differences by definition of disability, occupation class, claims and underwriting practices and policy wording amongst others.

Chart 13 Company Comparisons

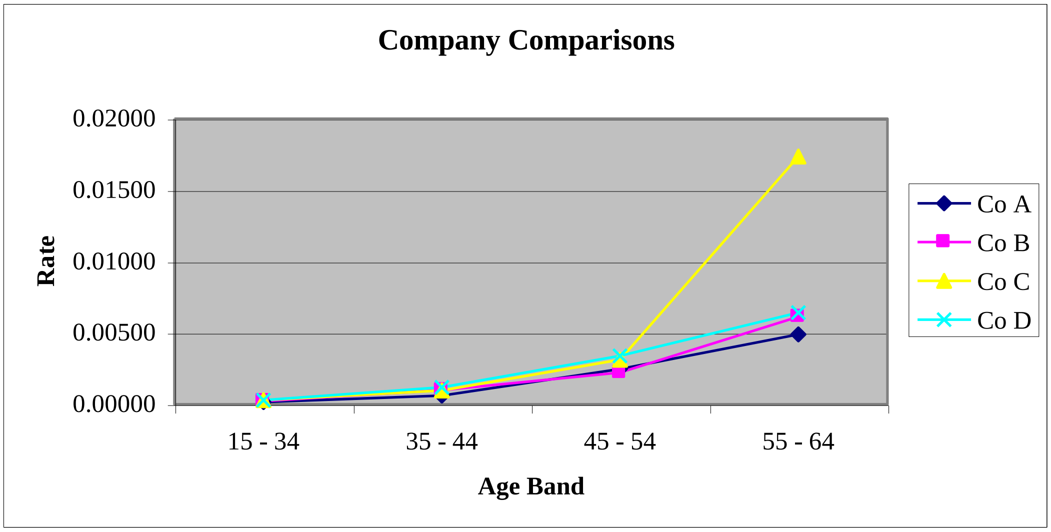
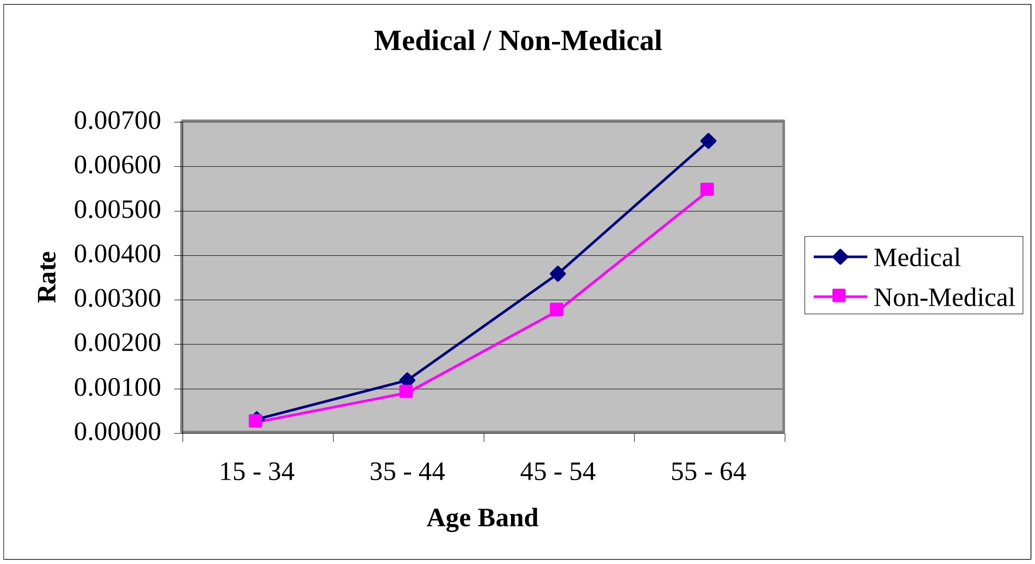
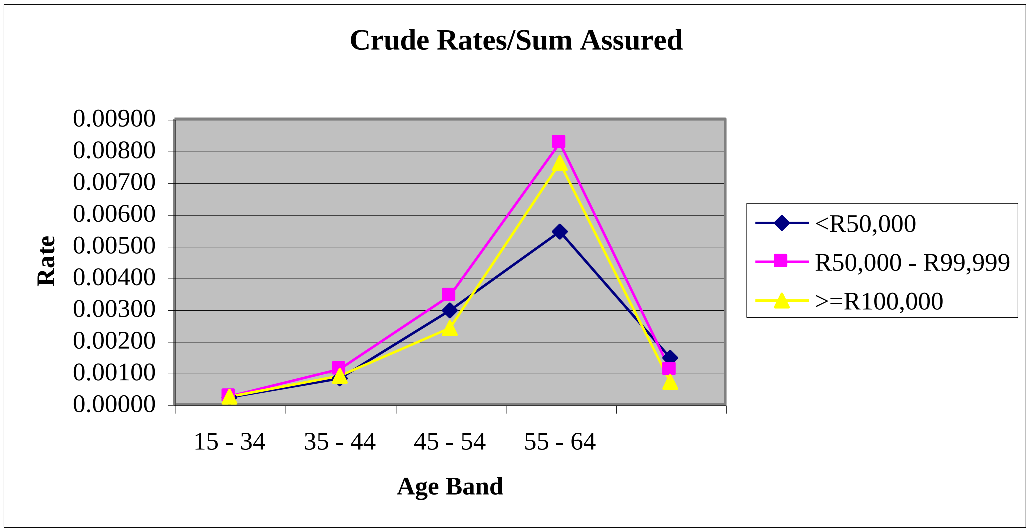


Chart 14 Medical Underwriting



The crude rates for policies which are medically underwritten are clearly higher than those where no medical underwriting has taken place. There is no evidence of medical underwriting leading to lower experience even at the older ages and this implies that either the medical underwriting is ineffective or some anti-selection exists.

