

ACTUARIAL SOCIETY OF SOUTH AFRICA
REPORT
of the
CONTINUOUS STATISTICAL INVESTIGATIONS COMMITTEE

DREAD DISEASE INVESTIGATION
1995-1999

1 Introduction

1.1 Previous Investigation

This Dread Disease investigation covering the period 1995 to 1999 is the second carried out by the CMI committee. The previous investigation covers the period 1991 to 1994.

1.2 Exposed-to-Risk Calculation

The Exact Method of calculating the exposed-to-risk was used. This investigation is by number of policy year exposure and not by amounts to be paid out on dread disease claims. The exposure by age and sex is shown in table 1.2 below.

Table 1.2

Age Group	Male			Female		
	Exposure	Claims	Crude Rates	Exposure	Claims	Crude Rates
0-19	13,507	2	0.0001	10,068	1	0.0001
20-24	143,427	35	0.0002	125,663	29	0.0002
25-29	357,914	140	0.0004	286,081	81	0.0003
30-34	400,693	276	0.0007	284,833	162	0.0006
35-39	346,301	419	0.0012	229,839	196	0.0009
40-44	252,754	567	0.0022	156,957	223	0.0014
45-49	160,753	625	0.0039	91,417	222	0.0024
50-54	87,270	558	0.0064	44,636	154	0.0035
55-59	35,204	316	0.0090	15,583	62	0.0040
60-64	7,551	89	0.0118	2,813	17	0.0060
65+	92	1	0.0109	21	1	0.0476
	1,805,466	3,028	0.0017	1,247,911	1148	0.0009

1.3 Data

This investigation includes data from Liberty, Sanlam, Momentum and Old Mutual. One other company did provide data, which was excluded due to concerns regarding data quality.

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.

1.4 Scope of investigation

The investigation covers individual policies with dread disease riders.

1.5 Data Categories

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

- (a) Calendar Year
- (b) Company Code
- (c) Age
- (d) Sex
- (e) Type of Medical Underwriting
- (f) HIV Testing / Exclusion Clause
- (g) Smoking / Non-Smoking
- (h) Level of Sum Assured
- (i) Cause of Dread Disease Claim
- (j) Duration

We were able to analysis experience by all these categories to some degree, although a number did contain a much higher proportion of unspecified than would be ideal. Improved data quality may allow more meaningful analysis to be carried out in the future.

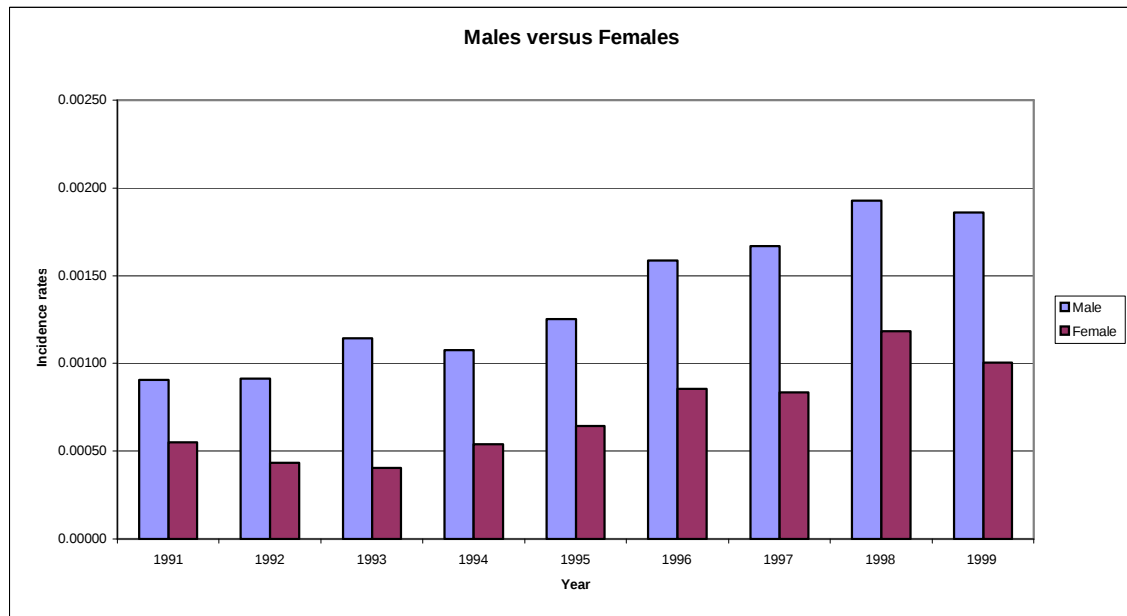
1.6 Consistency of Benefit Definitions

The definitions and number of specific dread diseases covered differ between companies and evolve over time. However these differences tend to be at the margins and the events giving rise to claims are reasonably consistent across companies and years. While the impact on this and previous investigations is marginal, this may not be the case in the future.

