Continuous Mortality Investigation

Income Protection Committee

WORKING PAPER 23

Analysis of Individual Income Protection experience by cause of disability

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CONTENTS

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1. **INTRODUCTION**

1.1. This paper summarises the work carried out so far by the Cause of Disability Working Party which was established by the Income Protection Committee of the CMI and first met on 15 October 2004. The Working Party comprised a mixture of IP Committee members and external members including some who had expressed an interest in joining such a Working Party at or following the 2004 Healthcare Conference at Warwick University. The membership consists of Graham Clark (Chairman), Bill Baker, David Leach, Jamie Marshall, Gerry Kennedy and David Wilkie. Until mid-2005, the Secretary to the Working Party was Pete McGurk who carried out much of the initial analysis. This role was then passed to Rajeev Shah.

1.2. There are a number of reasons, discussed below, for analysing IP claims by cause of disability. The members of the Working Party and the IP Committee were in agreement that the ability to reserve more reliably for claims in course of payment would be the area of most potential benefit to practitioners. Such reserves might be calculated using future termination assumptions that were directly related to the specific cause of disability for an individual claim or, perhaps more practically given low volumes of data at individual cause level, some sensible grouping of specific causes. The Working Party has looked at inceptions as well as terminations but, given the above, has focused its work more closely on terminations.

1.3. The terms of reference of the Working Party were therefore agreed to be:

    (a) Publish an initial analysis of the data in a manner that would be useful and/or interesting to practitioners.

    (b) Conduct, later, a statistically robust analysis of the data and publish the key results. This might be a 100A/E analysis or, if feasible, a graduation of termination experience by major cause or by groups of causes.

1.4. The CMI has accumulated a large database of information relating to cause of disability which, at the time of drafting this paper, covers the period 1975-2002. However, limited use of this database has been made to date. Some material has been published (see section 5), but previous attempts to extend the scope of published information have run into problems in deciding how to reflect the complex nature of the data and, in particular, how to group "similar" causes of disability for analysis purposes. In retrospect, such attempts may have also tried to move straight to stage 1.3.(b) before addressing a need for stage 1.3.(a).

1.5. The Working Party have now arrived at a point where they have some results for stage 1.3.(a) which they, and the IP Committee, believe could form the basis for a CMI Report and for further work for stage 1.3.(b). Before proceeding on the further work, the Working Party would like to request feedback from the actuarial profession on their work to date, in particular, whether their analysis is considered useful and/or interesting. The paper also sets out some very broad proposals for future work on which feedback is requested.

1.6. Section 2 of this paper gives a short summary of the data that the CMI holds, the nature of which constrains the analyses that are possible, and the general methodology used by the CMI in IP analyses. Section 3 identifies the merits in analysing IP experience by cause of disability and Section 4 covers some of the key issues that needed to be addressed before such analysis could be carried out. Section 5 summarises research which has been carried out into this field both by the CMI and other parties.

1.7. Section 6 discusses the different approaches to grouping causes and gives the background and rationale for the cause groupings that have been used for this paper. A discussion of the inception and termination results is presented in Sections 7 and 8 respectively. Section 9 then summarises the main findings and sets out the key questions on which the Working Party is seeking feedback, though feedback on any aspect of the work is welcomed.

2. THE NATURE OF THE DATA

2.1. The data collected is described in detail elsewhere, in particular *CMIR* **2**, 1 (1976). The various data fields are still essentially coded as set out in *CMIR* **2,** the main exception being the addition, with effect from 1991, of a field to represent the office's own occupational class code which is then converted to one of four standard CMI occupational codes to which it is most closely equivalent.

2.2. The in force data consists of a block of data for each policy describing the attributes of the policy and the insured person. The claims data contains exactly the same information in respect of the relevant policy but also contains additional information on the claim itself including key dates and mode of cessation. One particular field contains a coding that relates to the cause of disability.

2.3. Causes of disability are coded according to Abbreviated List C in the Eighth Revision of the *Manual of the International Statistical Classification of Diseases, Injuries and Causes of Death*. The code used is a two digit numeric code, originally from "01" to "70". A small proportion of the data could not be coded by cause and is hence coded as "00" (cause unknown). More recently, two additional codes have been added to reflect conditions which have emerged since the original coding was specified, "76" (ME) and "77" (AIDS/HIV). This gives 72 possible causes in addition to the records coded as "cause unknown". A full listing of the codes used and the cause to which they relate is contained in Appendix A1. In the rest of this paper, the detailed causes supplied in the data will be referred to as "ICD8" causes to distinguish them from any grouping of such causes.

2.4. Setting aside the question of analysing by cause of disability, it is worth giving a little background into the methods that are used to analyse the overall claims experience. In the early days of the investigation, the methodology employed was to compare actual weeks of sickness with expected weeks of sickness on the basis of the Manchester Unity AHJ table. *CMIR* **12** (1991) introduced a multiple state model which reconciled the Manchester Unity

approach with the inception/disability annuity approach which was, and still is, the more usual approach to pricing. *CMIR* **12** also developed graduations of the transition intensities used in the model based on the male, individual, Standard experience for 1975-78 (SM1975-78) together with methods for converting the graduated intensities to practical functions such as inception rates and termination decrement tables. The methods currently in use to analyse IP claims experience are based on a comparison of actual versus expected inceptions and actual versus expected claim terminations (with recoveries and deaths analysed separately). The detailed methodology was set out in *CMIR* **15**, 1 for inceptions and *CMIR* **15**, 51 for terminations. The same method of analysis is used in the comparisons of claim terminations by cause in this paper.

2.5. The various data subsets used by the CMI to analyse the data are described, amongst other places, in *CMIR* **18**, 3.

- The total data is referred to as the Aggregate data.
- The main analysis from the 1975-78 quadrennium was carried out on a subset of the Aggregate data known as the Standard data. This consists of UK policies with no special benefit types (e.g. lump sums), no identifiable underwriting exclusions and no occupational rating. The occupational rating field within the data has been used from the start of the investigation and has two values, "rated" or "not rated". Records where the occupational rating is unknown are excluded from the data.
- To make use of the occupational class information, collected with effect from 1991, a new subset of the Aggregate data was defined and named the Standard* data. This uses the same criteria as the Standard data but ignores the contents of the "occupational rating" field. It therefore represents a larger subset than the Standard data (the Standard data is itself a subset of the Standard* data), and consists of UK policies with no special benefit types and no identifiable underwriting exclusions.

2.6. The CMI's approach to occupational class data is also described in *CMIR* **18**, 3. In essence, this involves converting the office's own internal class code to one of the four standard classes used by the CMI. The classes can broadly be described as follows:

Class 1   Professional, managerial, executive, administrative and clerical classes not engaged in manual labour.

Class 2   Master craftsmen and tradesmen engaged in management and supervision; skilled operatives engaged in light manual work in non-hazardous occupations.

Class 3   Skilled operatives engaged in manual work in non-hazardous occupations.

Class 4   Skilled and semi-skilled operatives engaged in heavy manual work or subject to special hazard.

The CMI does not collect data by individual occupation and it is not possible to drill down into the data to analyse the experience of teachers, doctors, etc. Furthermore, it is entirely possible that a particular occupation insured by different offices could end up in different CMI standard classes. The IP Committee does believe, though, that despite this, there should be a reasonable degree of consistency across the investigation.

2.7. Not all offices, however, can provide a complete breakdown of all their data by occupational class. This arises for a number of reasons:
- None of the data can be coded by occupational class
- Coding by occupational class is not possible for all years
- Only part of the portfolio can be coded by occupational class
- Claims data can be coded by occupational class but in force data cannot

This requires a fifth subset of the Standard* data, "Class Unknown", to be analysed. This presents no special problems with the analysis of terminations. The analysis of inceptions requires consistent coding by occupational class for three sets of data, in force at both the beginning and end of a year and claims during the year.

Where there are clear inconsistencies (e.g. claims and year end in force data is coded by occupational class and year beginning data is not) all inception experience is analysed under "Class Unknown". This approach has also been adopted where there appears to be some inconsistency, e.g. the proportion of business coded as having unknown occupational class differs markedly between the beginning and end of year in force or between in force and claims. Some offices can code only claims data by occupational class but not in force data so the proportion of "Class Unknown" business is significantly lower for the termination analysis than for the inception analysis.

3.   WHY ANALYSE BY CAUSE OF DISABILITY?

3.1. There are a number of reasons why an analysis of claims experience by cause could be of use to IP practitioners. The main potential application, as perceived by the practitioner members of the Working Party and the IP Committee, is in the field of reserving more reliably for claims in payment. If such claims could be separated into similar causes and separate cause-specific assumptions developed for future terminations, then the resulting reserves should be more reliable in aggregate than applying a single aggregate termination assumption to the whole portfolio of claims. In particular, the aggregate reserves would reflect changes in the mix of underlying causes.

3.2. An analysis by cause of disability over an extended period may throw some light on trends visible in the overall experience and, perhaps more optimistically, assist in projecting future changes in experience.

3.3. It should also provide further insight into features of the experience such as the differences between the sexes and between occupational classes.

3.4. Product design processes should benefit from better knowledge of experience by cause, for example in better estimating the effect on claims costs of excluding claims from certain causes or limiting the duration of claim to a specified fixed period for specified causes.

3.5. Management of underwriting and claims control processes may also benefit from a better understanding of the contributions of various causes to claims costs and from a better understanding of claim termination patterns for specific causes.

4. WHAT KEY ISSUES NEED TO BE ADDRESSED?

Complexity

4.1. It quickly became apparent to the Working Party that there were two main challenges to be addressed. The first challenge arose from the complexity of the data and the large number of variables involved. To summarise:
- Sex (2)
- Deferred period (5)
- Age or age group
- Occupational class (4 + class unknown)
- Duration of claim for terminations
- Cause of disability (72 + unknown)
- Year (28) or quadrennium (7)
- Event (inceptions, recoveries, deaths)

4.2. The complexity of the data means that it is difficult to present the results in such a way that the main features of, and trends in, the experience can be identified in a digestible way without misleading readers. For example, a simple two-way analysis showing how the breakdown of inceptions by cause has changed over the 28 years may be distorted by changes in the mixture of the business by sex and deferred period in particular. The amount of information that could be presented on termination experience by cause of disability is vast. These issues and some high level results were discussed at the 2005 Healthcare Conference.

4.3. Given the complexity of the data, a practical approach was desirable that would both reduce the volume of published information to manageable levels and allow the results to be used in practical applications such as reserving for claims in payment. The Working Party concluded that this would be best achieved by basing the analyses around a grouping of "similar" causes. This paper reports on the results of these analyses.

Grouping of causes

4.4. Having decided on a grouped approach, the second challenge was deciding the appropriate groupings. How many groups should be used – 3, 9, 15? How then should the groups be determined? The two basic methods would be to group on "medical" grounds or to group on "statistical" grounds. The former involves looking at the 72 causes and grouping causes with some medical connection. The latter involves focusing on the claims reserving application and examining the data in some way to group causes which have statistically similar run-off patterns. Both methods have their advantages and disadvantages.

4.5. The pure "medical" approach is intuitively appealing, easy to understand and involves relatively little effort. It is also likely to be more robust than the statistical approach to changes arising from future medical improvements which are likely to affect similar medical causes in a similar way. However, it may group causes with fundamentally different termination patterns, thus reducing the effectiveness of any cause group-specific claims reserving.

4.6. The pure "statistical" approach may make it very difficult to reduce the number of groups to a manageable level, would require a large amount of work if done thoroughly and may

produce some strange bedfellows. It would, however, be more theoretically robust for reserving applications.

4.7. The two methods represent extremes of approach and hybrid approaches could be adopted. For example medical expertise could be employed to group causes which were considered, on the basis of the expert, to be likely to exhibit similar run-off patterns. Similarly, an "initial" medical approach could be refined by looking at some statistical information while still keeping a degree of medical similarity within the groupings. Indeed, this latter approach is the one that has been adopted for the purpose of this paper.

5.   PREVIOUS RESEARCH

CMIR 8

5.1. A report, *Cause of Disability: Individual P.H.I. Policies 1975-78* was published in *CMIR* **8**, 65. The experience was analysed using 14 groupings of causes or "sickness categories". The report employed three different types of table, with a separate table for each age and deferred period:
- An analysis of claim inceptions by sickness category and age group.
- An analysis of weeks of claim by sickness category and age group
- An analysis of average duration of claim by sickness category and termination mode (death, recovery, expiry).

5.2. A number of observations were made on the key features of the experience, in particular:
- The very high proportion of claim inceptions arising from Road Traffic Accidents and Other Injuries in the youngest male age group.
- The rising proportion of claim inceptions arising from Mental, Nervous and Musculoskeletal categories as the deferred period lengthens.
- The male and female proportions of claim inceptions by sickness category were very different with three particular differences highlighted: (1) much lower levels of Circulatory claims for females, (2) persistently higher levels of Mental claims for females and (3) much lower proportions of Road Traffic Accidents and Other Injuries claims for females.
- The distribution by weeks of claim differed from the distribution by number of inceptions, reflecting the variations in average recovery time – Mental, Nervous, Circulatory and Musculoskeletal categories were much more important in the weeks of claim tables whereas Other Infective, Acute and Chronic Respiratory and Road Traffic Accidents and Other Injuries were more important in the number of inceptions tables.

5.3. It should be noted that the tables on average claim duration needed to be interpreted with care in that they only related to the average duration of claims that **had** actually terminated and as such could not be used to derive an average cost (in terms of weeks of benefit) per claim.

Gutierrez-Delgado and Korabinski, ASTIN Bulletin 2000

5.4. A paper entitled *Initial Selection and Cause of Disability for Individual Permanent Health Insurance* was published in ASTIN Bulletin, Vol. 30, No. 2, pp369-389 in 2000. The paper set out to examine the influence of both initial selection and cause of disability in individual IP (then referred to as PHI). A generalized linear model was fitted in order to

explore these influences. Earlier research by Gutierrez-Delgado (1999) using CMI data had shown some evidence of anti-selection (inception rates decreasing with increasing duration) and the authors sought to investigate whether cause of disability, and particularly those causes felt to be most susceptible to moral hazard might help to explain the phenomenon.

5.5. The authors obtained data from the CMI covering the period 1987-1994. The ICD8 causes in the CMI data were allocated to only 5 groups – musculoskeletal, mental, infectious diseases, all other diseases and accidents/injuries. It was believed that the first two categories might be particularly susceptible to moral hazard.

5.6. The authors concluded that cause of disability factors did in fact help to partially explain the anti-selection effect as a consequence of some moral hazard but concluded that other effects might be present.

Recent Australian Research

5.7. The 2002 Report of the Disability Committee of the Australian Institute of Actuaries published details of an analysis of the claims experience of Australian individual disability income business in the 1995-98 quadrennium. Whilst the report covered the experience in general, there was a significant section devoted to cause of disability.

5.8. Australian business is focused around shorter deferred periods by UK standards, mainly 2 week and 1 month business. Inceptions are analysed in a detailed table appended to the report showing, for each sex and deferred period, inception rates by cause of claim and occupational class. The causes are coded A through to R (18 causes). The detailed table for 2 week business is summarised in the main body of the report by condensing the 18 causes into a group of six – "mental and nervous", "digestive system", "genito-urinary/ pregnancy & childbirth", "musculoskeletal", "accident and violent cause" and "others". The report draws attention to two key features of the inception experience. Firstly, a dramatic rise in the number of "accident and violent cause" claims compared to previous investigations and, secondly, the differences in the male and female experience. The higher female incidence rates were attributed principally to additional mental and genito-urinary claims which were only partially offset by lower accident claims.

5.9. Termination rates were not analysed by cause by calculating A/E against a standard table. The approach adopted was similar to that used in CMIR **8** for the UK experience, namely to calculate an average duration (in days) per closed claim. The claim length was limited to two years in order to avoid distortions arising from 2 year maximum benefit periods for certain conditions which are a feature of the Australian market. Average durations were shown for males and females separately. Causes were shown in two separate sections of the table, the first section covering 17 "sickness" causes and the second section covering a further 17 "accident" causes (fires, explosions, sports injuries, motor vehicle, etc.). A second table showed average claim duration by age group for both sexes combined for 18 causes, being the same 17 "sickness" causes as used for the earlier tabulation plus all accidents combined.

5.10. A set of "indicative" claim costs by cause were also tabulated by combining the cause-specific incidence rate with the cause-specific average closed claim duration for the 18 causes.

5.11. Prof. David Wilkie made a presentation to the above conference entitled *Trends in Causes of Sickness for IP policies*. The presentation was illustrated by a series of introductory slides followed by a series of charts, both of which were made available for download on the Actuarial Profession's website.

5.12. Prof. Wilkie's analysis covered the period 1975-1998 and looked primarily at the breakdown of inceptions by cause. No grouping of causes was employed, the main method of presenting results being coloured Excel bar charts. Each chart analysed one variable at a time - year, quadrennium, sex, deferred period, age group and occupational class. Each value of the variable had a separate bar (e.g. five bars for DP1, DP4, DP13, DP26 and DP52) with a differently coloured and proportionately sized section of the bar representing the claims accounted for by a particular cause. The charts featuring all causes were difficult to read and so separate charts were also produced showing the 10 most common causes, the next 10 most common, and so on.

5.13. The analysis showed, amongst other things, the increasing importance of Mental, Musculoskeletal and Neoplasm (cancer) claims over the period of the investigation. It also showed the reducing importance of accidents and influenza.

5.14. The Working Party believed that the format of the charts employed was an excellent way of illustrating trends - indeed it is used extensively in this paper – but to be more useful the analysis would have to move away from a single-variable approach. For example, it was not possible to see readily whether the reduction in accident claims was a genuine feature of the underlying morbidity or just a result of a change in the mix of business by sex and deferred period. Any meaningful analysis of trends would have to separate out at least these two key features.

United States Research

5.15. The most recent major study of US individual disability income business, covering the period 1990-99, was published in January 2005 by the Individual Disability Experience Committee of the Society of Actuaries. It analysed many aspects of the experience but had no information of claim experience by cause of disability. The Long Term Disability Experience Committee of the Society of Actuaries is specifically examining claim termination experience with a view to developing an experience table and a valuation table. They presented an update of their progress at a conference in New York in October 2004 including some analyses of termination experience in the period 1990-2002.

5.16. The presentation included some analysis by cause of disability based on 13 cause groupings plus an "unknown" group. The analysis looked at overall A/E for both recoveries and deaths in respect of each grouping.

6.   GROUPING OF CAUSES

6.1. As stated above, the Working Party's first challenge was deciding on whether, and if so how, to group the 72 different causes coded in the CMI data. Such a large number does not readily lend itself to presentation, especially in light of the many other variables present in IP data. Furthermore, many of the individual causes would have such a small number of terminations that they would lack statistical robustness. The Working Party therefore felt

that, for the purposes of this paper and for most practical work, some form of grouping was preferable, although some ICD8 cause-level data could be presented in downloadable form.

6.2.   The next consideration was of how any grouping should be carried out. The three basic approaches are:
- Keep the ICD8 codes for, say, the top 10 ICD8 causes and group the rest
- Group causes that are "medically similar" without consideration of actual experience
- Group causes that have a statistically similar termination experience

6.3.   This led the Working Party to re-visit the reasons for why the exercise was being carried out in the first place. Firstly, in terms of trying to understand the features of the experience and the trends in it, a purely statistical grouping methodology may produce some strange bedfellows in the same group and make it difficult to make sense of the results. For example if such groupings were expressed as "low recovery, low death", "low recovery, high death" etc., would this mean much to an audience in terms of explaining trends?

6.4.   In terms of claims reserving, the arguments for a statistical approach are much stronger in that a "medically similar" approach will, unless the groupings are sub-divided to a significant degree, usually group causes that are dissimilar in terms of termination patterns. Therefore the reliability of any reserving based on grouped cause data will be vulnerable to the mix of causes in an office's own claims portfolio for that group differing from the mix in the CMI data used to set the basis. On the other hand, a medical grouping seems more appealing from a practical implementation point of view.

6.5.   Given that the initial objective as stated in Section 1 is to publish an analysis of the data that would be interesting and/or useful to practitioners, rather than one focused exclusively on reserving, the Working Party felt that a "medically similar" grouping methodology was the most appropriate. Some limited statistical analysis of the experience of individual ICD8 causes within the groups is given and such an analysis has been considered when setting the groups, though some causes within the proposed groupings might still be considered statistically dissimilar. It is also worth noting that the previous research of which the Working Party was aware, both at home and overseas (as described above), also adopted a medical rather than statistical grouping.

6.6.   The next step was to consider what medical groupings should be used. Other major research appears to have concluded that separate mental and musculoskeletal categories are required, but after that approaches differ. Table 1 shows the different categories employed in *CMIR* **8**, by a major practitioner who kindly let us know their approach, by the US LTD Experience Committee, by the Australian Disability Committee and by Gutierrez-Delgado and Korabinski.

Table 1. Cause group categories used in different investigations

CMIR **8**	Major office	US LTD Experience Committee	Australian Disability Committee	Guitierrez-Delgado & Korabinski
Other Infective	Mental/psychological	Pregnancy/Childbirth	Pregnancy	Musculoskeletal
Neoplasms	Cardio-vascular	Mental/Nervous	Genito-Urinary	Mental
Endocrine/Metabolic	Nervous	AIDS/HIV	Mental	Infectious Disease
Mental	Musculoskeletal	Reproductive/Urinary	Respiratory	All other diseases
Nervous	Arthritic	Digestive	Nutritional	Accidents/Injuries
Circulatory	Respiratory	Injury/ Poisoning	Musculoskeletal	
Acute Respiratory	Cancer	Neoplasms	Digestive System	
Chronic Respiratory	Gastro-intestinal	Emergent Disabling	Infective & Parasitic	
Digestive	Endocrine/Metabolic	Musculoskeletal	Neoplasms	
Genito-Urinary	Visual/Auditory	Other	Nervous	
Musculoskeletal	Injuries	Respiratory	Skin	
RTA Injuries	HIV/AIDS	Nervous system and sense organ , infectious/parasitic	Circulatory	
Other Injuries	ME	Circulatory	Blood	
All Others	Ill defined/Misc.		Senility & ill-defined	
			AIDS	
			Congenital	
			HIV & Lymphadenopathy	
			Accidents/Injuries	
14 Categories	**14 Categories**	**13 Categories**	**18 Categories**	**5 Categories**

6.7. The Gutierrez-Delgado & Korabinski categories were developed for a specific purpose, principally to look at whether causes of early duration claims could explain an observed anti-selection effect. The other categories were developed for the more general purpose of publishing key features of the experience.

6.8. The Working Party does have the benefit of an analysis of the data by ICD8 cause for the period 1975-2002. It seemed sensible to use this analysis in deciding the grouping. In particular:
- Groups with very small amounts of data should be avoided
- It is desirable to avoid grouping causes with dissimilar termination patterns

6.9. Furthermore, the Working Party felt that interest in the results would be focused on deferred periods 4-52 weeks, given the limited market and special features of the DP1 business. Analysis of DP1 results is still provided but the groupings were decided in the light of the experience of the longer deferred periods. An analysis of the Standard* termination experience for the 12-year period 1991-2002 was carried out for each ICD8 cause separately. The Occupational Class 1 results for DP4-DP52 were tabulated for males and females combined showing A, E, and 100A/E for (a) recoveries, (b) deaths and (c) recoveries and deaths combined. The results are shown in Appendix A1.

6.10. The information on numbers of terminations was used to decide whether a grouping was large enough to be worthwhile. The A/E information was used to decide whether groups should be further sub-divided to separate causes with dissimilar termination levels. In both cases the figures for recoveries and deaths combined were used on the basis that claims costs will relate to overall levels of terminations. It is recognised that this approach may

not be considered reasonable if a graduation of both recoveries and deaths was being carried out for each group.

6.11. It was eventually decided to group the ICD8 causes into 12 categories as follows:

    1.   Infections & acute respiratory
    2.   Neoplasms
    3.   Mental illness
    4.   Nervous system & sensory organs
    5.   Circulatory
    6.   Digestive (non-infectious)
    7.   Genito-urinary
    8.   Arthritis
    9.   Musculoskeletal
    10.   Injuries
    11.   All other known causes
    12.   Unknown

6.12. The mapping of ICD8 causes to these cause groups is given in Appendix A2, along with the mappings used in the *CMIR* **8** investigation and those used by a major office as described in section 6.6.

6.13. Although some weight has been lent to the statistical experience of the causes in the categorisation, a significantly different set of cause groups would have emerged if the groupings had been decided primarily on a statistical basis. With this in mind, there may be some ICD8 causes where the termination experience sits uneasily with the experience of the other ICD8 causes contained in the allocated cause group. Again, Appendix A1 shows 100A/E values for all the ICD8 codes aggregated by cause group.

7.   INCEPTIONS EXPERIENCE

7.1. The analysis of the inceptions experience has been based mainly on the dataset with the following criteria: individual policies, Standard* experience, age 18-64 years, deferred period 4-52 weeks, 12 year period 1991-2002, all occupational classes. These criteria have been chosen to give a stable dataset over time; sufficient data for analysis, not excessive heterogeneity and an absence of distortions from the peculiar features of very short deferred period business (see 6.9 for more details). However, while being excluded elsewhere in the analyses, claim inception experience for 1975-1990 has been used to analyse trends and claim inception experience for deferred period 1 week business has been used to analyse experience by deferred period.

7.2. The submitted data contain duplicate records arising from multiple policies. These are identified, as far as possible, in the claims data by matching records by the following data fields: record year, sex, age definition, birth month and year, deferred period and date of sickness. It is not possible to identify duplicates in the in force data due to the lack of fields capable of differentiating between different policies. Therefore, in the analysis of claims inceptions, duplicates have not been removed in order to maintain consistency between the claims and in force datasets. The alternative approach would be to ratio down the in force data by a factor consistent with the frequency of duplicates in the claims data. This leads to an approximate in force data set excluding duplicates.

7.3. The figures in Appendix B show the variation in 100A/E of the claim inceptions by cause group. *Readers should note that the scales on the axes do vary between graphs, even within each set of Figures.* As detailed in section 2.4, the expected values are calculated on the basis of the graduated male, individual, Standard experience for 1975-78 (SM1975-78). This graduated male experience is used as the basis for calculating the expected values for both sexes. *Note that DP52 business was not considered in the graduation work of CMIR 12 and so there are no graduated rates for this business. For the SM1975-78 basis, the sickness transition intensity for DP52 is taken as 0.68926 multiplied by the DP26 sickness transition intensity used in SM1975-78. The sickness transition intensity forms part of the calculation of the expected inception rate as detailed in 7.4.*

7.4. The expected inception rate calculated on the SM1975-78 base table varies by deferred period and age. Thus, variations in the 100A/E values by deferred period or age need to be interpreted as relative differences as compared to the base table and not absolute variations in inception rates. This inception factor is multiplied by the exposure to produce the expected number of inceptions. The age definition used for the inceptions analyses is the age last birthday at the date of falling sick. Figure 1 shows the dependence of the inception rates in the base table on deferred period and age. The inception factor is defined as:

Inception factor (at age x last birthday) $= \sigma_{x+\frac{1}{2}-d} . \pi_{x+\frac{1}{2}-d,d} . r^d(x+\frac{1}{2}-d)$

where $\sigma_{x+\frac{1}{2}-d}$ is the sickness transition intensity at age $x+\frac{1}{2}-d$, where d is the deferred period.

$\pi_{x+\frac{1}{2}-d,d}$ is the probability that a life falling sick at age $x+\frac{1}{2}-d$ will remain sick until age $x+\frac{1}{2}$.

$r^d(x+\frac{1}{2}-d)$ is the probability that a life who fell sick at age $x+\frac{1}{2}-d$ and who has remained sick until age $x+\frac{1}{2}$ will make a claim.

Figure 1. Inception factors: dependence on deferred period and age for base table (SM1975-78).
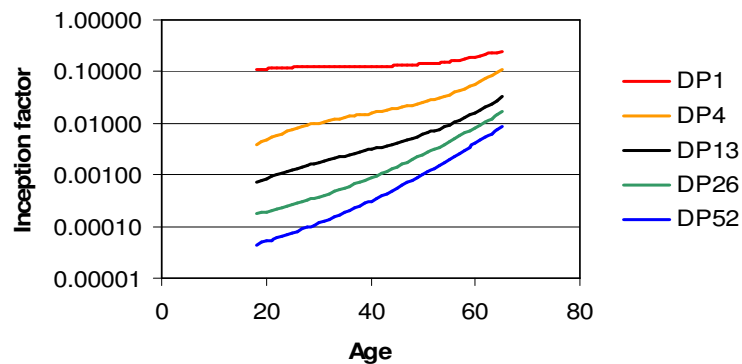
7.5. Appendix B1 shows high level analyses of how the total 100A/E for all causes is split between the cause groups for the different deferred periods, occupational classes, age groups and by quadrennia. The largest five cause groups in terms of actual claim inceptions as listed in Table 2 have been analysed further in Figures B2 to B5 in Appendix B.

Table 2: Actual number of claim inceptions for male, Standard* experience, age 18-64, deferred period 4-52 weeks for the years 1991-2002.

Cause Group	Actual Inceptions	% of Total
Musculoskeletal	4,765	17%
Mental Illness	4,488	16%
Injuries	4,168	15%
Circulatory	3,928	14%
Neoplasms	2,212	8%
Arthritis	1,473	5%
Nervous system & sensory organs	1,377	5%
Digestive (non-infectious)	1,320	5%
Infections & acute respiratory	719	3%
Genito-urinary	392	1%
All others (including unknown)	2,987	11%
Total	*27,829*	*100%*

Variation by deferred period

7.6. Figure B1.1 shows the 100A/Es, compared to the SM1975-78 basis, for claim inceptions by cause group for each deferred period. Significant features are:
- The total inception rate is higher for females than males generally but the variation by deferred period is similar.
- The Musculoskeletal experience is roughly constant for DP1-DP26 for males but increases significantly at DP52 (100A/E roughly doubles). A similar pattern is observed in the females except the increasing 100A/E begins at DP26 and continues in DP52.
- The 100A/E values for Mental illnesses increase significantly with increasing deferred period. This effect is especially pronounced for females.
- For males, there is a peak for injuries at DP4 and decrease with the longer deferred periods; whereas for females the 100A/Es increase with increasing deferred period.
- The 100 A/Es for Circulatory diseases are higher for males and increase with deferred period for both males and females.
- The 100A/Es for Neoplasms increase with increasing deferred period, particularly for females.
- Infections & acute respiratory diseases are very significant at DP1 but small for all other deferred periods.

Variation by occupational class

7.7. Figure B1.2 shows the 100A/Es for claim inceptions by cause for each occupational class. There is a general trend of increasing 100A/Es with higher occupational class particularly in the case of Musculoskeletal diseases and Injuries, consistent with the more manual nature of the occupations. Other features are:
- Female inception rate is higher than males but the variation by occupational class is similar.
- Rates of Mental illness decrease with increasing occupational class.
- There is little variation in the rate of inceptions of Circulatory diseases or Neoplasms by occupational class. Though Figure B1.2 shows a large increase in Circulatory disease for females in occupational class 4, this is not statistically credible as the number of actual inceptions is small.

Variation by age

7.8. Figure B1.3a shows the 100A/Es for claim inceptions by cause in each age group. While, at first glance, the shape by age of the male and female experience appears to differ markedly, the majority of this difference is due to the high prevalence of injuries in young males. With the effect of Injuries on the claims inception pattern removed in Figure B1.3b, the distribution of the overall inception rate for males across age groups is: minor peak at youngest age group (18-24), falling away at 24-29 before increasing and peaking in the 40-55 age range and falling away at older ages (small fall at 55-59 and large drop at 60-64). The pattern for females is similar to the pattern observed for males, but the variation in 100A/E by age group is much more exaggerated and the figures for the 60-64 age range are less reliable due to the number of claim inceptions being far fewer. Other significant features are:
- There is a high rate of Musculoskeletal inceptions at younger ages, similar to the pattern for Injuries but less pronounced.
- In females, there is a large humped experience for Mental illness where the inception rate increases significantly with age peaking at ages 40-45 and decreasing thereafter.
- 100 A/Es for Circulatory diseases increase with age, particularly strongly for males.
- Increasing rates of Neoplasms with increasing age, particularly for females.

Trends in inception experience

7.9. There is a complication in analysing trends over time in inception experience due to the available data. Since 1991, analyses have been done on the Standard* basis but it is not possible to reproduce these analyses for prior years. The figures in Appendix B1.4 show the percentage of claim inceptions by cause for each quadrennium over 1975-2002. However, for the years 1975-1990 this is based on the Standard experience; for years since 1991, this is based on the Standard* experience. The Standard experience has not been used for 1991 onwards for comparison purposes because this subset of data relies on the occupational rating field, which appears to have become less reliable in the data as the occupational class field has superseded this field.

7.10. Therefore, while Figure B1.4 indicates a significant change in experience between 1987-1990 and 1991-1994, this may be due to differences in the constituent data as explained above rather than changes in the underlying experiences. Notwithstanding this, significant trends are:
- Many causes show increases in 100A/Es up to the early nineties and decreases thereafter, for example Musculoskeletal, Injuries and Circulatory diseases.
- Neoplasm inceptions have remained fairly constant over the period.
- A general increase in Mental illness since the 1975-78 quadrennium, particularly for females.
- Decrease in Infections & acute respiratory and Digestive diseases over the period.

7.11. The trends in the five largest cause groups are then analysed in further detail by age and quadrennium in Appendix B2, by deferred period and quadrennium in Appendix B3 and by occupational class and quadrennium in Appendix B4. These causes are also analysed in further detail by deferred period and occupational class in Appendix B5. In Appendix B1, all the 100A/E values, irrespective of the number of actual claim inceptions in the cause group, are shown so that the relative importance of the different cause groups and how the

total claims experience varies can be seen. However, for Appendices B2 to B5 where the 100A/E values are examined in more detail, only the 100A/E values where the actual claim inceptions are at least 10 are shown.

7.12. The figures in Appendices B2 to B5 were used to check that any trends seen in Appendix B1 were not due to changes in the mix of business over time and we have not provided further commentary on these figures.

8.   TERMINATIONS EXPERIENCE

8.1.   The analysis of the terminations experience is based on the same dataset as used for the analysis of inceptions, the criteria for which were described in Section 7.1. However, the analysis of terminations does not use in force data and only uses claims data in which duplicate records arising from multiple policies can be identified. Therefore, for the analysis of terminations, duplicates have been removed from the data. As for the inceptions analyses; while being excluded elsewhere in the analyses, claim termination experience for 1975-1990 has been used to analyse trends and claim termination experience for deferred period 1 week business has been used to analyse experience by deferred period.

8.2.   The expected termination rate calculated on the SM1975-78 base table varies by deferred period, age and duration. Thus, variations in the 100A/E values by these factors need to be interpreted as relative differences as compared to the base table and not absolute variations in termination rates. Figure 2 shows the dependence of the termination rates in the base table on deferred period, age and duration. The age definition used for the terminations analyses is age last birthday at the date of claim termination.

Figure 2a. Recovery rates: dependence on deferred period and duration for base table (SM1975-78).

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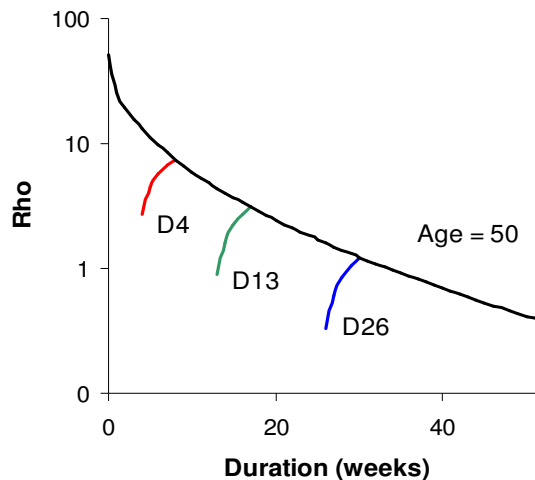
Figure 2b. Recovery rates: dependence on duration and age for base table (SM1975-78).
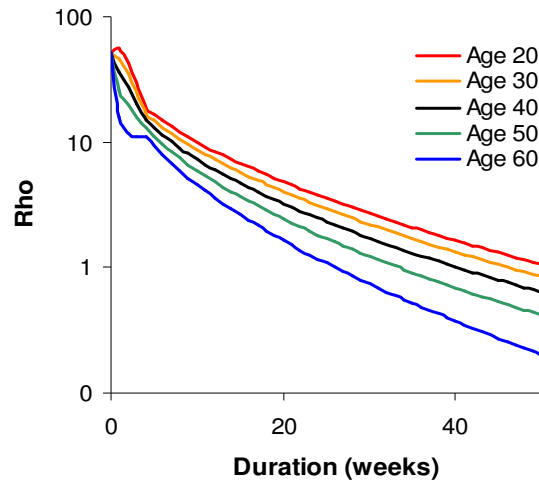
Figure 2c. Death rates: dependence on duration and age for base table (SM1975-78). *Under SM1975-78, expected numbers of deaths are independent of deferred period.*
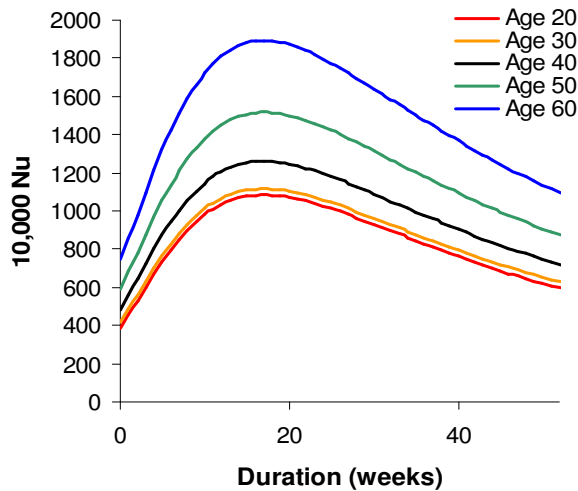
8.3. Figure 3 shows the comparison of the values of 100A/E, for all causes of disability combined, for each successive quadrennia for 1975-2002. While this shows a trend of falling values in the overall 100A/E for both recoveries and deaths in both sexes over the period 1975-2002, some of this may be explained by changes in the mix of the causes of claims and in the general mix of business. Further analyses reveal differences in trends for individual causes that are masked when the causes are aggregated.

Figure 3. Terminations for 1975-2002, individual policies, Standard* experience, deferred period 4-52 weeks, all occupational classes.
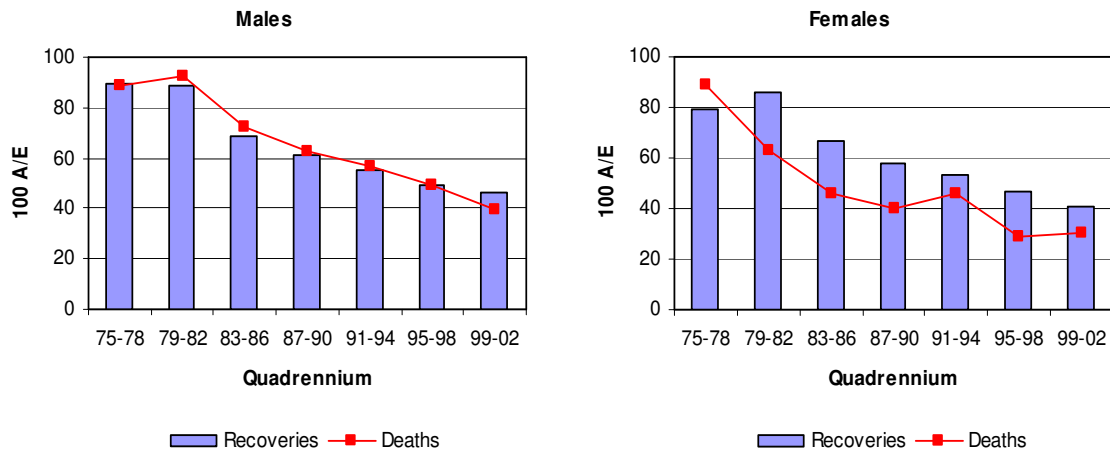
8.4. The termination experience is illustrated in Appendix C. *Readers should note that the scales on the axes do vary between graphs, even within each set of Figures.* Appendix C1 provides a comparison of the terminations experience by cause group over the 12 year period from 1991 to 2002. This shows a wide variation in termination rates by cause group. The male and female experiences for each cause group are similar for both recoveries and deaths; but this is tempered somewhat by the paucity of data in some cause groups for females and for deaths generally.

8.5. With the exception of Neoplasms where the actual numbers of recoveries and deaths are broadly similar; the number of actual recoveries for the other cause groups are far higher than the number of actual deaths. Relatively high recovery rates are observed for the Infections & acute respiratory, Digestive (non-infectious) and Genito-urinary cause groups.

8.6. Neoplasms have very high rates of death compared to other cause groups which drags up the 'all causes' rate so that the other cause groups generally have rates of death below the 'all causes' rate. Over half of the deaths recorded in the data are due to Neoplasms and so there are insufficient deaths in most other cause groups, especially for females, to draw reliable conclusions. However, particularly low death rates can be seen for Mental illness, Arthritis, Musculoskeletal diseases and Injuries.

8.7. Appendices C2, C3 and C4 analyse the terminations experience for each cause of disability by quadrennium, deferred period and occupational class respectively. For Appendices C1 to C4, in addition to the 100 A/E results being shown, there is also illustrated a confidence interval, the lower limit being 100 $(A–2\sqrt{E})$/E and the upper limit being 100 $(A+2\sqrt{E})$/E.

8.8. Appendices C5 and C6 analyse the termination experience for each cause group by age group and duration respectively. The difficulties arising from insufficient numbers of deaths or recoveries are more acute when analysing the terminations experience by age groups or duration and so the 100A/E values in these Appendices are only shown where the expected claim terminations number at least 8.

Trends in termination experience

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8.9. The trend in termination experience for each cause group is shown in Appendix C2. The general trend of a falling recovery rate is reflected across the cause groups for both sexes. Again, the death rates are dominated by the experience of Neoplasms, for which the trend of falling rates largely determines the overall trend. A falling trend in 100A/E values for deaths is also observed for Circulatory diseases, the other cause group containing a significant volume of data.

Variation by deferred period

8.10. The termination experience by deferred period for each cause group is shown in Appendix C3. The general trend seems to be a slight reduction in relative recovery rates with increasing deferred period. Areas with marked differences from the general trend observed are:
- High recovery rate for deferred period 1 business within the Infections & acute respiratory, Musculoskeletal, Injuries and Nervous system & sensory organs cause groups. This could be due to a different mix of causes of disability contained within the cause group at different deferred periods. Milder diseases are likely to be concentrated within the shorter deferred periods while the more acute diseases may show no similar concentration.
- Recovery rates increase with longer deferred periods for Neoplasms.

8.11. Generally, the 100A/E of deaths is reasonably flat across the deferred periods. However, for Neoplasms, the death rates increase with longer deferred periods, but fall at DP52.

Variation by occupational class

8.12. The termination experience by occupational class for each cause group is shown in Appendix C4. There is little variation by occupational class in the termination experience in most cause groups. However, Class 1 recoveries for Musculoskeletal and Injuries are slightly higher than for the other occupational classes. This could be due to the likelihood that the more serious injuries and musculoskeletal complaints would occur in the more manual occupations – a similar effect is noticed for deferred period 1 week business which is primarily class 1 business. For all causes combined, the 100A/Es for deaths are lower for occupational classes 3 and 4 primarily because of the variation in the mix of disabilities by occupational class.

Variation by age

8.13. The termination experience by age for each cause group is shown in Appendix C5. It is more complicated to analyse the terminations experience by age due to the large number of possible ages, even when expressed in integer years. Therefore, as a compromise between credible data cells and cell homogeneity, ages have been grouped into 5 year bands. The key features are:
- For Injuries, the 100A/E values for recoveries increase with age for males while for females they are primarily flat across age ranges. This could be due to the nature of the injuries suffered by younger males which lead to claims being more serious.
- For males, the 100 A/E values for recoveries from Digestive (non-infectious) diseases are level at younger ages but start increasing from about age 40.
- The 100A/E values for recoveries from Genito-urinary diseases increase with age. This may be due to a change in the diseases suffered or a difference in the severity of the disease which will lead to a claim e.g. older people being more affected by

minor diseases/injuries which lead to more claim inceptions due to the more minor ailments which have a higher recovery rate than severer forms of the disease/injury.

Variation by duration

8.14. The termination experience by duration for each cause group is shown in Appendix C6. The variations in experience, relative to the base table, that can be seen with increasing duration are:

- The 100A/E values for recoveries from Neoplasms increase with duration for both sexes.
- There is a step-change in the observed male experience for Circulatory diseases at the duration of 1 year. At shorter durations, the 100 A/E for recoveries is increasing and the 100A/E for deaths is decreasing with increasing duration. However, for durations over a year, the trend for deaths is reversed and the 100 A/E for recoveries flattens off.

9. SUMMARY AND QUESTIONS

9.1. The above analyses show that there are marked differences between the overall terminations experience of different cause groups which can not be explained by variations in other rating factors (age, duration, occupational class, deferred period, time period). Thus, cause of disability can be considered as an important rating factor for claim terminations.

9.2. The Working Party therefore considers that these analyses have shown sufficient variation in termination experience by cause of disability to make further research in this area useful for practitioners. Its tentative proposals are to carry out a more robust statistical analysis of the termination experience by cause of disability which would continue to use the approach of medically similar cause groups but, if necessary, may break these into more statistically similar sub- groups. The output of this work could provide 100 A/E adjustment factors by cause of disability that could be applied to the all causes termination rates or even a graduation of termination rates by cause of disability.

9.3. However, this would be a major piece of research for the Working Party and before proceeding with it, the Working Party would like to request feedback on the analyses carried out to date as well as on its tentative proposals. Whilst feedback is welcomed on all aspects of its work, the Working Party would especially welcome feedback on the following questions:

1. Do members of the profession agree with the Working Party's approach of grouping causes of disability for the purpose of analyses?
2. Do members of the profession think that it would be more useful to have causes of disability grouped in a different way? This may involve large-scale changes arising from a change of method, to perhaps a more statistical method of assigning groups, or changes of a smaller scale such as separation or amalgamation of the cause groups chosen for this paper by the Working Party.
3. Do practitioners consider that further analyses of the terminations experience by cause of disability, albeit in cause groups, would be useful?

4. Would 100 A/E adjustment factors by cause of disability and duration that could be applied to the all-causes termination rates be considered adequate for use in reserving or is there a need for fully graduated termination rates by cause of disability? It should be noted, however, that using 100A/E adjustment factors is a crude method and that the combined termination rates, calculated using these adjustments for each individual cause, would be likely to differ from the all-causes termination rates.

5. Although the inceptions analysis highlights some interesting features and trends, would practitioners find further analysis in this area useful or should further work be confined to analyses of terminations for reserving purposes?

9.4. Feedback should be addressed to Rajeev Shah at ip@cmib.org.uk by 30 September 2006.

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Appendix A1: Experience of individual ICD8 causes within cause groups

Deferred Period 4-52 weeks

Individual IP, 1991-2002, Standard* experience, CMI Occupational Class 1, males and females combined. Recoveries, deaths, combined terminations and claim inceptions. Expected values based on SM1975-78.