Chart 15 Sum Assured



For males, policies with cover amounts greater than R100,000 had the lightest experience. This pattern does not appear for females and there is no indication of a significant difference in experience due to size of sum assured.

2.3. Males vs. Females

2.3.1. Comparisons on Disability Definition and Occupation

Table 22 Own Occupation - Professional

	Own Occupation-Professional-Females			Own Occupation-Professional-Males			Ratio
Age Band	**Claims**	**Exposure**	**Rates**	**Claims**	**Exposure**	**Rates**	**F:M**
25-29	10	71,245	0.00014	12	75,366	0.00016	**88%**
30-34	38	98,647	0.00038	38	136,727	0.00028	**139%**
35-39	77	79,528	0.00097	110	141,336	0.00078	**124%**
40-44	114	54,005	0.00211	148	112,111	0.00132	**160%**
45-49	118	29,863	0.00395	197	68,843	0.00286	**138%**
50-54	94	14,488	0.00649	174	36,092	0.00482	**135%**
55-59	53	5,007	0.01056	114	14,301	0.00797	**133%**
Grand Total	**504**	**352,783**	**0.00143**	**793**	**584,776**	**0.00136**	**135%**

Females have higher rates in this type of disability insurance.

Table 23 Own and Similar Occupation - Professional

	Own/Similar-Professional-Females			Own/Similar-Professional-Males			Ratio
Age Band	**Claims**	**Exposure**	**Rates**	**Claims**	**Exposure**	**Rates**	**F:M**
25-29	83	476,454	0.00017	101	430,487	0.00023	**74%**
30-34	169	536,071	0.00031	258	525,557	0.00049	**64%**
35-39	302	486,973	0.00062	457	518,358	0.00088	**70%**
40-44	401	369,923	0.00108	768	419,077	0.00183	**59%**
45-49	477	243,638	0.00196	855	297,019	0.00288	**68%**
50-54	567	140,417	0.00404	894	182,721	0.00489	**83%**
55-59	335	57,691	0.00581	433	78,172	0.00554	**105%**
Grand Total	**2,334**	**2,311,167**	**0.00101**	**3,766**	**2,451,391**	**0.00154**	**84%**

Males' rates are higher in this definition of disability in terms of the professional occupation.

Table 24 Own and Similar Occupation - Skilled

	Own/Similar-Skilled Female			Own/Similar-Skilled-Males			Ratio
Age Band	**Claims**	**Exposure**	**Rates**	**Claims**	**Exposure**	**Rates**	**F:M**
25-29	24	91,978	0.00026	167	379,730	0.00044	**59%**
30-34	55	111,246	0.00049	485	480,915	0.00101	**49%**
35-39	108	116,418	0.00093	791	473,093	0.00167	**55%**
40-44	171	98,275	0.00174	1092	381,288	0.00286	**61%**
45-49	235	71,742	0.00328	1137	279,744	0.00406	**81%**
50-54	205	45,200	0.00453	1079	180,792	0.00597	**76%**
55-59	147	21,072	0.006987	732	83,202	0.00880	**79%**
Grand Total	**945**	**555,931**	**0.0017**	**5,483**	**2,258,764**	**0.00243**	**73%**

Males' rates are also higher when comparing in terms of the skilled occupation.

3. CONCLUDING REMARKS

- The mix of occupation classes has changed significantly since the previous investigation. It appears likely that both the mix of business by type of disability and the occupational definitions used by some or all of the companies involved have changed since the last investigation. The impact of the likely change in occupational definitions should be taken into account when comparisons are made with the previous investigation.
- The experience appears to have deteriorated below age 55 and improved at the older ages since the previous investigation. This is most apparent when comparing by occupation and age band.
- Female experience is lighter than that for males, the difference being more marked at higher ages. The exception is the own occupation professional class where female morbidity is significantly heavier.
- Analysis by the various categories tends to produce similar results for males and females.
- Unlike recent mortality analysis the experience does deteriorate with duration, as one would expect. It is likely that the very low duration 0 rates are as a result of a lack of correspondence between claims and exposure. The CSI committee is investigating the possibility that some of the participating life offices may have measured the date of claim from the end of the waiting period rather than from the actual date the disability event occurred.
- Contrary to expectation the experience for females is heavier for policies with medical underwriting. This may be due to a greater awareness of benefits or some form of anti-selection. There is no clear pattern for policies with different levels of sum assured.
- Contrary to expectation the own occupation experience for males is lighter than that for own and similar occupation at all ages below age 55. For females as expected the own occupation experience is heavier than that for own and similar occupation at all ages.
- For males the experience appears lighter for policies with medical underwriting for ages above age 40 and high sums assured at all ages.
- Smokers have heavier experience than non-smokers.
- The smoker differential is highest for the occupations with the lightest experience; own occupation professional, own and similar occupation professional, skilled and unskilled in descending order of smoker differentials.

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OCTOBER 2002