2 Results

2.1 General Trends

Graph 2.1



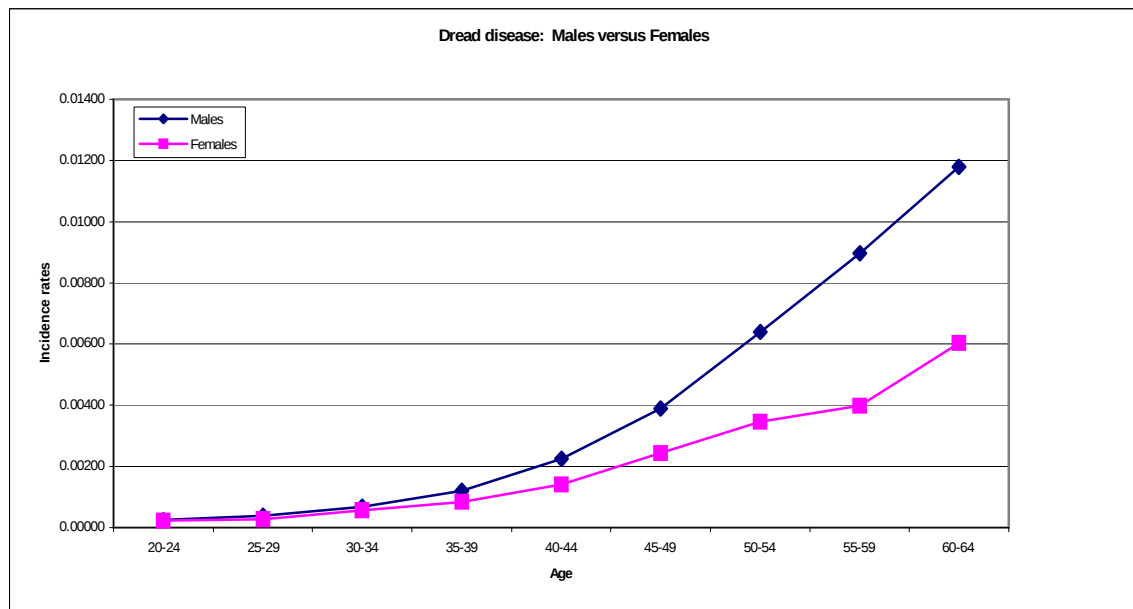
Graph 2.1 shows the trend in aggregate rates from the start of the previous investigation until the end of the current one.

The figures show a steady deterioration for both males and females since 1991. There appears to be a suggestion of an improvement during 1999 but this is probably due to all 1999 claims not being processed at the time the data was prepared.

Whereas there has been a slight increase in the average age over the period it has remained in the mid-30's and would not have a material impact on the above graph.

2.2 Males versus Females

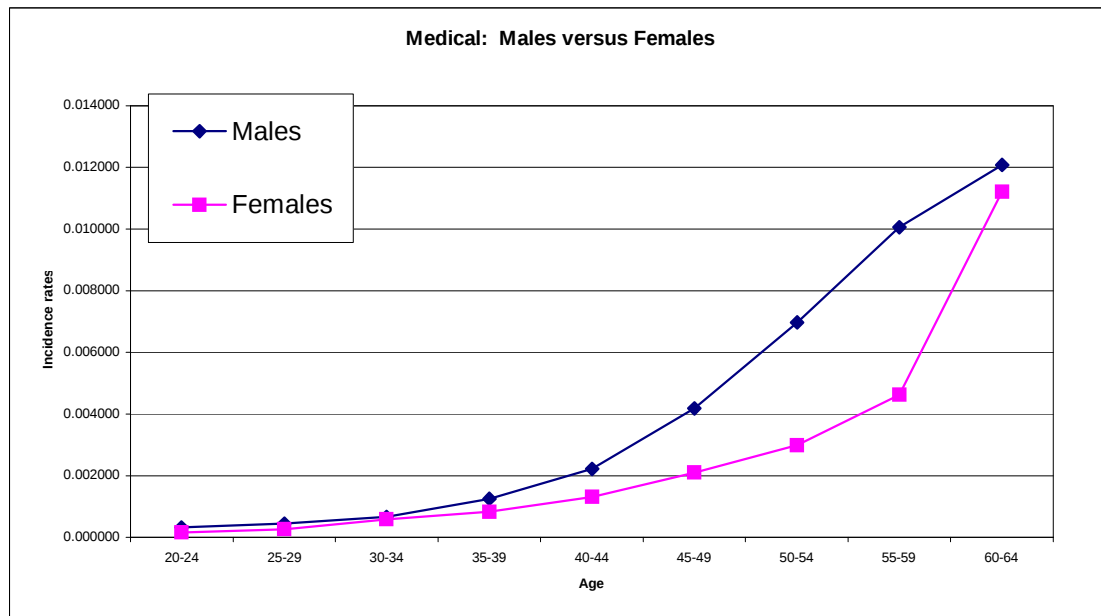
Graph 2.2.1



Graph 2.2.1 compares total male and total female experience over the period of the latest investigation.

The female experience is lighter than that for males, the difference increasing with age. At the younger ages, the female rates are around 95% of male rates, reducing to 50% at the older ages.