Code	ICD8 Cause / Cause Group	Recoveries		Deaths		Recs + Dths		Inceptions
		A	100A/E	A	100A/E	A	100A/E	A
01	Typhoid, paratyphoid fever, other salmonella infections	8	-	0	-	8	-	13
02	Bacillary dysentery and amoebiasis	0	-	0	-	0	-	0
03	Enteritis and other diarrhoeal	10	50	0	-	10	47	20
04	Tuberculosis of respiratory system	8	-	0	-	8	-	7
05	Other tuberculosis, including late effects	4	-	2	-	6	-	8
06	Brucellosis	2	-	1	-	3	-	2
07	Diphtheria	0	-	0	-	0	-	0
08	Whooping Cough	0	-	0	-	0	-	0
09	Streptococcal sore throat and scarlet fever	2	-	0	-	2	-	1
10	Smallpox	1	-	0	-	1	-	2
11	Measles	0	-	0	-	0	-	0
12	Viral Encephalitis	5	-	0	-	5	-	13
13	Infectious hepatitis	28	91	2	-	30	85	51
14	Typhus and other rickettsioses	0	-	0	-	0	-	1
15	Malaria	3	-	0	-	3	-	5
16	Syphilis and its sequelae	0	-	0	-	0	-	3
17	Gonococcal infections	0	-	0	-	0	-	0
18	Helminthiasis	0	-	1	-	1	-	0
19	All other infective and parasitic diseases	100	70	2	-	102	65	143
39	Acute respiratory infections	36	83	2	-	38	78	64
40	Influenza	12	118	0	-	12	111	12
41	Pneumonia	51	104	6	-	57	110	57
59	Infections of skin and subcutaneous tissue	41	84	3	-	44	81	67
G1	**Infections & acute respiratory**	**311**	**78**	**19**	**51**	**330**	**76**	**469**
20	Malignant neoplasms, including neoplasms of lymphatic and haematopoietic tissue	511	40	525	374	1,036	73	1,352
21	Benign neoplasms and neoplasms of unspecified nature	65	56	23	162	88	68	98
G2	**Neoplasms**	**576**	**41**	**548**	**354**	**1,124**	**73**	**1,450**
27	Psychoses and non-psychotic mental disorders	1,350	36	81	15	1,431	33	3,528
G3	**Mental Illness**	**1,350**	**36**	**81**	**15**	**1,431**	**33**	**3,528**
28	Inflammatory diseases of the eye	24	41	0	-	24	34	39
29	Cataract	14	122	0	-	14	99	38
30	Otitis media and mastoiditis	9	-	0	-	9	-	15
31	Other diseases of nervous system and sense organs	198	25	62	40	260	27	756
G4	**Nervous system & sensory organs**	**245**	**28**	**62**	**36**	**307**	**29**	**848**
32	Active rheumatic fever	0	-	0	-	0	-	0
33	Chronic rheumatic heart disease	3	-	1	-	4	-	11
34	Hypertensive disease	50	46	1	-	51	38	146
35	Ischaemic heart disease	554	56	63	30	617	51	1,187
36	Cerebrovascular disease	72	24	37	56	109	30	348
37	Venous thrombosis and embolism	40	61	6	-	46	62	69
38	Other diseases of the circulatory system	72	40	9	-	81	39	159
G5	**Circulatory**	**791**	**48**	**117**	**34**	**908**	**45**	**1,920**
47	Peptic ulcer	11	49	1	-	12	49	17
48	Appendicitis	30	196	0	-	30	189	34
49	Intestinal obstruction and hernia	118	156	0	-	118	144	134
50	Cholelithiasis and cholecystitis	35	105	2	-	37	106	41
51	Other diseases of the digestive system	135	70	11	50	146	68	175
G6	**Digestive (non-infectious)**	**329**	**97**	**14**	**42**	**343**	**92**	**401**

Code	ICD8 Cause / Cause Group	Recoveries		Deaths		Recs + Dths		Inceptions
		A	100A/E	A	100A/E	A	100A/E	A
52	Nephritis and nephrosis	18	65	3	-	21	65	30
53	Calculus of the urinary system	3	-	1	-	4	-	5
54	Hyperplasia of prostate	4	-	0	-	4	-	4
55	Other diseases of the genito-urinary system	271	97	9	-	280	95	347
G7	**Genito-urinary**	**296**	**92**	**13**	**57**	**309**	**90**	**386**
61	Arthritis and spondylitis	207	36	22	19	229	33	631
G8	**Arthritis**	**207**	**36**	**22**	**19**	**229**	**33**	**631**
62	Other diseases of the musculoskeletal system and connective tissue	1,089	60	16	7	1,105	54	1,964
G9	**Musculoskeletal**	**1,089**	**60**	**16**	**7**	**1,105**	**54**	**1,964**
66	Road transport accidents	477	85	1	-	478	80	653
67	All other accidents	335	65	7	-	342	61	306
68	Attempted suicide and self-inflicted injuries	1	-	0	-	1	-	3
69	Attempted homicide and injury purposefully inflicted by other persons; legal intervention	10	81	0	-	10	74	15
70	All other external causes	163	98	7	-	170	94	213
G10	**Injuries**	**986**	**78**	**15**	**16**	**1,001**	**74**	**1,190**
22	Thyrotoxicosis with or without goitre	21	27	0	-	21	24	21
23	Diabetes mellitus	14	38	2	-	16	34	47
24	Avitaminoses and other nutritional deficiency	0	-	0	-	0	-	0
25	Other endocrine and metobolic diseases	27	63	2	-	29	60	72
26	Anaemias	7	-	6	-	13	47	21
42	Bronchitis, emphysema and asthma	17	26	6	-	23	28	77
43	Hypertrophy of tonsils and adenoids	8	-	0	-	8	-	10
44	Pneumoconioses and related diseases	0	-	0	-	0	-	0
45	Other diseases of the respiratory system	27	53	2	-	29	50	49
46	Diseases of teeth and supporting structures	8	-	0	-	8	-	6
56	Abortion	0	-	0	-	0	-	0
57	Other complications of pregnancy, childbirth and the puerperium	26	104	0	-	26	101	22
58	Delivery without mention of complication	0	-	0	-	0	-	0
60	Other diseases of skin and subcutaneous tissue	34	57	4	-	38	56	60
63	Congenital anomalies	6	-	0	-	6	-	7
64	Certain causes of perinatal morbidity	25	106	0	-	25	102	5
65	Other specified and ill-defined diseases	276	36	21	19	297	34	542
76	ME	14	34	1	-	15	31	23
77	AIDS and HIV	0	-	2	-	2	-	4
G11	**All other known causes**	**510**	**41**	**46**	**25**	**556**	**39**	**966**
	All known causes	**6,690**	**49**	**953**	**50**	**7,643**	**49**	**13,753**
00	Unknown	385	49	69	49	454	49	752
	Grand total	**7,075**	**49**	**1,022**	**50**	**8,097**	**49**	**14,505**

Note: No A/E figures are shown where the number of actual events is less than 10

Deferred Period 1 week

Individual IP, 1991-2002, Standard* experience, CMI Occupational Class 1, males and females combined. Recoveries, deaths, combined terminations and claim inceptions. Expected values based on SM1975-78.

Code	ICD8 Cause / Cause Group	Recoveries		Deaths		Recs + Dths		Inceptions
		A	100A/E	A	100A/E	A	100A/E	A
01	Typhoid, paratyphoid fever, other salmonella infections	41	177	0	-	41	176	98
02	Bacillary dysentery and amoebiasis	3	-	0	-	3	-	8
03	Enteritis and other diarrhoeal	301	253	0	-	301	251	722
04	Tuberculosis of respiratory system	4	-	0	-	4	-	6
05	Other tuberculosis, including late effects	1	-	1	-	2	-	7
06	Brucellosis	0	-	0	-	0	-	0
07	Diphtheria	0	-	0	-	0	-	0
08	Whooping Cough	0	-	0	-	0	-	0
09	Streptococcal sore throat and scarlet fever	4	-	0	-	4	-	8
10	Smallpox	2	-	0	-	2	-	5
11	Measles	3	-	0	-	3	-	7
12	Viral Encephalitis	5	-	0	-	5	-	13
13	Infectious hepatitis	22	47	0	-	22	46	63
14	Typhus and other rickettsioses	2	-	0	-	2	-	3
15	Malaria	11	234	0	-	11	234	24
16	Syphilis and its sequelae	0	-	0	-	0	-	0
17	Gonococcal infections	0	-	0	-	0	-	0
18	Helminthiasis	1	-	0	-	1	-	2
19	All other infective and parasitic diseases	812	198	1	-	813	196	1,773
39	Acute respiratory infections	961	239	1	-	962	238	2,302
40	Influenza	1,609	309	0	-	1,609	308	3,967
41	Pneumonia	98	115	0	-	98	114	216
59	Infections of skin and subcutaneous tissue	157	147	0	-	157	146	368
G1	**Infections & acute respiratory**	**4,037**	**231**	**3**	**-**	**4,040**	**230**	**9,592**
20	Malignant neoplasms, including neoplasms of lymphatic and haematopoietic tissue	192	34	66	289	258	44	609
21	Benign neoplasms and neoplasms of unspecified nature	41	89	3	-	44	93	91
G2	**Neoplasms**	**233**	**38**	**69**	**288**	**302**	**48**	**700**
27	Psychoses and non-psychotic mental disorders	773	44	16	18	789	42	2,102
G3	**Mental Illness**	**773**	**44**	**16**	**18**	**789**	**42**	**2,102**
28	Inflammatory diseases of the eye	113	141	0	-	113	136	276
29	Cataract	111	118	0	-	111	116	213
30	Otitis media and mastoiditis	13	173	0	-	13	173	38
31	Other diseases of nervous system and sense organs	573	82	5	-	578	80	1,567
G4	**Nervous system & sensory organs**	**810**	**92**	**5**	**-**	**815**	**89**	**2,094**
32	Active rheumatic fever	1	-	0	-	1	-	5
33	Chronic rheumatic heart disease	0	-	0	-	0	-	0
34	Hypertensive disease	109	74	2	-	111	72	248
35	Ischaemic heart disease	409	45	11	19	420	43	1,094
36	Cerebrovascular disease	28	20	6	-	34	22	147
37	Venous thrombosis and embolism	28	94	1	-	29	93	67
38	Other diseases of the circulatory system	251	104	3	-	254	102	605
G5	**Circulatory**	**826**	**56**	**23**	**27**	**849**	**54**	**2,166**
47	Peptic ulcer	20	147	0	-	20	145	50
48	Appendicitis	57	102	0	-	57	101	115
49	Intestinal obstruction and hernia	350	125	1	-	351	124	879
50	Cholelithiasis and cholecystitis	67	89	0	-	67	88	132
51	Other diseases of the digestive system	146	90	2	-	148	89	366
G6	**Digestive (non-infectious)**	**640**	**109**	**3**	**-**	**643**	**108**	**1,542**

Code	ICD8 Cause / Cause Group	Recoveries		Deaths		Recs + Dths		Inceptions
		A	100A/E	A	100A/E	A	100A/E	A
52	Nephritis and nephrosis	45	102	0	-	45	99	105
53	Calculus of the urinary system	4	-	0	-	4	-	5
54	Hyperplasia of prostate	12	69	0	-	12	67	29
55	Other diseases of the genito-urinary system	454	102	4	-	458	102	945
G7	**Genito-urinary**	**515**	**101**	**4**	**-**	**519**	**100**	**1,084**
61	Arthritis and spondylitis	281	43	6	-	287	41	1,004
G8	**Arthritis**	**281**	**43**	**6**	**-**	**287**	**41**	**1,004**
62	Other diseases of the musculoskeletal system and connective tissue	2,447	100	8	-	2,455	98	6,184
G9	**Musculoskeletal**	**2,447**	**100**	**8**	**-**	**2,455**	**98**	**6,184**
66	Road transport accidents	678	66	1	-	679	65	1,488
67	All other accidents	254	103	0	-	254	101	595
68	Attempted suicide and self-inflicted injuries	22	214	0	-	22	214	56
69	Attempted homicide and injury purposefully inflicted by other persons; legal intervention	18	83	0	-	18	82	44
70	All other external causes	275	109	3	-	278	108	666
G10	**Injuries**	**1,247**	**80**	**4**	**-**	**1,251**	**79**	**2,849**
22	Thyrotoxicosis with or without goitre	5	-	0	-	5	-	17
23	Diabetes mellitus	15	60	2	-	16	61	42
24	Avitaminoses and other nutritional deficiency	3	-	0	-	3	-	3
25	Other endocrine and metobolic diseases	60	94	2	-	64	98	192
26	Anaemias	7	-	6	-	8	-	12
42	Bronchitis, emphysema and asthma	261	202	6	-	262	197	576
43	Hypertrophy of tonsils and adenoids	161	213	0	-	161	212	371
44	Pneumoconioses and related diseases	3	-	0	-	3	-	5
45	Other diseases of the respiratory system	73	162	2	-	75	163	183
46	Diseases of teeth and supporting structures	50	263	0	-	50	262	93
56	Abortion	11	153	0	-	11	153	15
57	Other complications of pregnancy, childbirth and the puerperium	7	-	0	-	7	-	12
58	Delivery without mention of complication	0	-	0	-	0	-	0
60	Other diseases of skin and subcutaneous tissue	202	123	4	-	204	122	545
63	Congenital anomalies	1	-	0	-	1	-	2
64	Certain causes of perinatal morbidity	0	-	0	-	0	-	0
65	Other specified and ill-defined diseases	133	63	21	-	136	62	256
76	ME	0	-	1	-	0	-	0
77	AIDS and HIV	0	-	2	-	0	-	0
G11	**All other known causes**	**992**	**128**	**46**	**63**	**1,006**	**126**	**2,324**
	All known causes	**12,801**	**98**	**155**	**37**	**12,956**	**97**	**31,641**
00	Unknown	1	-	0	-	1	-	2
	Grand total	**12,802**	**98**	**155**	**37**	**12,957**	**96**	**31,643**

Note: No A/E figures are shown where the number of actual events is less than 10

Appendix A2: ICD8 causes and mapping to cause groups

ICD 8 Code	Cause Description	CMIR 8 Mapping	Major Office Mapping	CMI Working Party Mapping
01	Typhoid, paratyphoid fever, other salmonella infections	Other Infective	Ill defined / Misc.	Infections & acute respiratory
02	Bacillary dysentery and amoebiasis	Other Infective	Ill defined / Misc.	Infections & acute respiratory
03	Enteritis and other diarrhoeal	Other Infective	Gastro-intestinal	Infections & acute respiratory
04	Tuberculosis of respiratory system	Other Infective	Respiratory	Infections & acute respiratory
05	Other tuberculosis, including late effects	Other Infective	Ill defined / Misc.	Infections & acute respiratory
06	Brucellosis	Other Infective	Respiratory	Infections & acute respiratory
07	Diphtheria	Other Infective	Ill defined / Misc.	Infections & acute respiratory
08	Whooping Cough	Other Infective	Ill defined / Misc.	Infections & acute respiratory
09	Streptococcal sore throat and scarlet fever	Other Infective	Ill defined / Misc.	Infections & acute respiratory
10	Smallpox	Other Infective	Ill defined / Misc.	Infections & acute respiratory
11	Measles	Other Infective	Ill defined / Misc.	Infections & acute respiratory
12	Viral Encephalitis	Other Infective	Ill defined / Misc.	Infections & acute respiratory
13	Infectious hepatitis	Other Infective	Ill defined / Misc.	Infections & acute respiratory
14	Typhus and other rickettsioses	Other Infective	Ill defined / Misc.	Infections & acute respiratory
15	Malaria	Other Infective	Ill defined / Misc.	Infections & acute respiratory
16	Syphilis and its sequelae	Other Infective	Ill defined / Misc.	Infections & acute respiratory
17	Gonococcal infections	Other Infective	Ill defined / Misc.	Infections & acute respiratory
18	Helminthiasis	Other Infective	Ill defined / Misc.	Infections & acute respiratory
19	All other infective and parasitic diseases	Other Infective	Ill defined / Misc.	Infections & acute respiratory
20	Malignant neoplasms, including neoplasms of lymphatic and haematopoietic tissue	Neoplasms	Cancer	Neoplasms
21	Benign neoplasms and neoplasms of unspecified nature	Neoplasms	Cancer	Neoplasms
22	Thyrotoxicosis with or without goitre	Endocrine and Metabolic	Endocrine / Metabolic	All other known causes
23	Diabetes mellitus	Endocrine and Metabolic	Endocrine / Metabolic	All other known causes
24	Avitaminoses and other nutritional deficiency	Endocrine and Metabolic	Endocrine / Metabolic	All other known causes
25	Other endocrine and metabolic diseases	Endocrine and Metabolic	Endocrine / Metabolic	All other known causes

ICD 8 Code	Cause Description	CMIR 8 Mapping	Major Office Mapping	CMI Working Party Mapping
26	Anaemias	Endocrine and Metabolic	Endocrine / Metabolic	All other known causes
27	Psychoses and non-psychotic mental disorders	Mental	Mental / psychological	Mental illness
28	Inflammatory diseases of the eye	All Others	Visual / auditory	Nervous system & sensory organs
29	Cataract	All Others	Visual / auditory	Nervous system & sensory organs
30	Otitis media and mastoiditis	All Others	Visual / auditory	Nervous system & sensory organs
31	Other diseases of nervous system and sense organs	Nervous	Nervous	Nervous system & sensory organs
32	Active rheumatic fever	All Others	Ill defined / Misc.	Circulatory
33	Chronic rheumatic heart disease	All Others	Cardio-vascular	Circulatory
34	Hypertensive disease	Circulatory	Cardio-vascular	Circulatory
35	Ischaemic heart disease	Circulatory	Cardio-vascular	Circulatory
36	Cerebrovascular disease	Circulatory	Cardio-vascular	Circulatory
37	Venous thrombosis and embolism	Circulatory	Cardio-vascular	Circulatory
38	Other diseases of the circulatory system	Circulatory	Cardio-vascular	Circulatory
39	Acute respiratory infections	Acute Respiratory	Respiratory	Infections & acute respiratory
40	Influenza	Acute Respiratory	Respiratory	Infections & acute respiratory
41	Pneumonia	Acute Respiratory	Respiratory	Infections & acute respiratory
42	Bronchitis, emphysema and asthma	Chronic Respiratory	Respiratory	All other known causes
43	Hypertrophy of tonsils and adenoids	Chronic Respiratory	Respiratory	All other known causes
44	Pneumoconioses and related diseases	Chronic Respiratory	Respiratory	All other known causes
45	Other diseases of the respiratory system	Chronic Respiratory	Respiratory	All other known causes
46	Diseases of teeth and supporting structures	All Others	Ill defined / Misc.	All other known causes
47	Peptic ulcer	Digestive	Gastro-intestinal	Digestive (non-infectious)
48	Appendicitis	Digestive	Gastro-intestinal	Digestive (non-infectious)
49	Intestinal obstruction and hernia	Digestive	Gastro-intestinal	Digestive (non-infectious)
50	Cholelithiasis and cholecystitis	Digestive	Gastro-intestinal	Digestive (non-infectious)
51	Other diseases of the digestive system	Digestive	Gastro-intestinal	Digestive (non-infectious)
52	Nephritis and nephrosis	Genito-Urinary	Endocrine / Metabolic	Genito-Urinary
53	Calculus of the urinary system	Genito-Urinary	Endocrine / Metabolic	Genito-Urinary
54	Hyperplasia of prostate	Genito-Urinary	Endocrine / Metabolic	Genito-Urinary
55	Other diseases of the genito-urinary system	Genito-Urinary	Endocrine / Metabolic	Genito-Urinary

ICD 8 Code	Cause Description	CMIR 8 Mapping	Major Office Mapping	CMI Working Party Mapping
56	Abortion	All Others	Ill defined / Misc.	All other known causes
57	Other complications of pregnancy, childbirth and the puerperium	All Others	Ill defined / Misc.	All other known causes
58	Delivery without mention of complication	All Others	Ill defined / Misc.	All other known causes
59	Infections of skin and subcutaneous tissue	All Others	Ill defined / Misc.	Infections & acute respiratory
60	Other diseases of skin and subcutaneous tissue	All Others	Ill defined / Misc.	All other known causes
61	Arthritis and spondylitis	Musculoskeletal	Arthritic	Arthritis
62	Other diseases of the musculoskeletal system and connective tissue	Musculoskeletal	Musculoskeletal	Musculoskeletal
63	Congenital anomalies	All Others	Ill defined / Misc.	All other known causes
64	Certain causes of perinatal morbidity	All Others	Ill defined / Misc.	All other known causes
65	Other specified and ill-defined diseases	All Others	Ill defined / Misc.	All other known causes
66	Road transport accidents	RTA Injuries	Injuries	Injuries
67	All other accidents	Other injuries	Injuries	Injuries
68	Attempted suicide and self-inflicted injuries	Other injuries	Injuries	Injuries
69	Attempted homicide and injury purposefully inflicted by other persons; legal intervention	Other injuries	Injuries	Injuries
70	All other external causes	Other injuries	Injuries	Injuries
76	ME	Other Infective	ME	All other known causes
77	AIDS and HIV	Other Infective	HIV / AIDS	All other known causes

Appendix B1: Claim inceptions analysis for all cause groups

Figure B1.1.   Inceptions by cause group and deferred period for 1991-2002, individual policies, Standard* experience, all occupational classes, ages 18-64. Expected values based on SM1975-78.
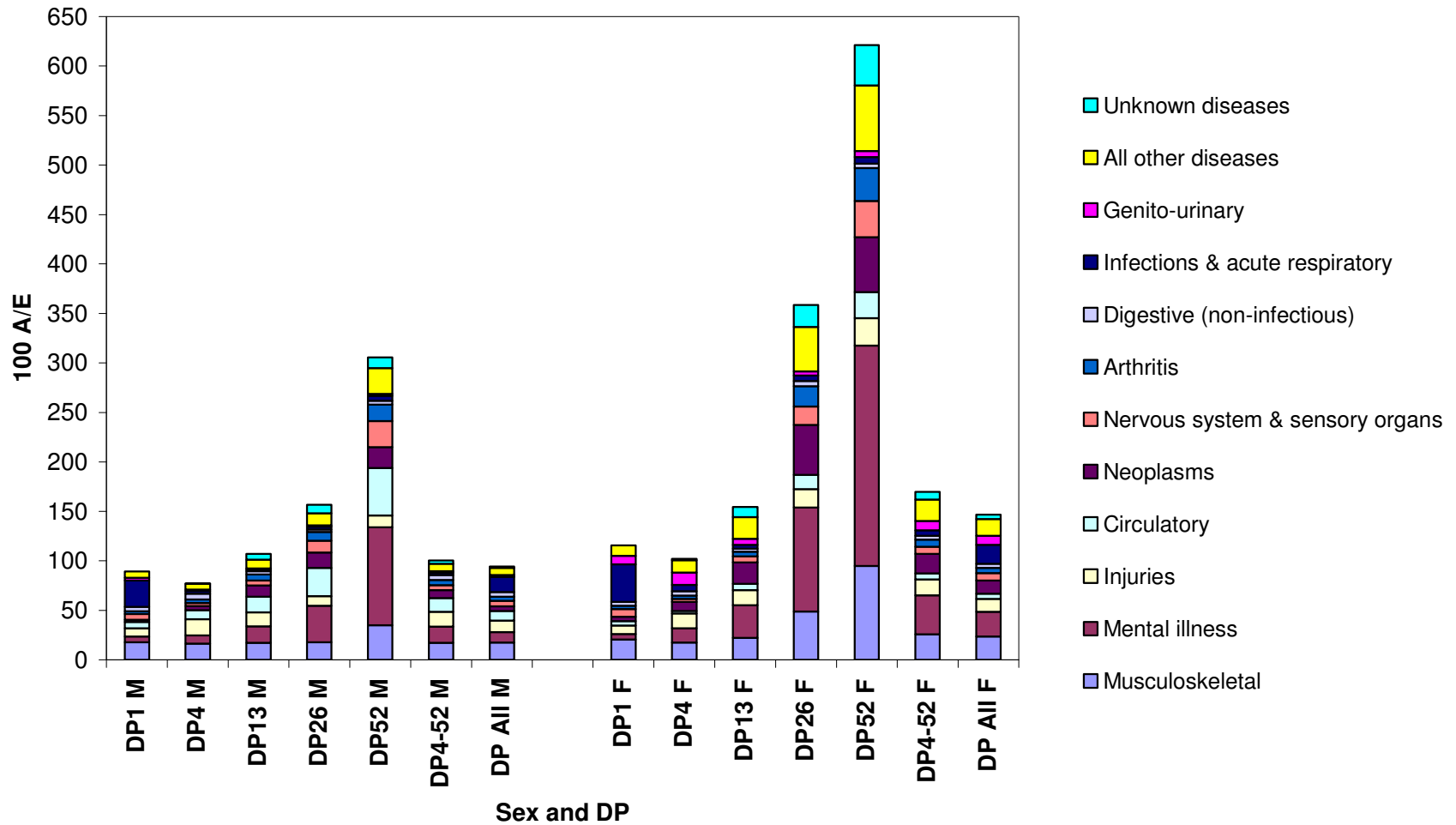
Figure B1.2.   Inceptions by cause group and occupational class for 1991-2002, individual policies, Standard* experience, deferred periods 4-52 weeks, ages 18-64. Expected values based on SM1975-78.
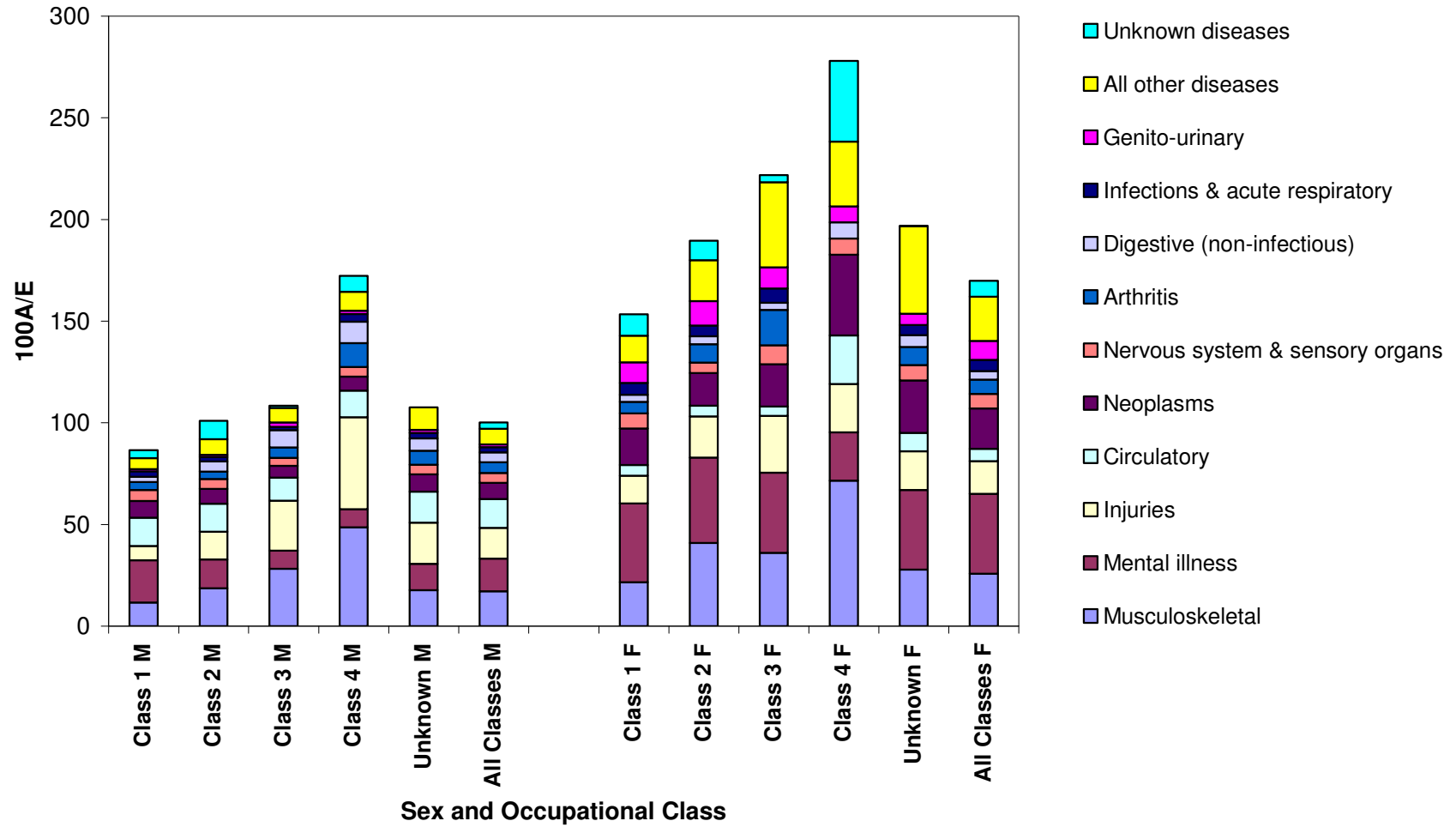
Figure B1.3. Inceptions by cause group and age for 1991-2002, individual policies, Standard* experience, deferred period 4-52 weeks, all occupational classes. Expected values based on SM1975-78.

Figure B1.3a: All cause groups
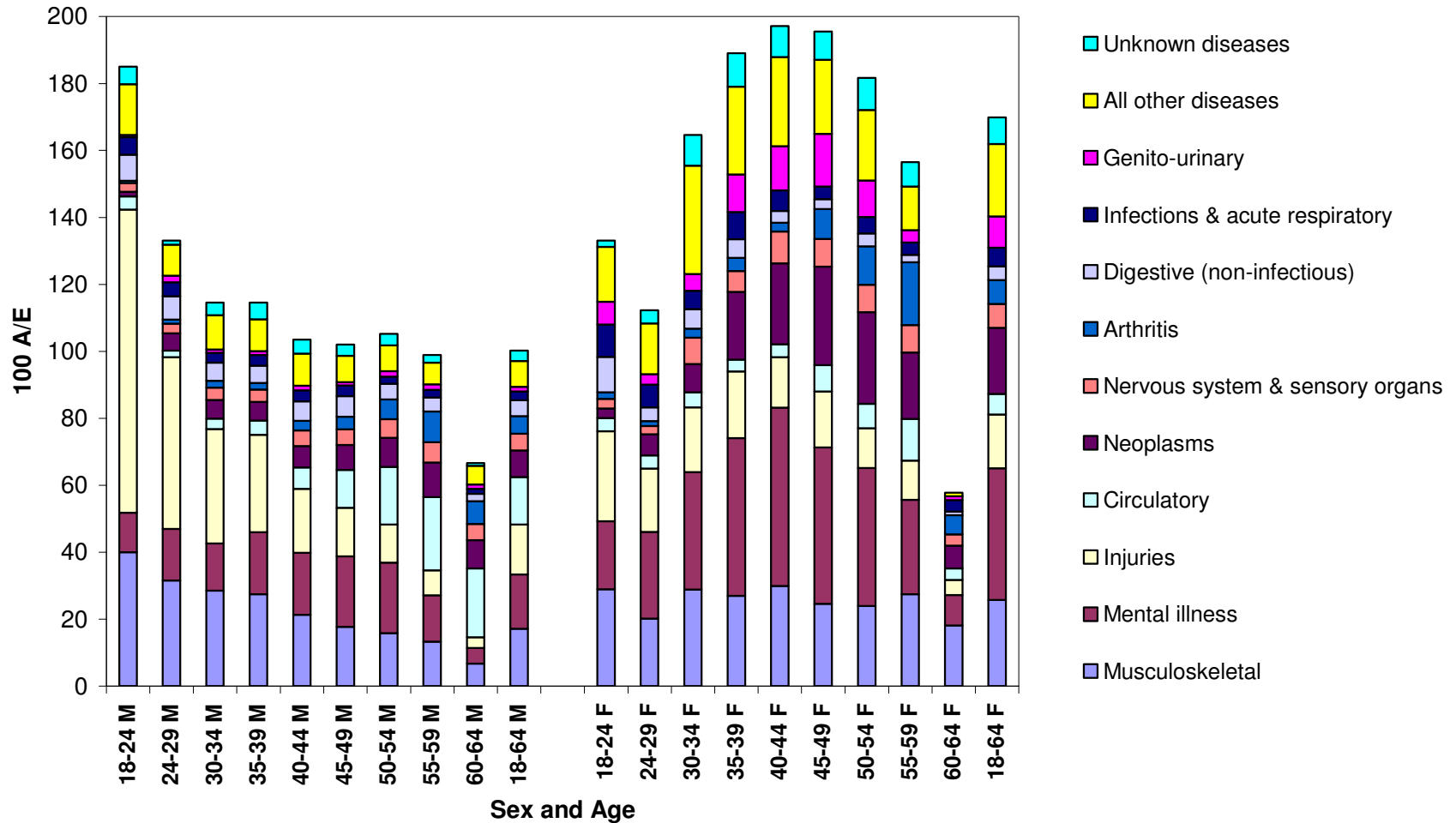
Figure B1.3b: Excluding injuries
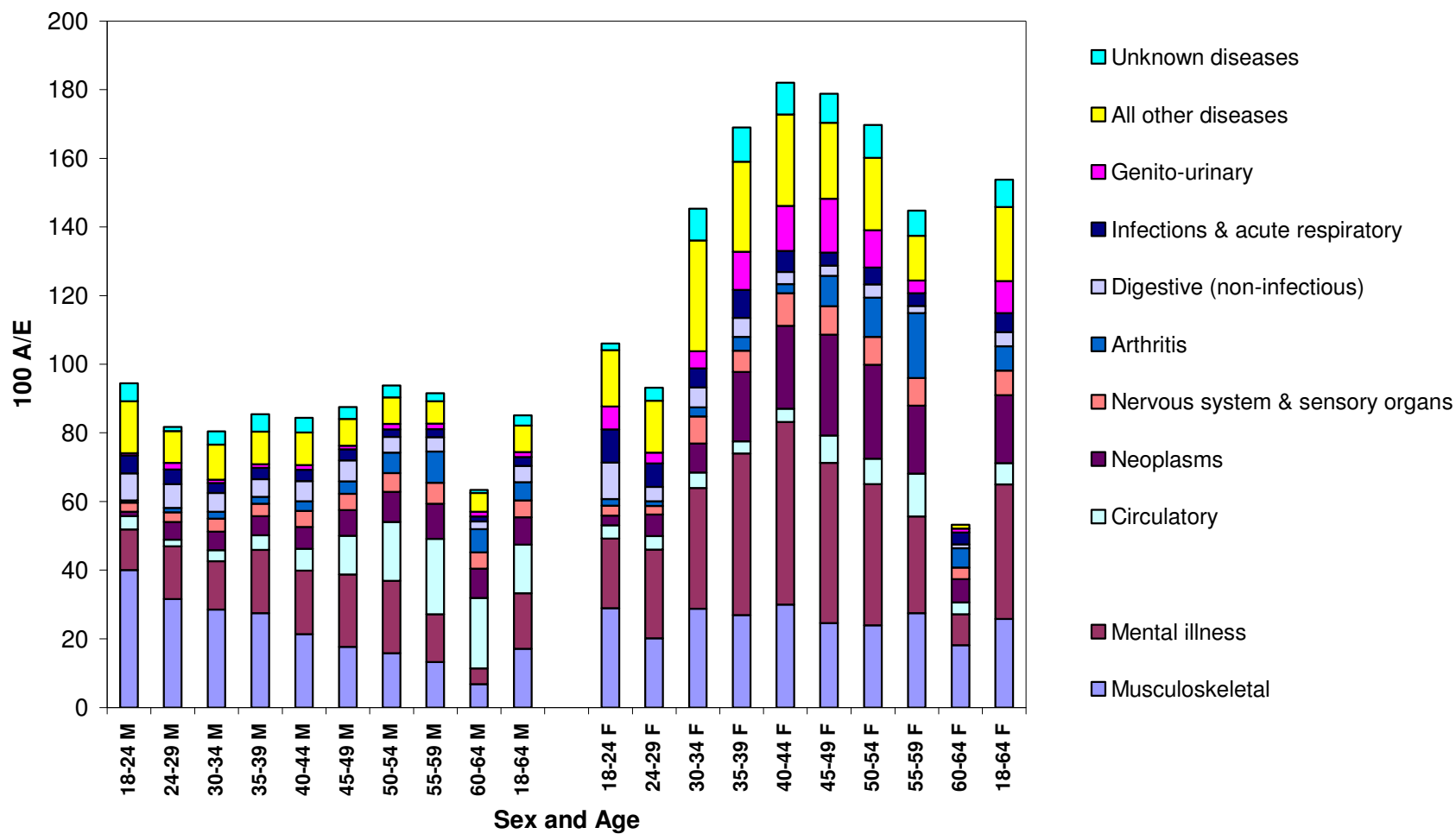
Figure B1.4.   Inceptions by cause group and quadrennium for 1975-2002, individual policies, deferred period 4-52 weeks. Standard, ages 20-64, for 1975-1990; Standard*, all occupational classes, ages 18-64, for 1991-2002. Expected values based on SM1975-78.
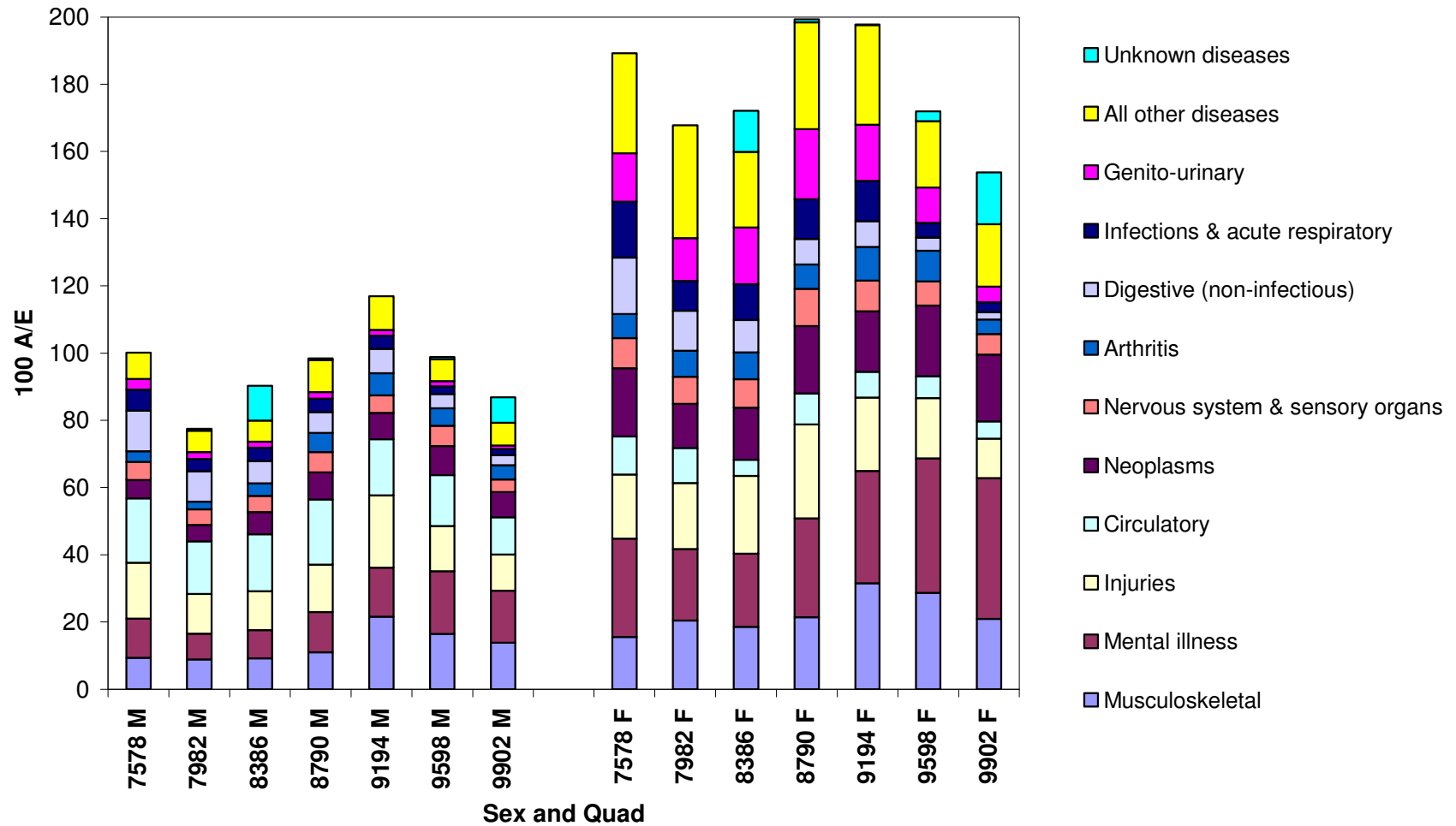
Appendix B2: Male claim inceptions by age and quadrennium for major cause groups
Deferred period 4 weeks only

Figure B2.1.   Male Musculoskeletal inceptions by quadrennium and age for 1975-2002, individual policies, deferred period 4 weeks. Standard for 1975-1990; Standard*, all occupational classes for 1991-2002. Expected values based on SM1975-78.
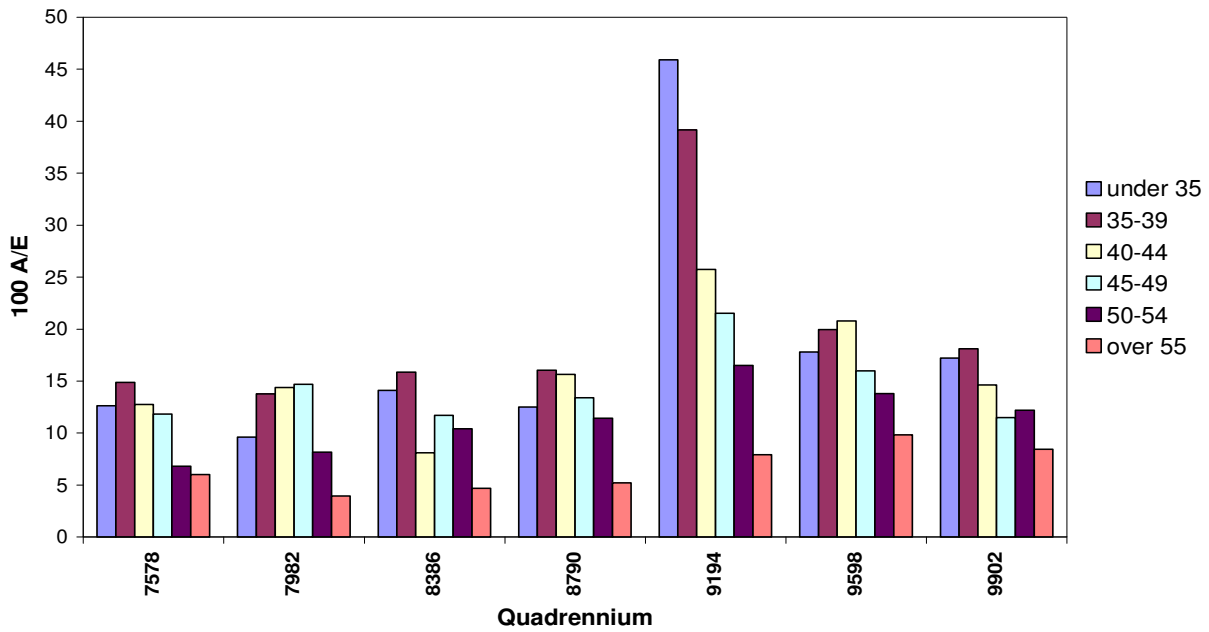
Figure B2.2.   Male Mental illness inceptions by quadrennium and age for 1975-2002, individual policies, deferred period 4 weeks. Standard for 1975-1990; Standard*, all occupational classes for 1991-2002. Expected values based on SM1975-78.
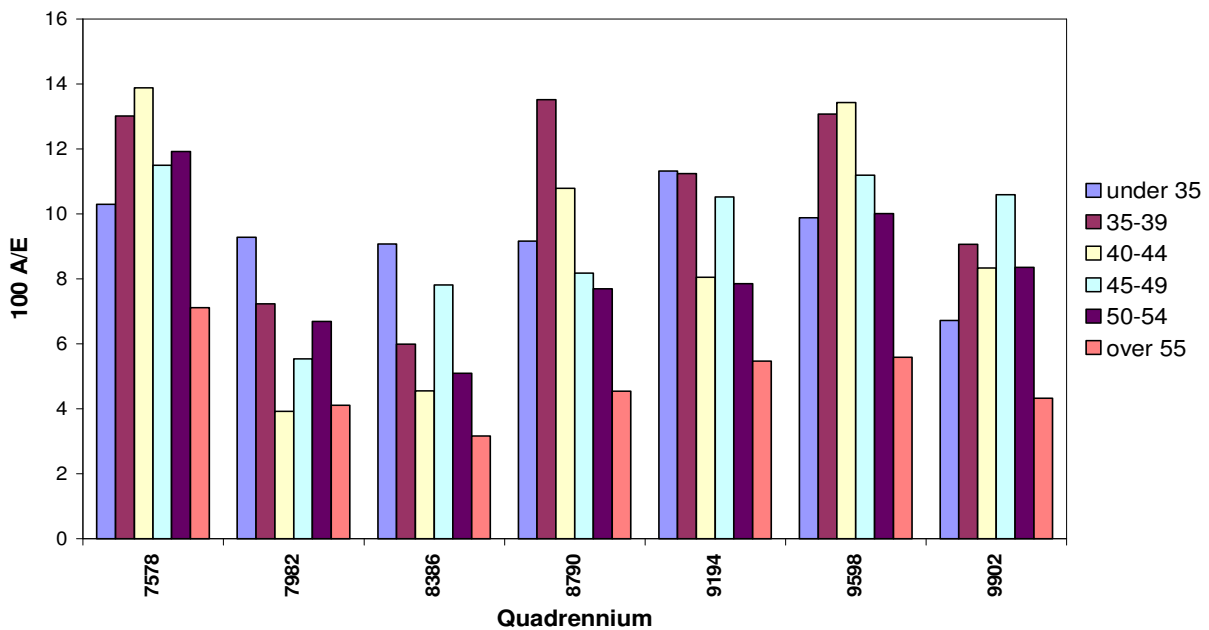
Figure B2.3. Male Injuries inceptions by quadrennium and age for 1975-2002, individual policies, deferred period 4 weeks. Standard for 1975-1990; Standard*, all occupational classes for 1991-2002. Expected values based on SM1975-78.
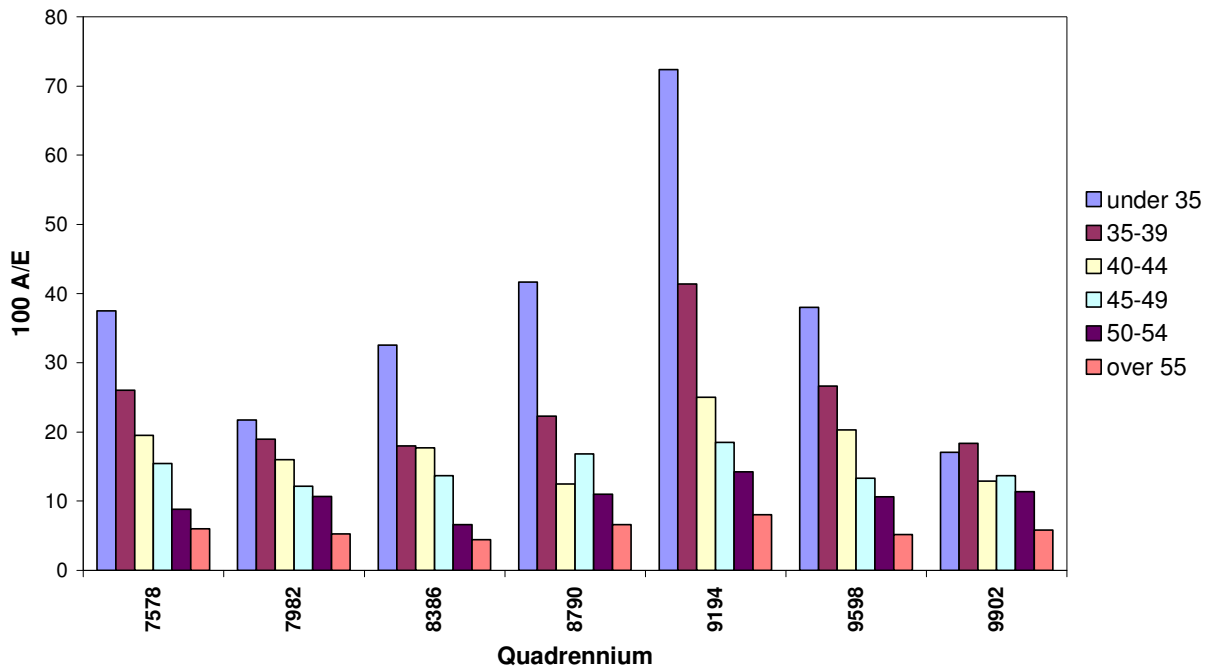
Figure B2.4. Male Circulatory inceptions by quadrennium and age for 1975-2002, individual policies, deferred period 4 weeks. Standard for 1975-1990; Standard*, all occupational classes for 1991-2002. Expected values based on SM1975-78.
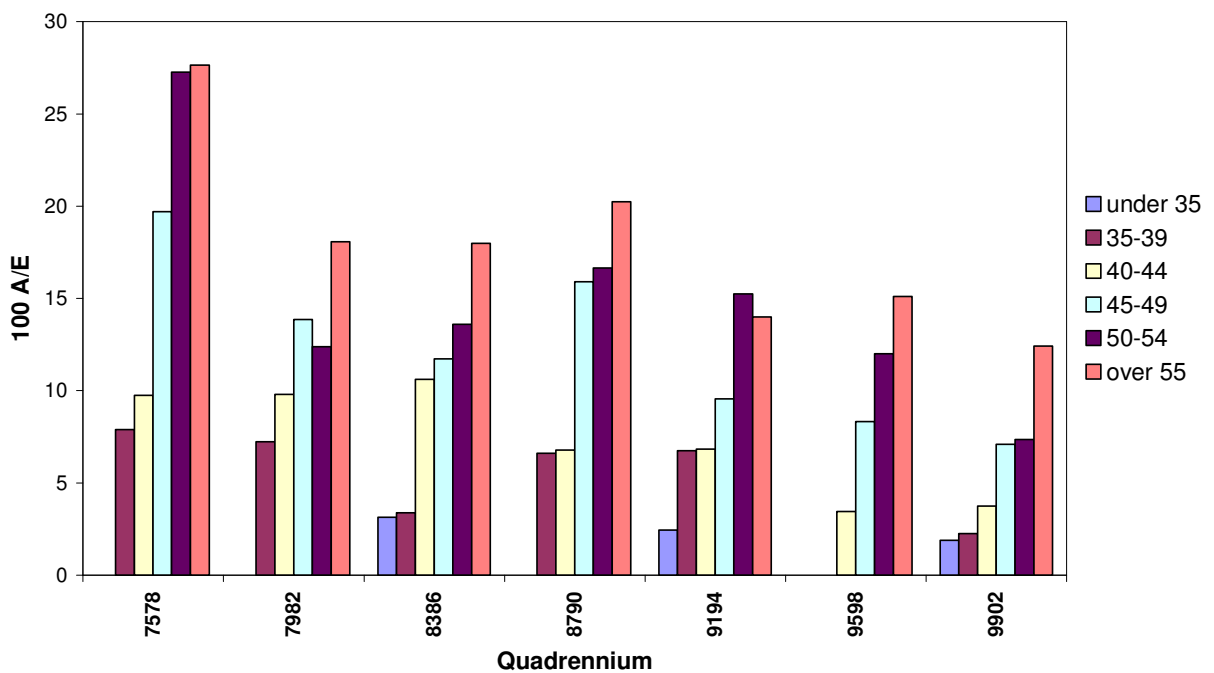
Figure B2.5. Male Neoplasm inceptions by quadrennium and age for 1975-2002, individual policies, deferred period 4 weeks. Standard for 1975-1990; Standard*, all occupational classes for 1991-2002. Expected values based on SM1975-78.
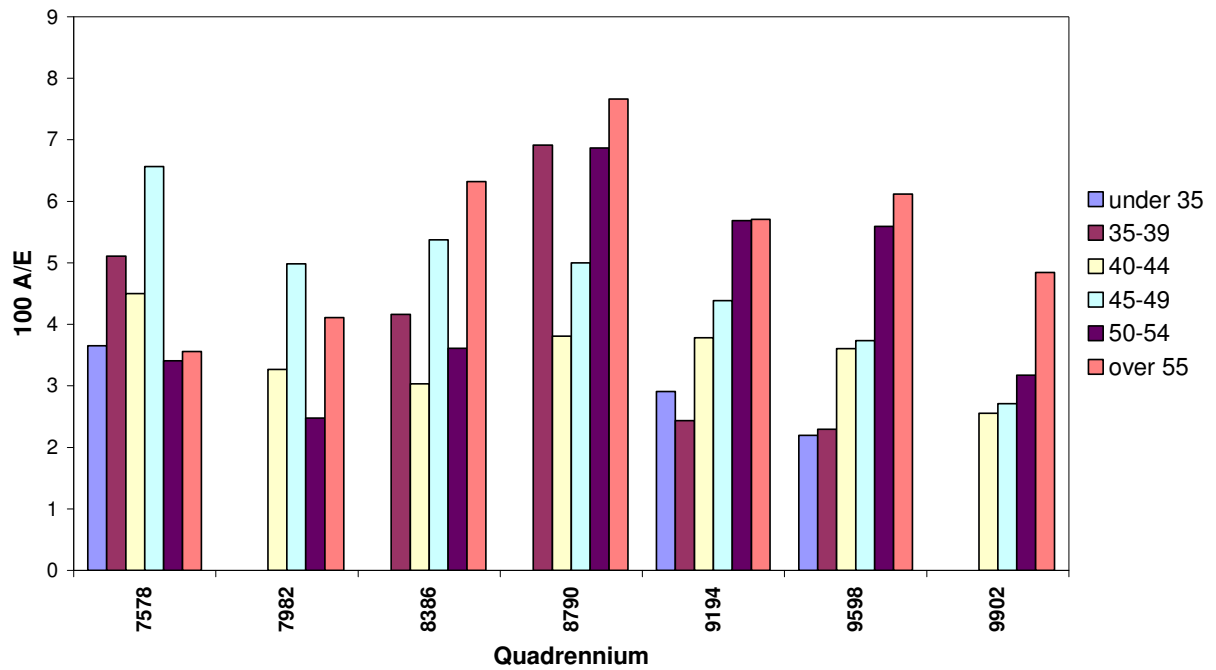
Appendix B3: Claim inceptions by deferred period, sex and quadrennium for major cause groups