Graph 2.2.2

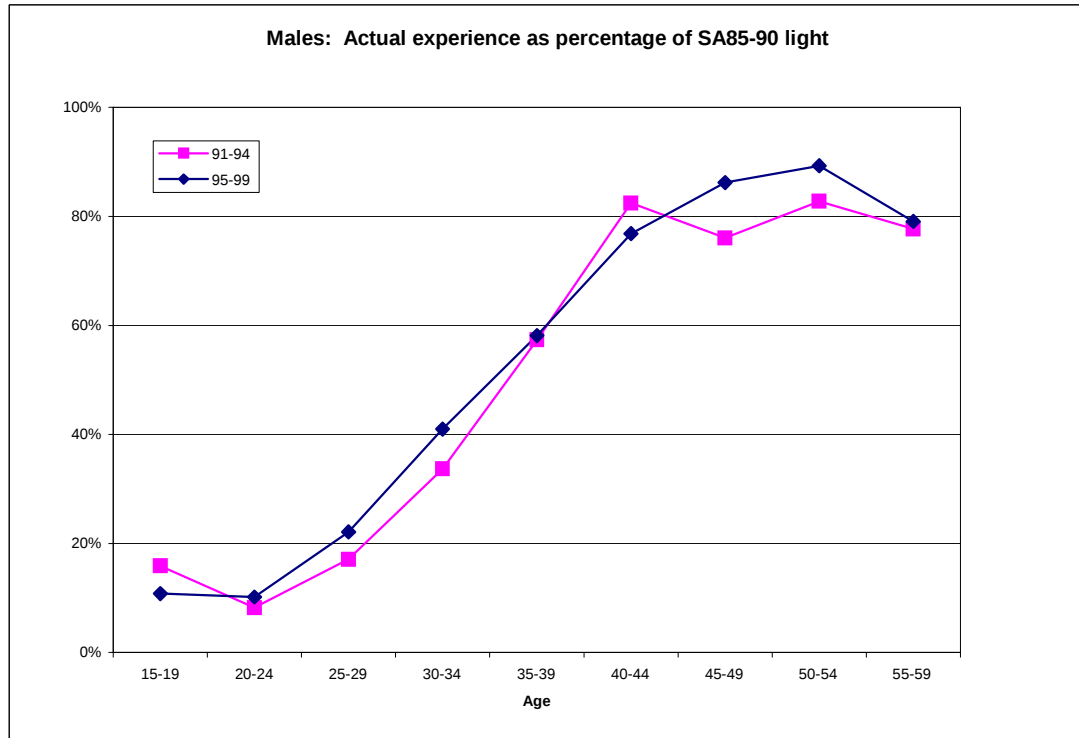


The above graph shows a similar picture to the aggregate graph. There does seem to be a suggestion that the experience is converging at the higher ages but this is more a function of small data volumes than genuine experience.

2.3 Males

2.3.1 Experience versus Standard Table

Graph 2.3.1



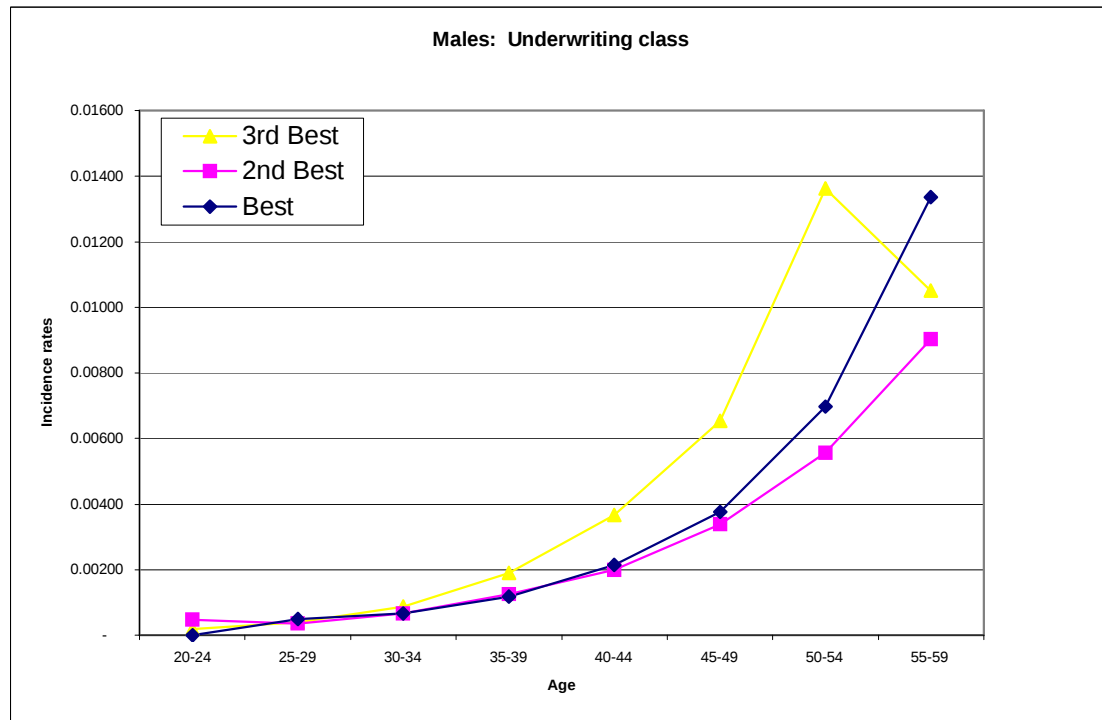
There is no standard table for dread disease in South Africa so comparisons have been made with the mortality table, SA 85-90 light.

The dread disease rate increases as a percentage of the mortality rate as age increases. This seems reasonable given that the proportion of death due to accident and violence will reduce with age and the dread disease rate will be related to the deaths due to sickness.

Although the relationship between the mortality and dread disease rates seems reasonable there is no easily definable relationship between the two.

2.3.2 Underwriting Class

Graph 2.3.2



Around 50% of the data did not specify the underwriting class and limited conclusions can be drawn from the above graph. Moreover the data at the old ages is very limited and no significance should be attached to the fall in the observed rates for the 3rd best class in the 55-59 age band.

Apart from the very early ages, where data is again limited, the 3rd best category has experienced the highest rates, as is seen in the mortality investigation.

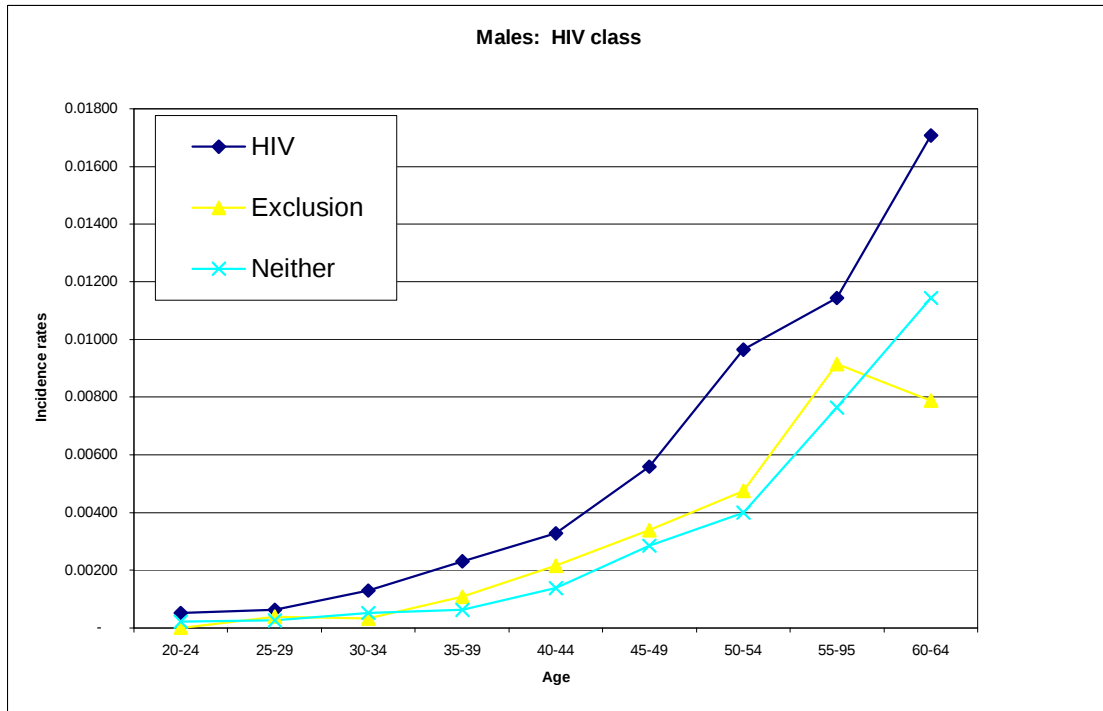
As a whole the best class appears to show heavier experience than the 2nd best class, which is counter-intuitive. However, in the key category in terms of weight of exposure 35-39, the best class has the lightest experience and in fact the aggregate rate across all ages is lowest for the best class.

It should be borne in mind that the difference between the best and 2nd best classes can be very small, especially when data from a number of companies is combined. Moreover limited credibility can be attached to the best results given the limited quantity of date, just over 100,000 years exposure.

The correlation between smoking status and underwriting class was investigated and showed that the percentage of smokers was 26% for the best class, 32% for second best and 33% for third. It would appear that this is not a major factor.

2.3.3 HIV Testing

Graph 2.3.3

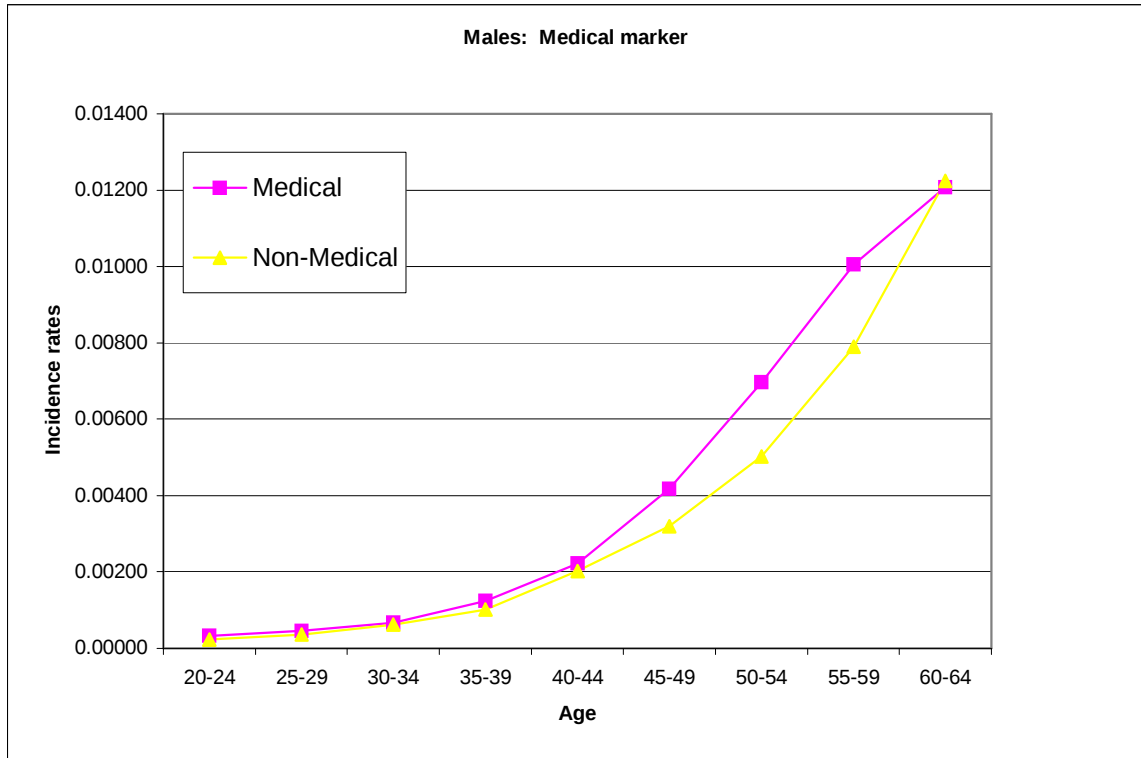


Again around 50% of the data did not specify if the insured was HIV tested or not and hence the results should be viewed with this in mind.

The results suggest that HIV tested lives have heavier experience than policies with exclusions, which in turn have higher experience than policies with neither a HIV test nor exclusion. It is not clear how one would expect HIV tested cases to compare with policies with exclusion but one would expect both of these to show lighter experience than the neither category.