Figure B3.1. Musculoskeletal inceptions by quadrennium and deferred period for 1975-2002, individual policies. Standard, ages 20-64 for 1975-90; Standard*, all occupational classes, ages 18-64 for 1991-2002. Expected values based on SM1975-78.
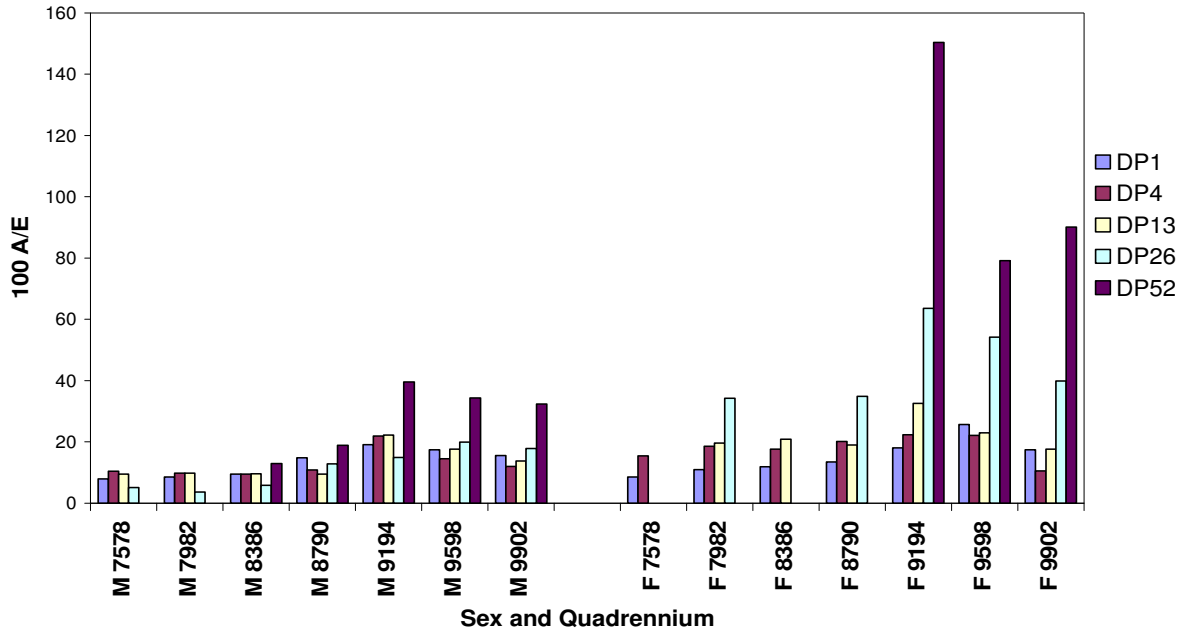
Figure B3.2. Mental illness inceptions by quadrennium and deferred period for 1975-2002, individual policies. Standard, ages 20-64 for 1975-90; Standard*, all occupational classes, ages 18-64 for 1991-2002. Expected values based on SM1975-78.
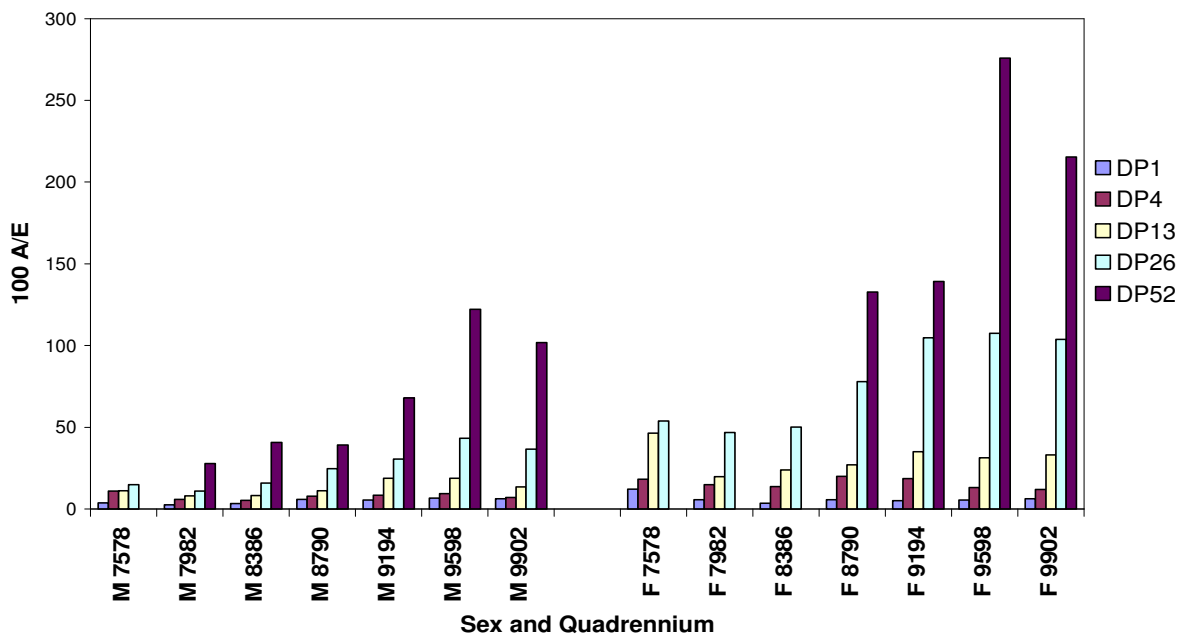
Figure B3.3.   Injuries inceptions by quadrennium and deferred period for 1975-2002, individual policies. Standard, ages 20-64 for 1975-90; Standard*, all occupational classes, ages 18-64 for 1991-2002. Expected values based on SM1975-78
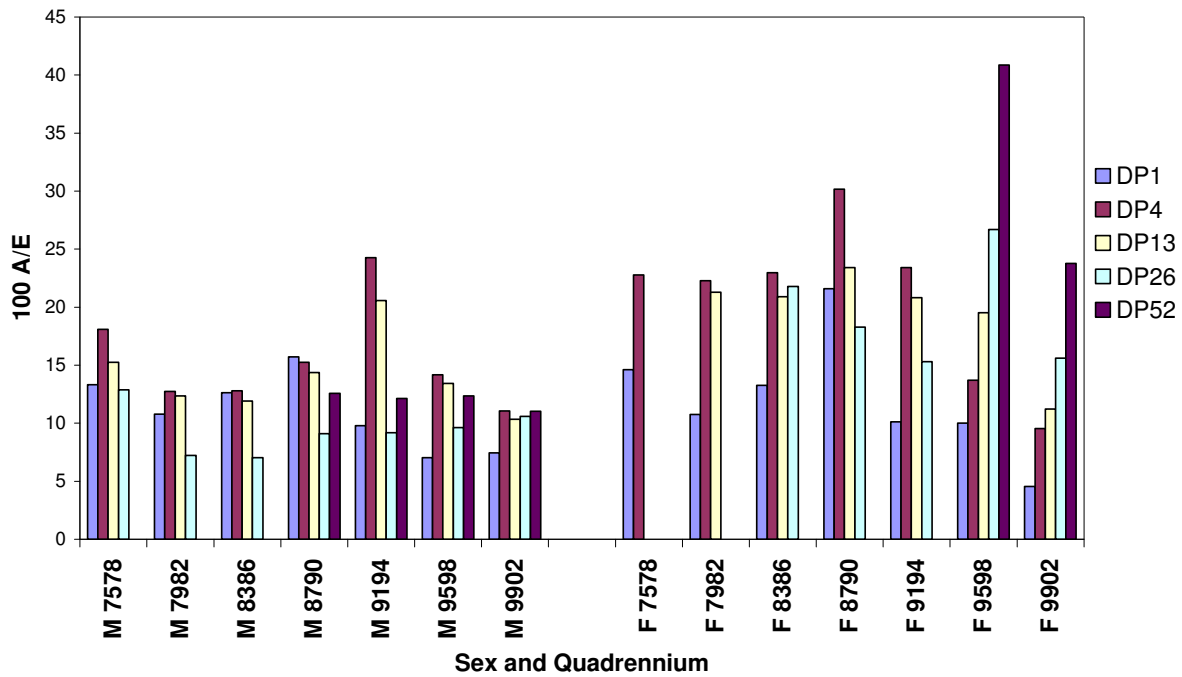
Figure B3.4.   Circulatory inceptions by quadrennium and deferred period for 1975-2002, individual policies. Standard, ages 20-64 for 1975-90; Standard*, all occupational classes, ages 18-64 for 1991-2002. Expected values based on SM1975-78

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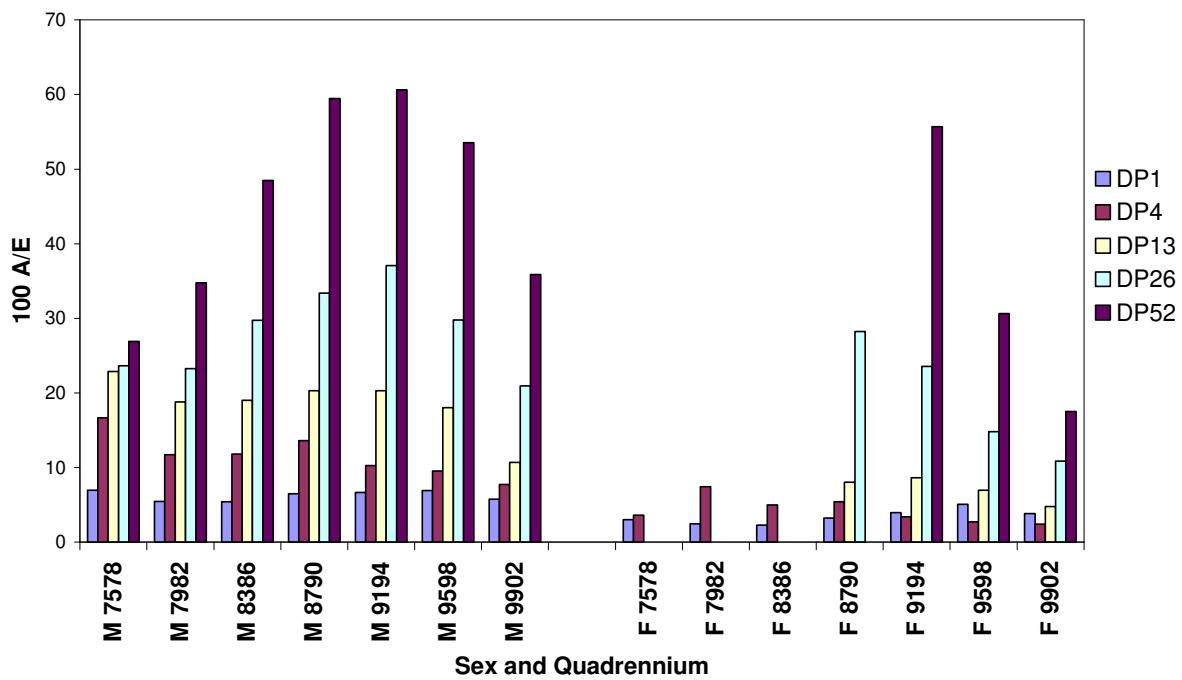
Figure B3.5.   Neoplasms inceptions by quadrennium and deferred period for 1975-2002, individual policies. Standard, ages 20-64 for 1975-90; Standard*, all occupational classes, ages 18-64 for 1991-2002. Expected values based on SM1975-78
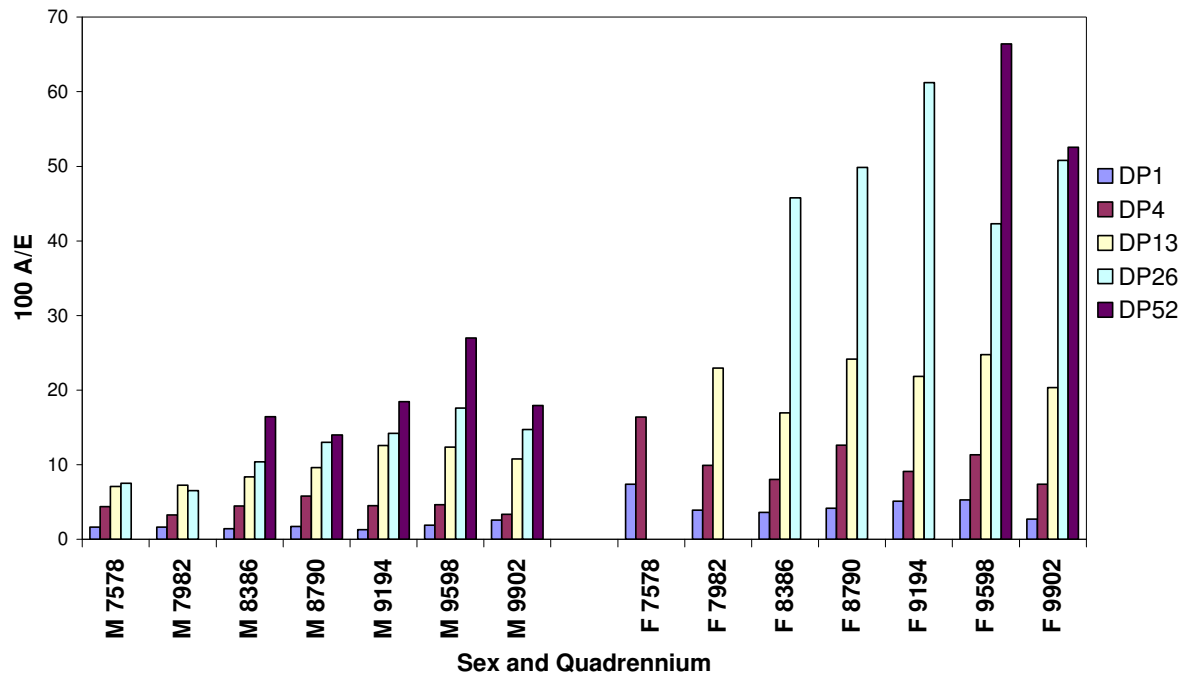
Appendix B4: Claim inceptions by occupational class, sex and quadrennium for major cause groups

Figure B4.1.   Musculoskeletal inceptions by quadrennium and occupational class for 1991-2002, individual policies, Standard* experience, ages 18-64, deferred periods 4- 52 weeks. Expected values based on SM1975-78
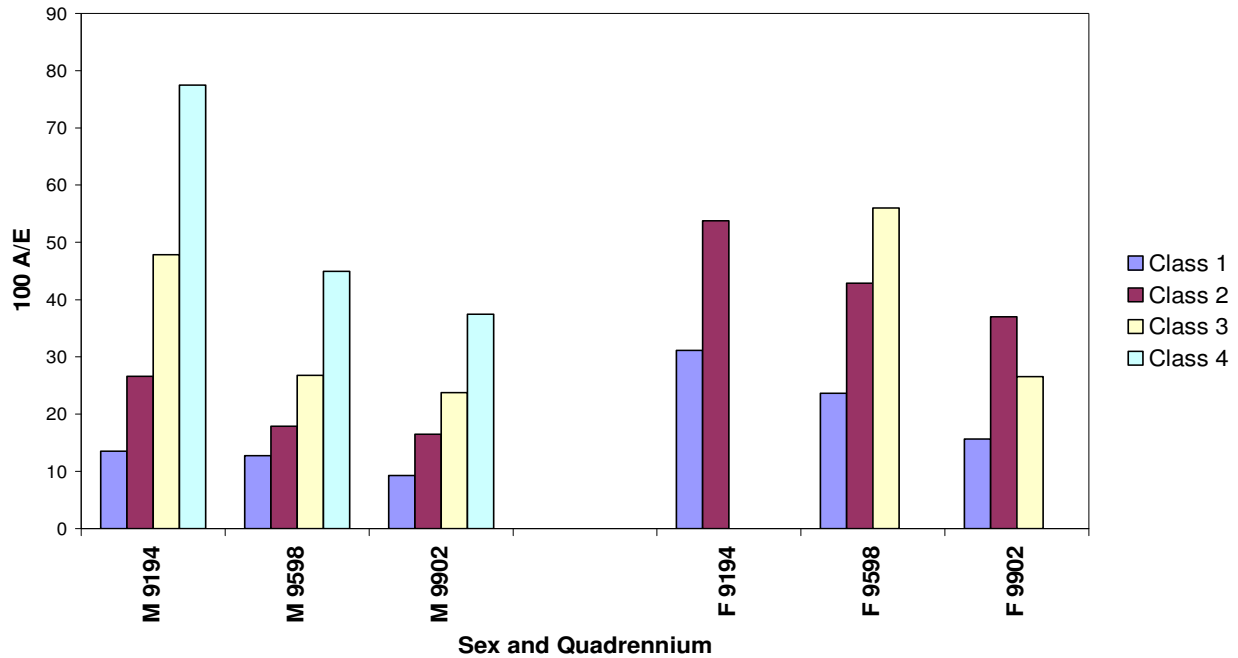
Figure B4.2.   Mental illness inceptions by quadrennium and occupational class for 1991-2002, individual policies, Standard* experience, ages 18-64, deferred periods 4- 52 weeks. Expected values based on SM1975-78
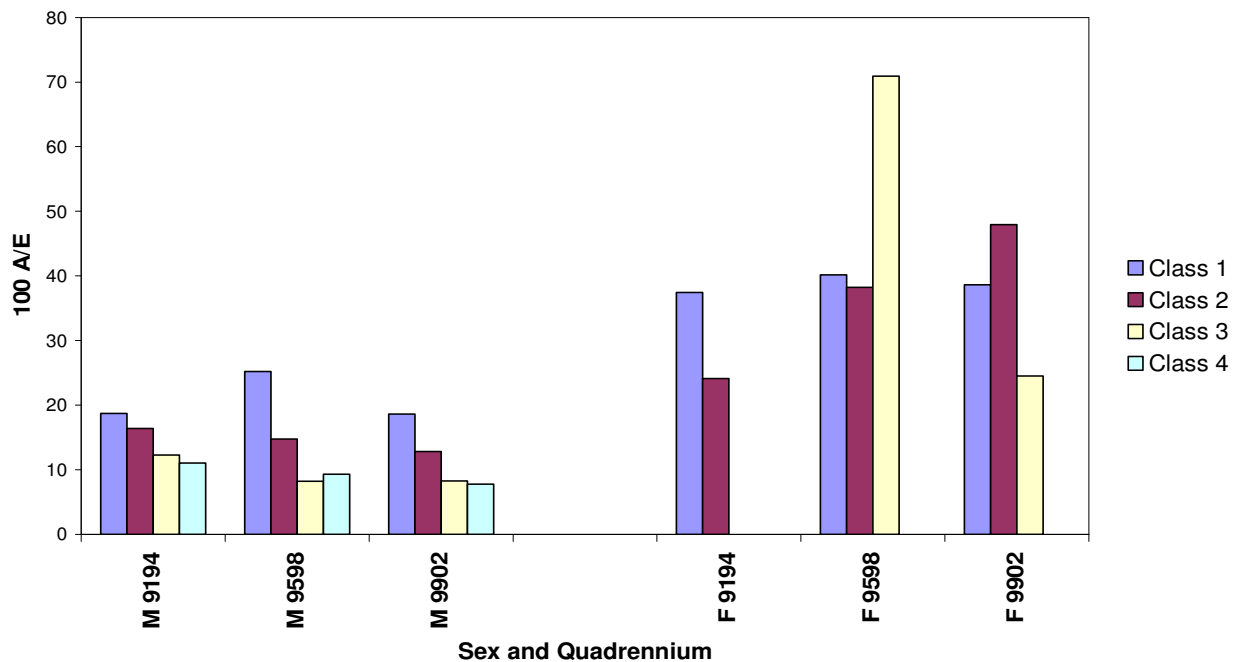
Figure B4.3. Injuries inceptions by quadrennium and occupational class for 1991-2002, individual policies, Standard* experience, ages 18-64, deferred periods 4- 52 weeks. Expected values based on SM1975-78
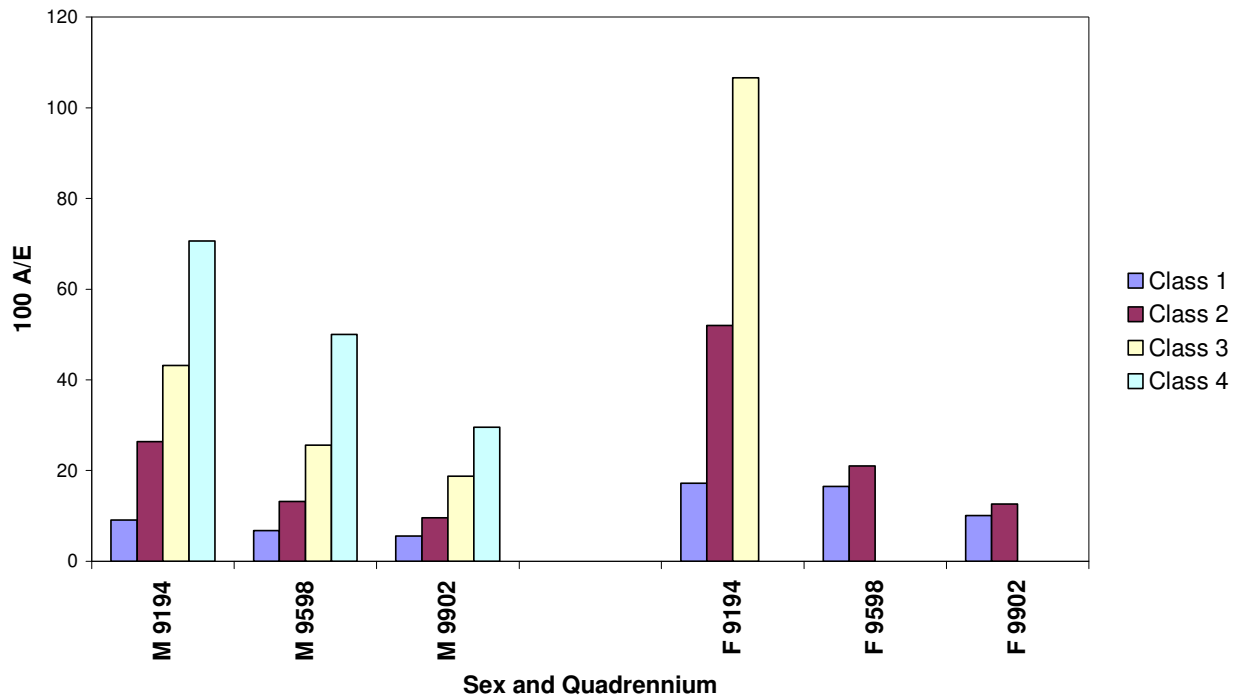
Figure B4.4. Circulatory inceptions by quadrennium and occupational class for 1991-2002, individual policies, Standard* experience, ages 18-64, deferred periods 4- 52 weeks. Expected values based on SM1975-78
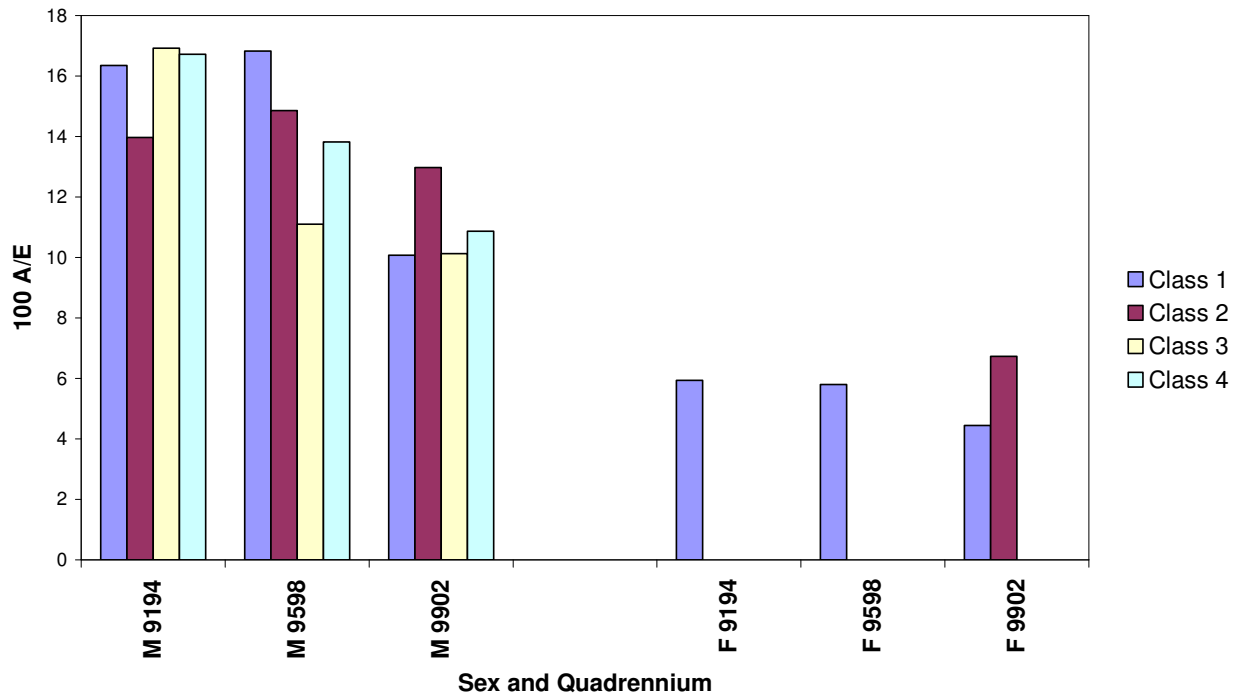
Figure B4.5. Neoplasms inceptions by quadrennium and occupational class for 1991-2002, individual policies, Standard* experience, ages 18-64, deferred periods 4- 52 weeks. Expected values based on SM1975-78
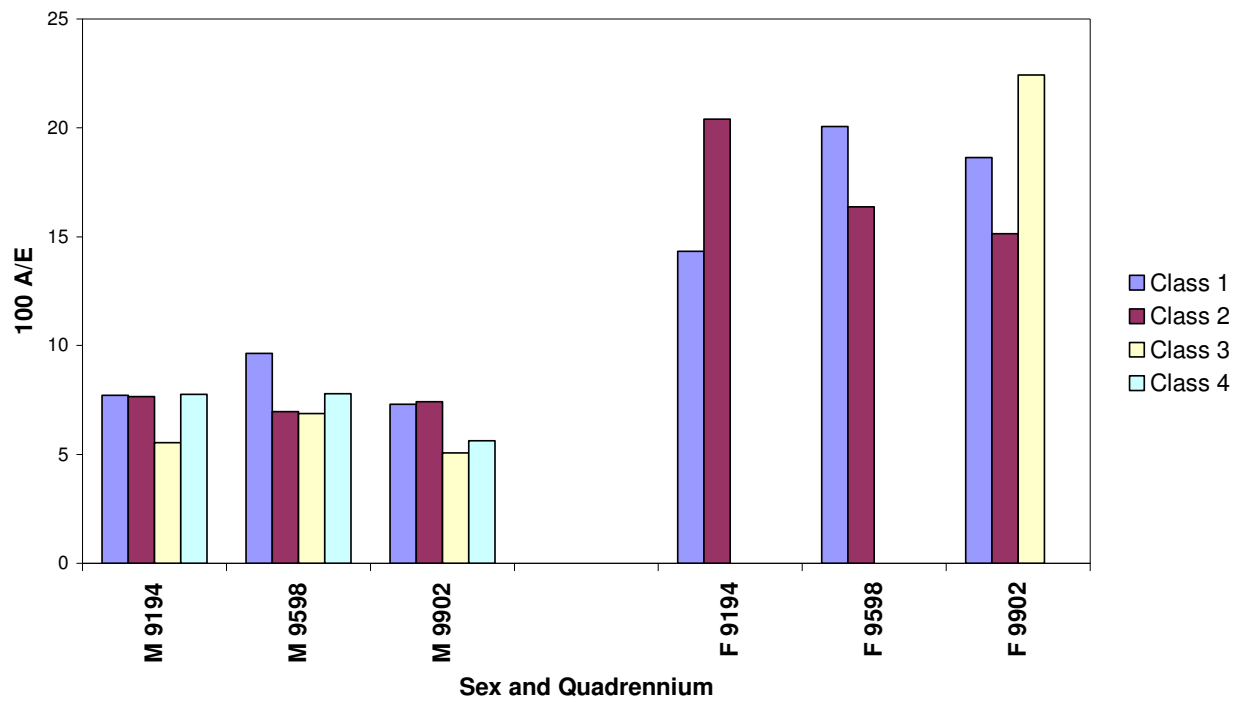
Appendix B5: Claim inceptions by CMI occupational class, deferred period and sex for major cause groups

Figure B5.1. Musculoskeletal inceptions by deferred period and occupational class for 1991-2002, individual policies, Standard* experience, ages 18-64, deferred periods 4- 52 weeks. Expected values based on SM1975-78
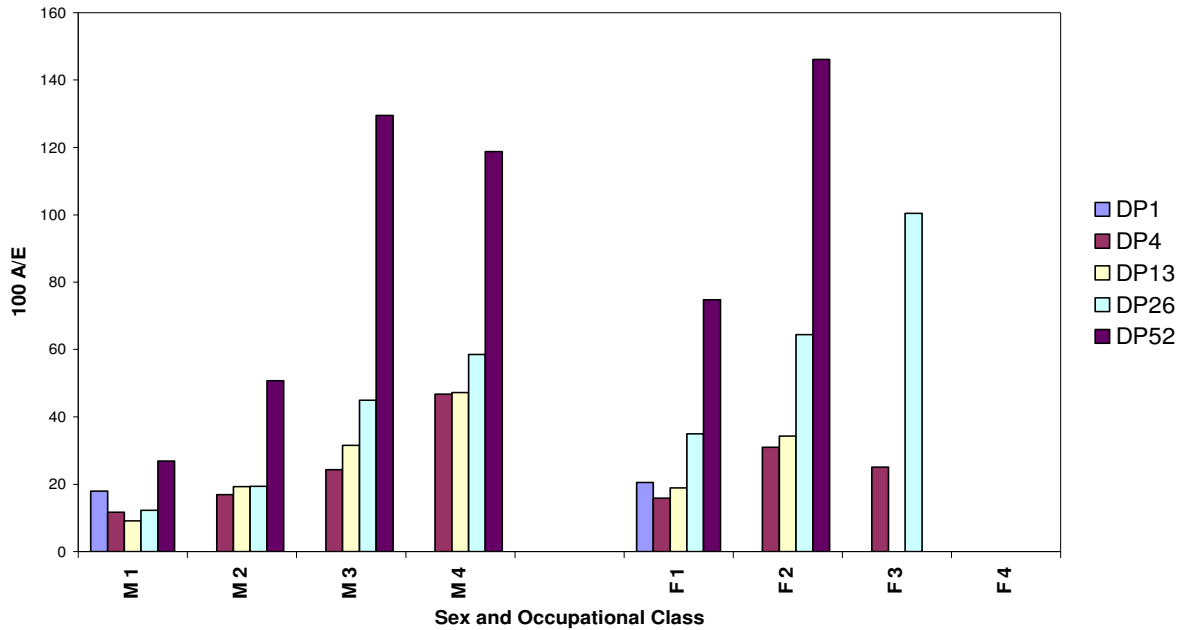
Figure B5.2. Mental illness inceptions by deferred period and occupational class for 1991-2002, individual policies, Standard* experience, ages 18-64, deferred periods 4- 52 weeks. Expected values based on SM1975-78
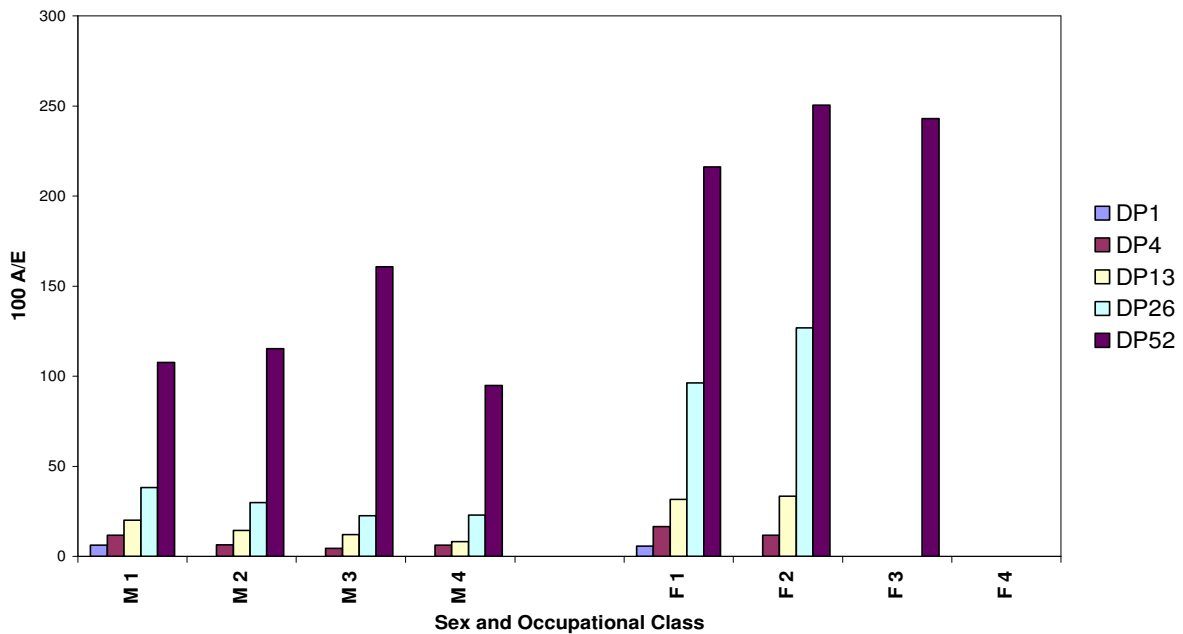
Figure B5.3.   Injuries inceptions by deferred period and occupational class for 1991-2002, individual policies, Standard* experience, ages 18-64, deferred periods 4- 52 weeks. Expected values based on SM1975-78
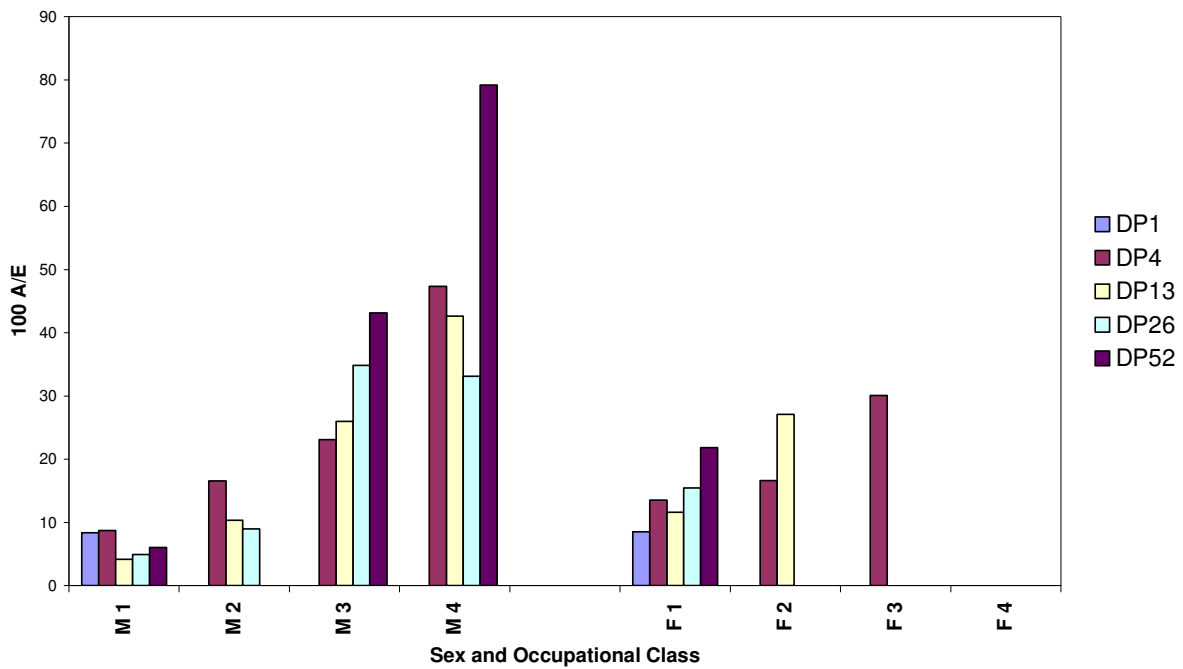
Figure B5.4.   Circulatory inceptions by deferred period and occupational class for 1991-2002, individual policies, Standard* experience, ages 18-64, deferred periods 4- 52 weeks. Expected values based on SM1975-78
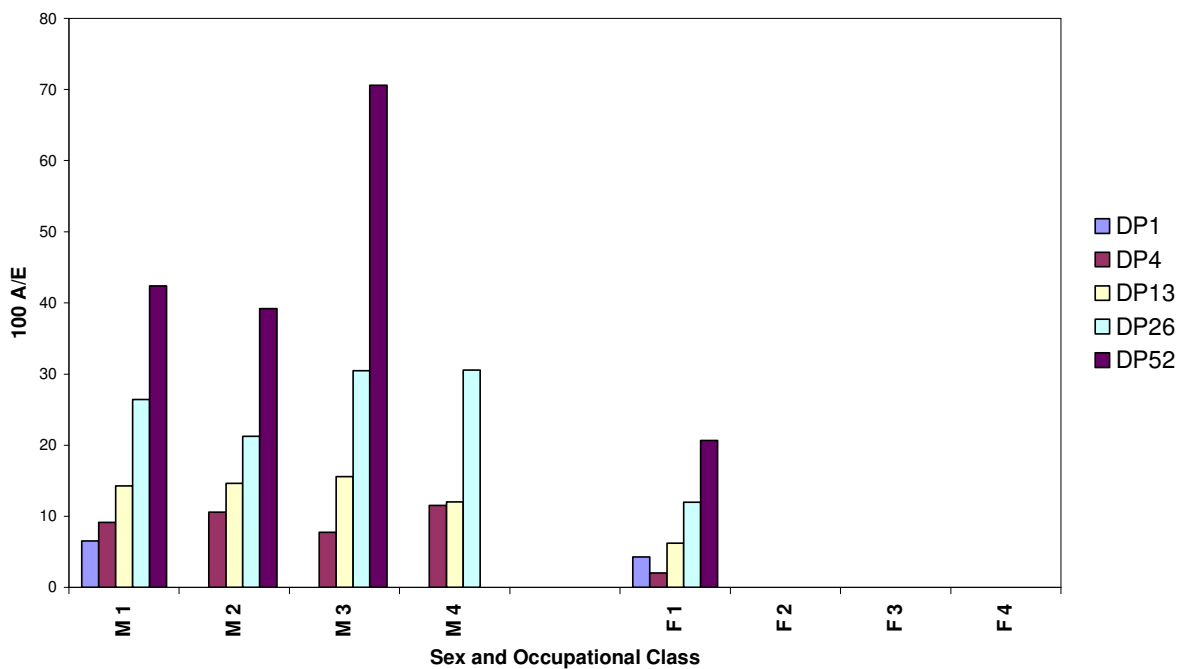
Figure B5.5. Neoplasms inceptions by deferred period and occupational class for 1991-2002, individual policies, Standard* experience, ages 18-64, deferred periods 4- 52 weeks. Expected values based on SM1975-78
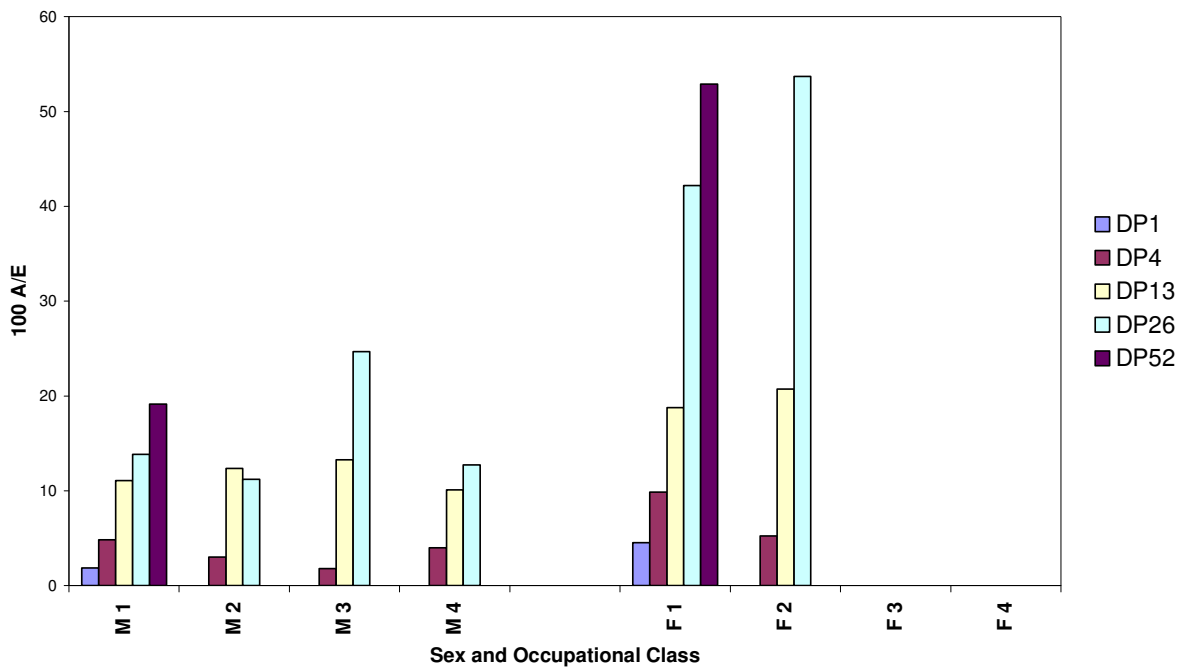
Appendix C1: Claim terminations analysis by cause group

Figure C1.1. Males, terminations by cause group for the 12-year period 1991-2002, individual policies, Standard* experience, deferred period 4-52 weeks, all occupational classes. Expected values based on SM1975-78
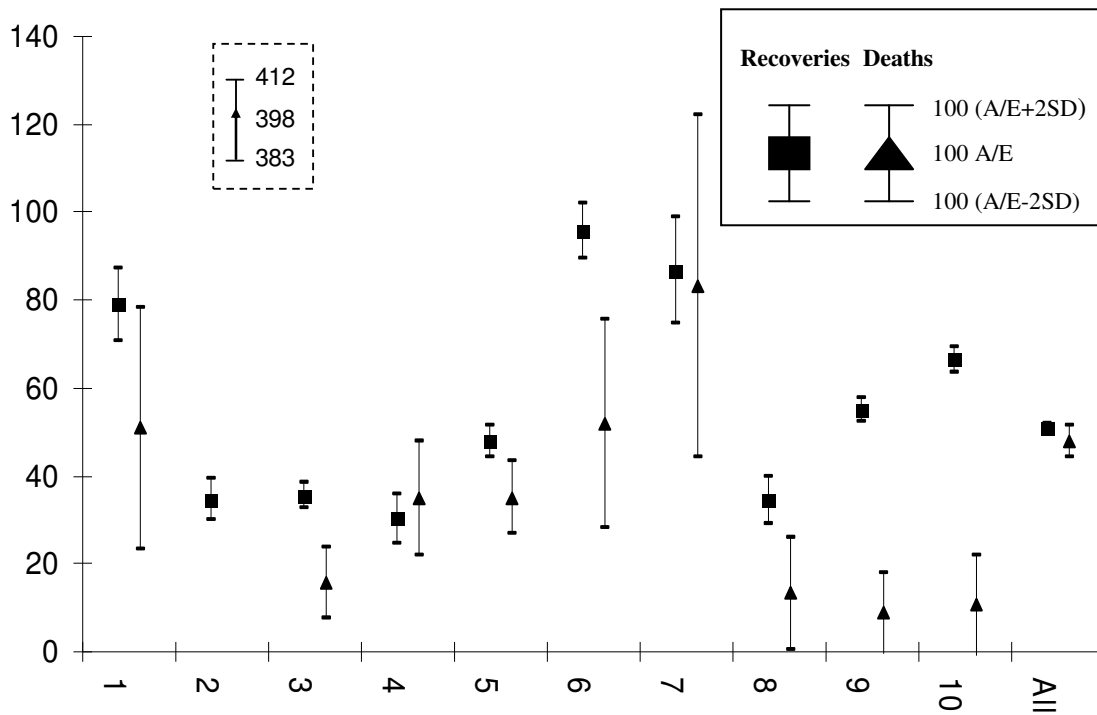
Cause Groups

1 Infections & acute respiratory

2 Neoplasms

3 Mental

4 Nervous system & sensory organs

5 Circulatory

6 Digestive (non-infectious)

7 Genito-urinary

8 Arthritis

9 Musculoskeletal

10 Injuries

Figure C1.2. Females, terminations by cause group for the 12-year period 1991-2002, individual policies, Standard* experience, deferred period 4-52 weeks, all occupational classes. Expected values based on SM1975-78