2.3.4 Medical Status

Graph 2.3.4



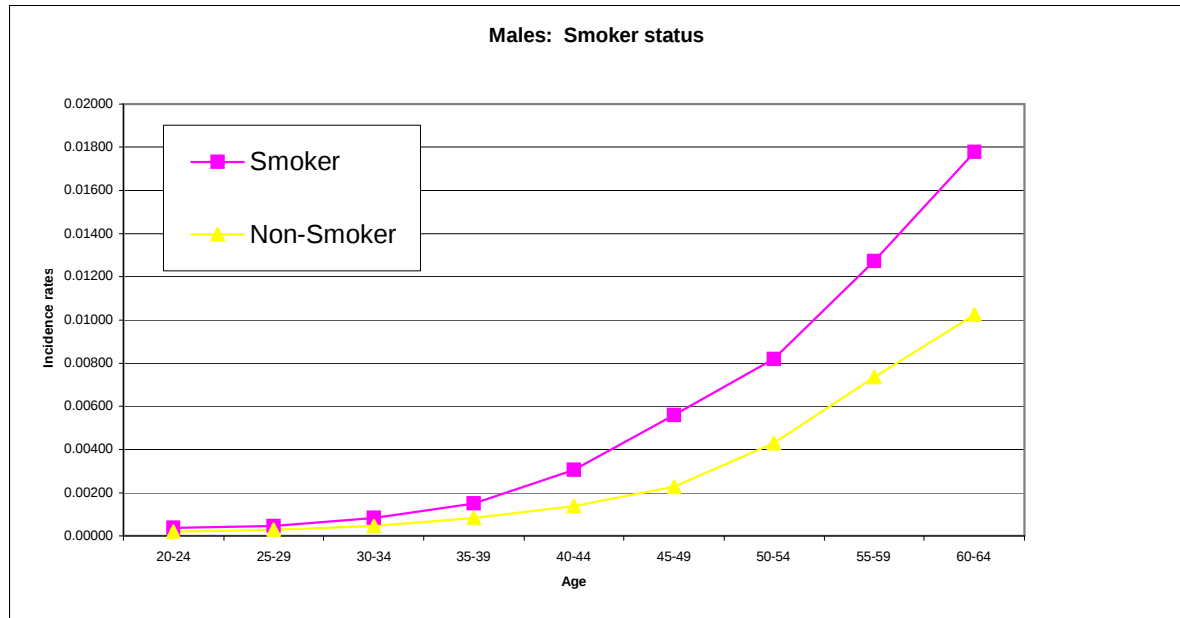
Overall the non-medical rate is around 70% of the medical rates, the difference being lowest in the key 30-45 age bands.

It is not clear why the non-medical experience should be lighter than the medical and intuitively one would expect the latter to show the lighter experience.

It is possible that the medical business relates to cases with higher sums insured, which experience higher dread disease rates (see 2.3.7).

2.3.5 Smoker Status

Graph 2.3.5



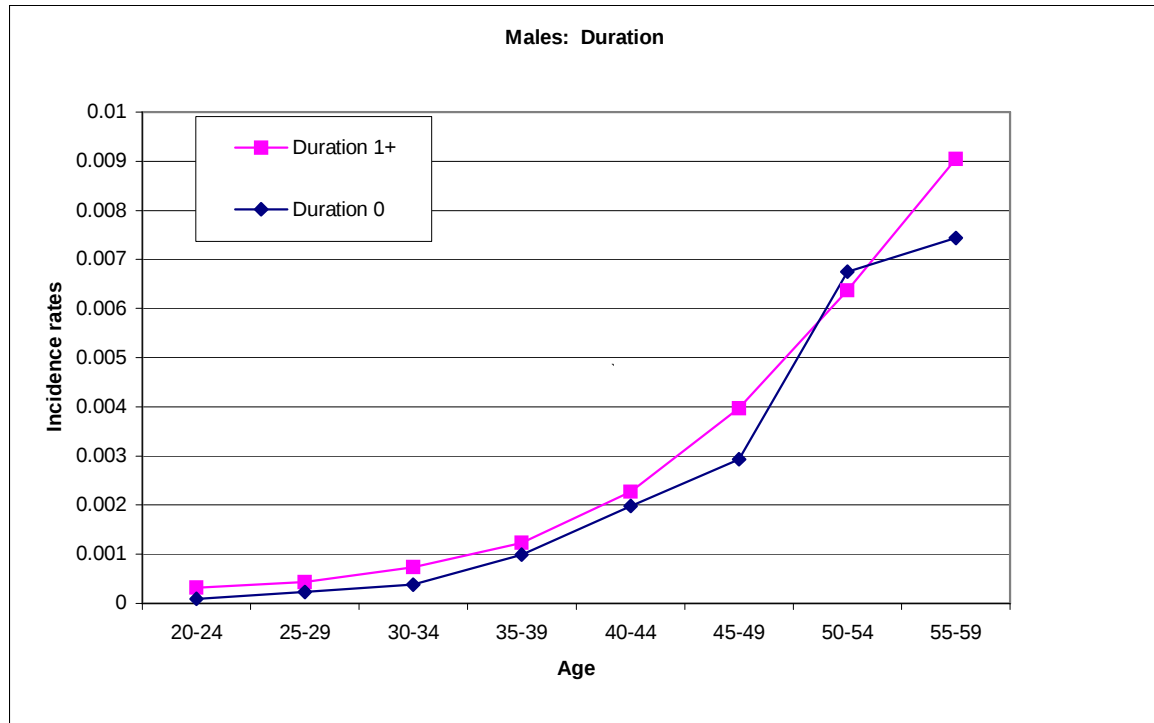
As one would expect smokers show heavier Dread Disease than non-smokers. The smoker rates are around 150% of non-smokers at very young ages, increasing to 250% at age 45 then reducing to 175% at older ages. This is a similar relationship to that seen between smokers and non-smokers for mortality experience.

One would expect the difference between smokers and non-smokers to be more pronounced for dread disease than for mortality as the risk of almost all dread diseases increase with smoking. This is not the case with death where certain risks, such as accidents, are not directly linked to smoking status.

This theory is borne out by the above figures.

2.3.6 Duration in force

Graph 2.3.6



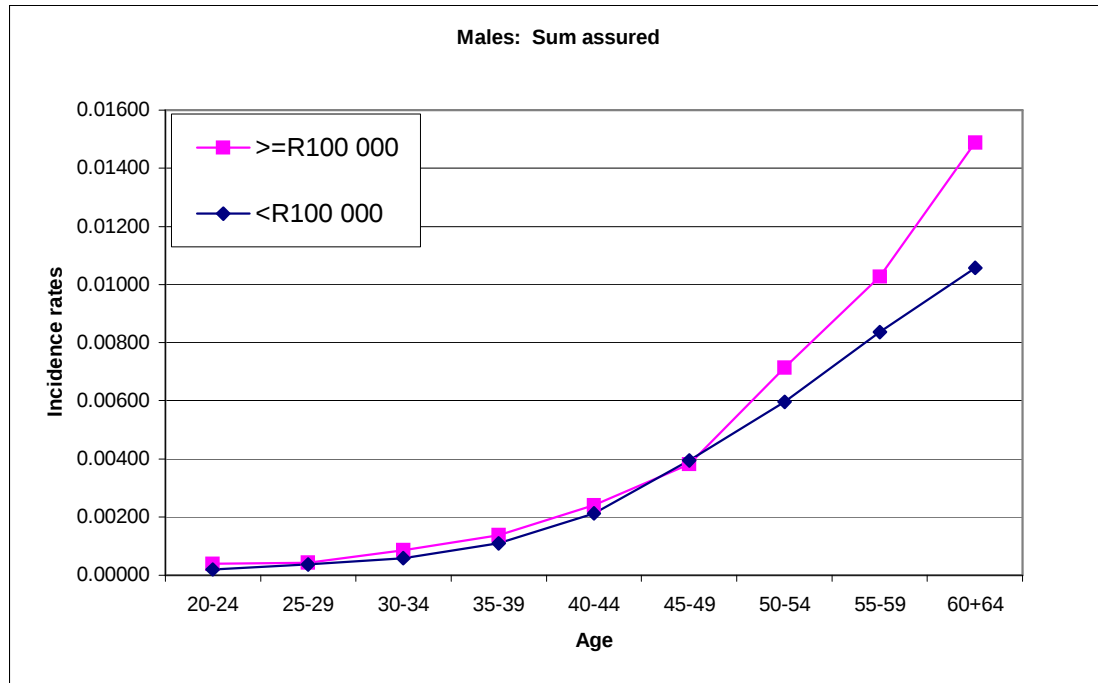
Graph 2.3.6 shows the impact of increased duration on Dread Disease rates. With the exception of the 50-54 age band the experience is clearly heavier for the longer duration. Limited value should be attached to the 50-54 age band as this has a very limited amount of data and the anomaly is caused by a high number of claims for one company.

The above graph demonstrates a “normal” selection effect with the lives that were underwritten most recently having better experience. When the Duration 1+ figures were split out further one would clearly see experience getting heavier as duration increases.

While this is what one would expect to see this has not been the case when comparing mortality rates with duration, which shows evidence of anti-selection. It would appear that factors giving rise to early death claims, for example fraud and anti-selection, are less applicable in the case of dread disease.

2.3.7 Sum assured

Graph 2.3.7



Graph 2.3.7 shows that the Dread Disease rates are higher at higher sums insured. This is counter-intuitive, as one would expect higher sums assured to be associated with better socio-economic groups and more rigorous underwriting.

However, this is consistent with the comments in sections 2.3.3 and 2.3.4. There are a number of possible explanations for this phenomenon.

It may be that lives in higher socio-economic groups are more aware of risk factors relating to family history etc. that are either not disclosed or not picked up by the underwriting process.

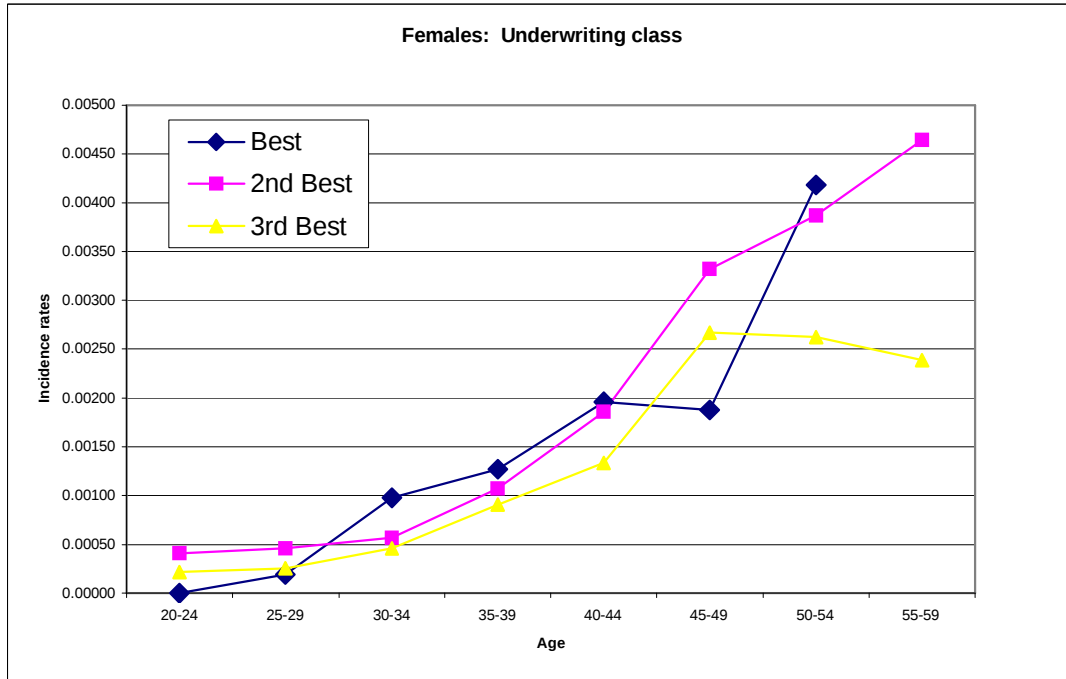
Alternately the events that give rise to dread disease claims may be more prevalent in the higher socio-economic groups.