Cause Groups

1 Infections & acute respiratory	6 Digestive (non-infectious)
2 Neoplasms	7 Genito-urinary
3 Mental	8 Arthritis
4 Nervous system & sensory organs	9 Musculoskeletal
5 Circulatory	10 Injuries

Appendix C2: Claim terminations by quadrennium

Figure C2.1. Males, terminations by cause group for 1975-2002, individual policies, deferred period 4-52 weeks. Standard, ages 20-64 for 1975-90; Standard*, all occupational classes, ages 18-64 for 1991-2002. Expected values based on SM1975-78

Figure C2.1a. Males, Infections and acute respiratory (Cause group 1)
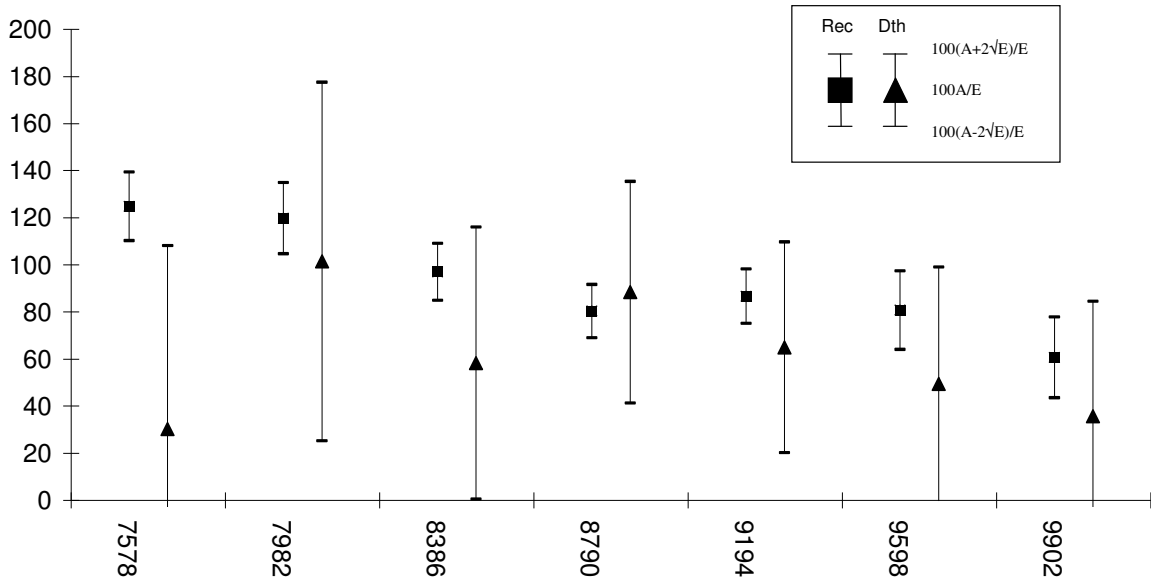
Figure C2.1b. Males, Neoplasms (Cause group 2) – Recoveries only
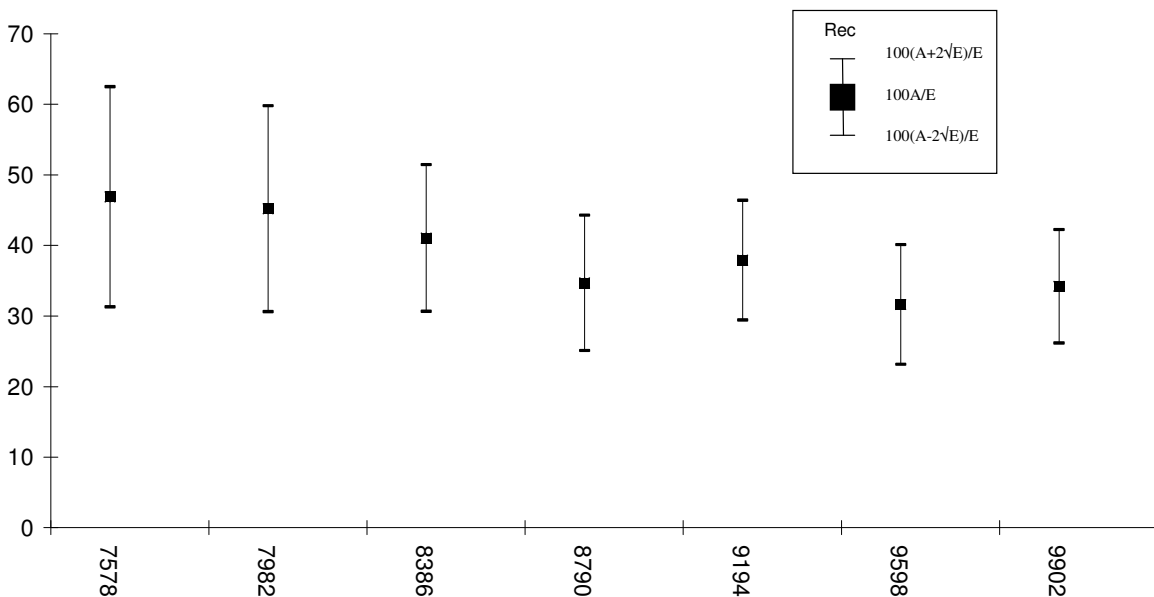
Figure C2.1c. Males, Neoplasms (Cause group 2) – Deaths only
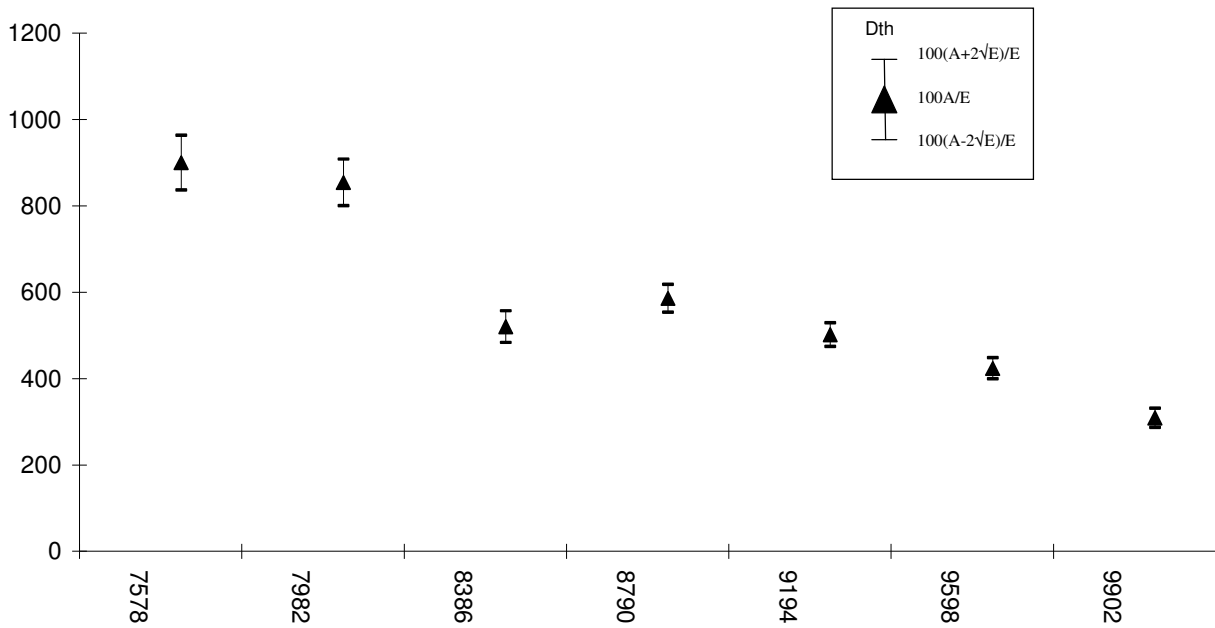
Figure C2.1d. Males, Mental (Cause group 3)

50
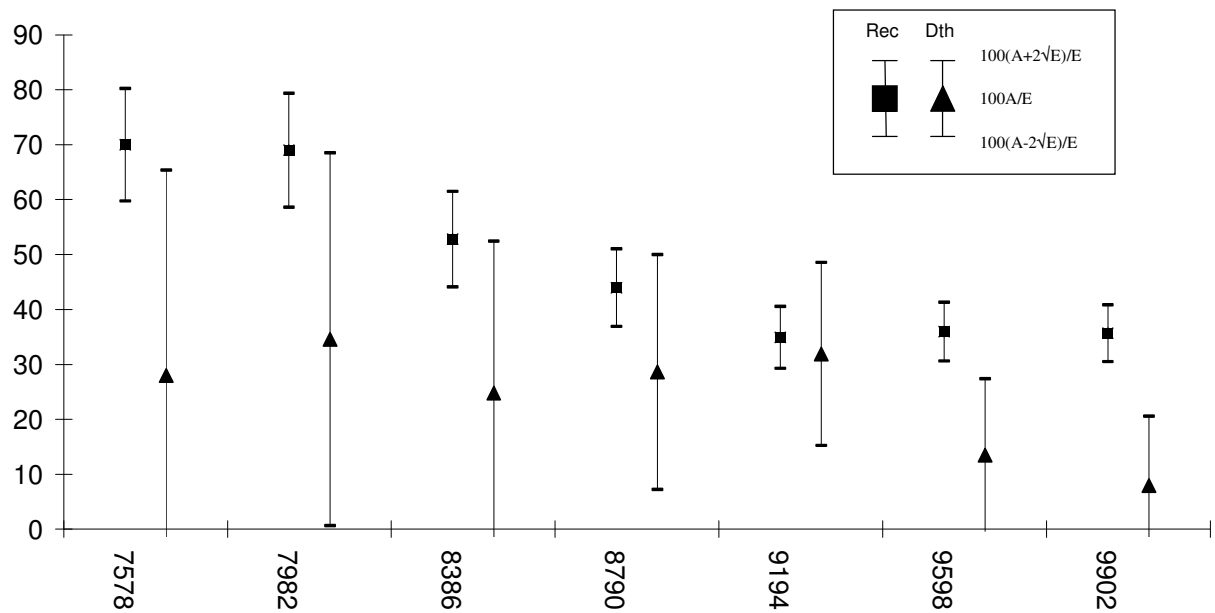
Figure C2.1e. Males, Nervous system & sensory organs (Cause group 4)
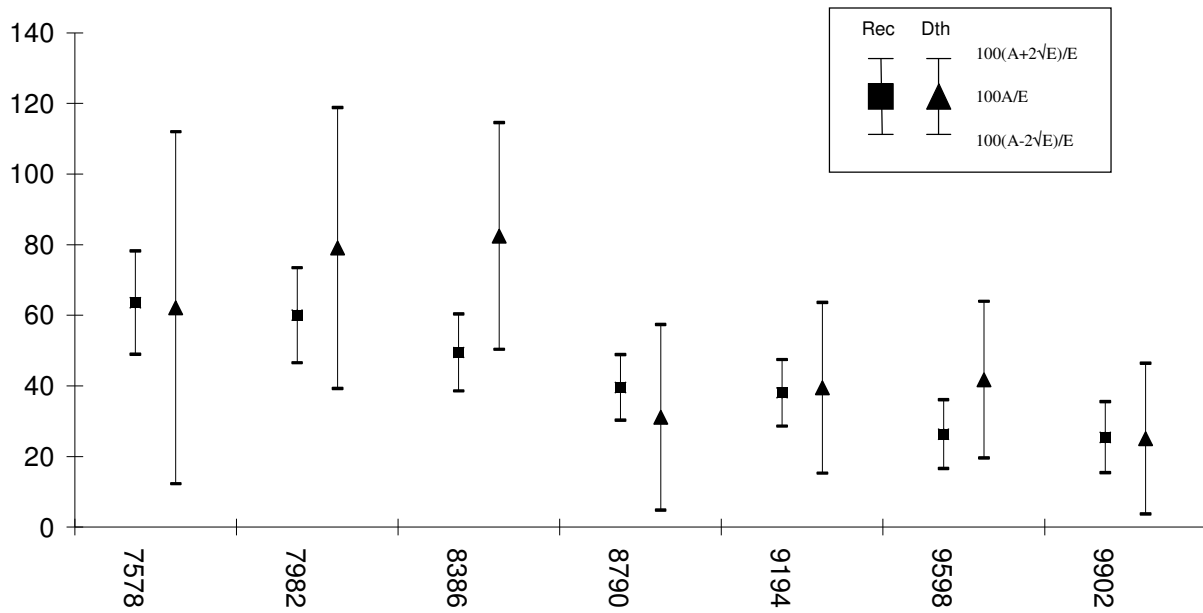
Figure C2.1f. Males, Circulatory (Cause group 5)
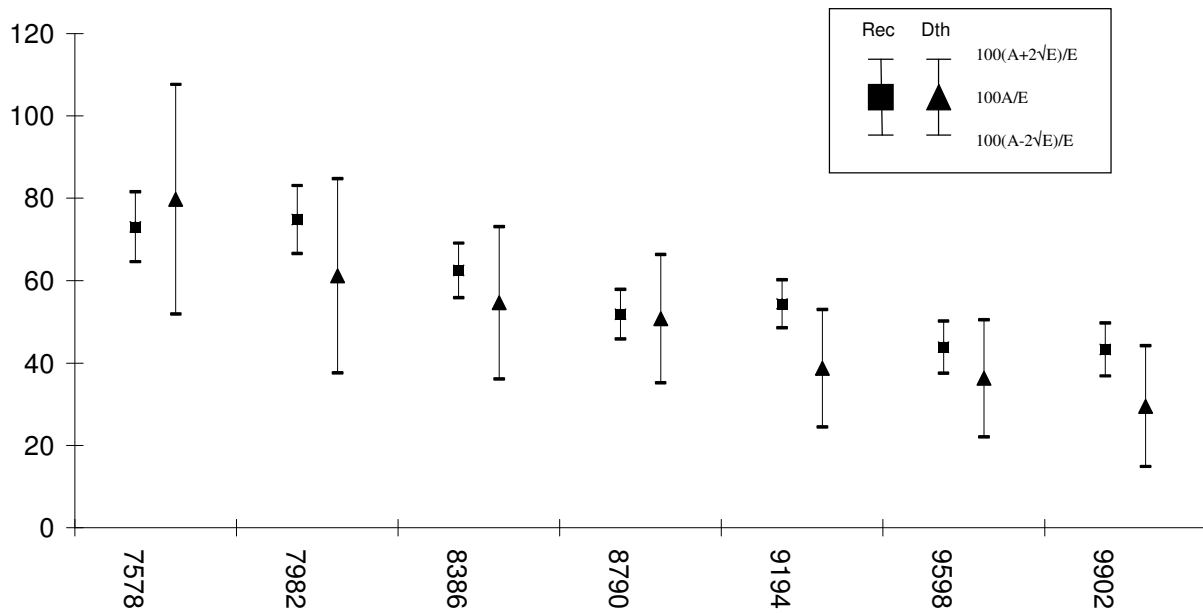
Figure C2.1g. Males, Digestive (non-infectious) (Cause group 6)
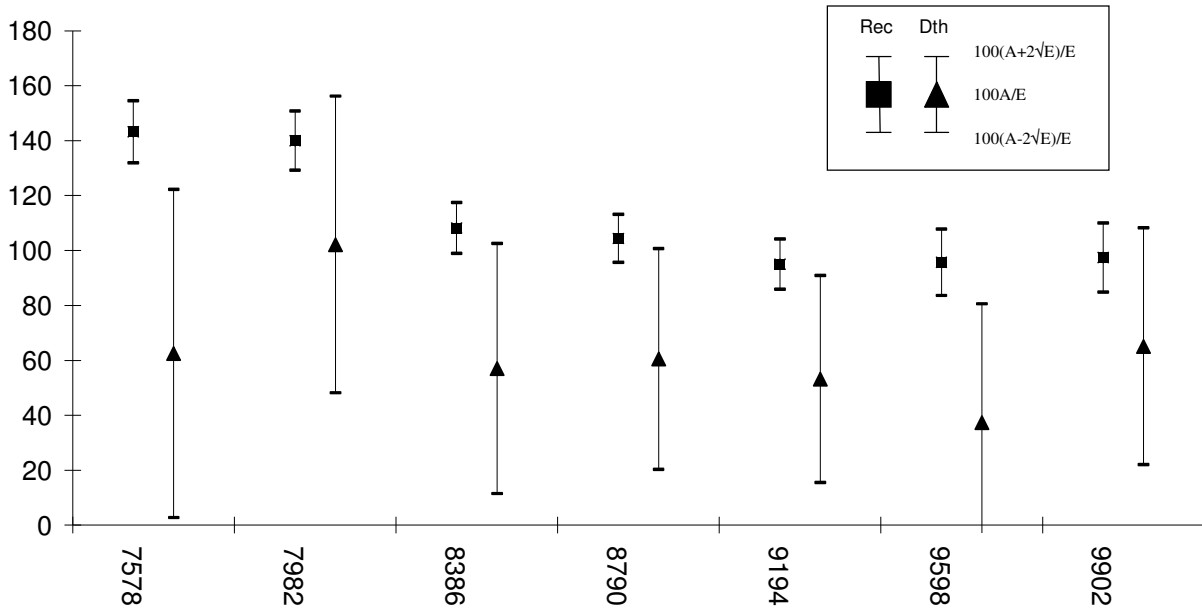
Figure C2.1h. Males, Genito-urinary (Cause group 7)
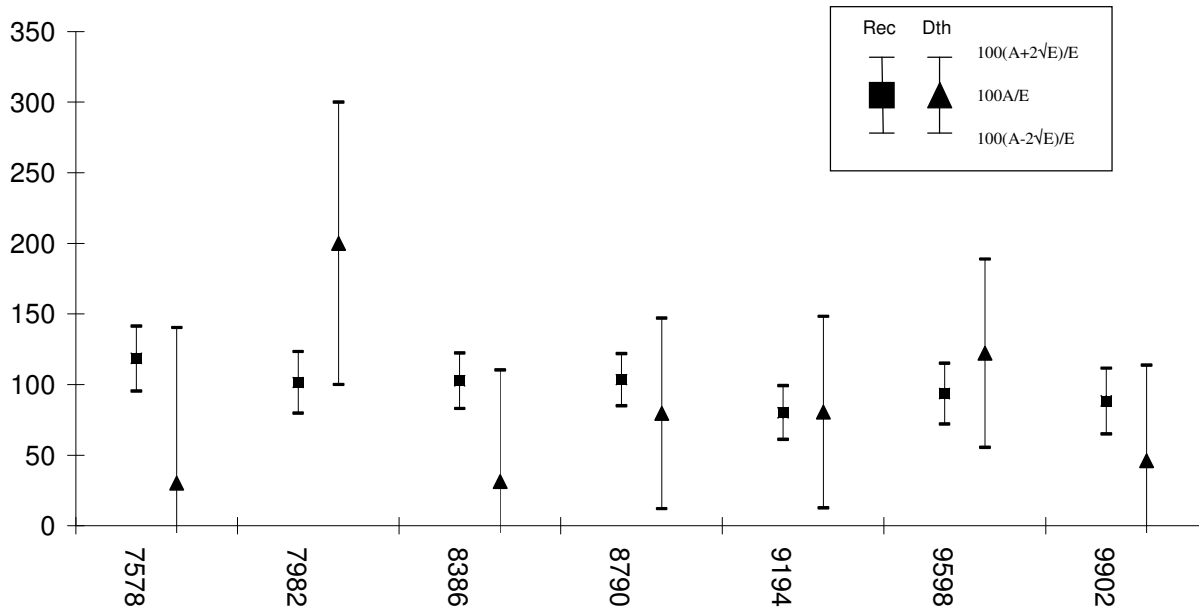
Figure C2.1i. Males, Arthritis (Cause group 8)
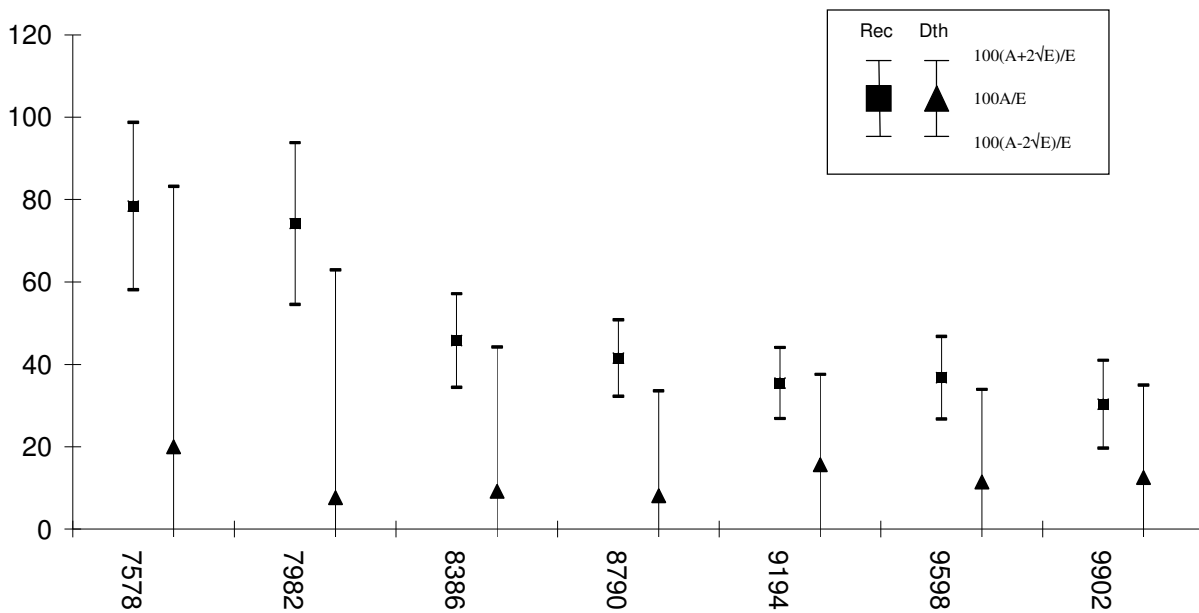

Figure C2.1j. Males, Musculoskeletal (Cause group 9)


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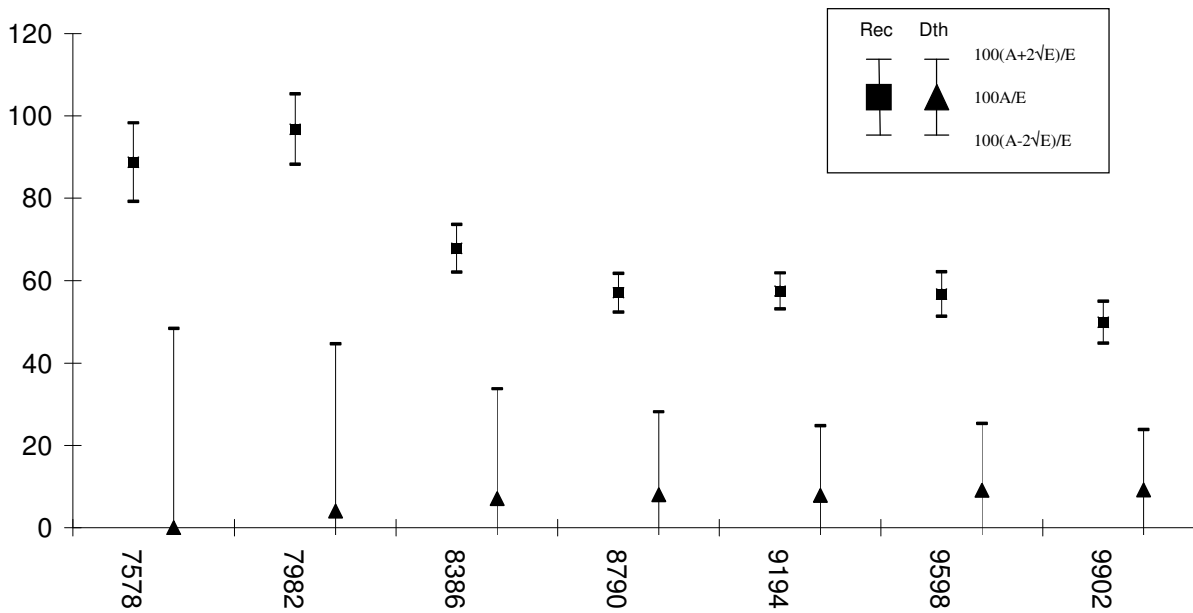
Figure C2.1k. Males, Injuries (Cause group 10)
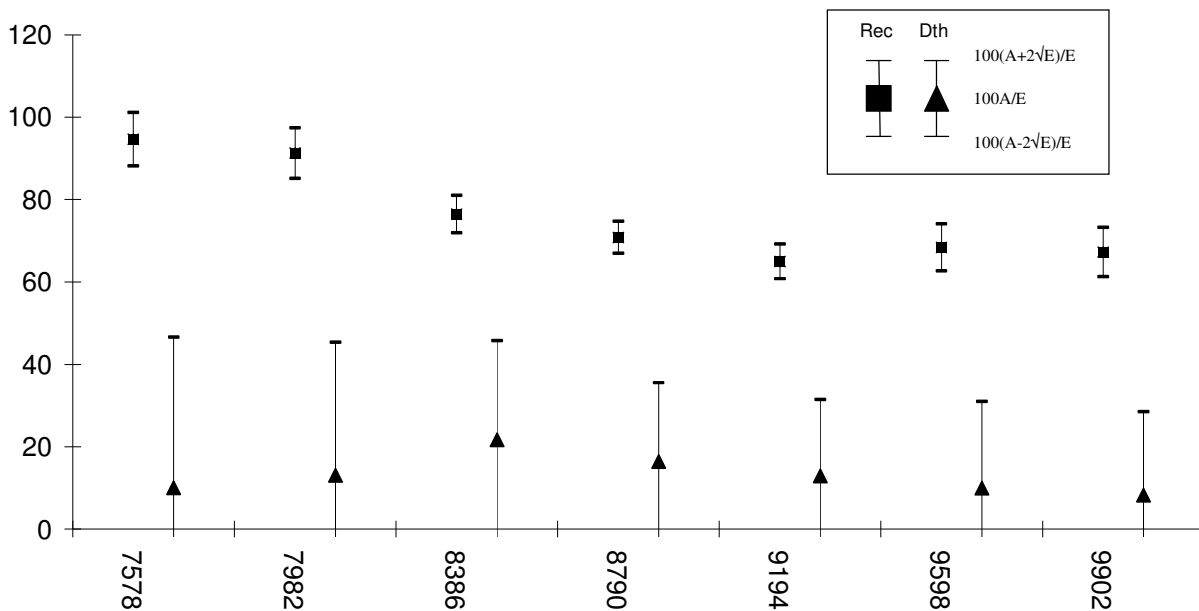
Figure C2.1l. Males, All causes
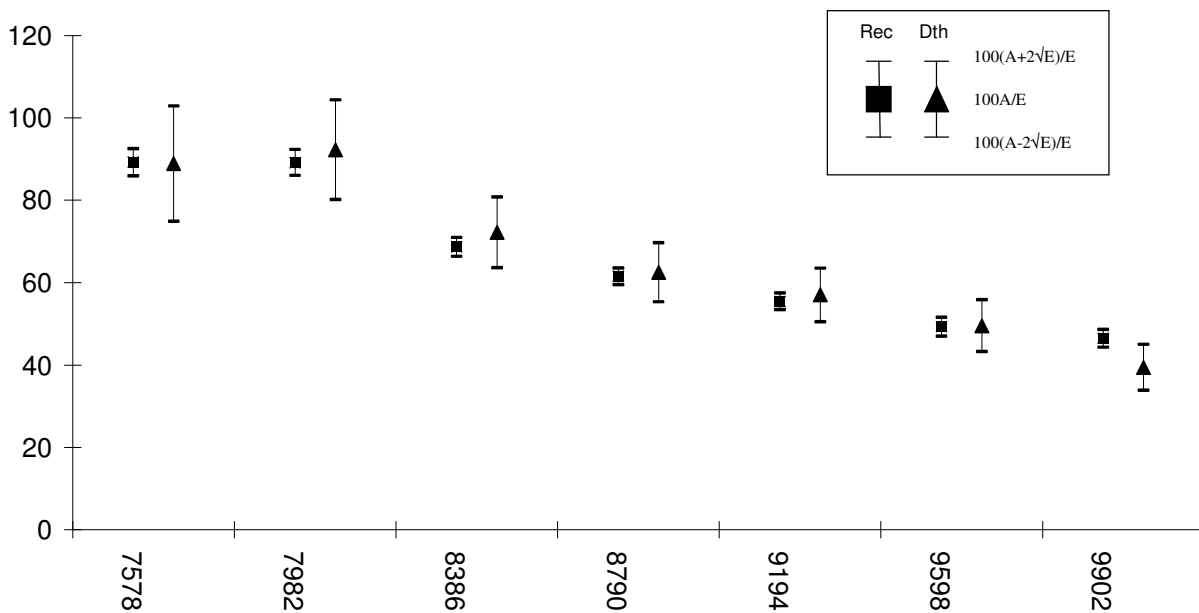
Figure C2.2. Females, terminations by cause group for 1975-2002, individual policies, deferred period 4-52 weeks. Standard, ages 20-64 for 1975-90; Standard*, all occupational classes, ages 18-64 for 1991-2002. Expected values based on SM1975-78

Figure C2.2a. Females, Infections and acute respiratory (Cause group 1)
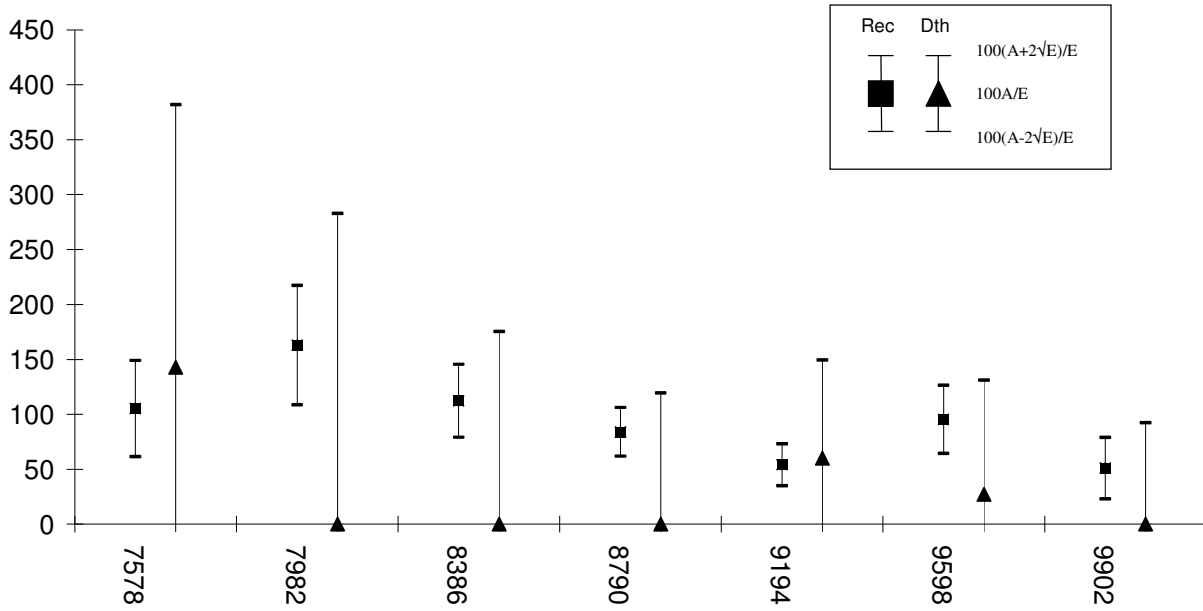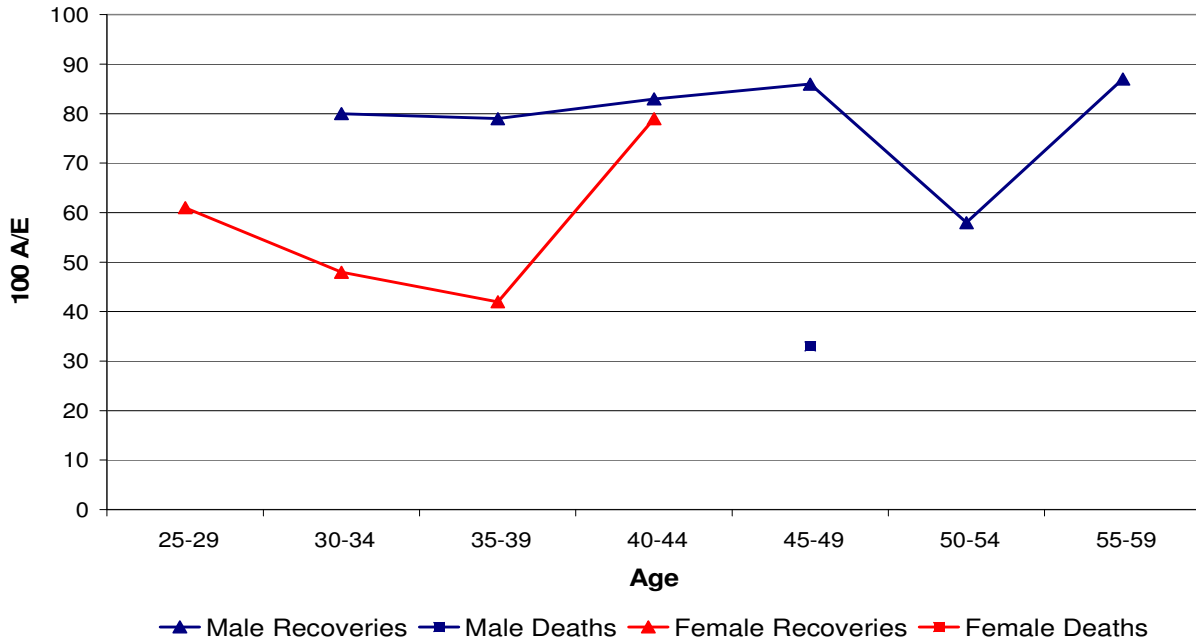

Figure C2.2b. Females, Neoplasms (Cause group 2) – Recoveries only
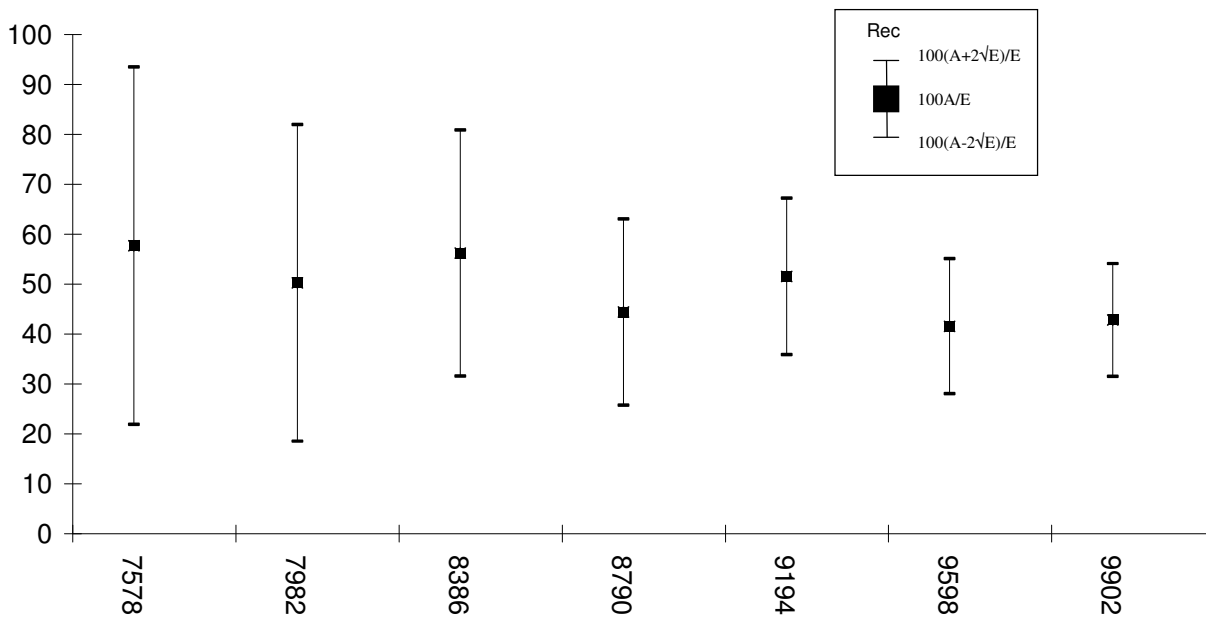
Figure C2.2c. Females, Neoplasms (Cause group 2) – Deaths only
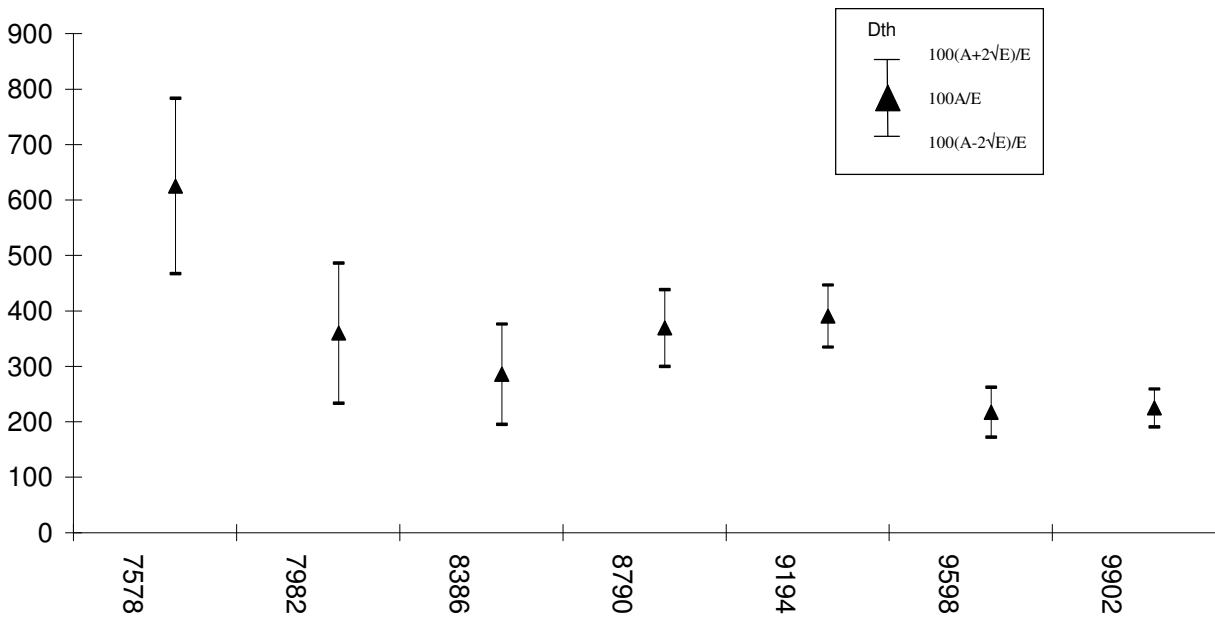
Figure C2.2d. Females, Mental (Cause group 3)
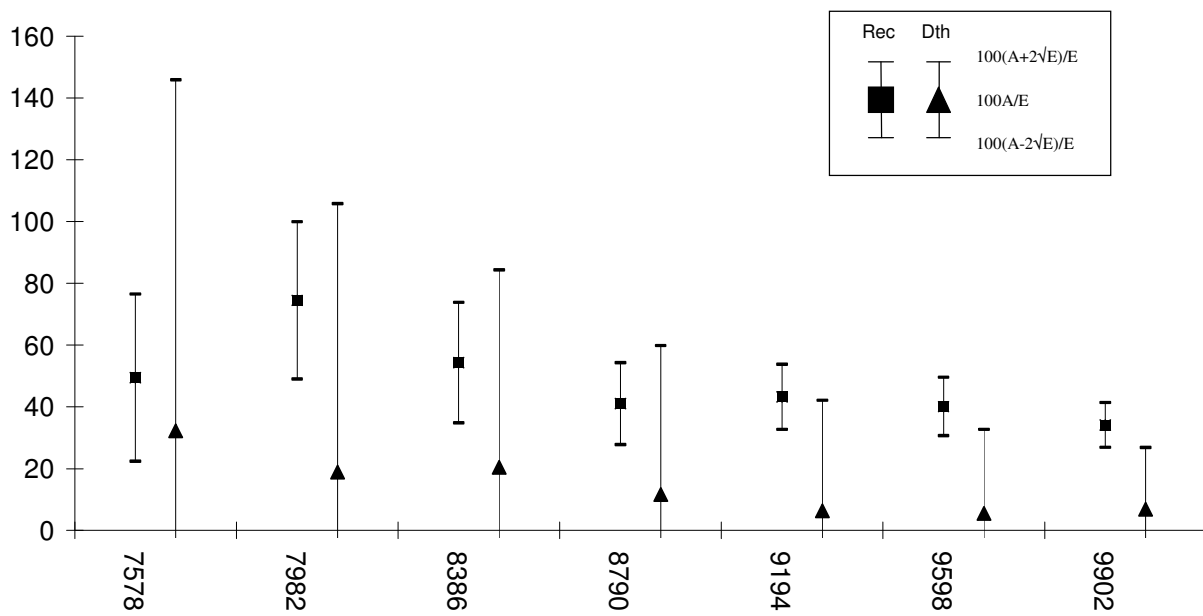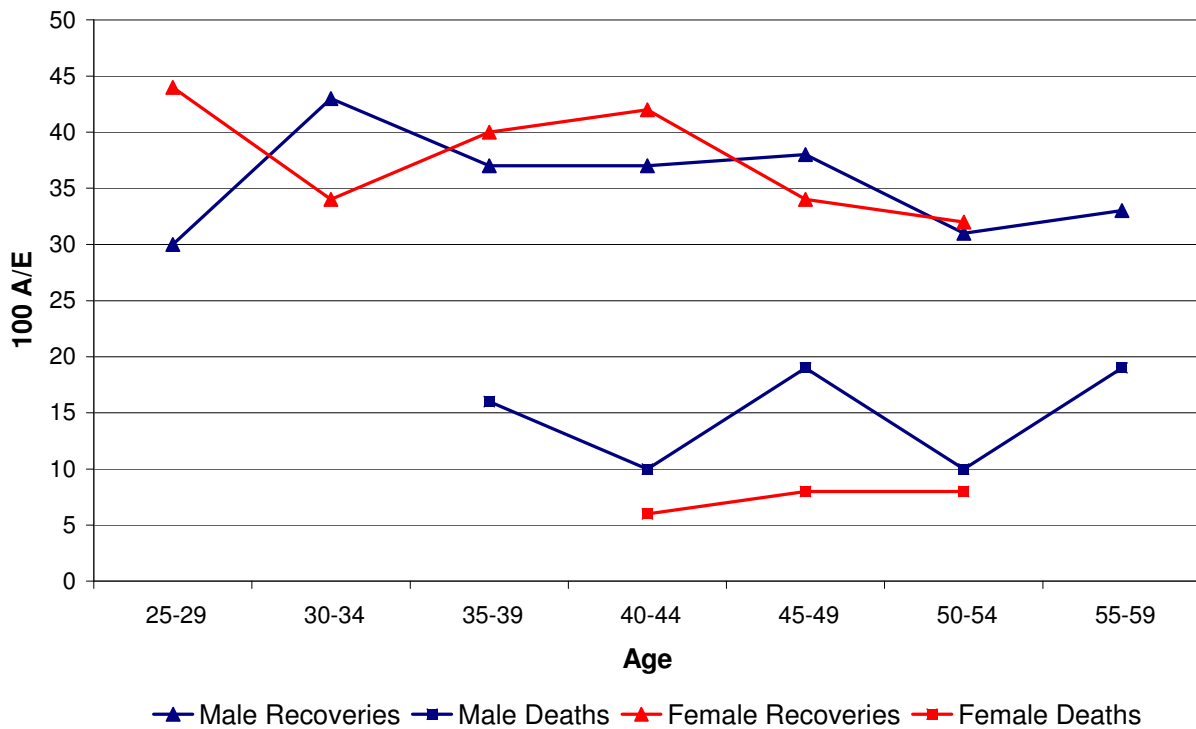
Figure C2.2e. Females, Nervous system & sensory organs (Cause group 4)
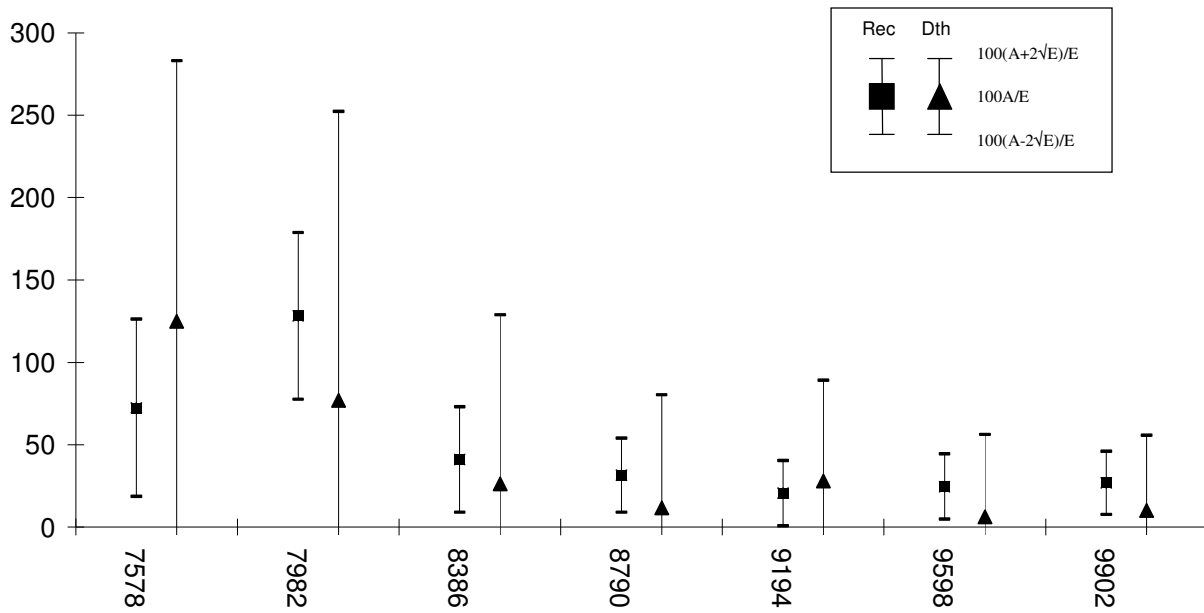
Figure C2.2f. Females, Circulatory (Cause group 5)
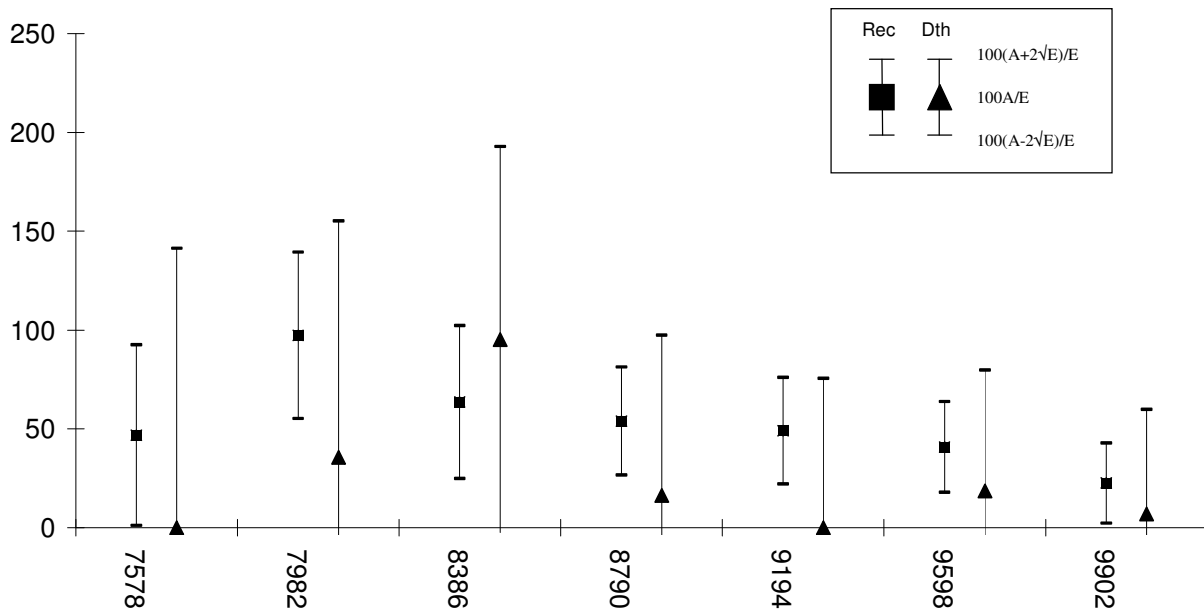
Figure C2.2g. Females, Digestive (non-infectious) (Cause group 6)
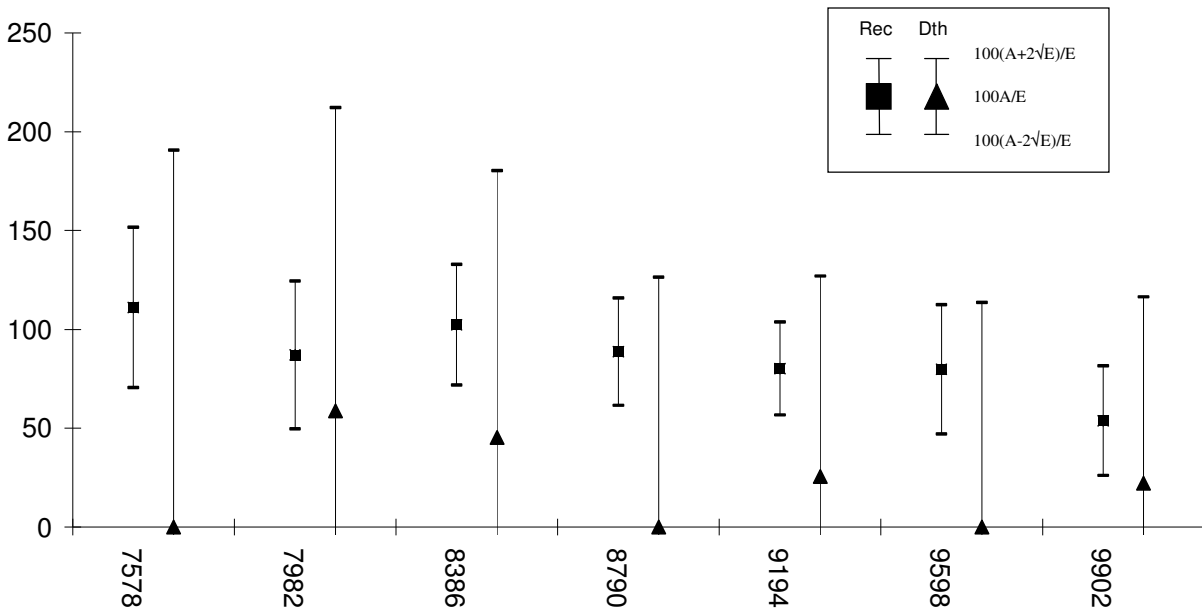
Figure C2.2h. Females, Genito-urinary (Cause group 7)
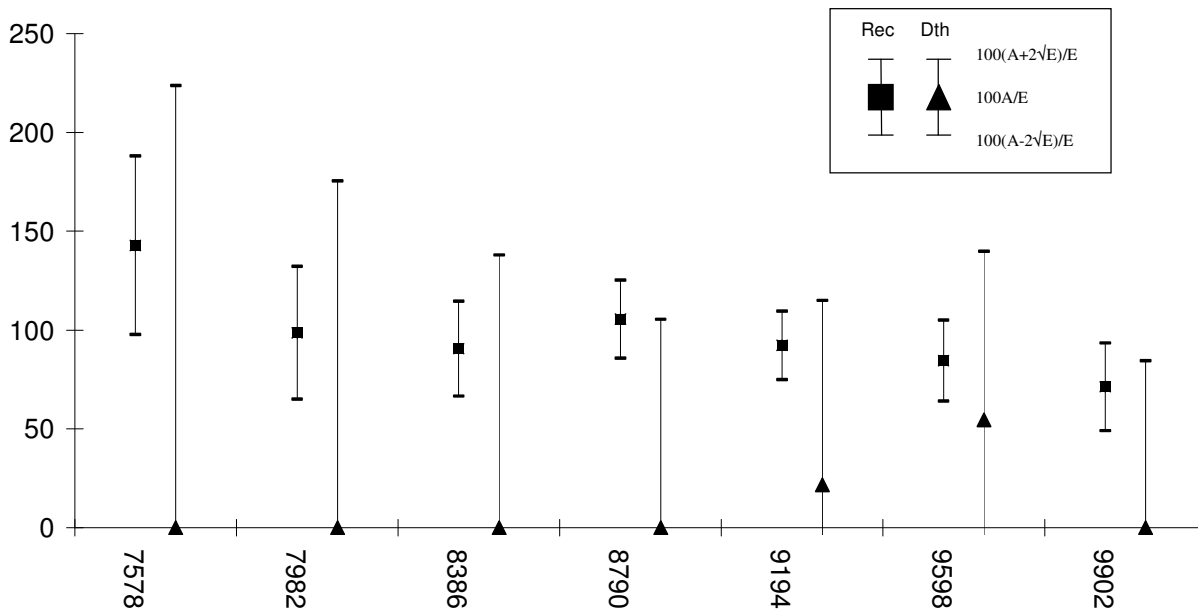
Figure C2.2i. Females, Arthritis (Cause group 8)
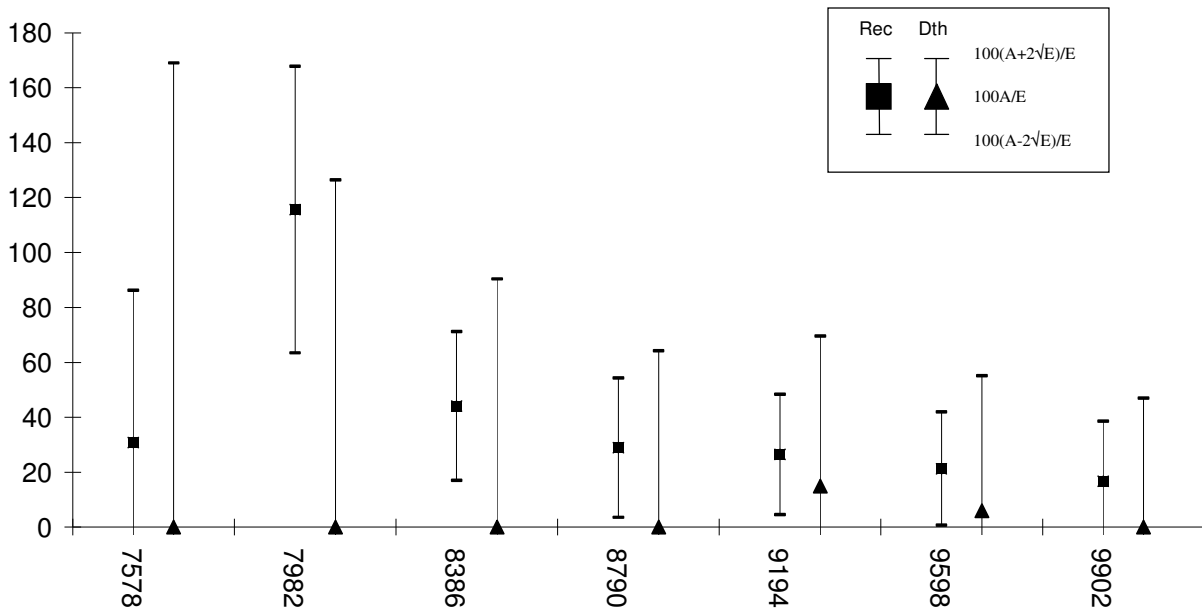
Figure C2.2j. Females, Musculoskeletal (Cause group 9)
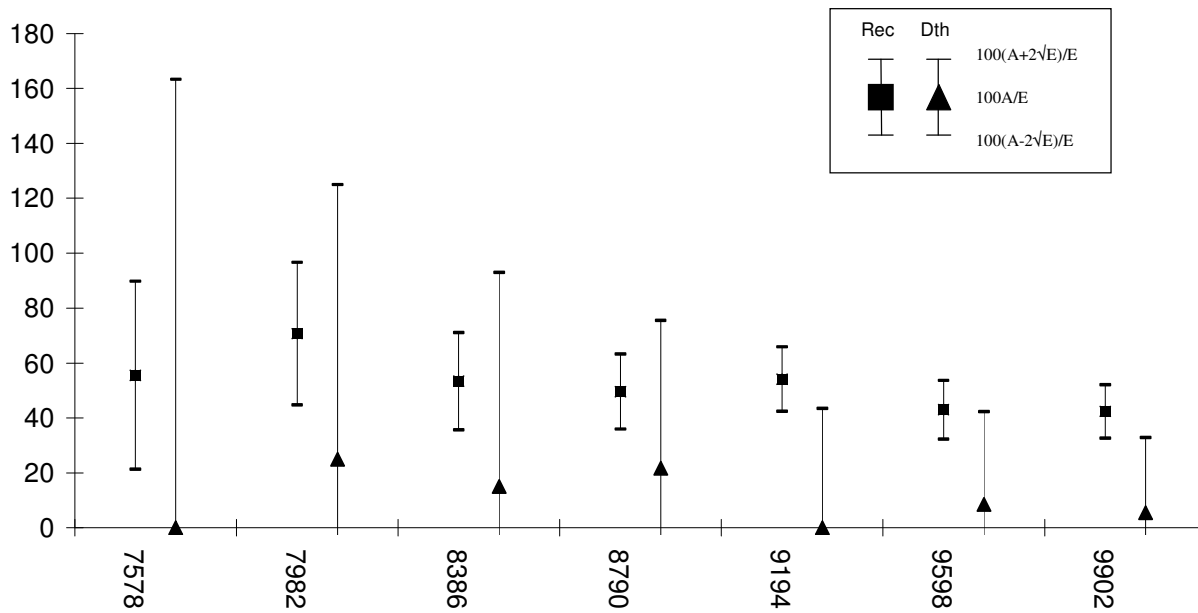
Figure C2.2k. Females, Injuries (Cause group 10)
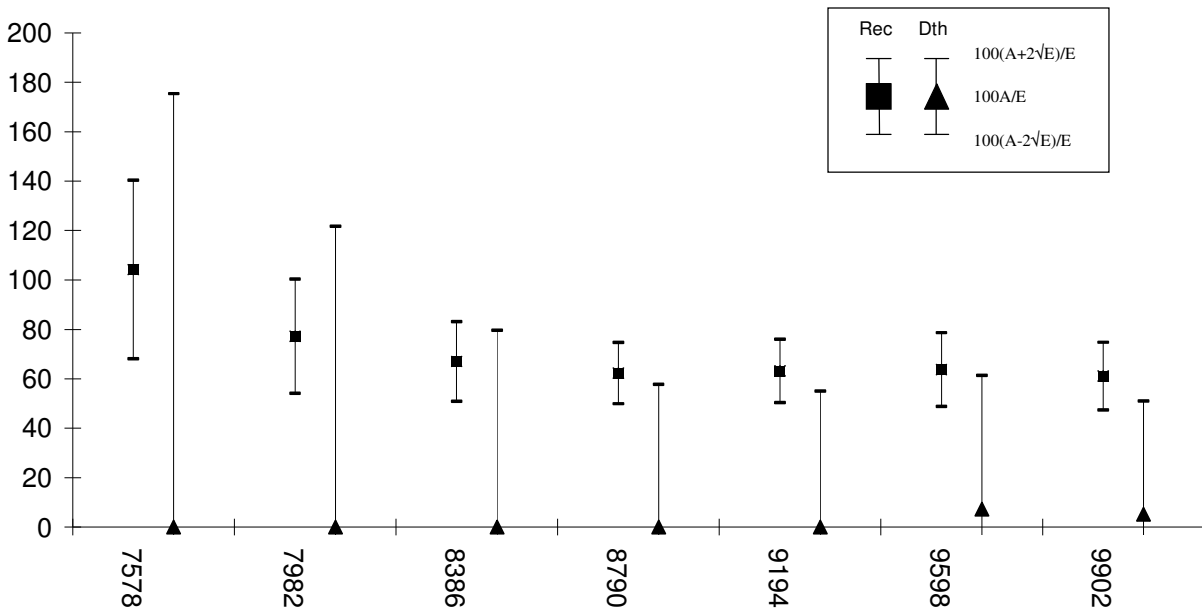
Figure C2.2l. Females, All causes
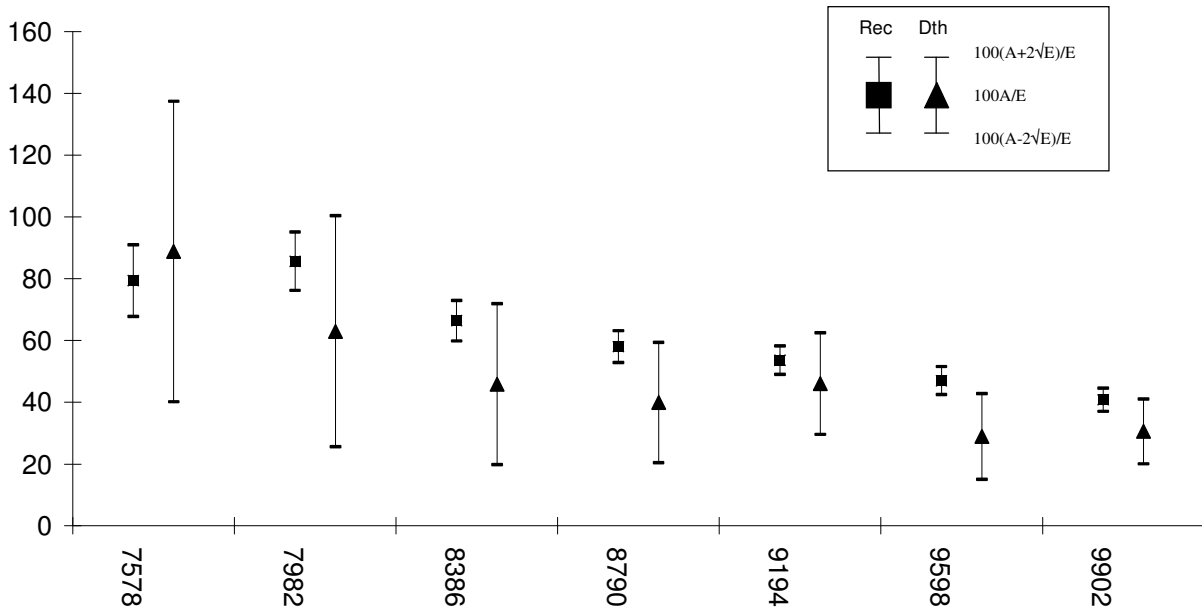
Appendix C3: Claim terminations by deferred period

Figure C3.1. Males, terminations by deferred period for each cause group for the 12-year period 1991-2002, individual policies, Standard* experience, all occupational classes. Expected values based on SM1975-78

Figure C3.1a. Males, Infections and acute respiratory (Cause group 1)
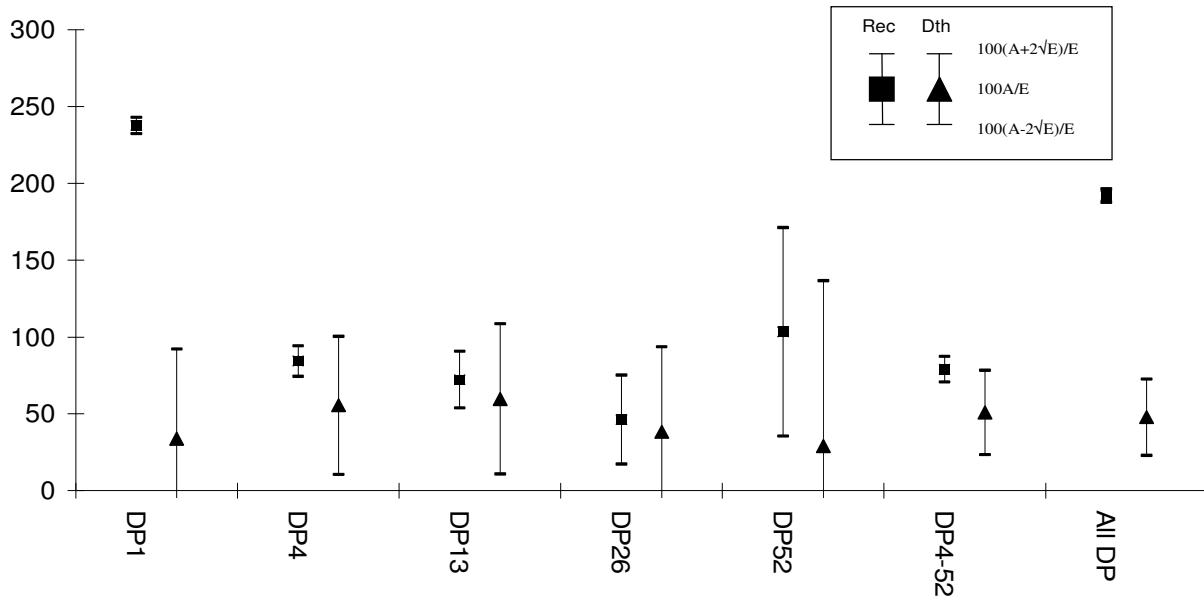
Figure C3.1b. Males, Neoplasms (Cause group 2) – Recoveries only
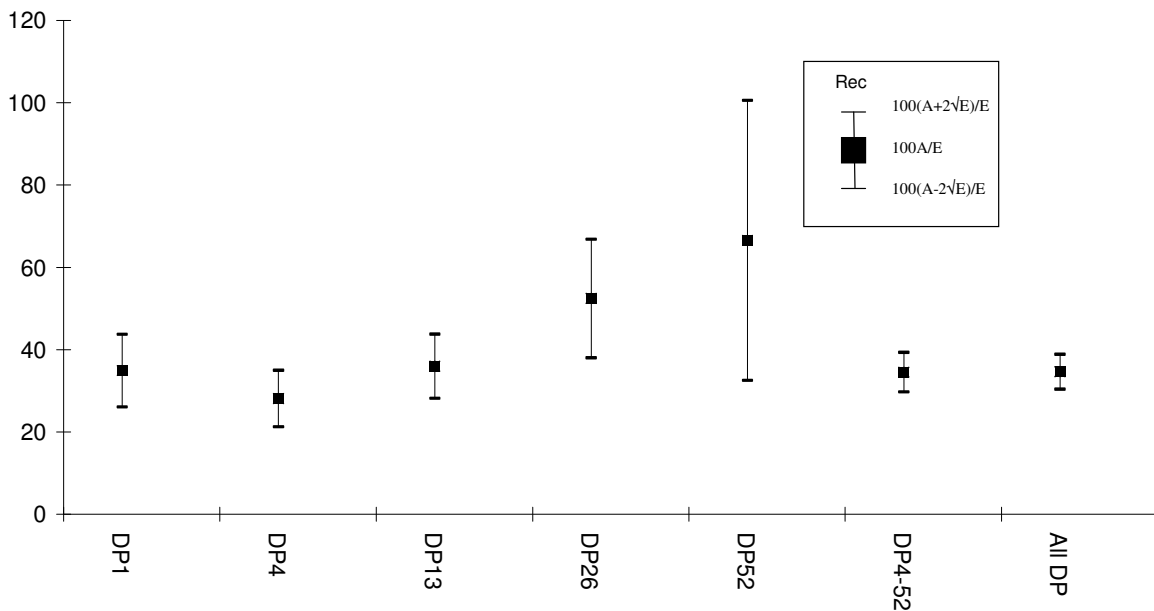
Figure C3.1c. Males, Neoplasms (Cause group 2) – Deaths only
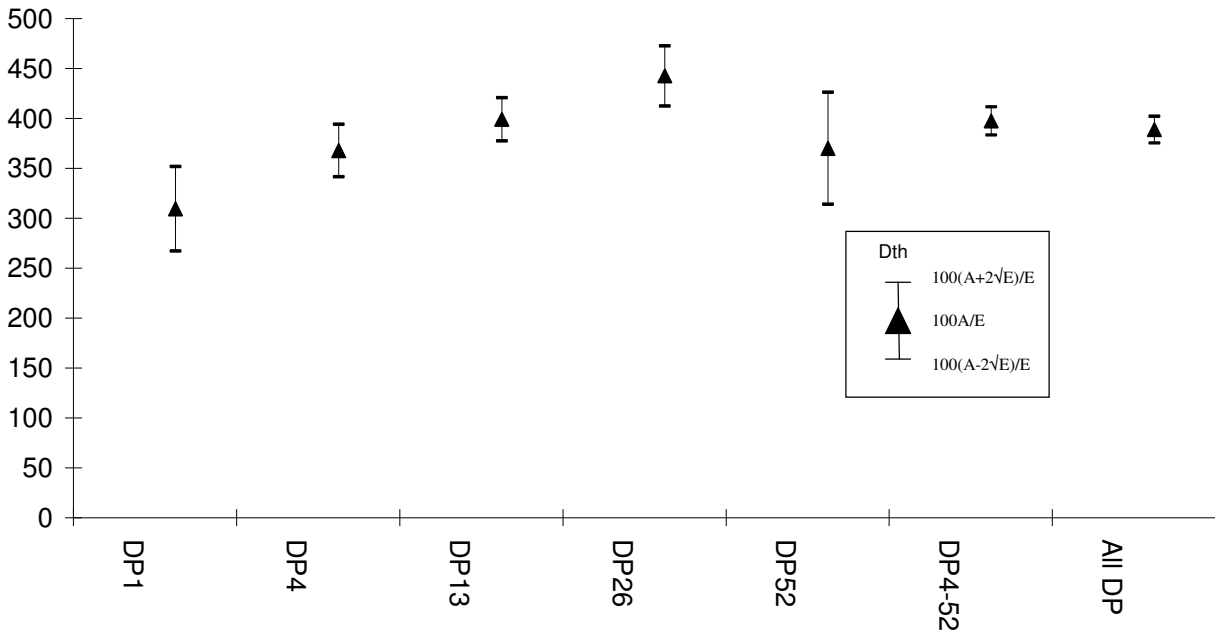
Figure C3.1d. Males, Mental (Cause group 3)
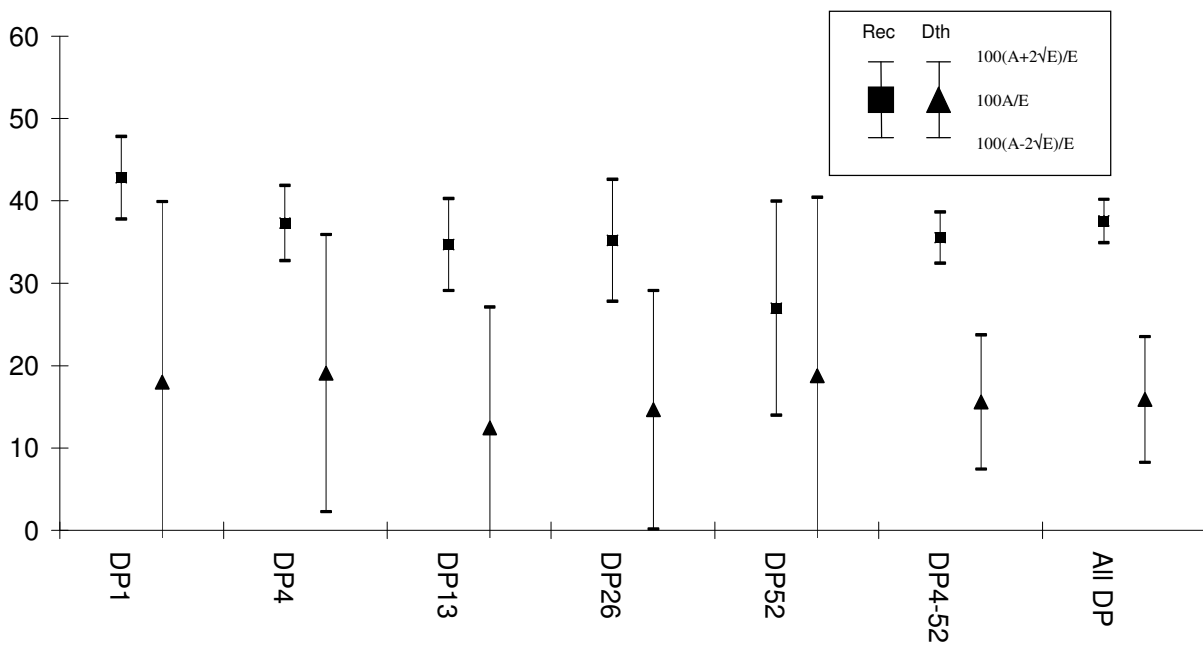
Figure C3.1e. Males, Nervous system & sensory organs (Cause group 4)
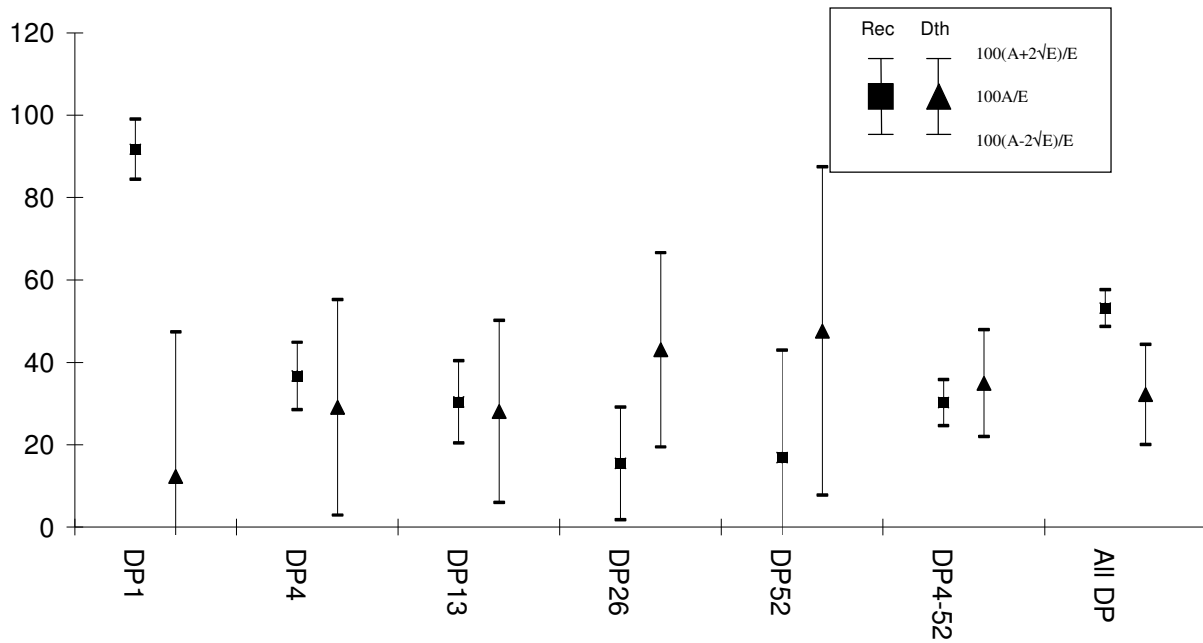
Figure C3.1f. Males, Circulatory (Cause group 5)
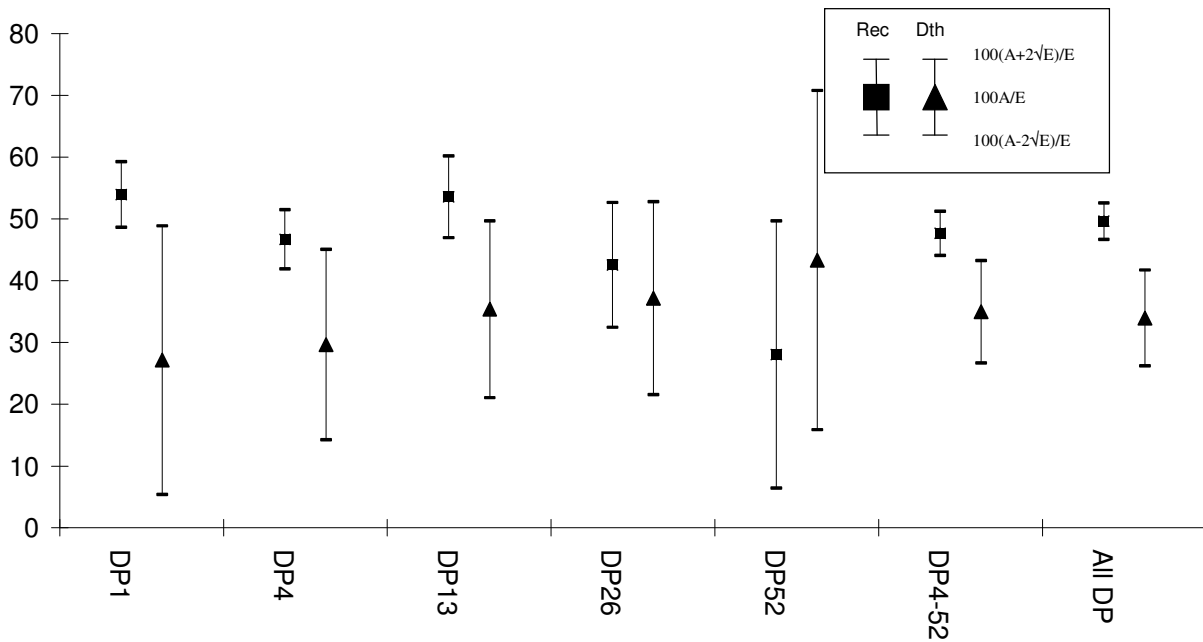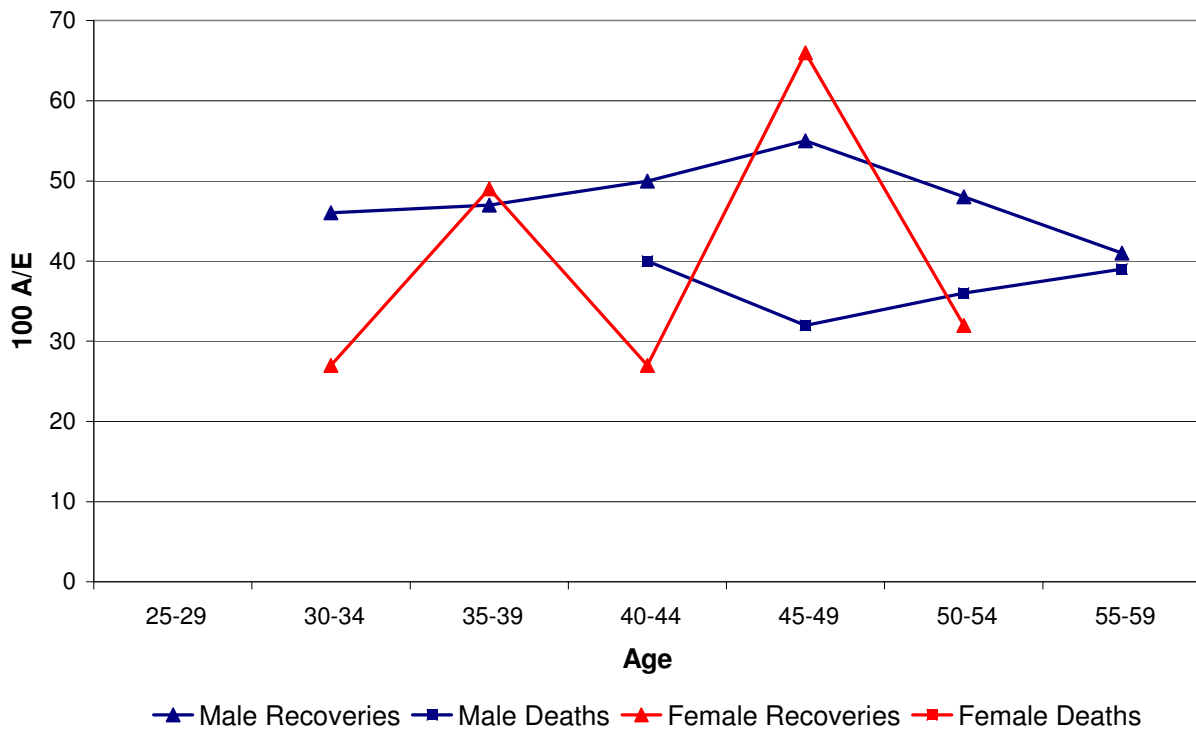
Figure C3.1g. Males, Digestive (non-infectious) (Cause group 6)
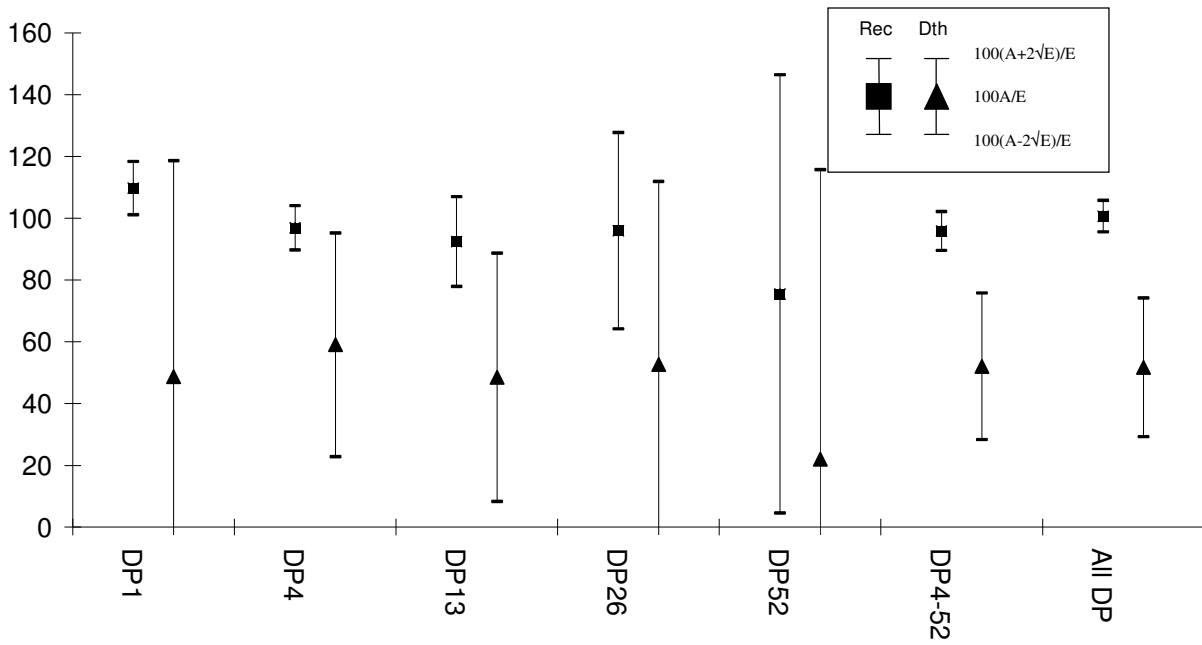
Figure C3.1h. Males, Genito-urinary (Cause group 7)
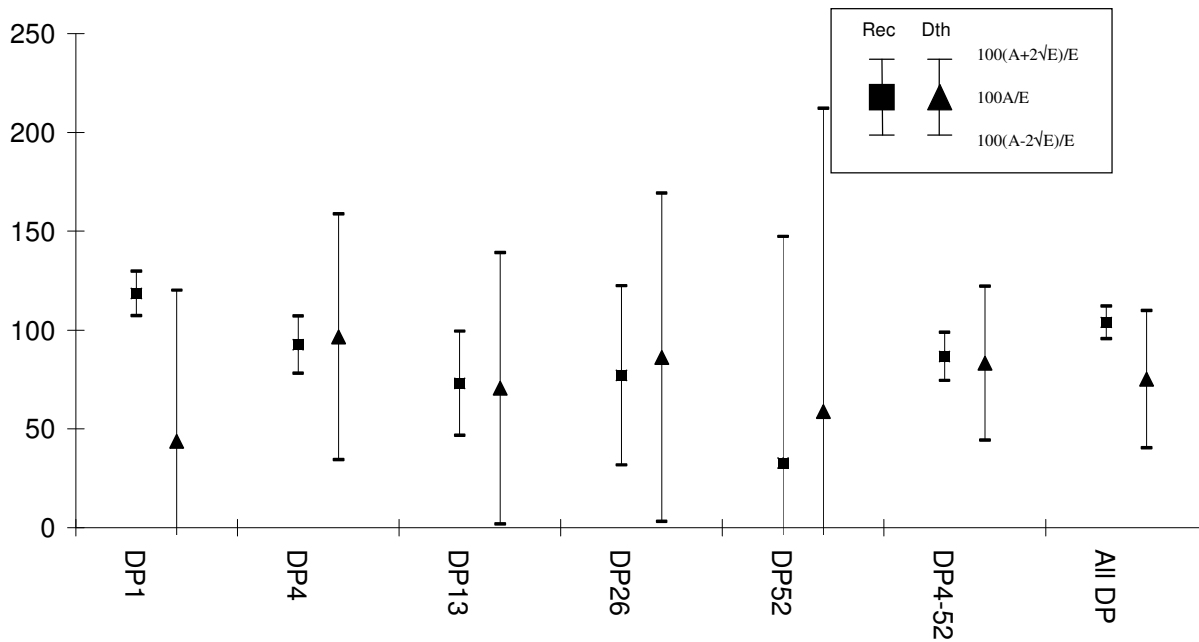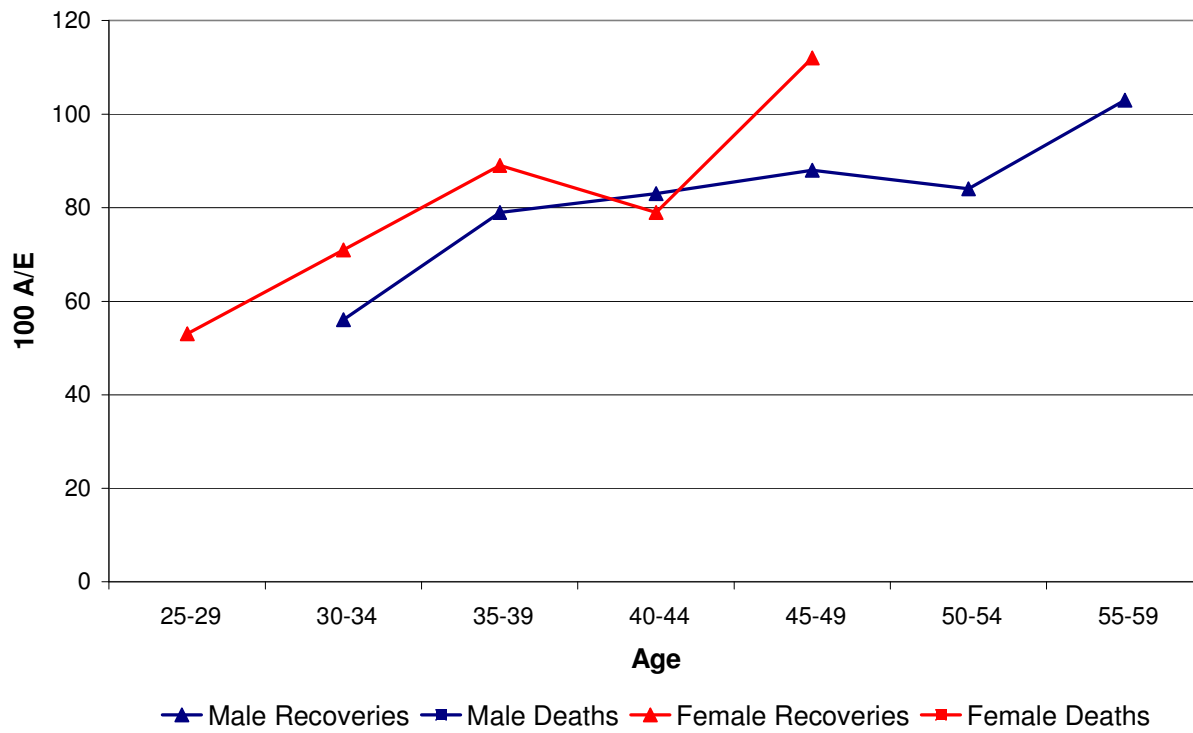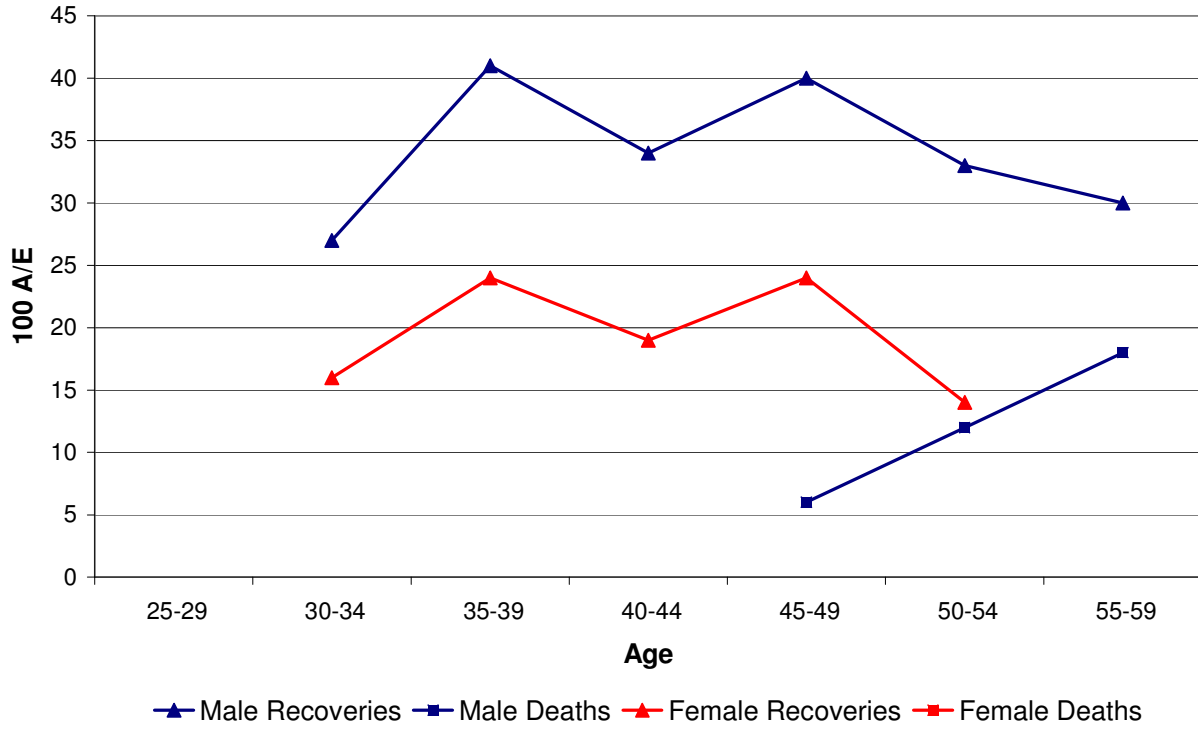
Figure C3.1i. Males, Arthritis (Cause group 8)
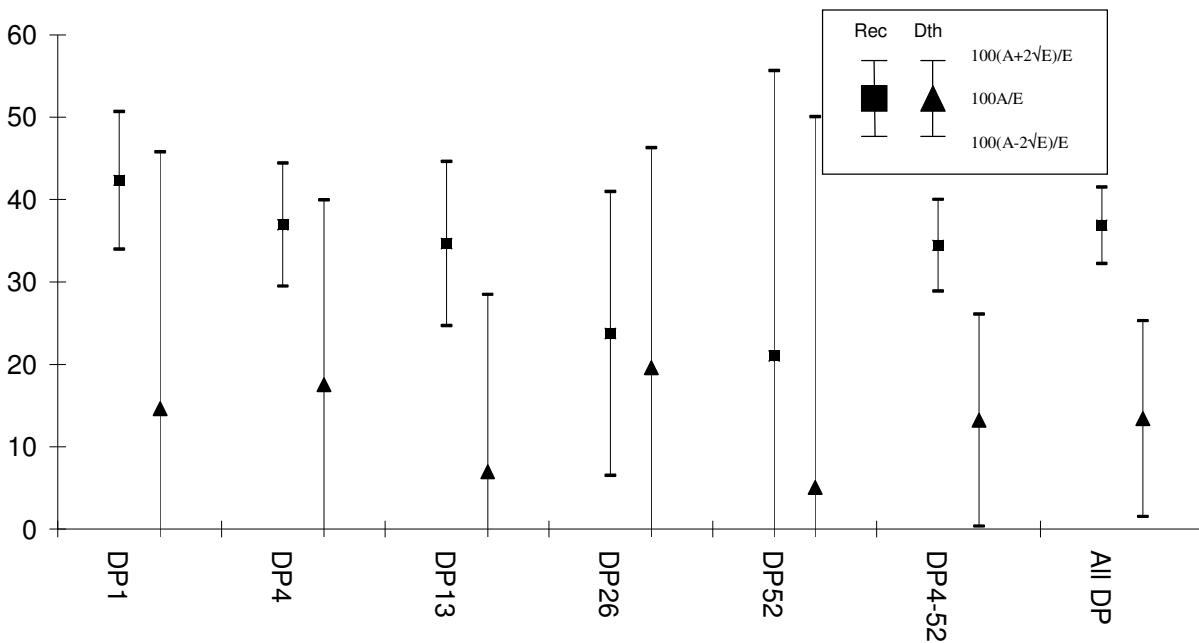
Figure C3.1j. Males, Musculoskeletal (Cause group 9)
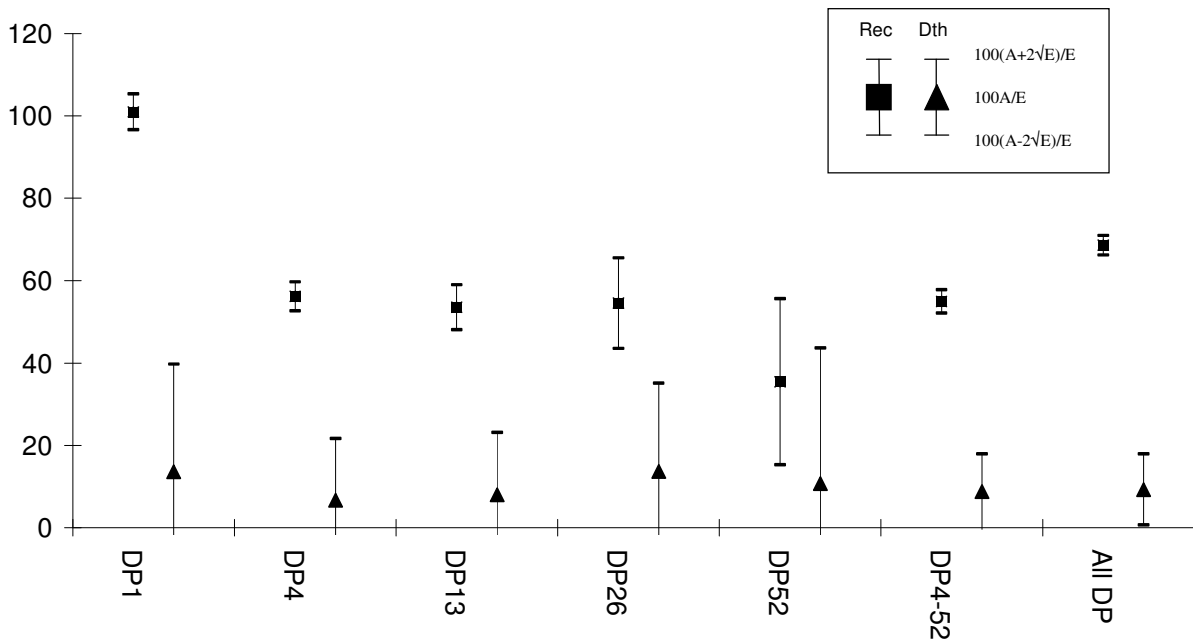
Figure C3.1k. Males, Injuries (Cause group 10)
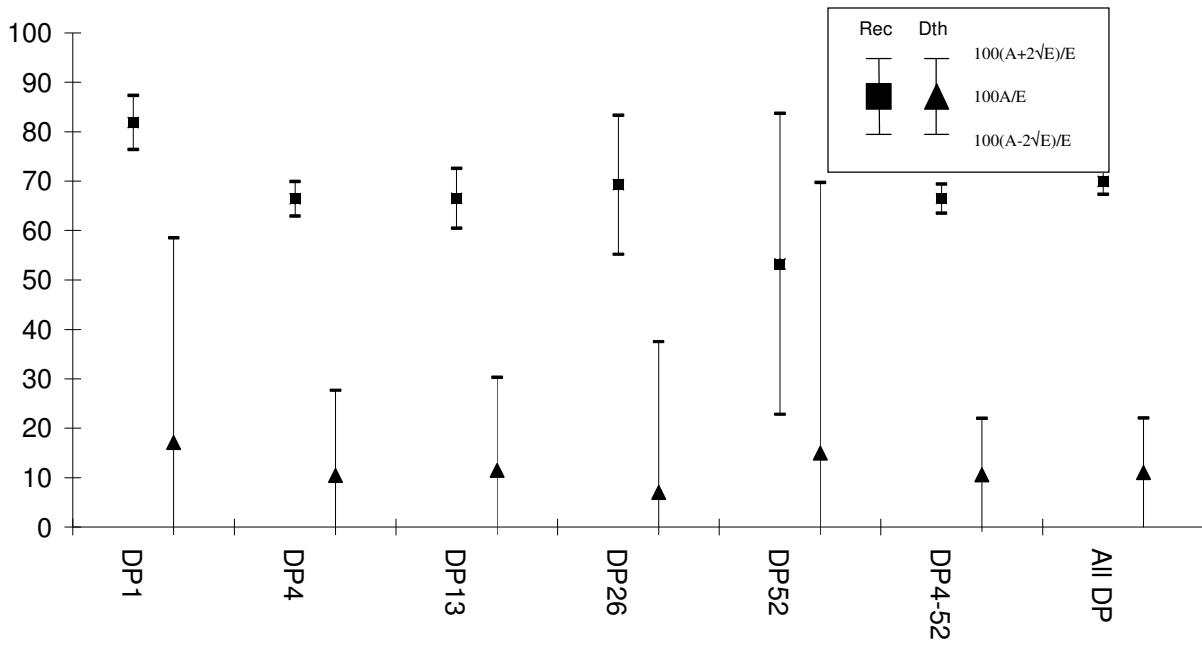
Figure C3.1l. Males, All causes
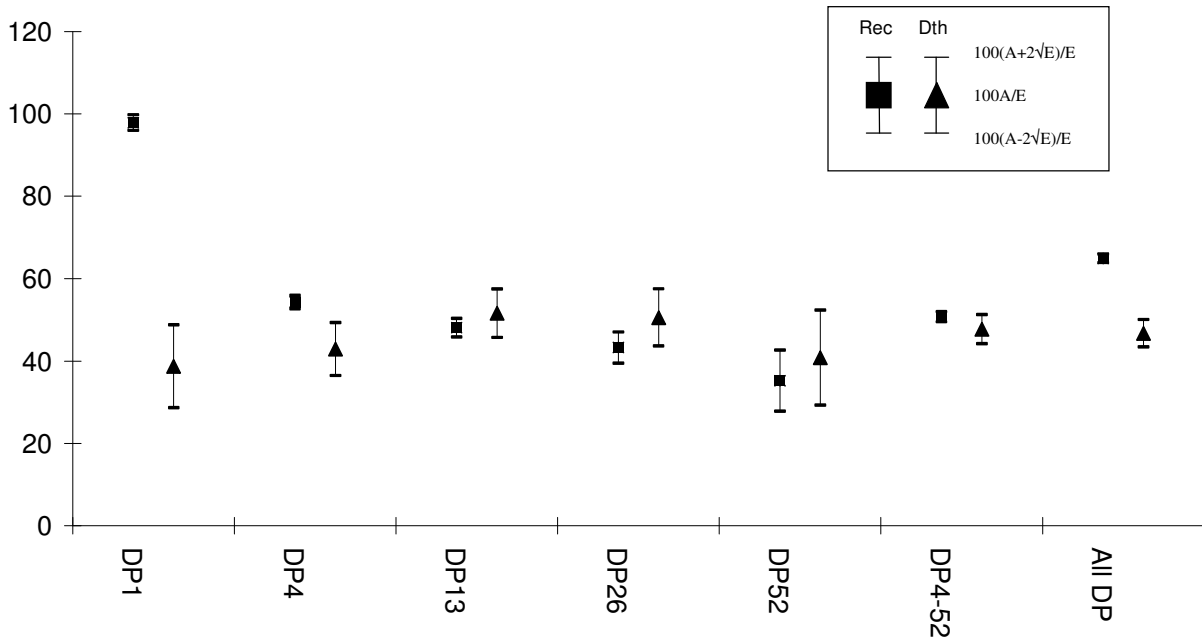
Figure C3.2. Females, terminations by deferred period for each cause group for the 12-year period 1991-2002, individual policies, Standard* experience, all occupational classes. Expected values based on SM1975-78