Finally the higher socio-economic groups may have access to better diagnostic procedures to identify a potential dread disease claims and better awareness of what benefits are covered by the dread disease policy.

Females

2.4.1 Underwriting class

Graph 2.4.1

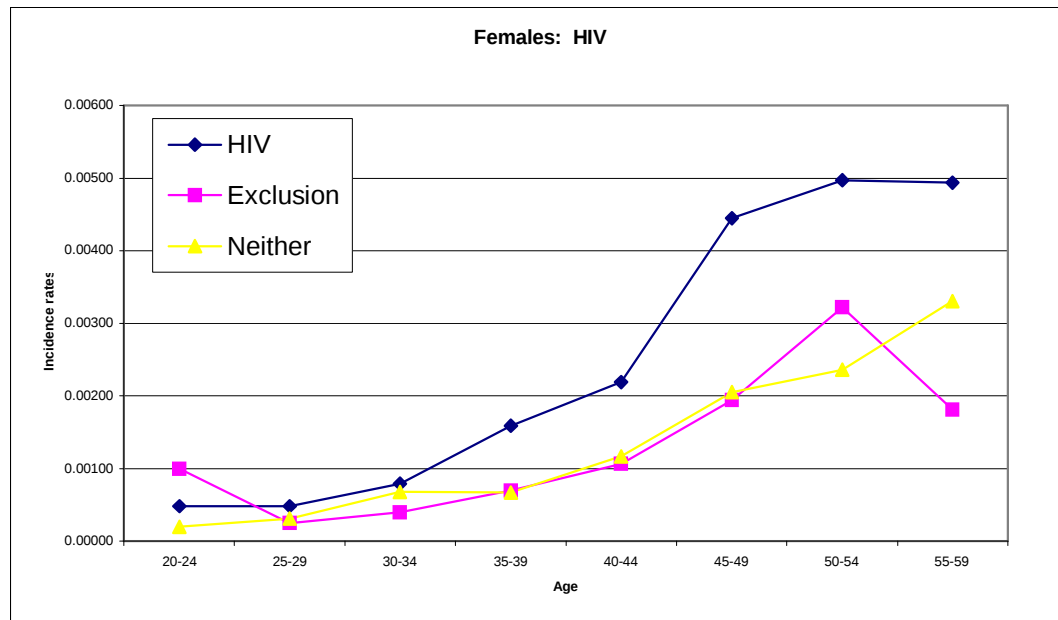


Although graph 2.4.1 does not give a particularly clear picture overall the experience is not what one would expect in the age groups where the bulk of the data is. The experience for females differs from that for males.

Approximately half the data was labelled as “unspecified” meaning that the above results are based on total exposure of only 600,000 years.

2.4.2 HIV

Graph 2.4.2

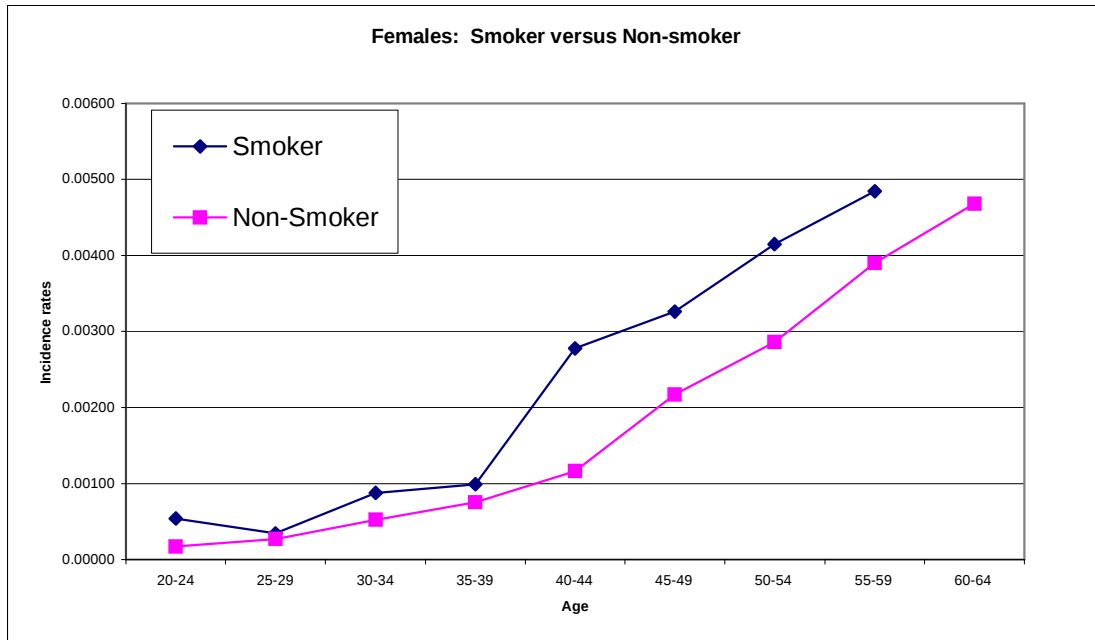


Graph 2.4.2 tells a similar story to that for males. The results are not as one would expect, with the HIV tested polices having higher experience than those either not tested or where an exclusion applies.