Figure C3.2a. Females, Infections and acute respiratory (Cause group 1)
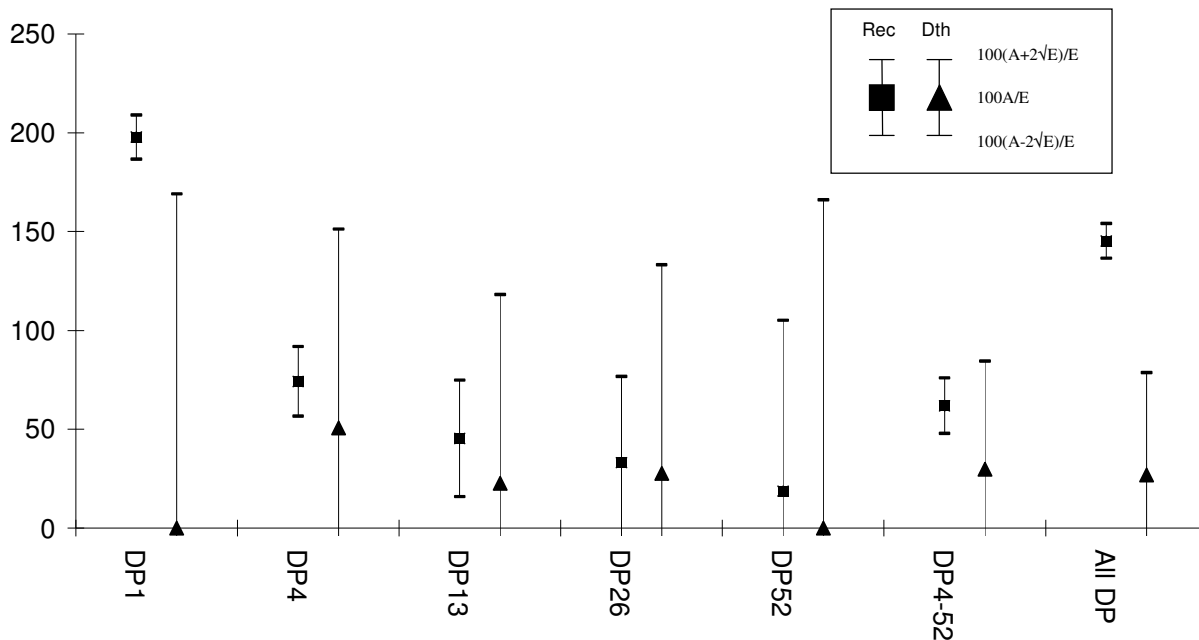
Figure C3.2b. Females, Neoplasms (Cause group 2) – Recoveries only
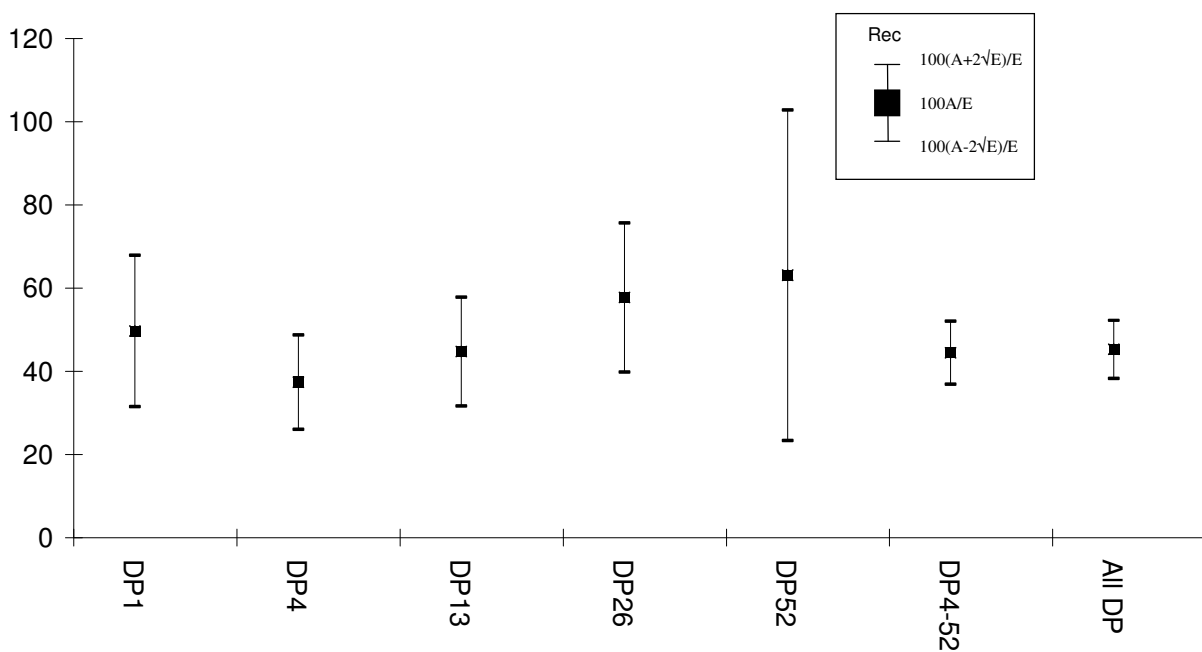
Figure C3.2c. Females, Neoplasms (Cause group 2) – Deaths only
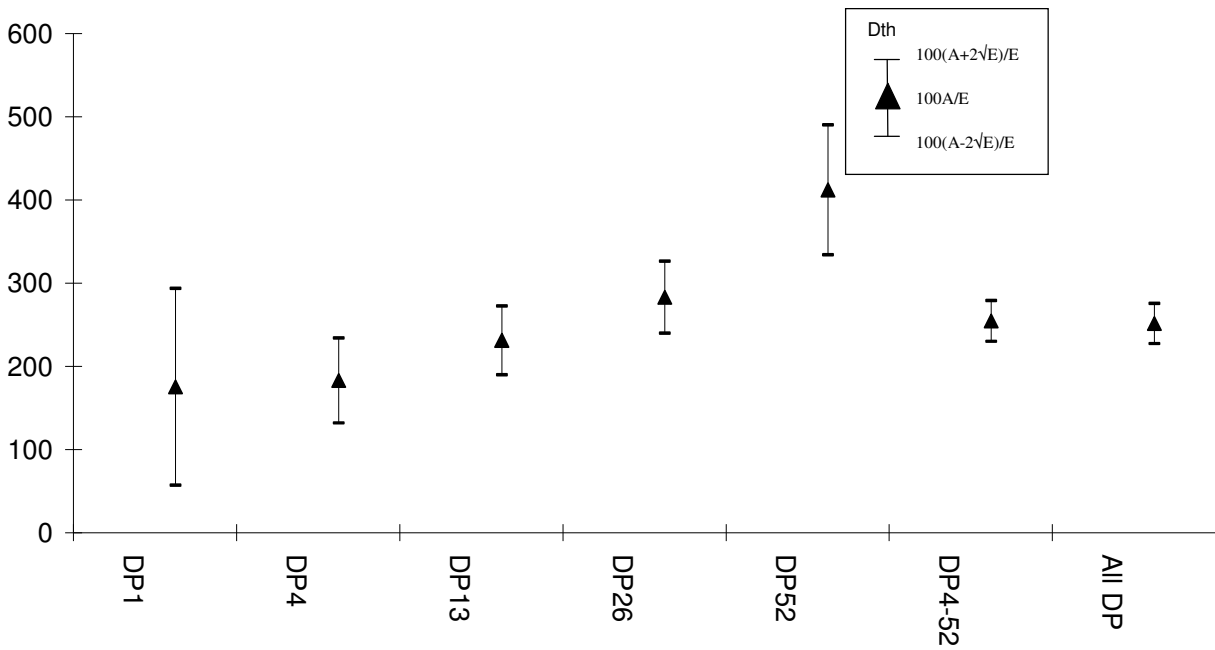
Figure C3.2d. Females, Mental (Cause group 3)
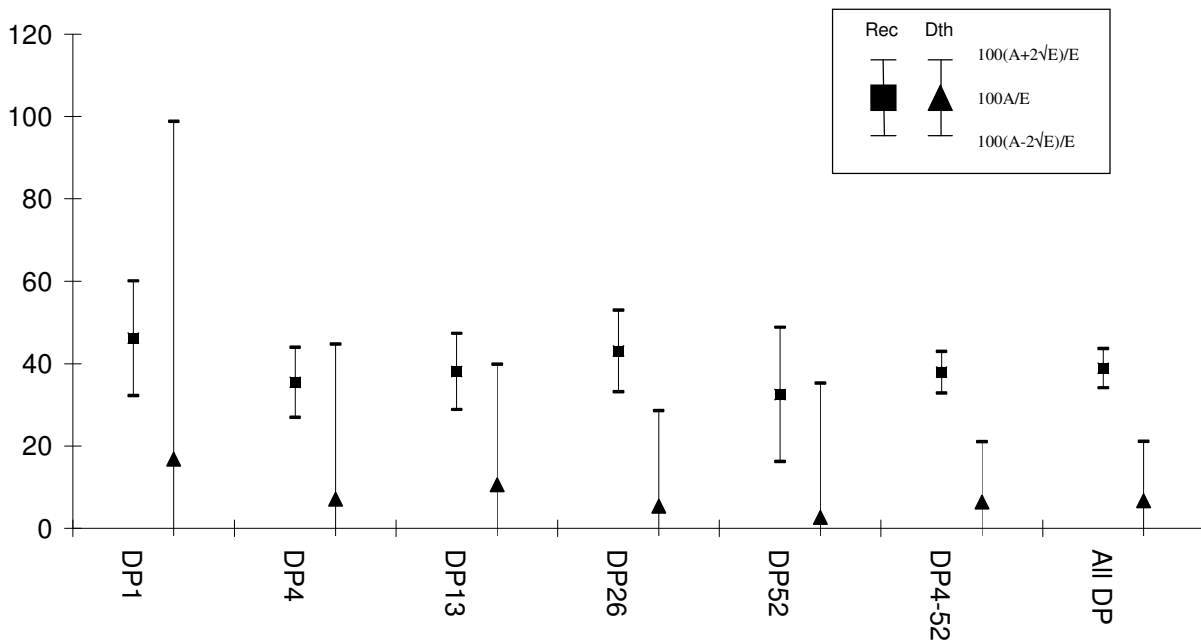
Figure C3.2e. Females, Nervous system & sensory organs (Cause group 4)
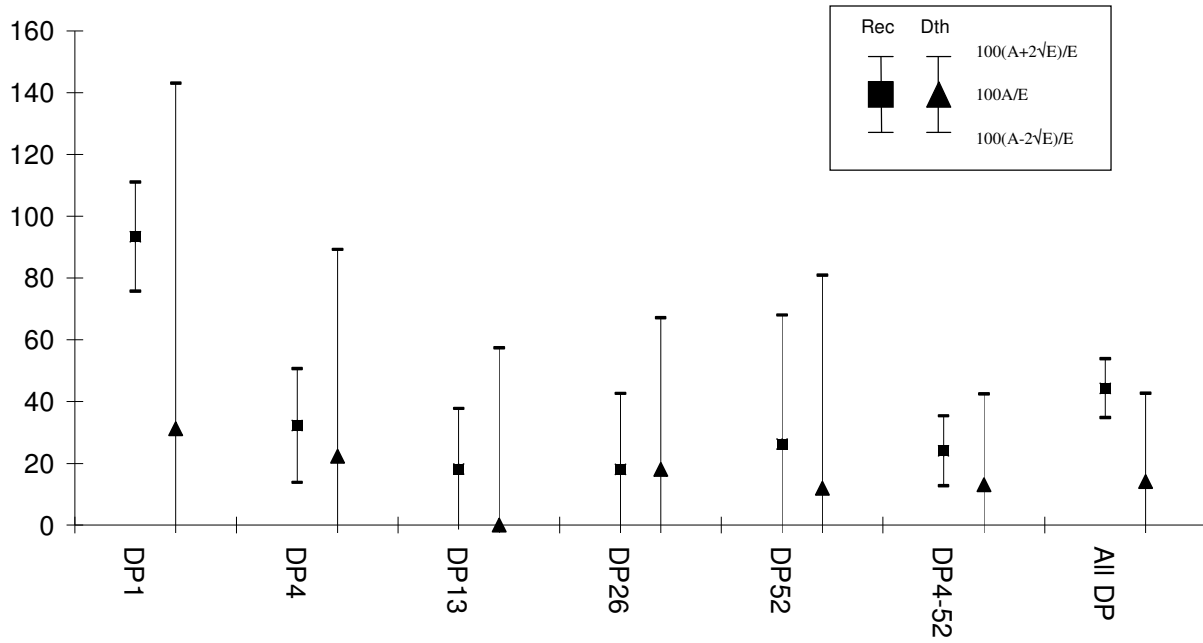
Figure C3.2f. Females, Circulatory (Cause group 5)
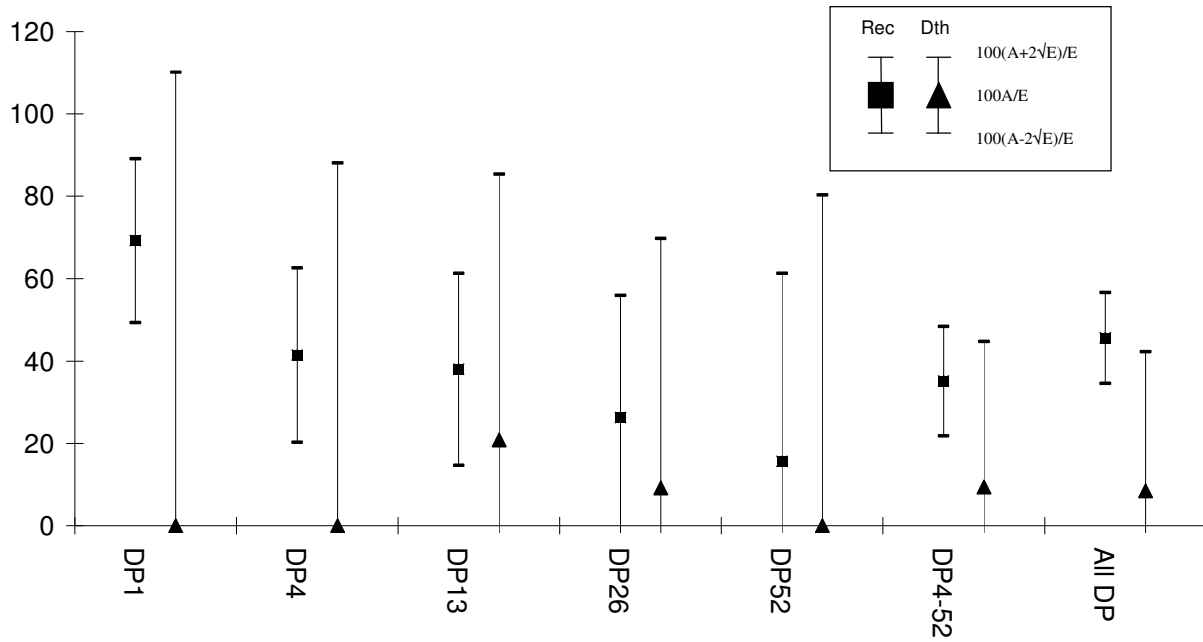
Figure C3.2g. Females, Digestive (non-infectious) (Cause group 6)
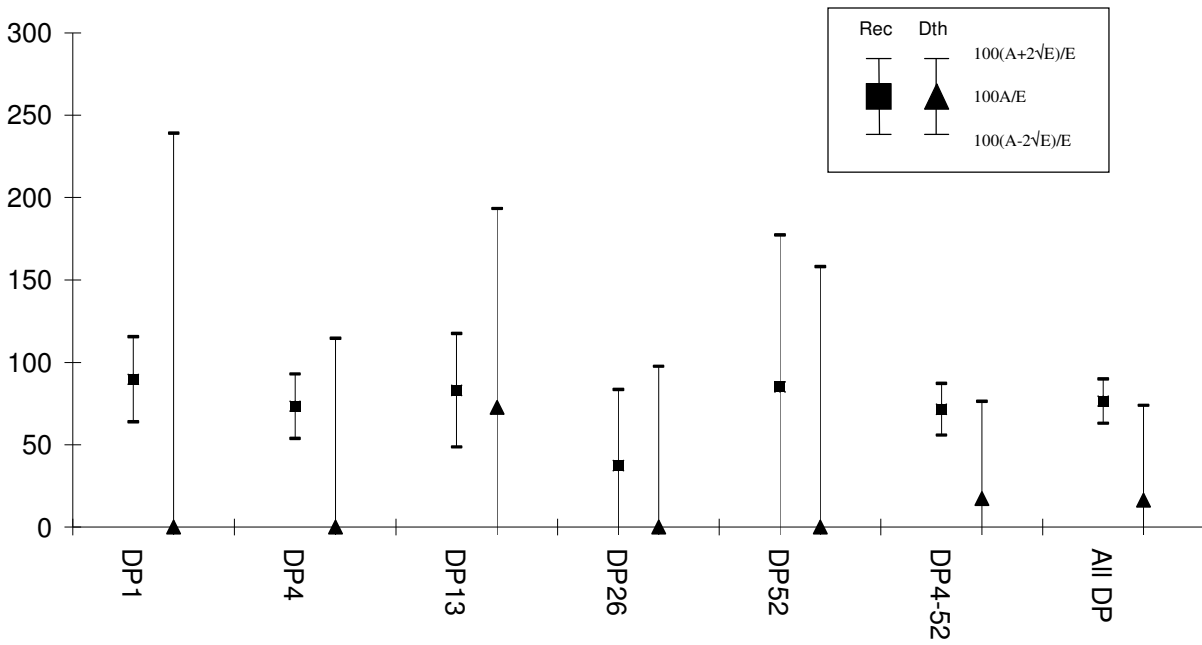
Figure C3.2h. Females, Genito-urinary (Cause group 7)
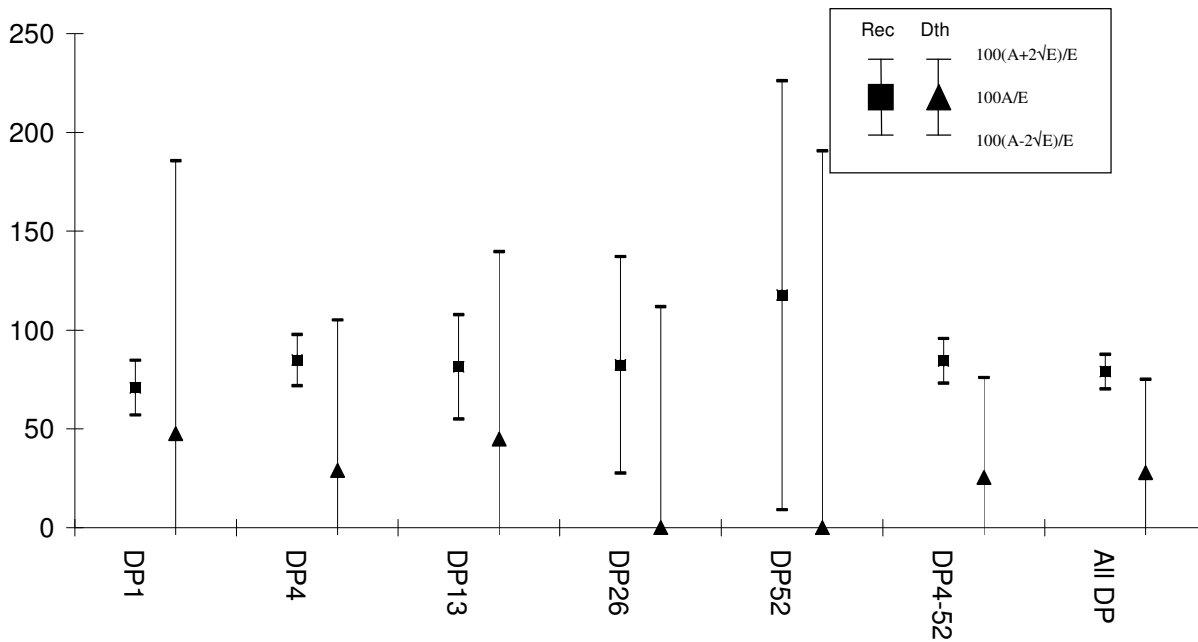
Figure C3.2i. Females, Arthritis (Cause group 8)
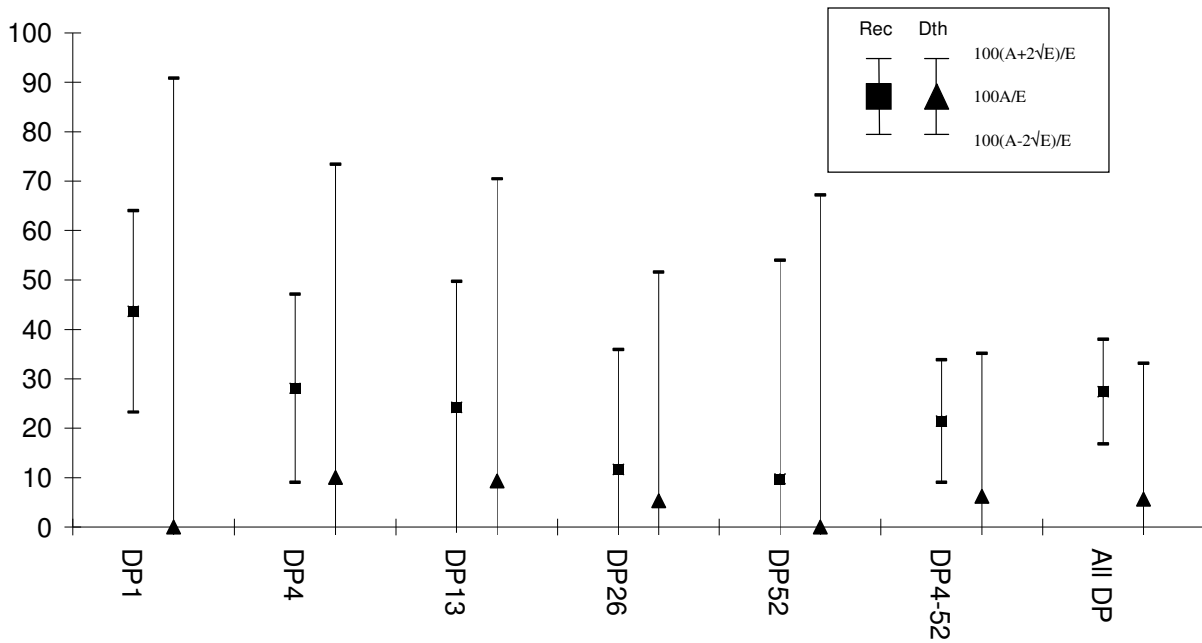
Figure C3.2j. Females, Musculoskeletal (Cause group 9)
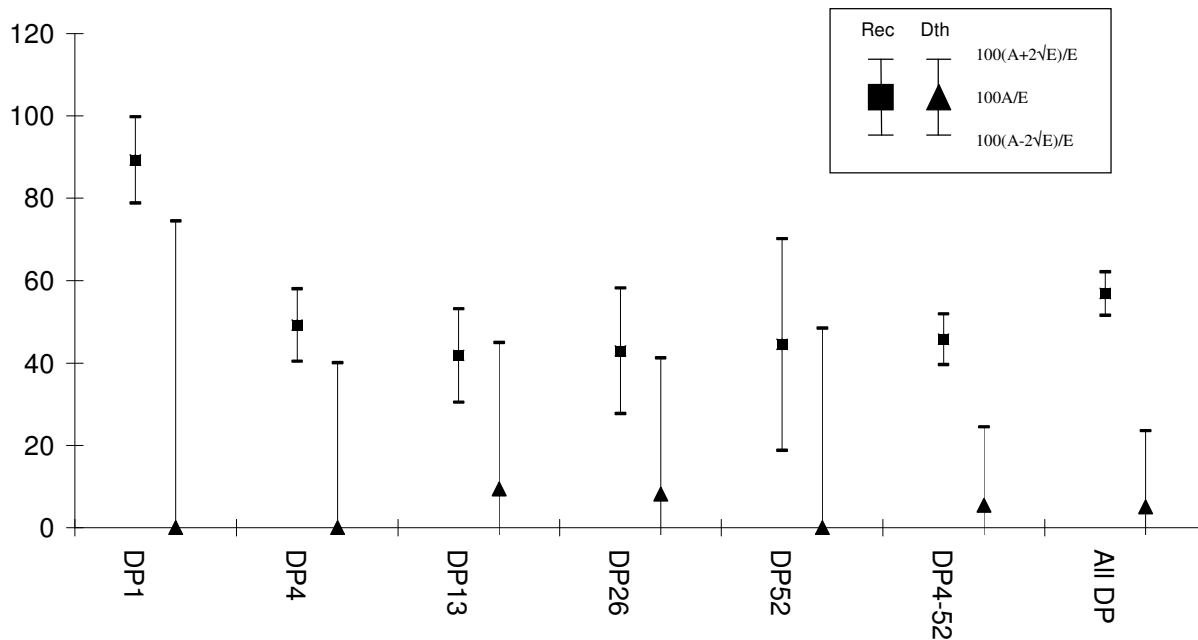
Figure C3.2k. Females, Injuries (Cause group 10)
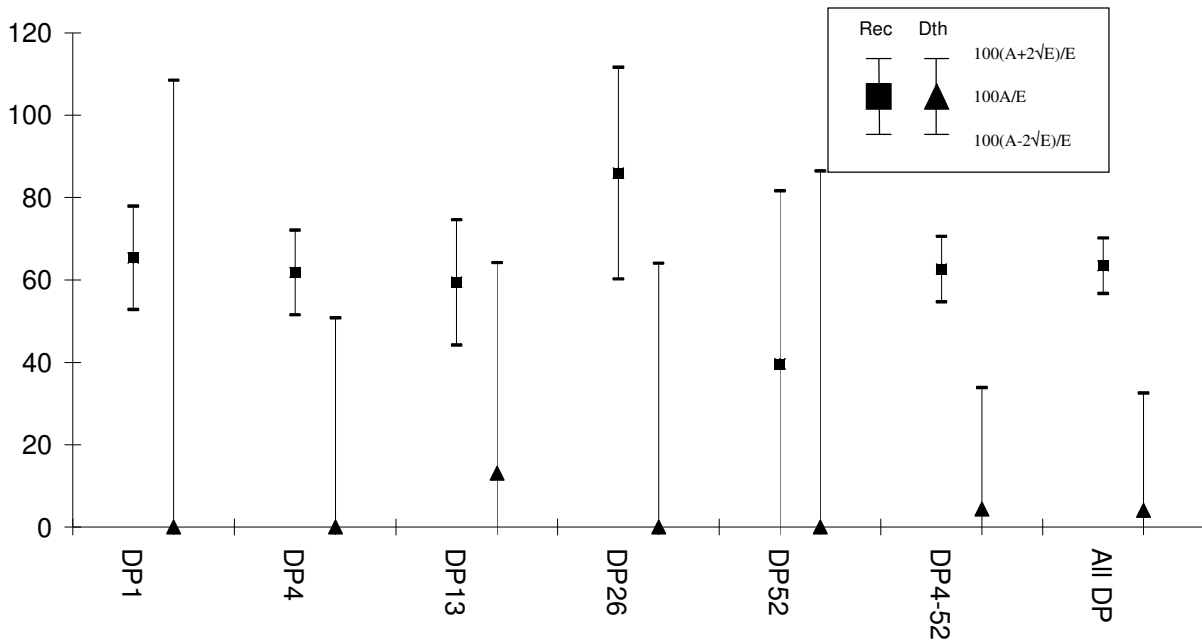
Figure C3.2l. Females, All causes
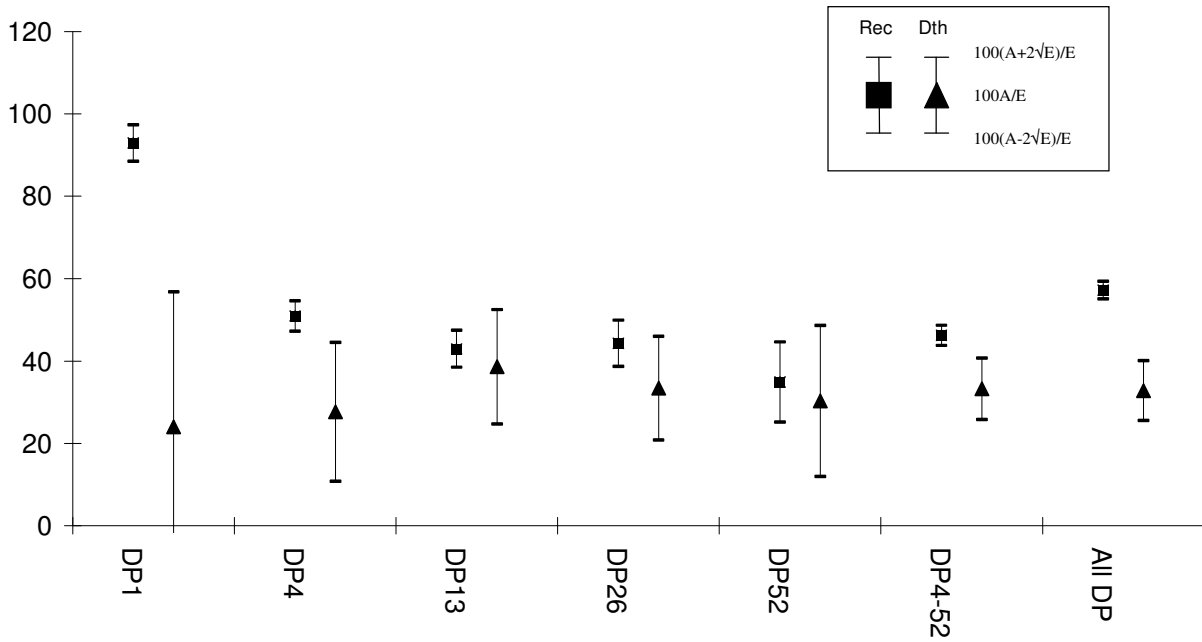
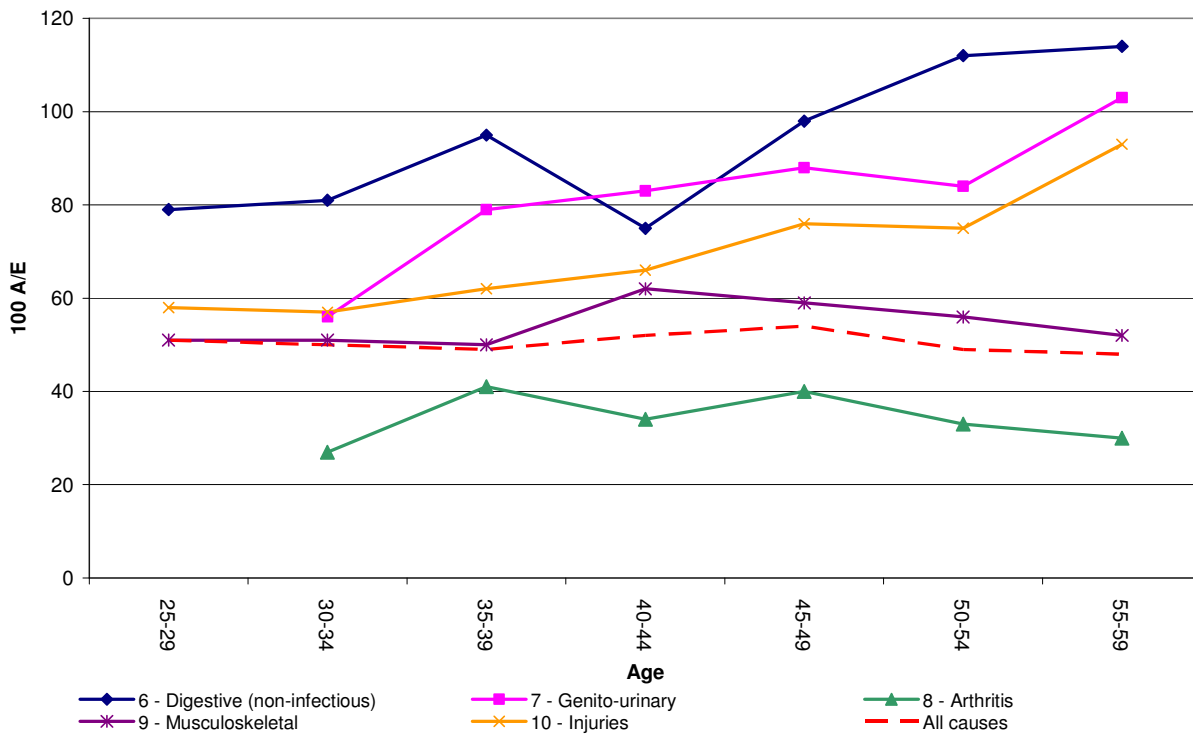## Appendix C4: Claim terminations by occupational class

Figure C4.1. Males, terminations by occupational class for each cause group for the 12-year period 1991-2002, individual policies, Standard* experience, deferred period 4-52 weeks. Expected values based on SM1975-78

Figure C4.1a. Males, Infections and acute respiratory (Cause group 1)
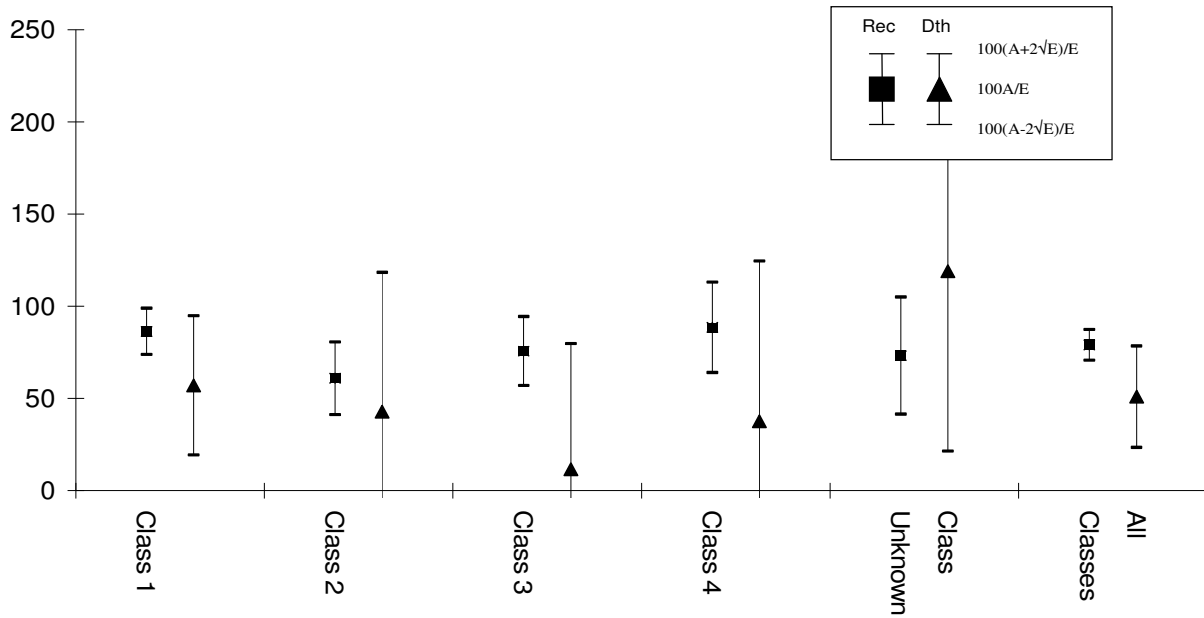
Figure C4.1b. Males, Neoplasms (Cause group 2) – Recoveries only
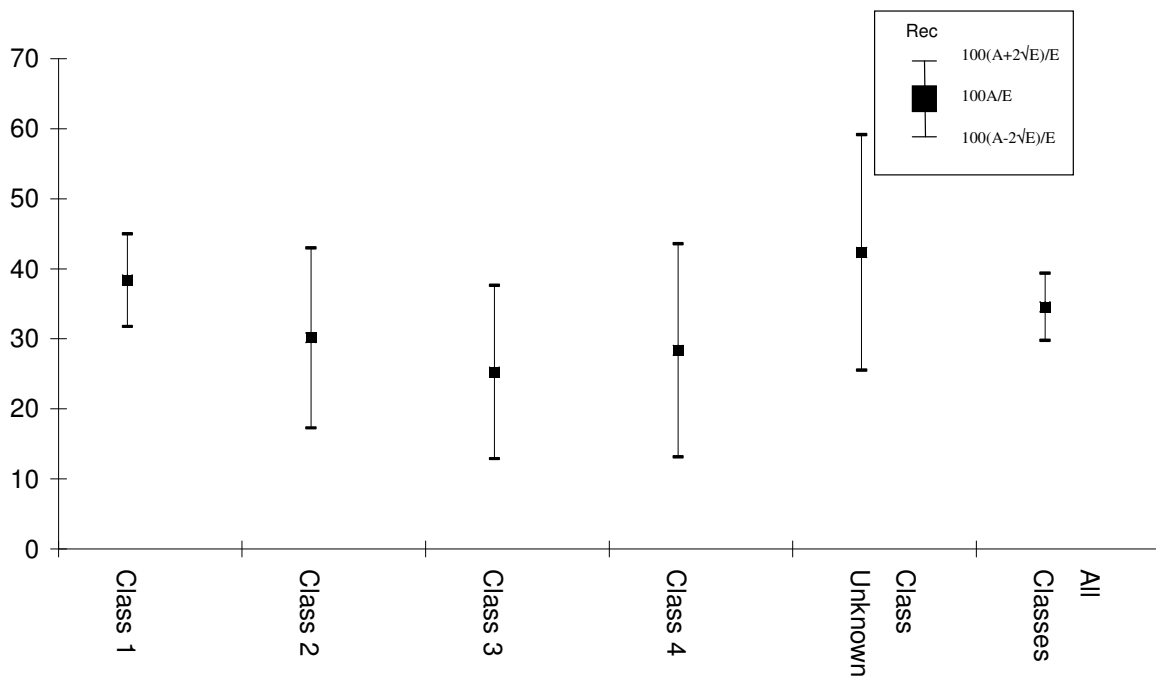
Figure C4.1c. Males, Neoplasms (Cause group 2) – Deaths only
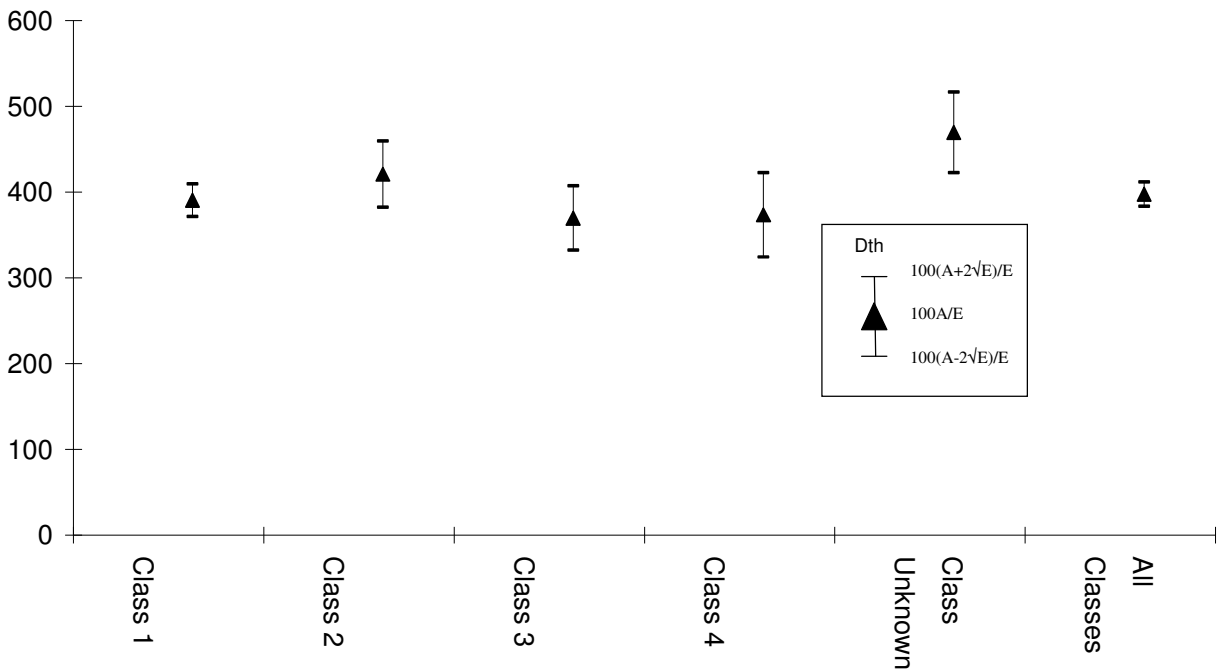
Figure C4.1d. Males, Mental (Cause group 3)
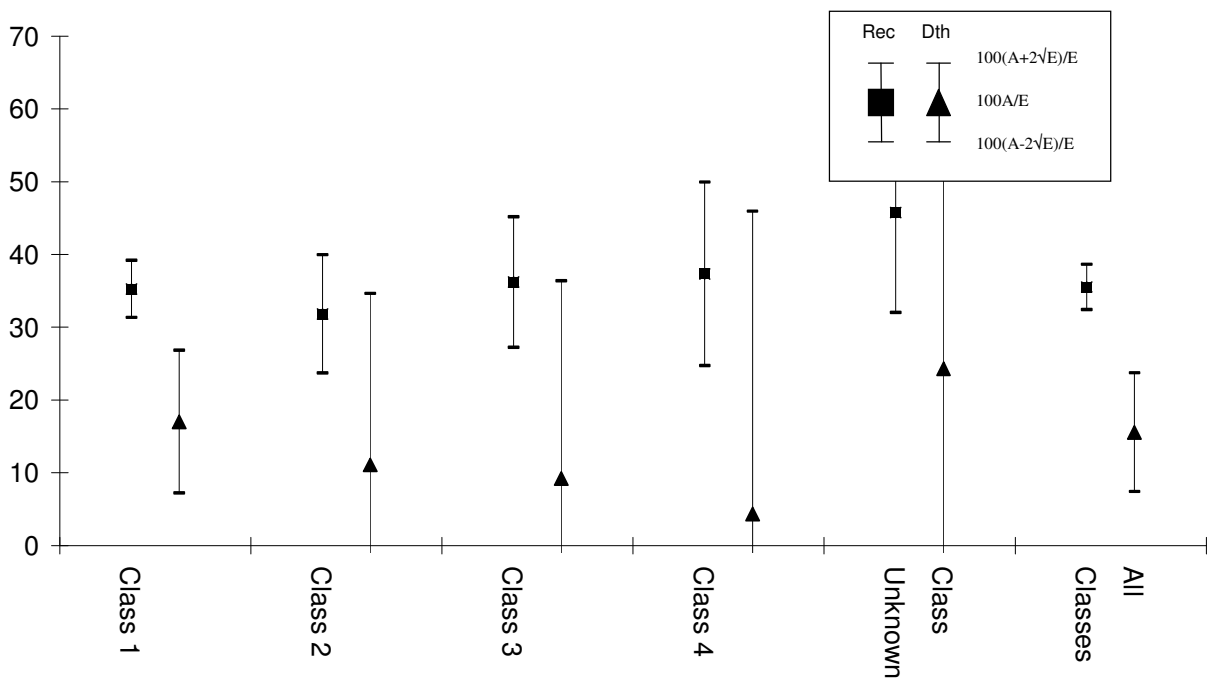
Figure C4.1e. Males, Nervous system & sensory organs (Cause group 4)
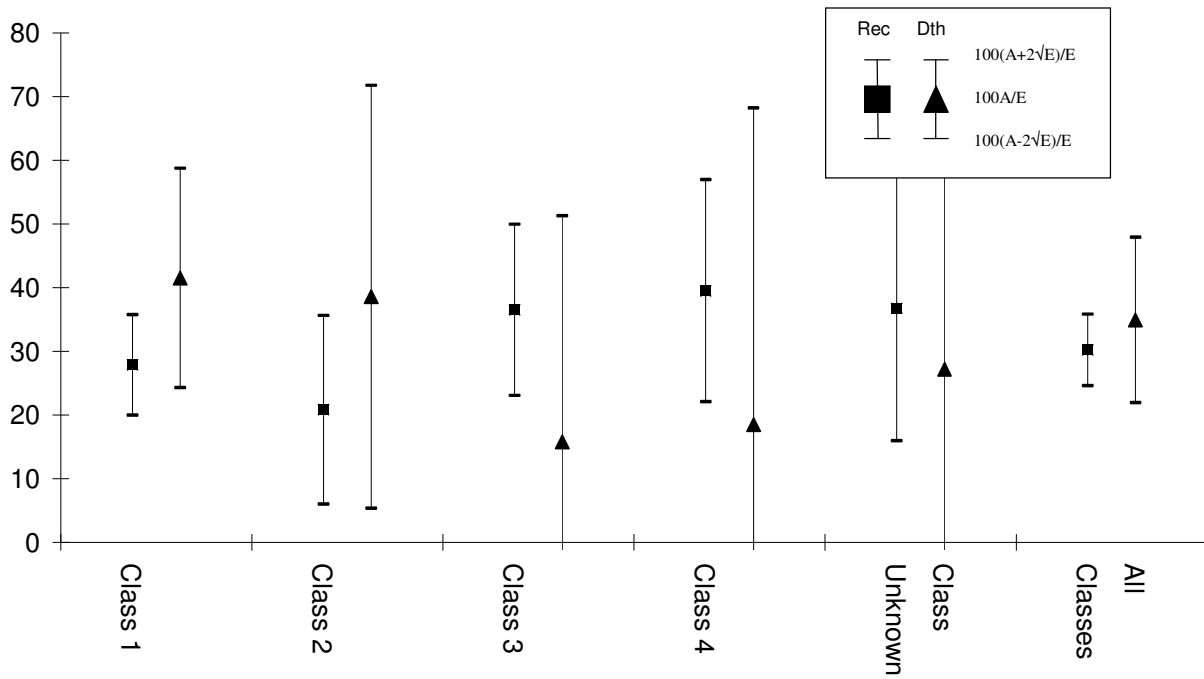
Figure C4.1f. Males, Circulatory (Cause group 5)
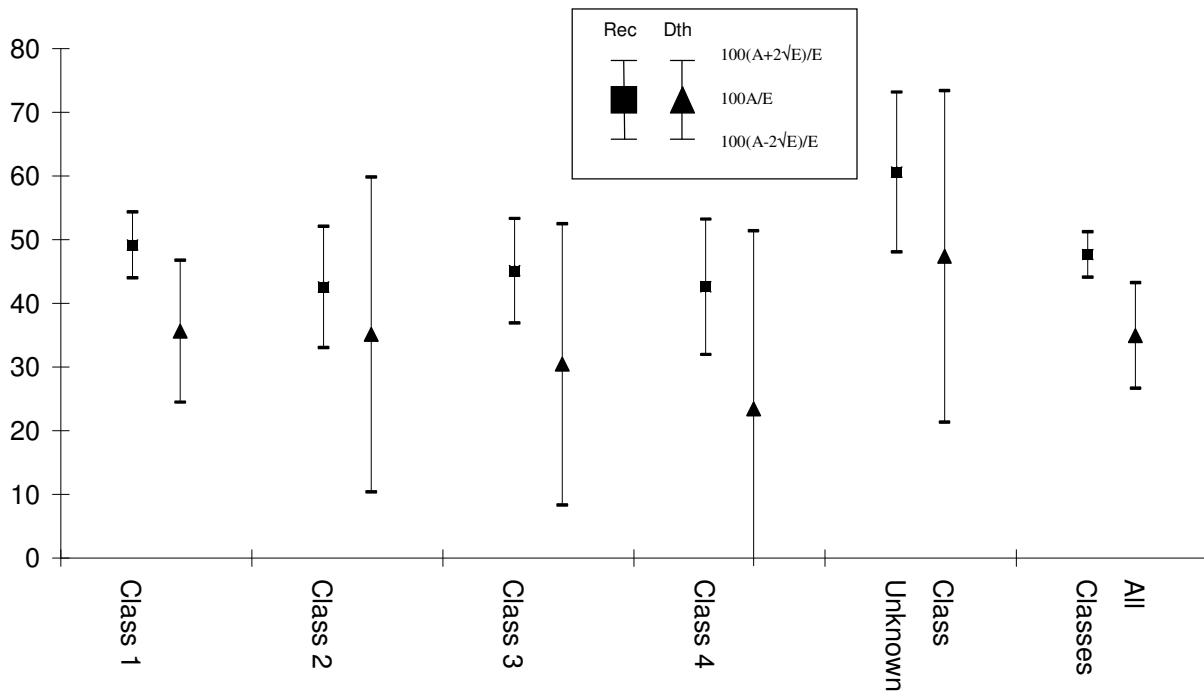
Figure C4.1g. Males, Digestive (non-infectious) (Cause group 6)
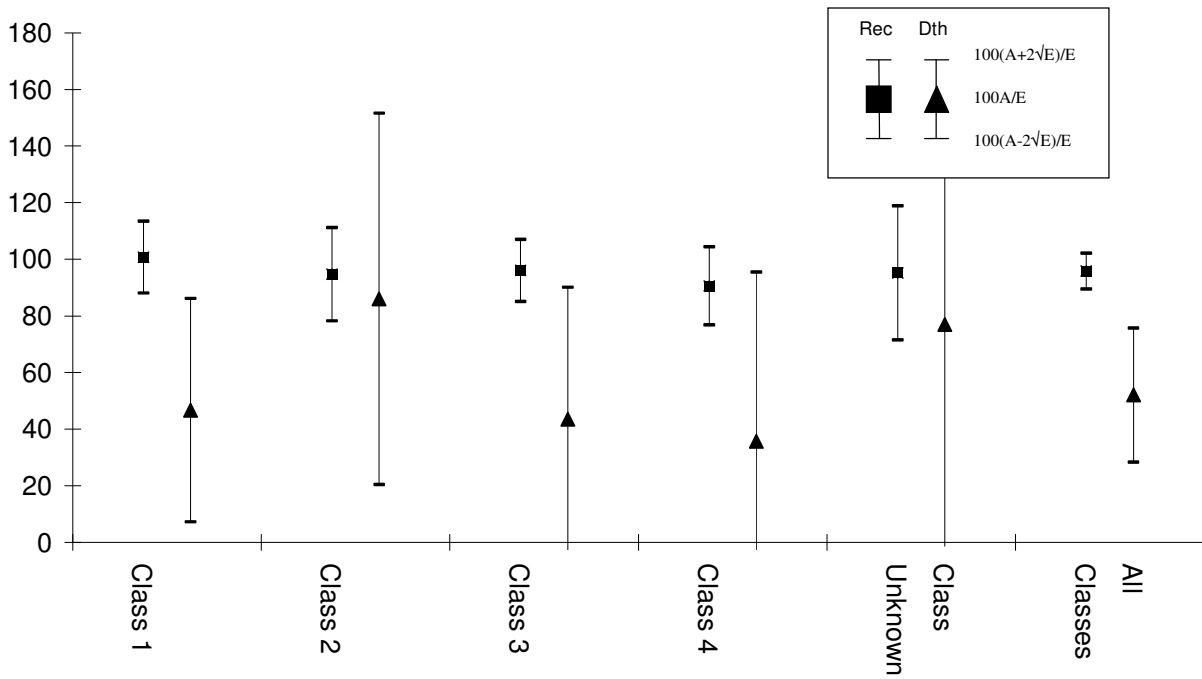
Figure C4.1h. Males, Genito-urinary (Cause group 7)
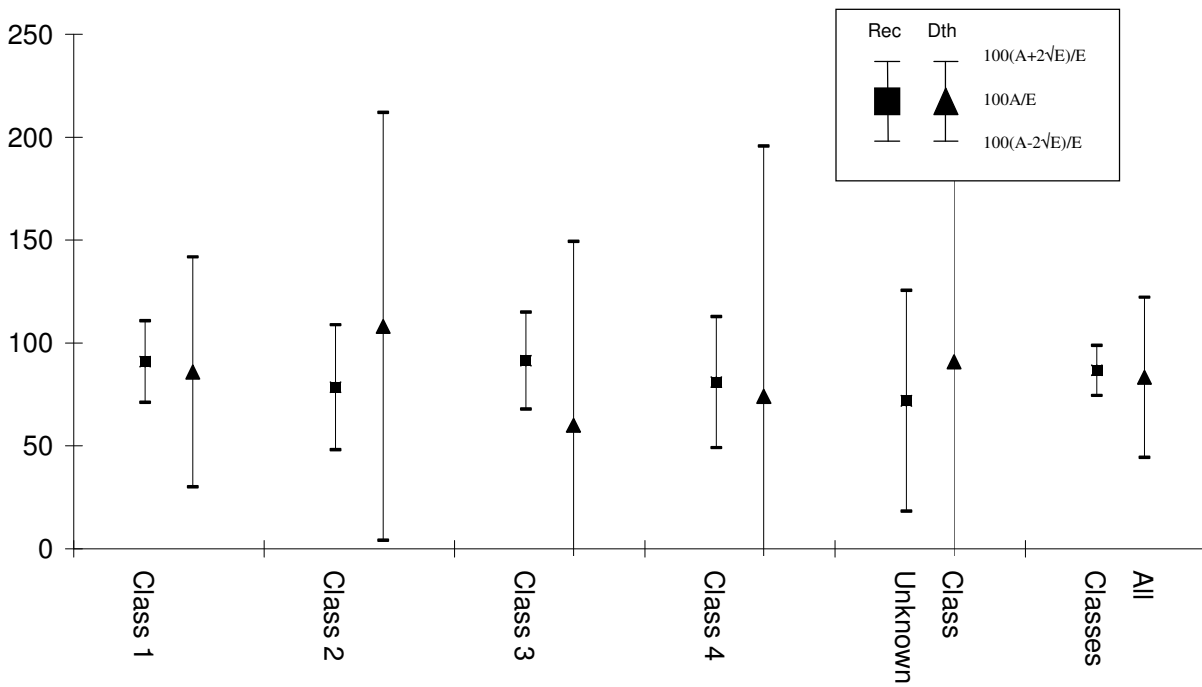
Figure C4.1i. Males, Arthritis (Cause group 8)
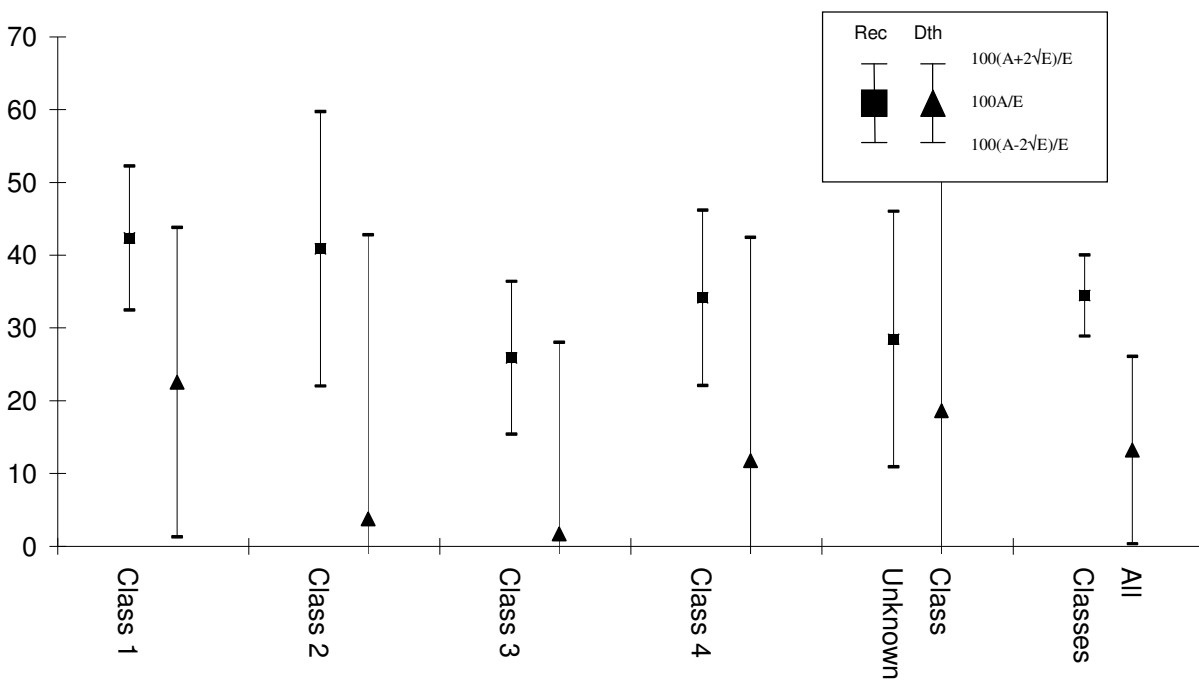
Figure C4.1j. Males, Musculoskeletal (Cause group 9)
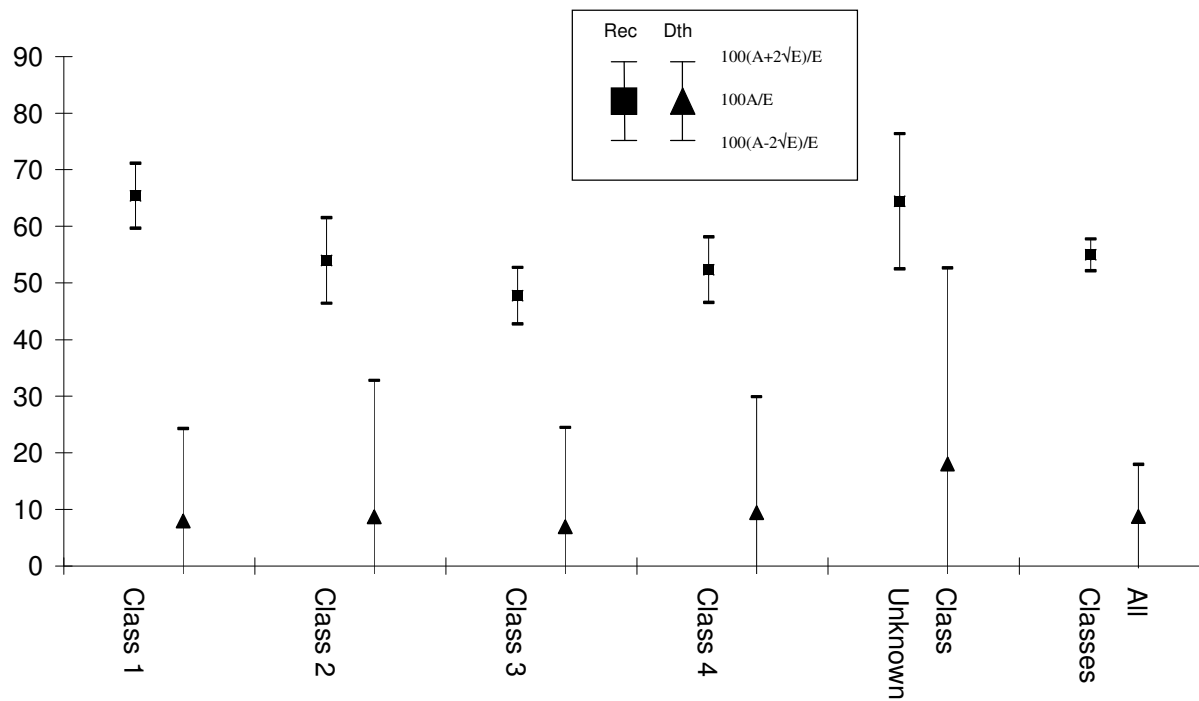
Figure C4.1k. Males, Injuries (Cause group 10)
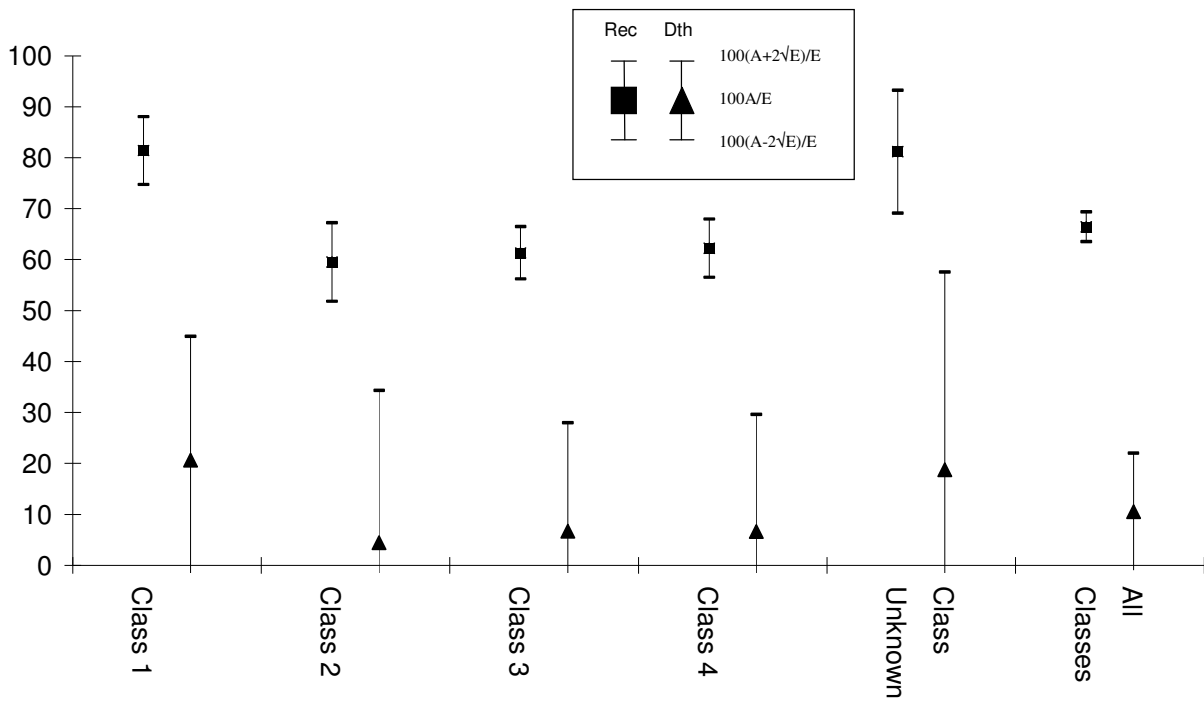
Figure C4.1l. Males, All causes

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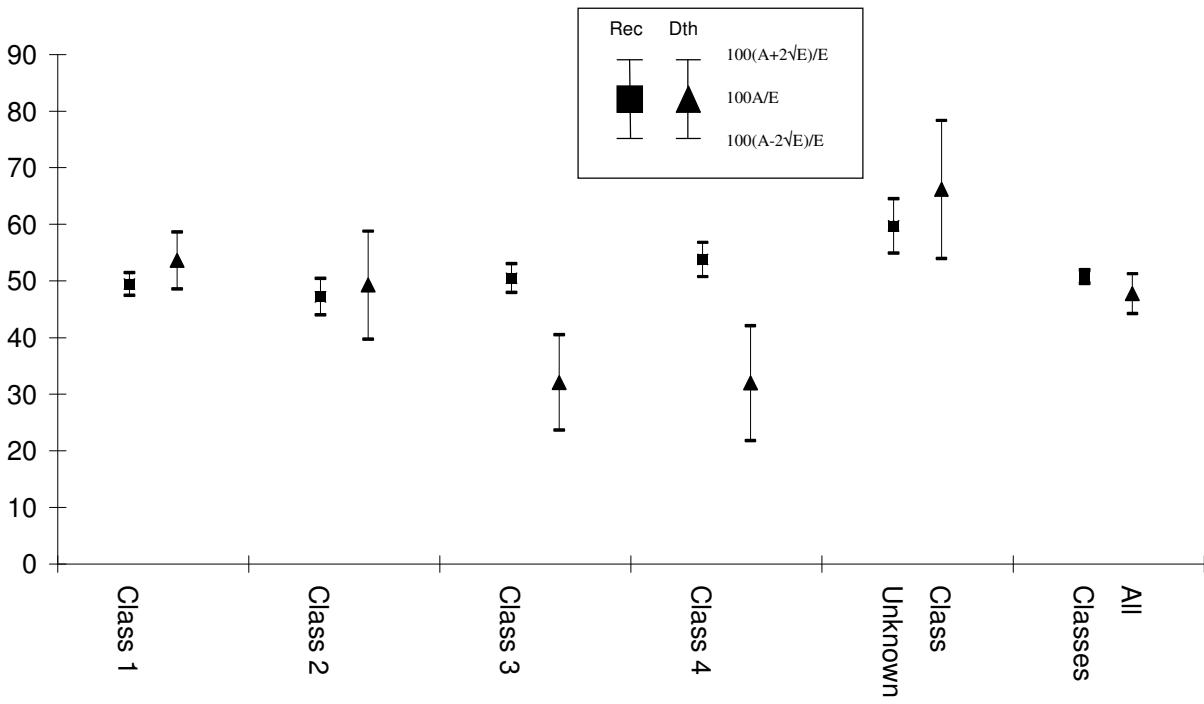
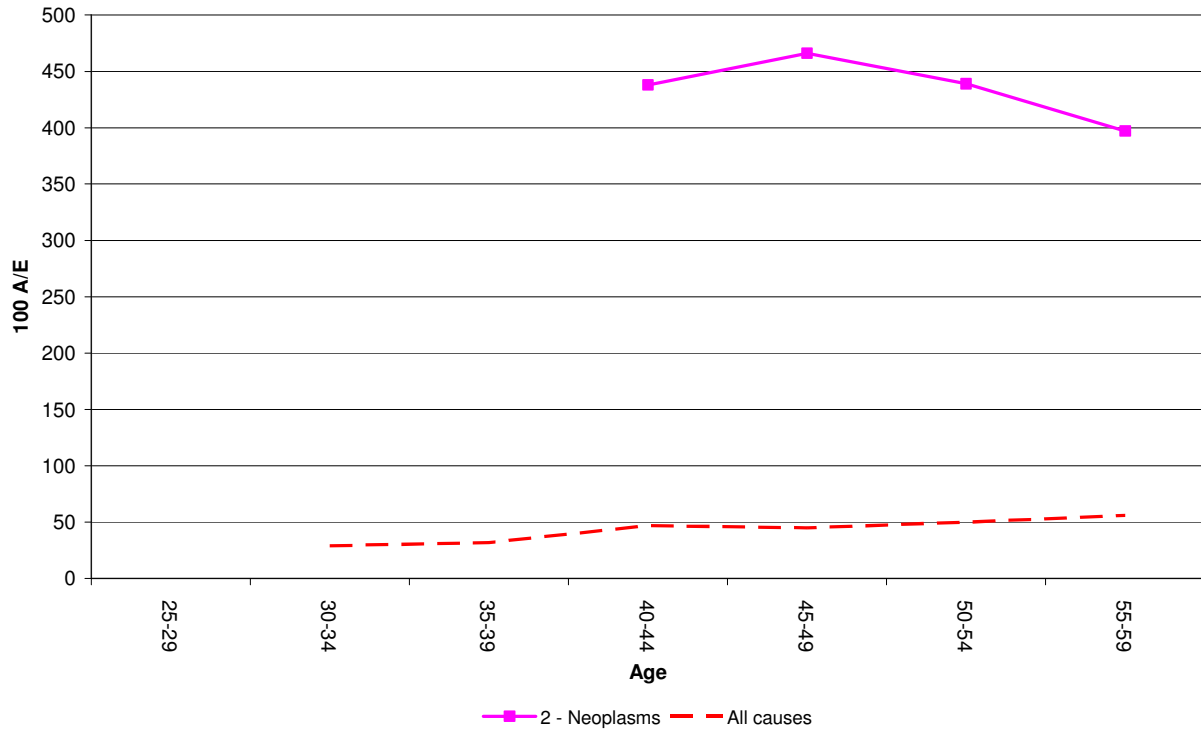Figure C4.2. Females, terminations by occupational class for each cause group for the 12-year period 1991-2002, individual policies, Standard* experience, deferred period 4-52 weeks. Expected values based on SM1975-78

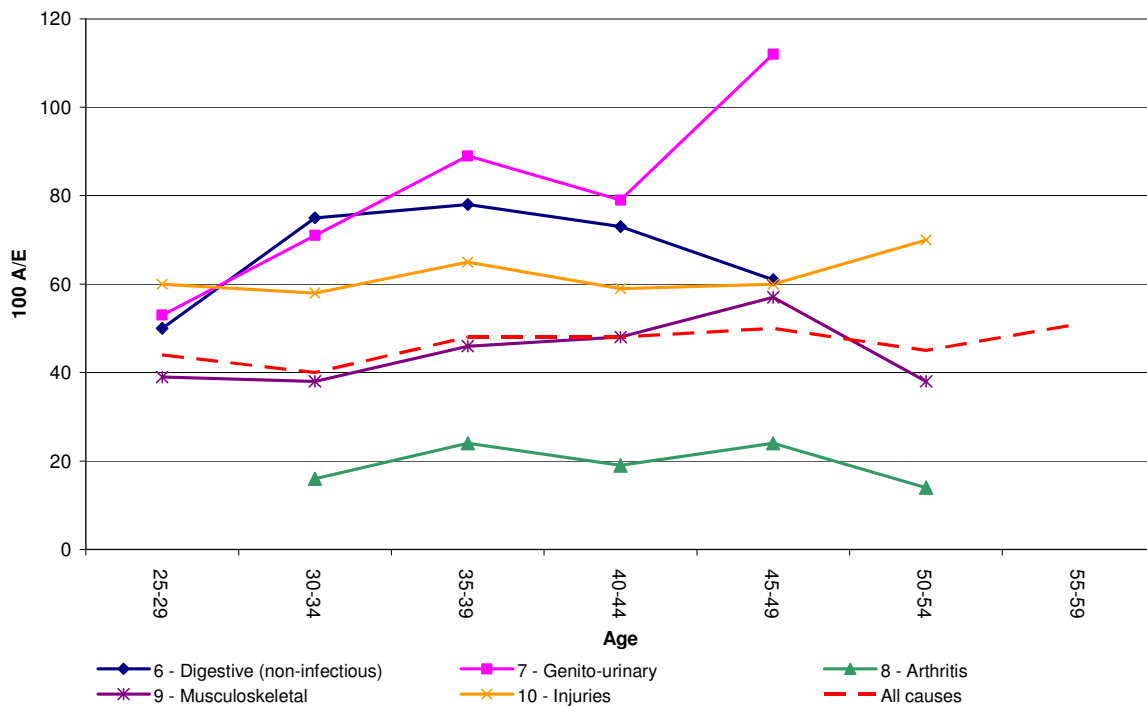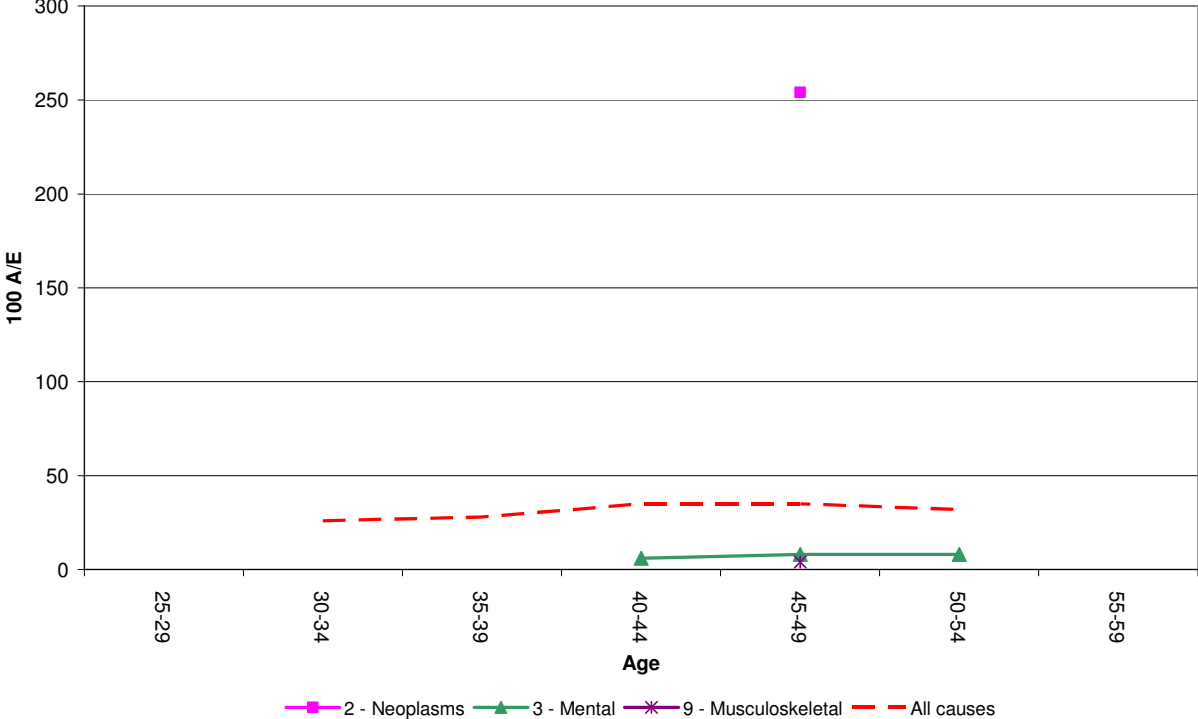Figure C4.2a. Females, Infections and acute respiratory (Cause group 1)
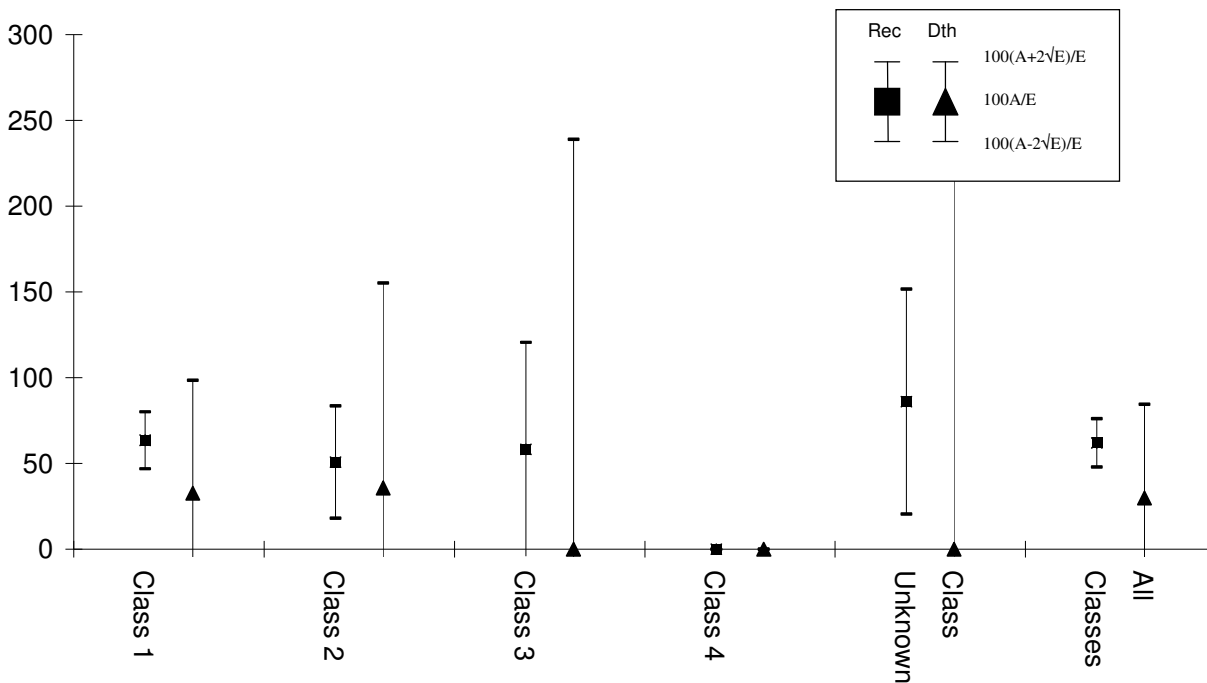
Figure C4.2b. Females, Neoplasms (Cause group 2) – Recoveries only
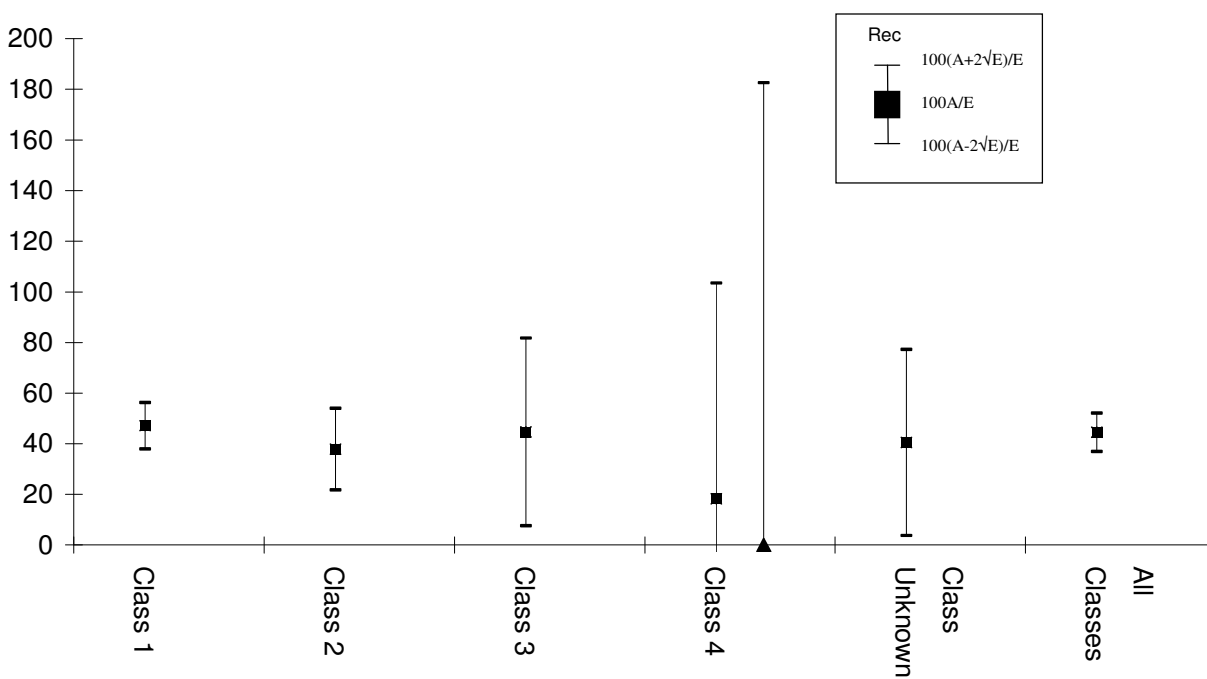
Figure C4.2c. Females, Neoplasms (Cause group 2) – Deaths only
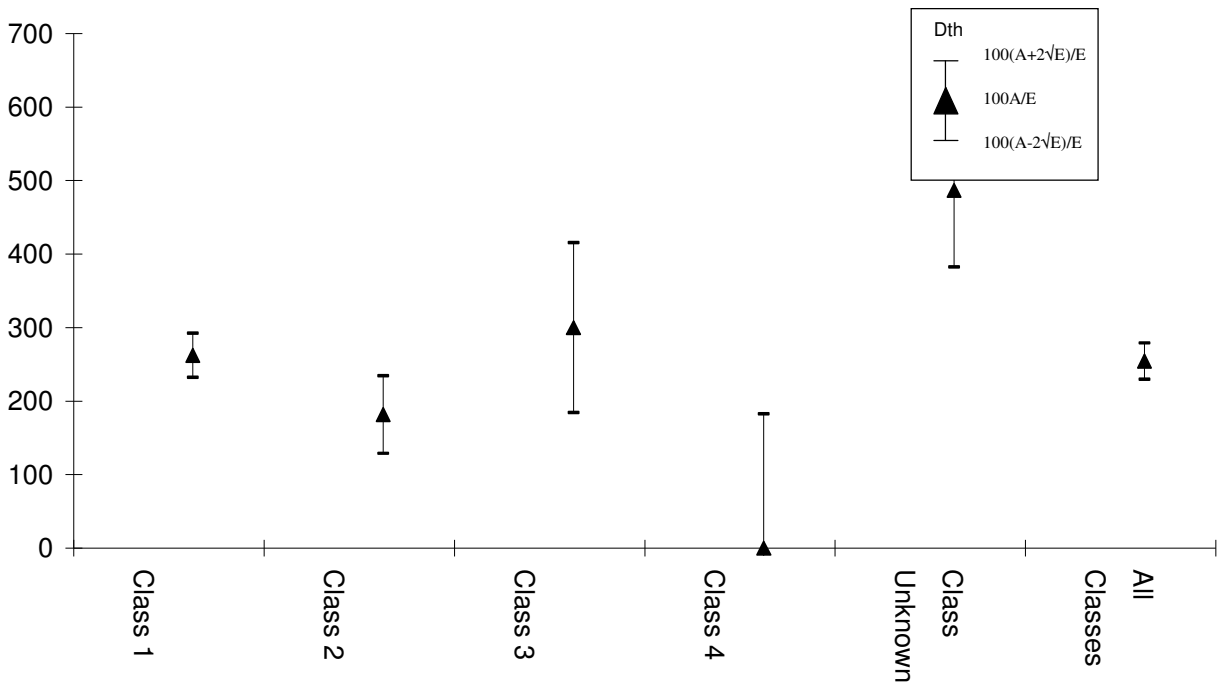
Figure C4.2d. Females, Mental (Cause group 3)
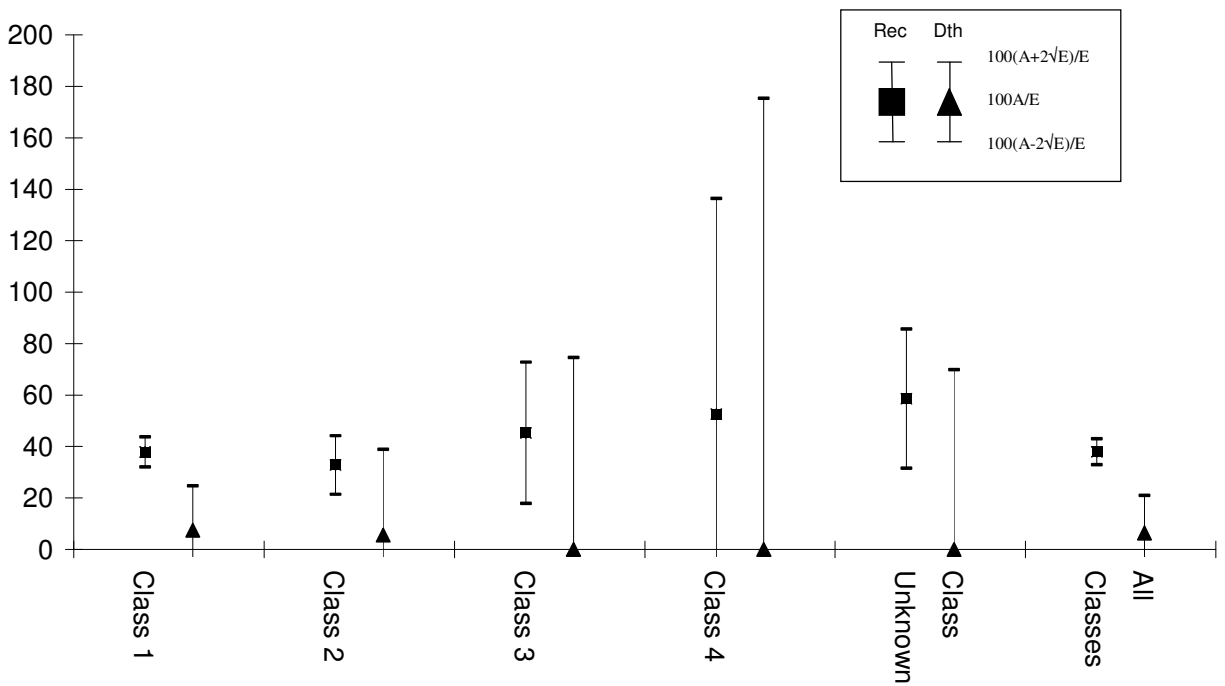
Figure C4.2e. Females, Nervous system & sensory organs (Cause group 4)
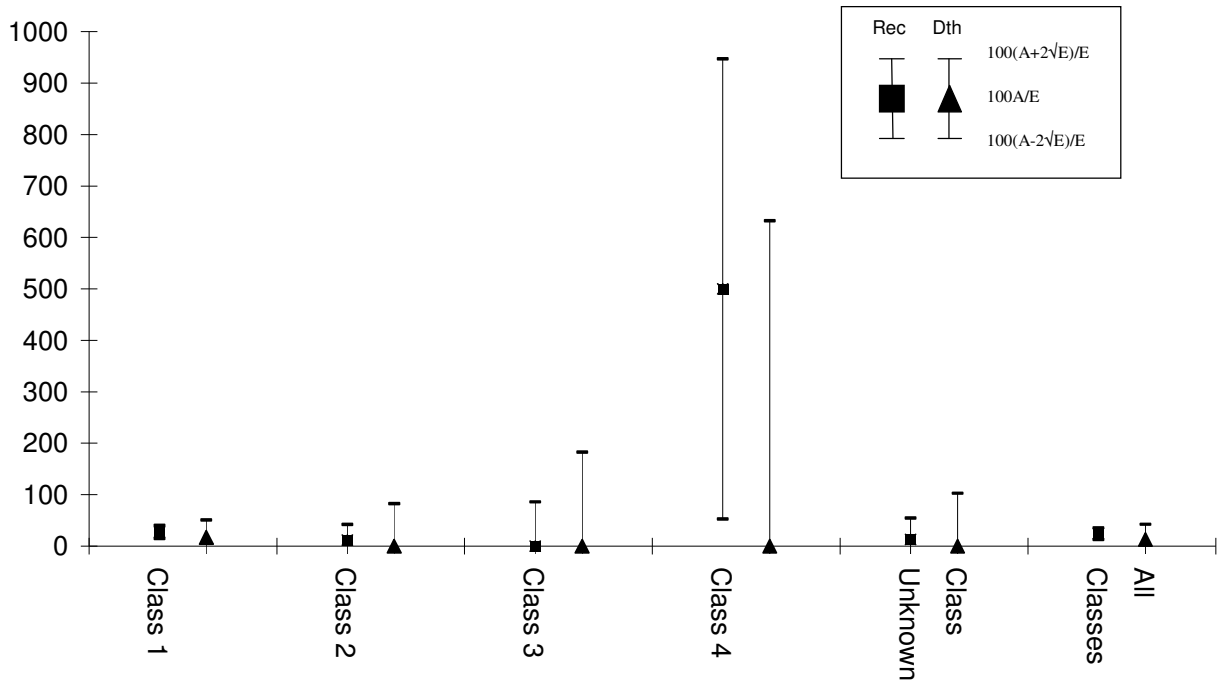
Figure C4.2f. Females, Circulatory (Cause group 5)
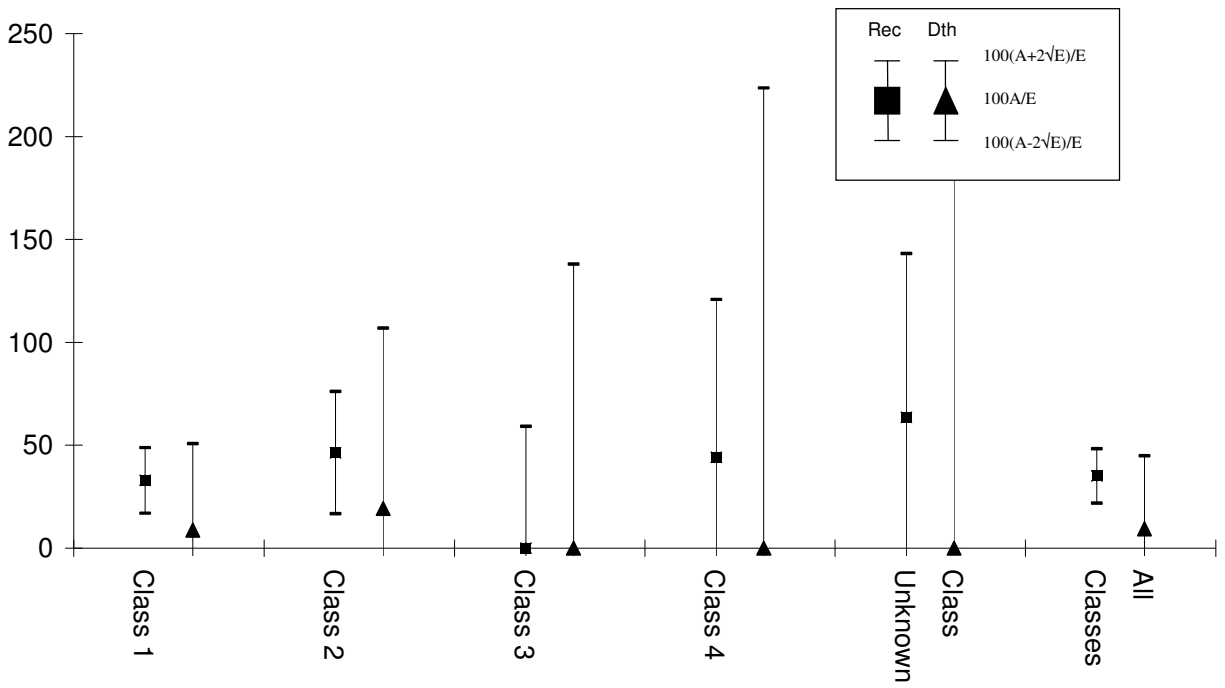
Figure C4.2g. Females, Digestive (non-infectious) (Cause group 6)
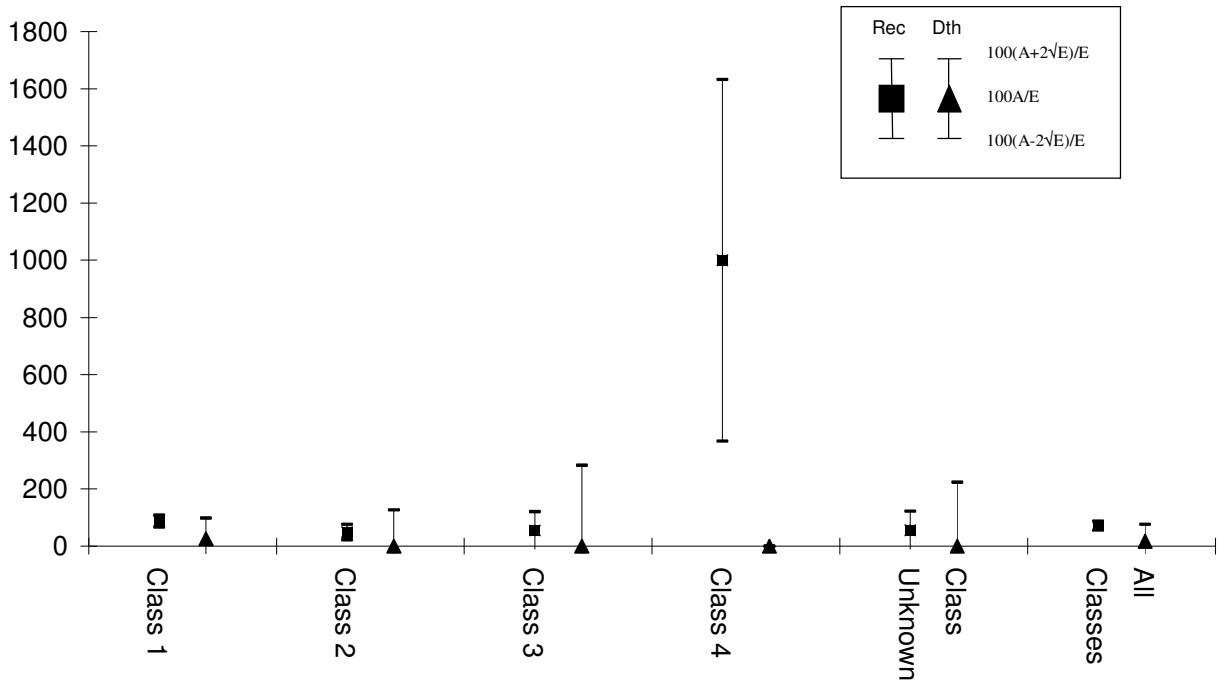
Figure C4.2h. Females, Genito-urinary (Cause group 7)
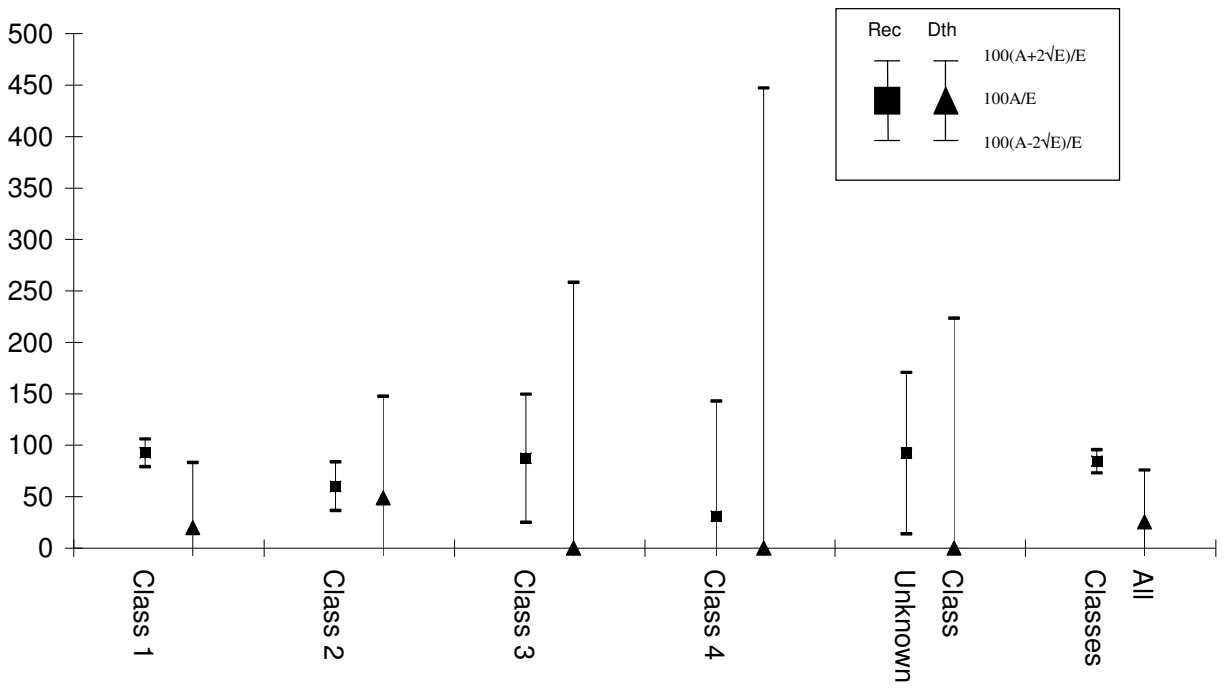
Figure C4.2i. Females, Arthritis (Cause group 8)
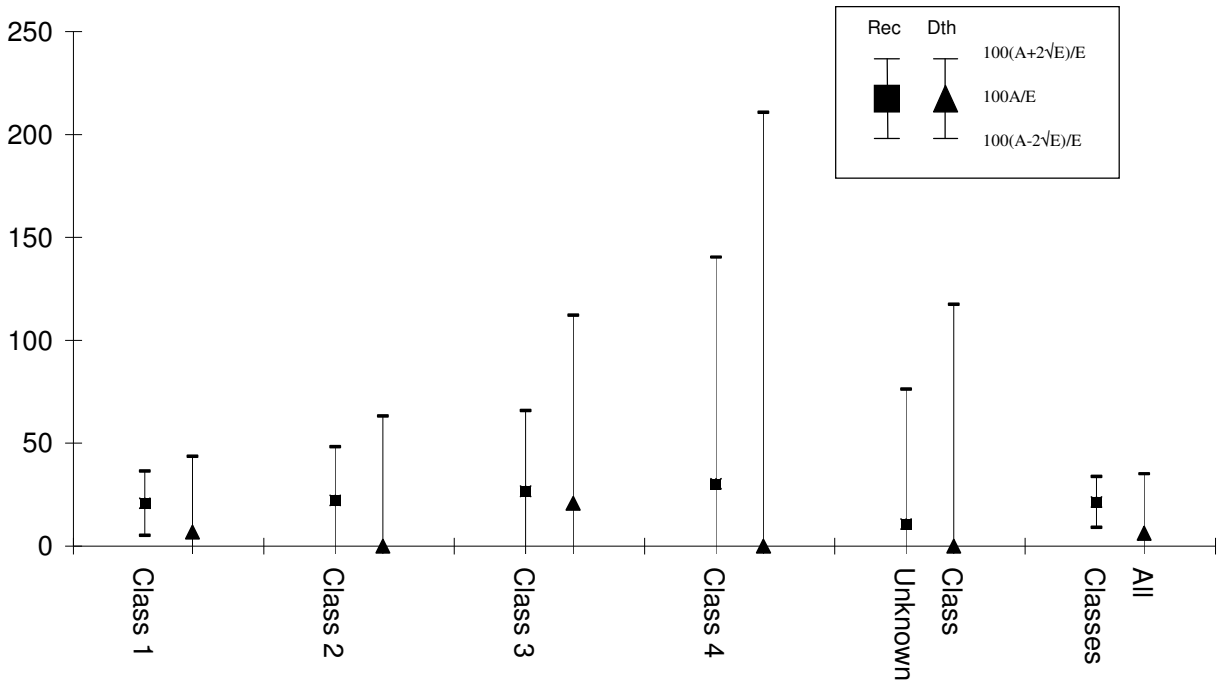
Figure C4.2j. Females, Musculoskeletal (Cause group 9)
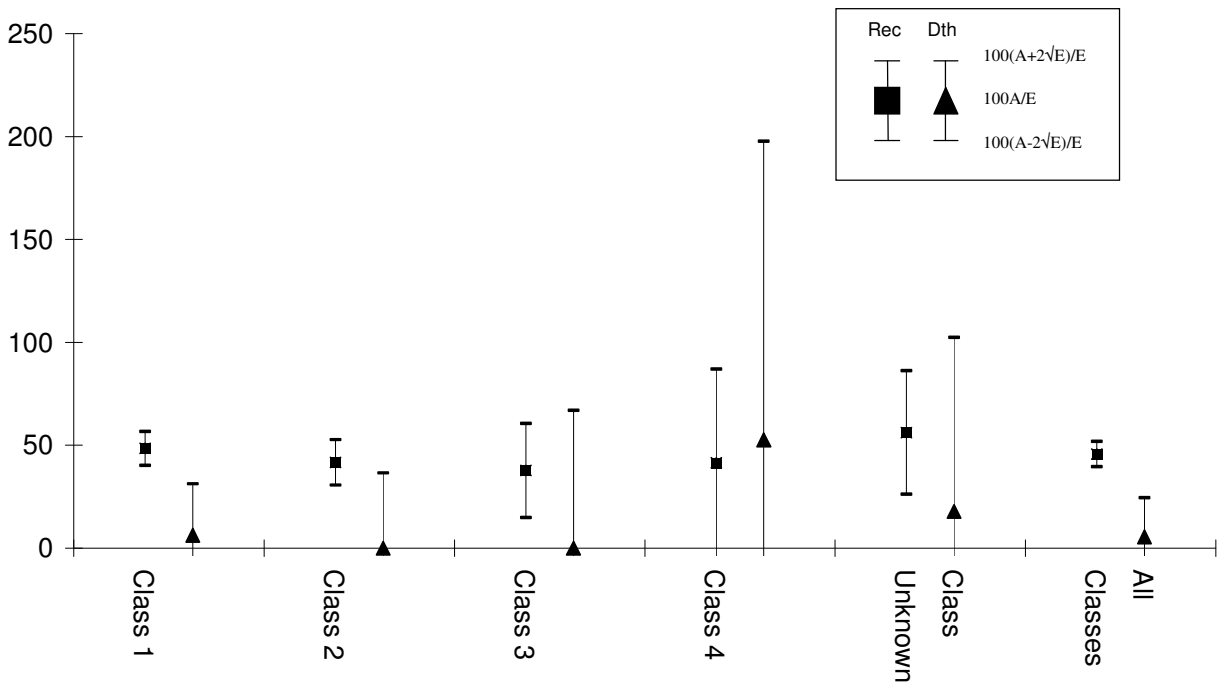
Figure C4.2k. Females, Injuries (Cause group 10)
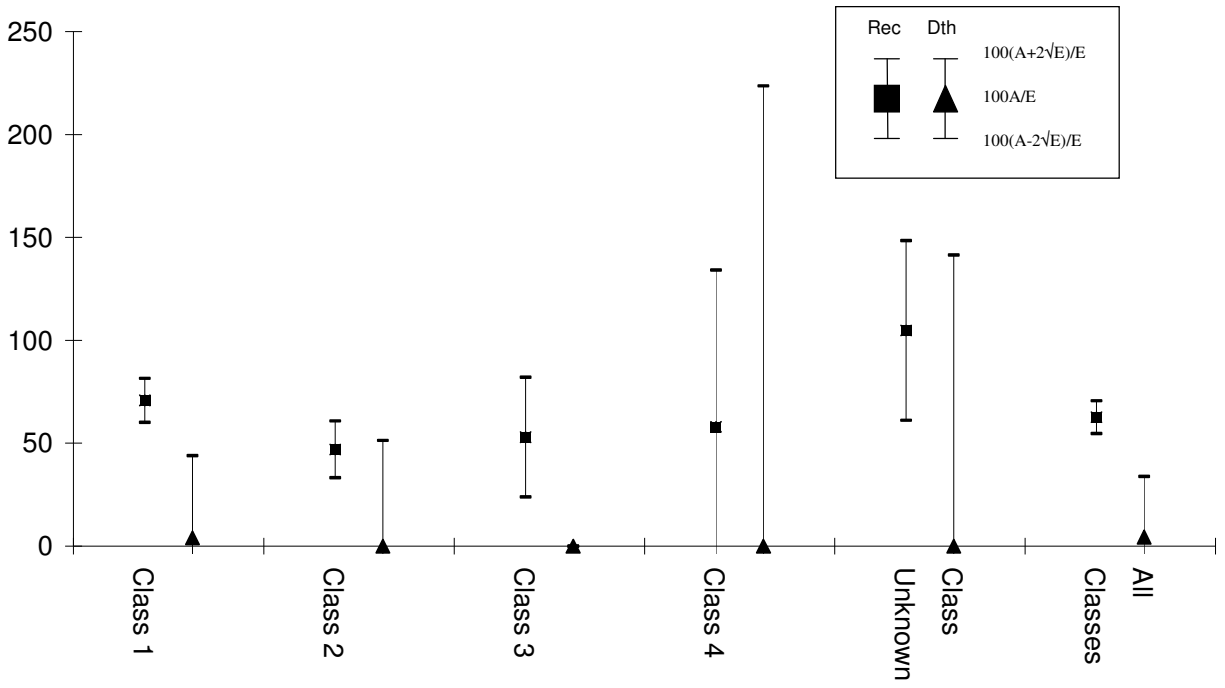
Figure C4.2l. Females, All causes
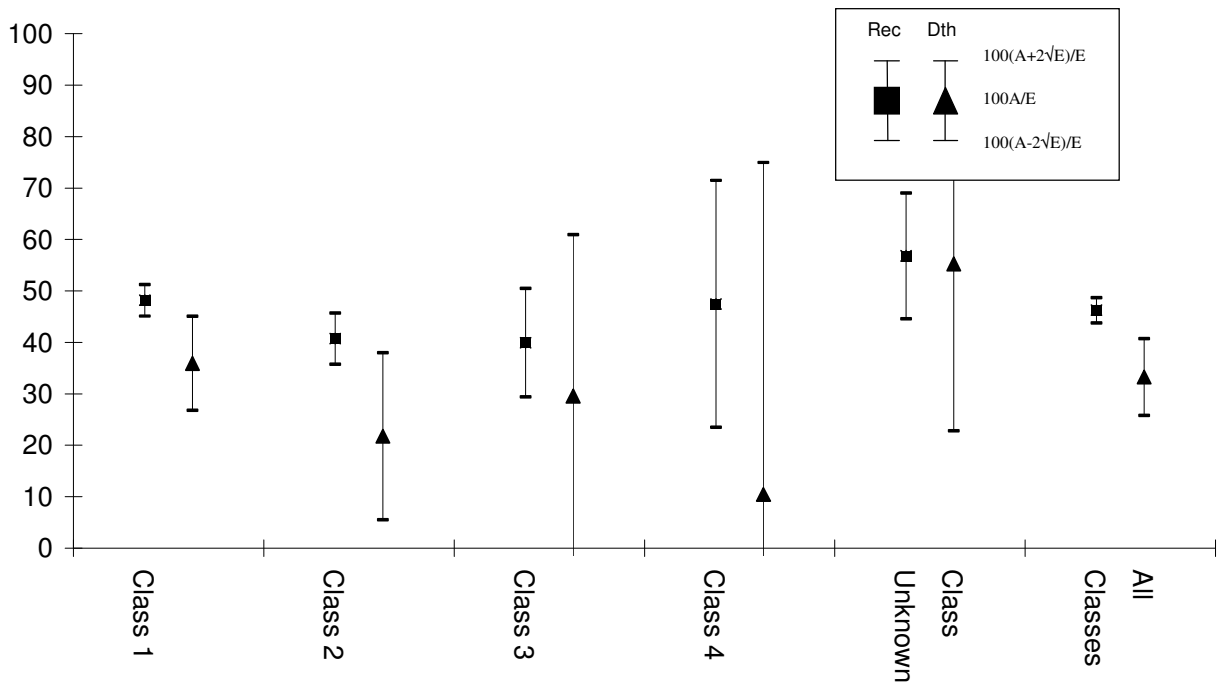
Appendix C5: Claim terminations by age