See 2.3.2 for further comments.

2.4.3 Smoker versus Non-smoker

Graph 2.4.3

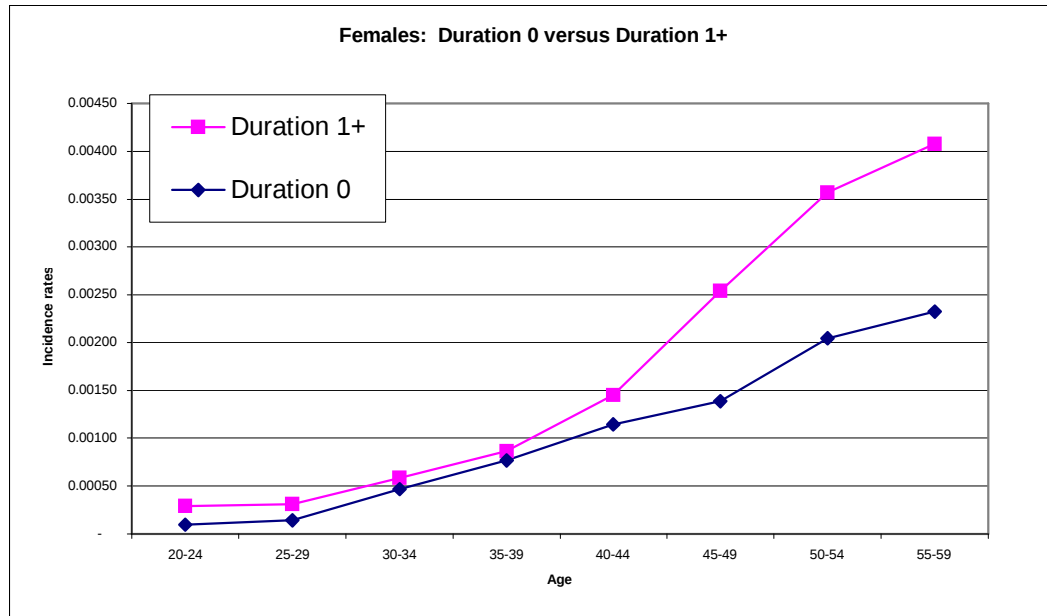


Graph 2.4.4 clearly shows that female smokers have heavier Dread Disease experience than non-smokers, as one would expect.

This is the same as the male experience although the difference between female smokers and non-smokers is not as marked as that for males. There are a number of possible explanations, such as the main cause of female claims being influenced by genetics rather than smoking, different mixes in the class of lives or female smokers being lighter smokers than male smokers.

2.4.4 Duration

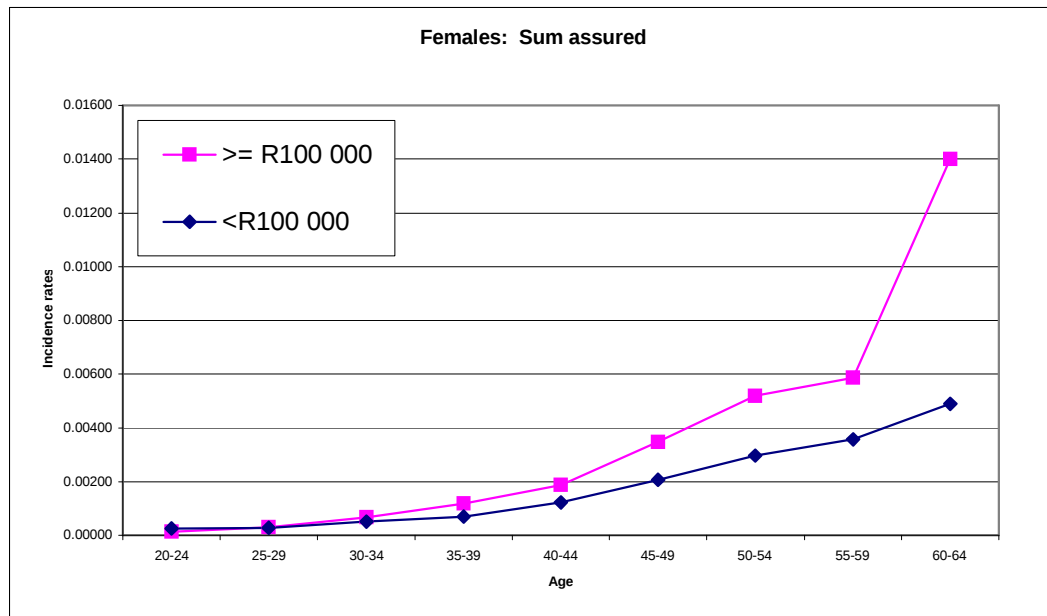
Graph 2.4.4



Graph 2.4.5 is consistent with expectation and in line with the male experience.

2.4.5 Sum assured

Graph 2.4.5



The female experience by sum assured band is consistent with the male experience.

See section 2.3.6 for further comments.

3 Key Findings

- The experience has deteriorated since the previous investigation.
- Female experience is lighter than that for males, the difference being more marked at higher ages.
- 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.
- Contrary to expectation the experience is heavier for policies with HIV testing, medical underwriting and high sum assured. It is likely that these three categories are highly correlated. This may be due to better access to medical facilities, a greater awareness of benefits or some form of anti-selection.
- Smokers have heavier experience than non-smokers.