Figure C5.1. Males and females, terminations by age for each cause group for the 12-year period 1991-2002, individual policies, Standard* experience, deferred period 4-52 weeks, all occupational classes. Expected values based on SM1975-78

Figure C5.1a. Infections and acute respiratory (Cause group 1)
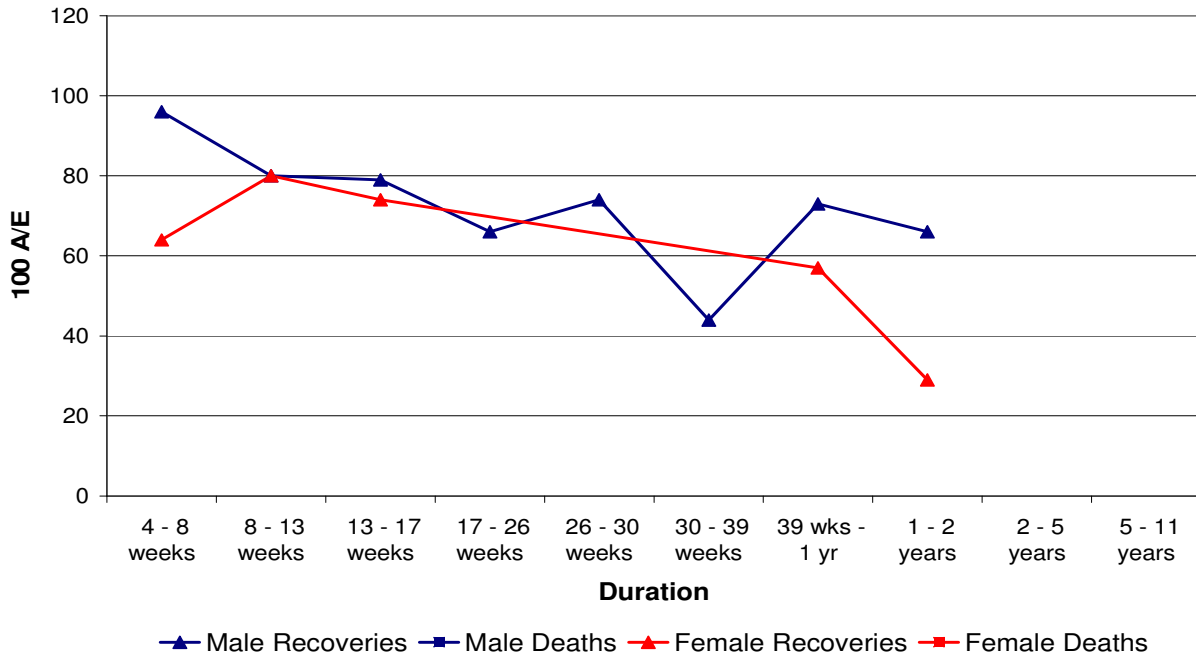

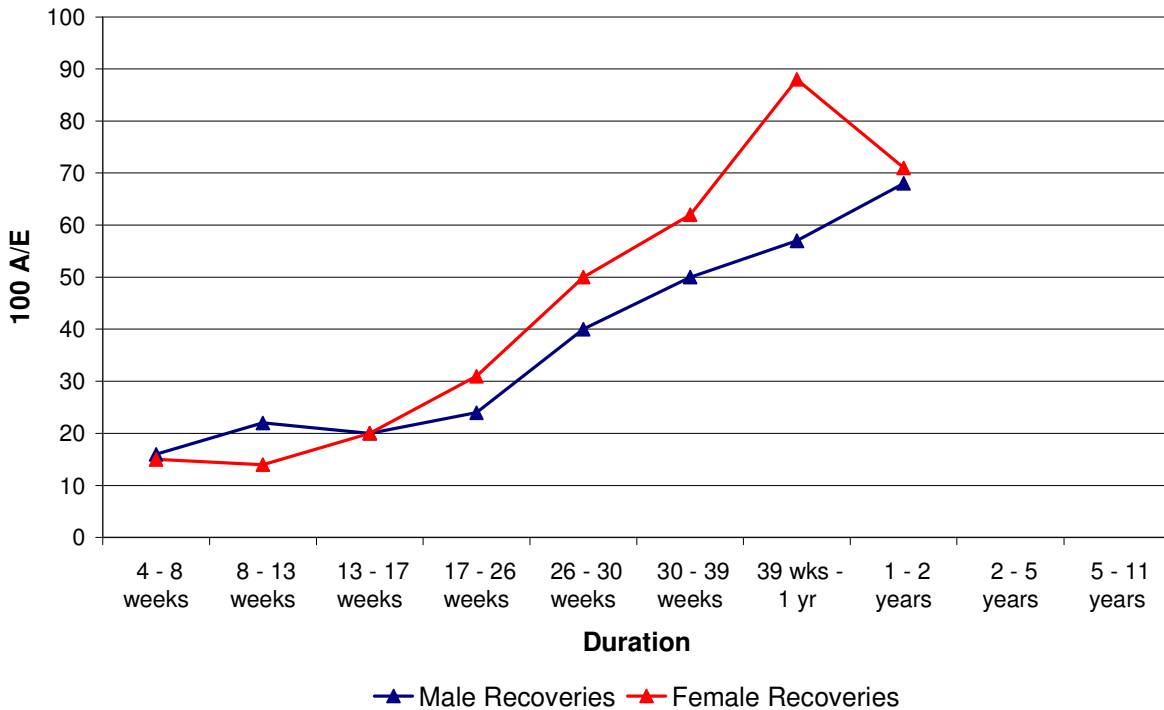### Figure C5.1b. Neoplasms (Cause group 2) – Recoveries only
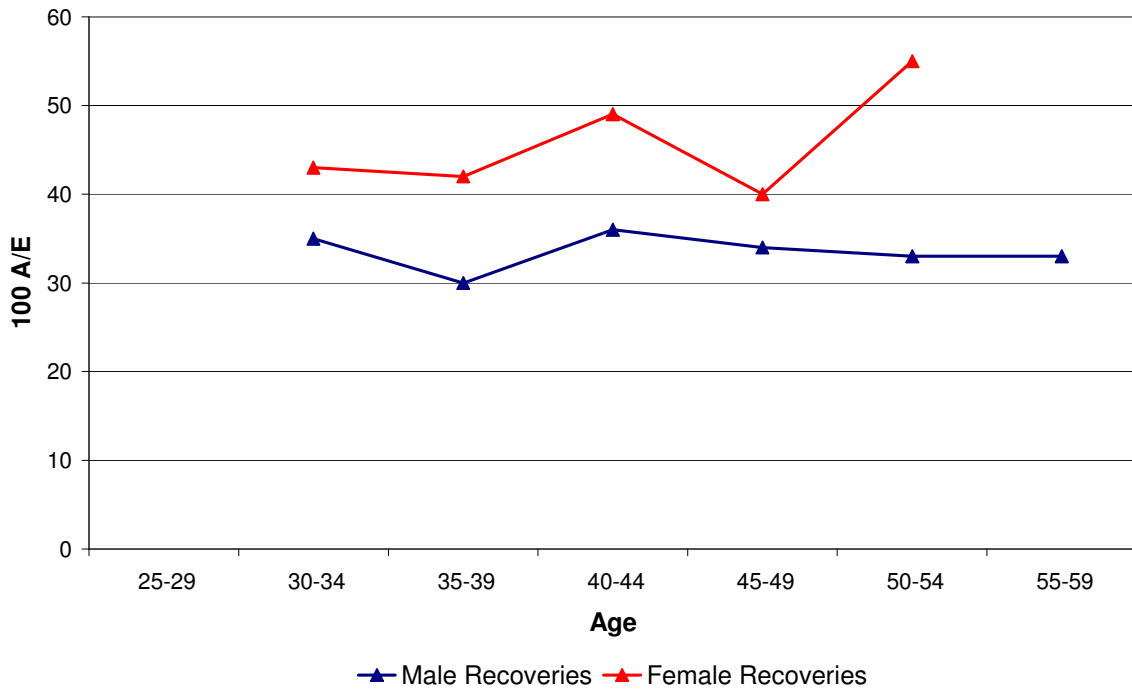
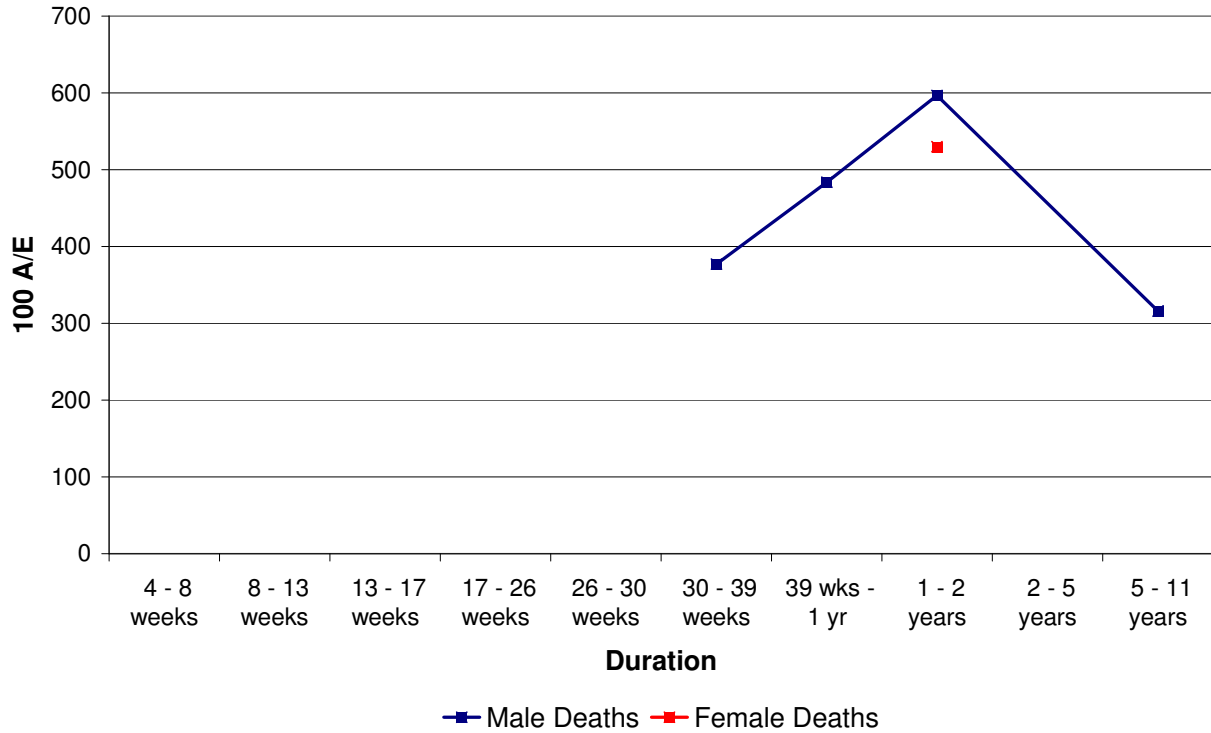Figure C5.1c. Neoplasms (Cause group 2) – Deaths only
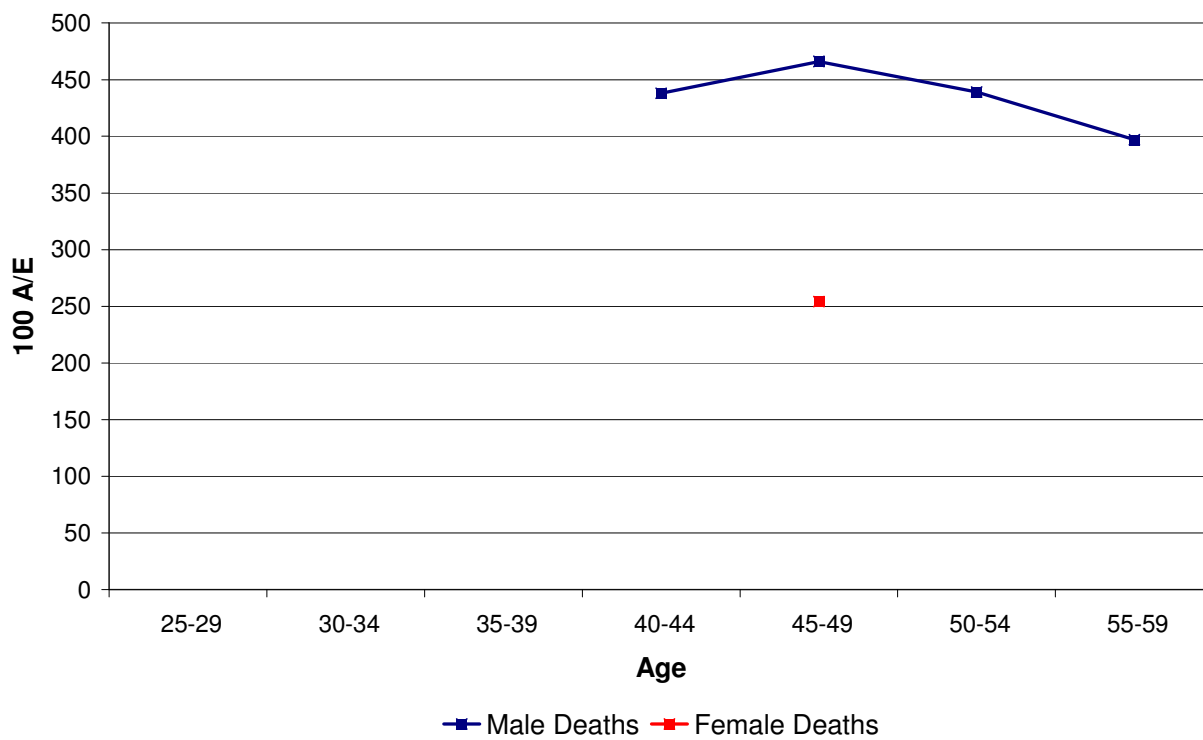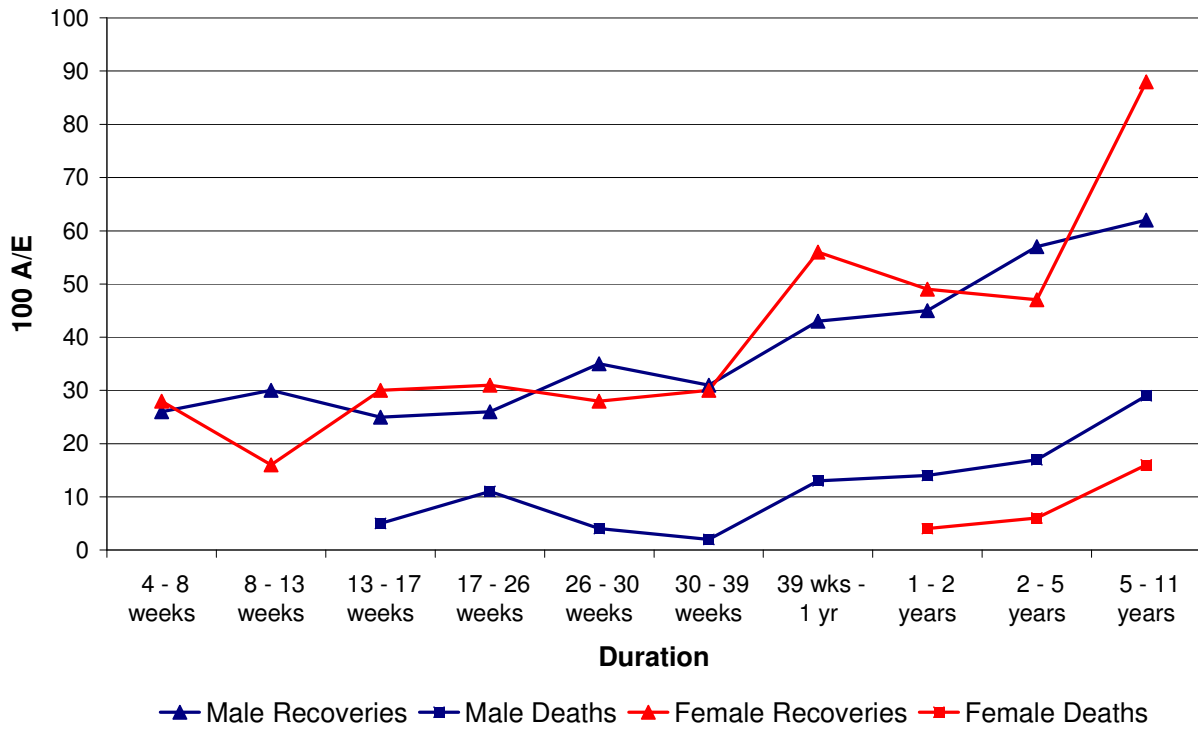

Figure C5.1d. Mental (Cause group 3)

Figure C5.1e. Nervous system & sensory organs (Cause group 4)
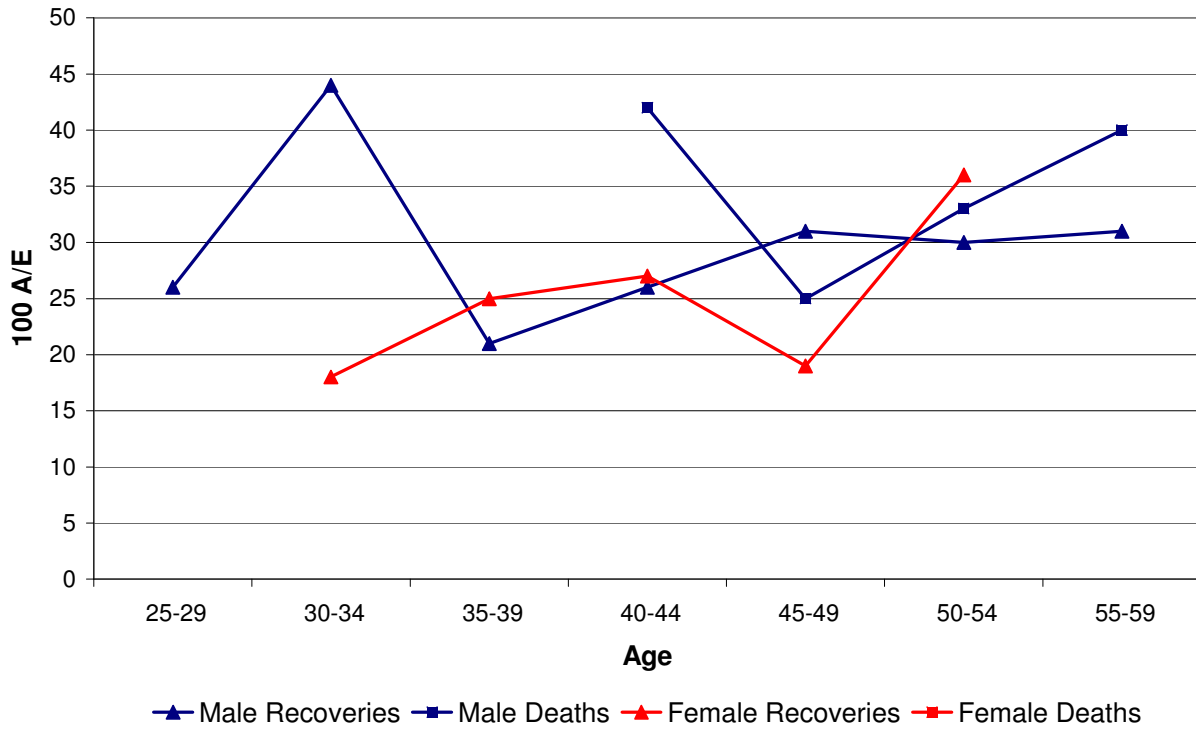
Figure C5.1f. Circulatory (Cause group 5)

Figure C5.1g. Digestive (non-infectious) (Cause group 6)

Male Recoveries   Male Deaths   Female Recoveries   Female Deaths
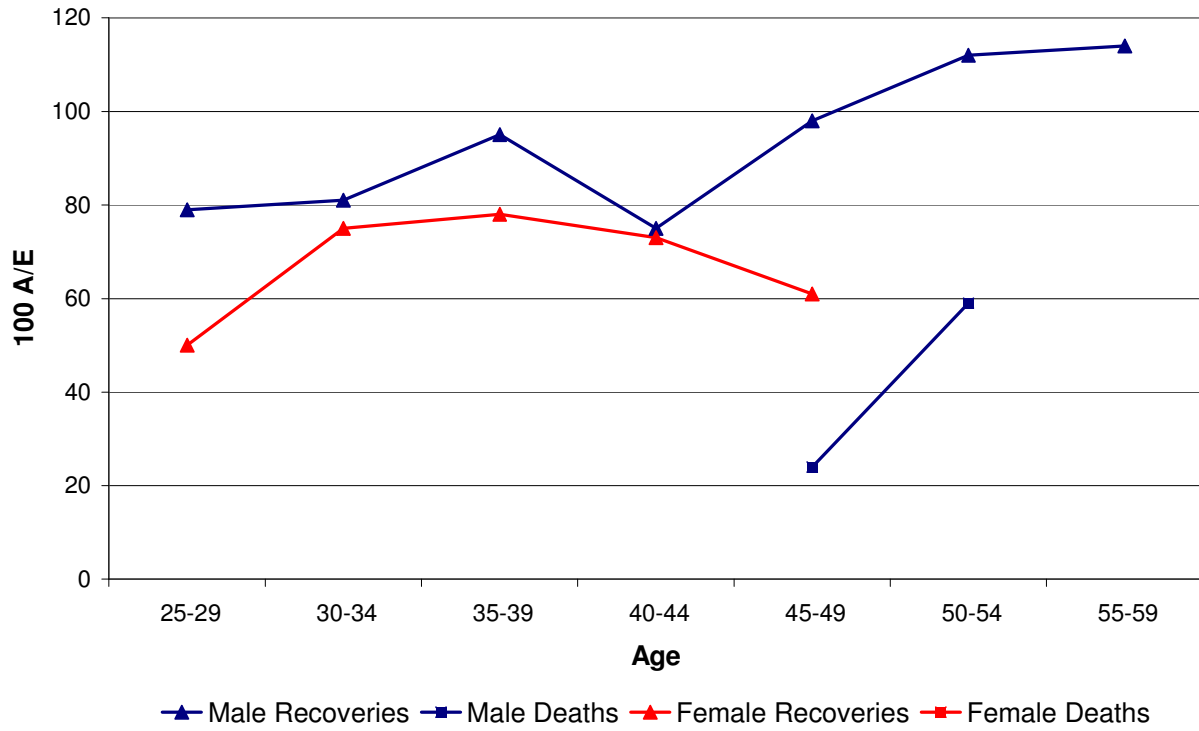
Figure C5.1h. Genito-urinary (Cause group 7)

Male Recoveries   Male Deaths   Female Recoveries   Female Deaths

Figure C5.1i. Arthritis (Cause group 8)

Figure C5.1j. Musculoskeletal (Cause group 9)
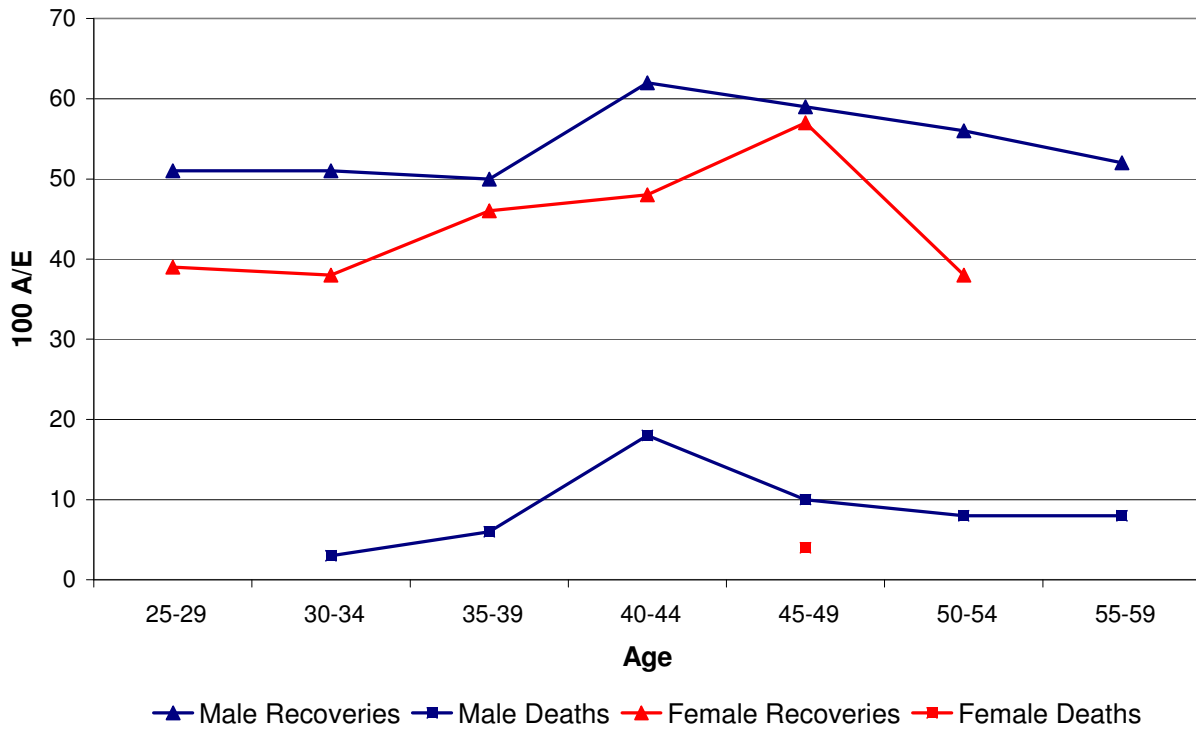
Figure C5.1k. Injuries (Cause group 10)
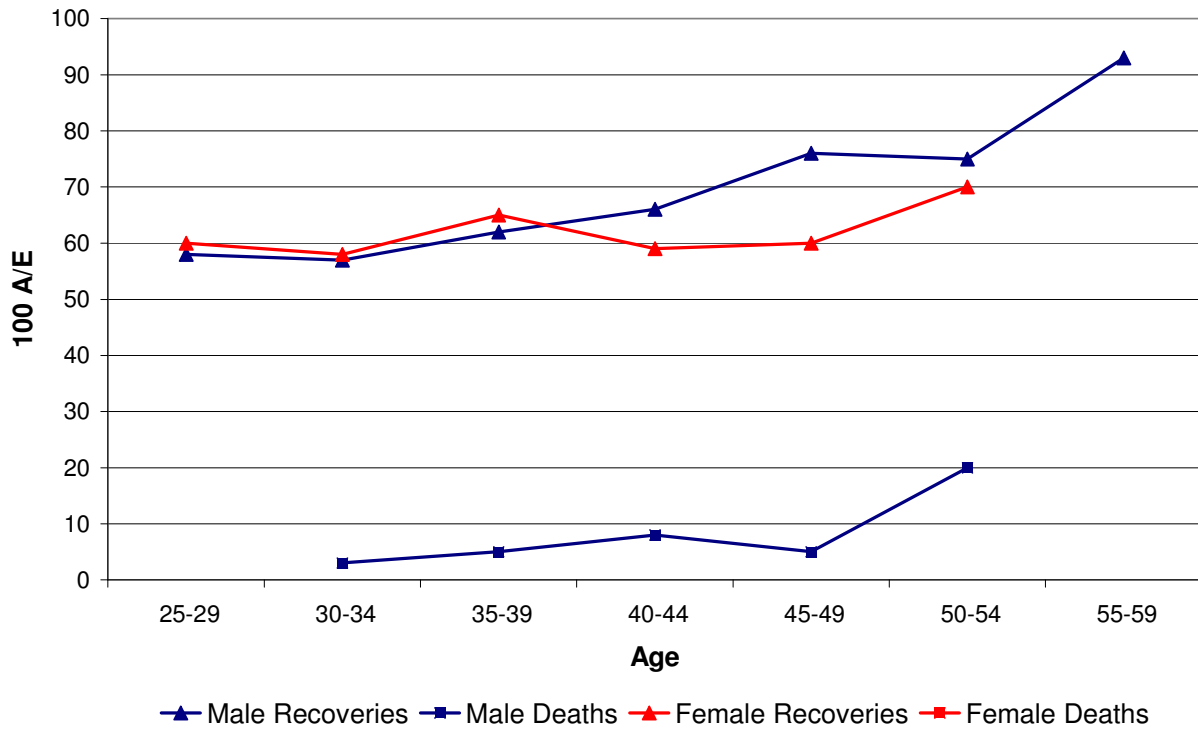
Figure C5.1l. All causes
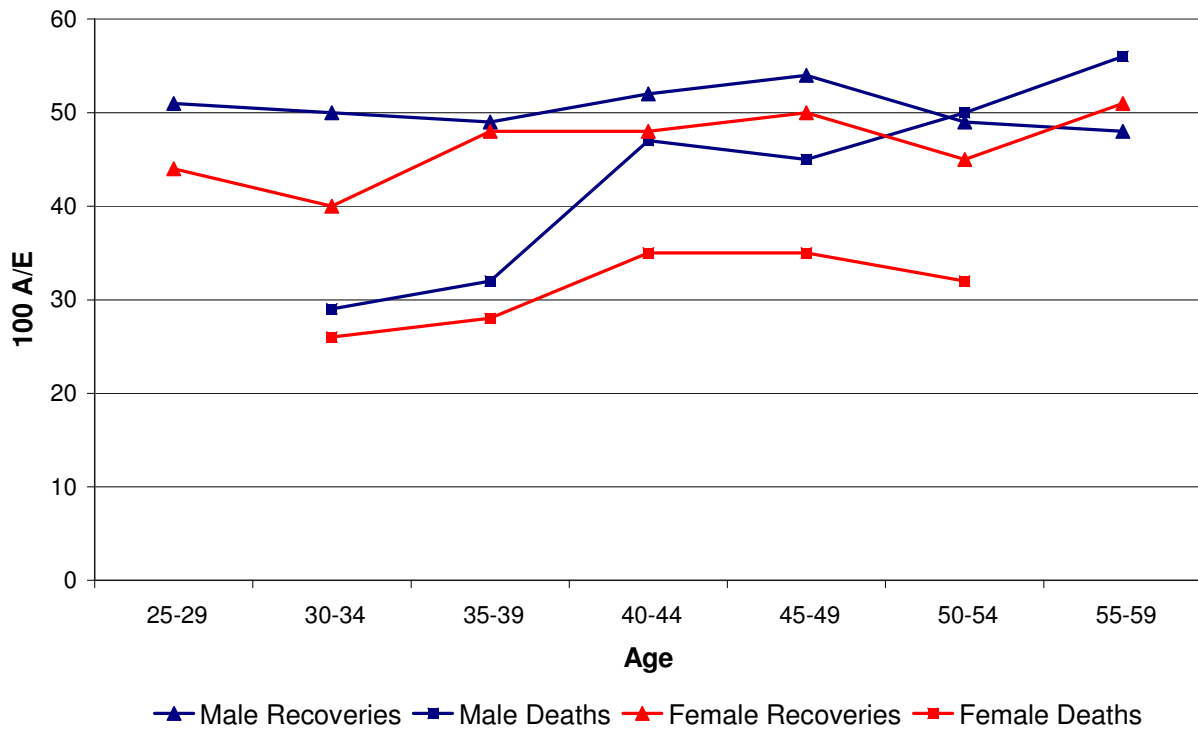
Figure C5.2. Male recoveries by age for each cause group for the 12-year period 1991-2002, individual policies, Standard* experience, deferred period 4-52 weeks, all occupational classes. Expected values based on SM1975-78

Figure C5.2a. Male recoveries, cause groups 1-5
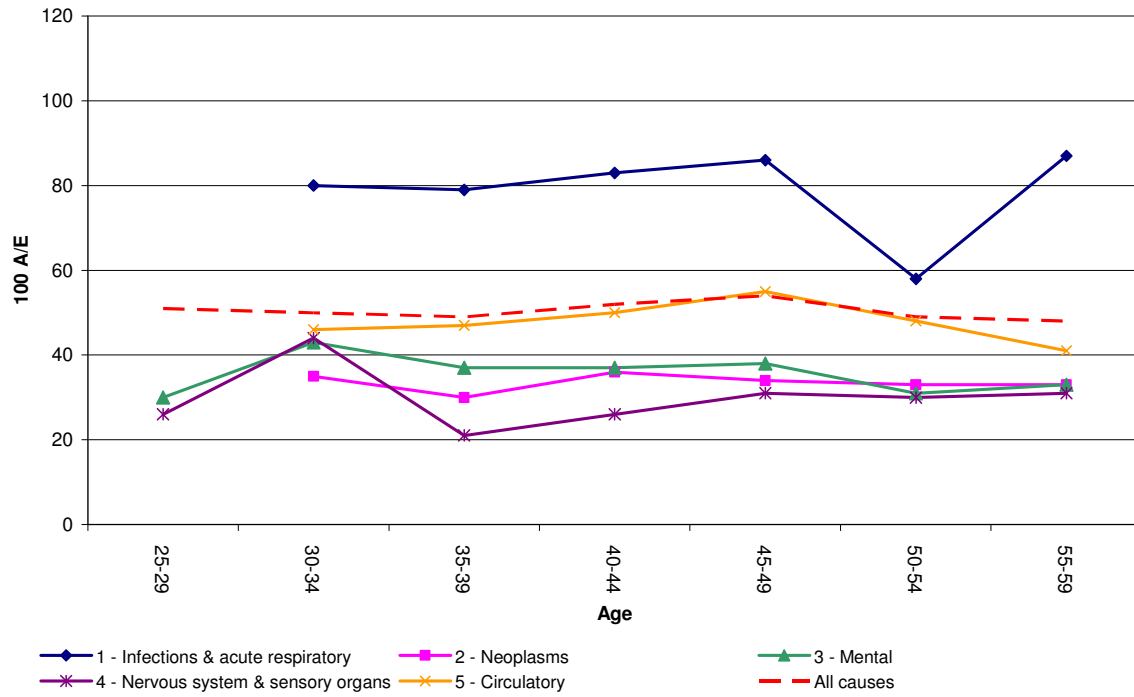
Figure C5.2b. Male recoveries, cause groups 6-10

Figure C5.3. Male deaths by age for each cause group for the 12-year period 1991-2002, individual policies, Standard* experience, deferred period 4-52 weeks, all occupational classes. Expected values based on SM1975-78

Figure C5.3a. Male deaths, cause groups 1, 3, 4, 5
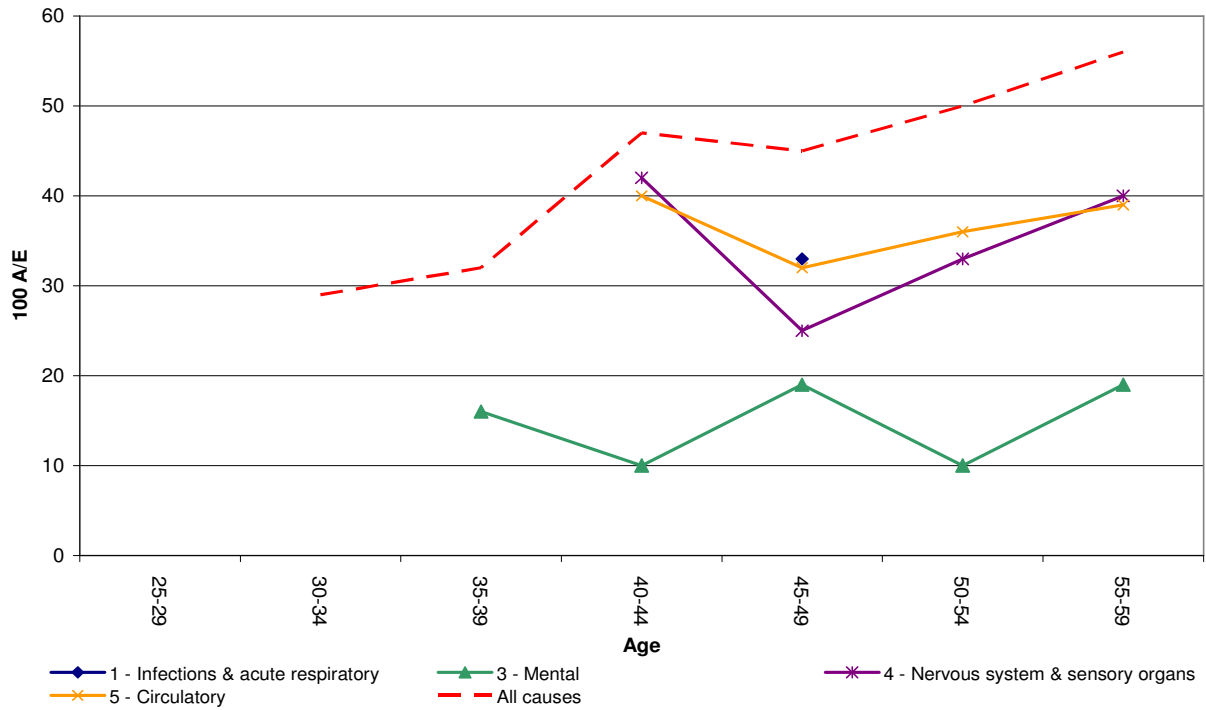
Figure C5.3b. Male deaths, cause groups 6-10

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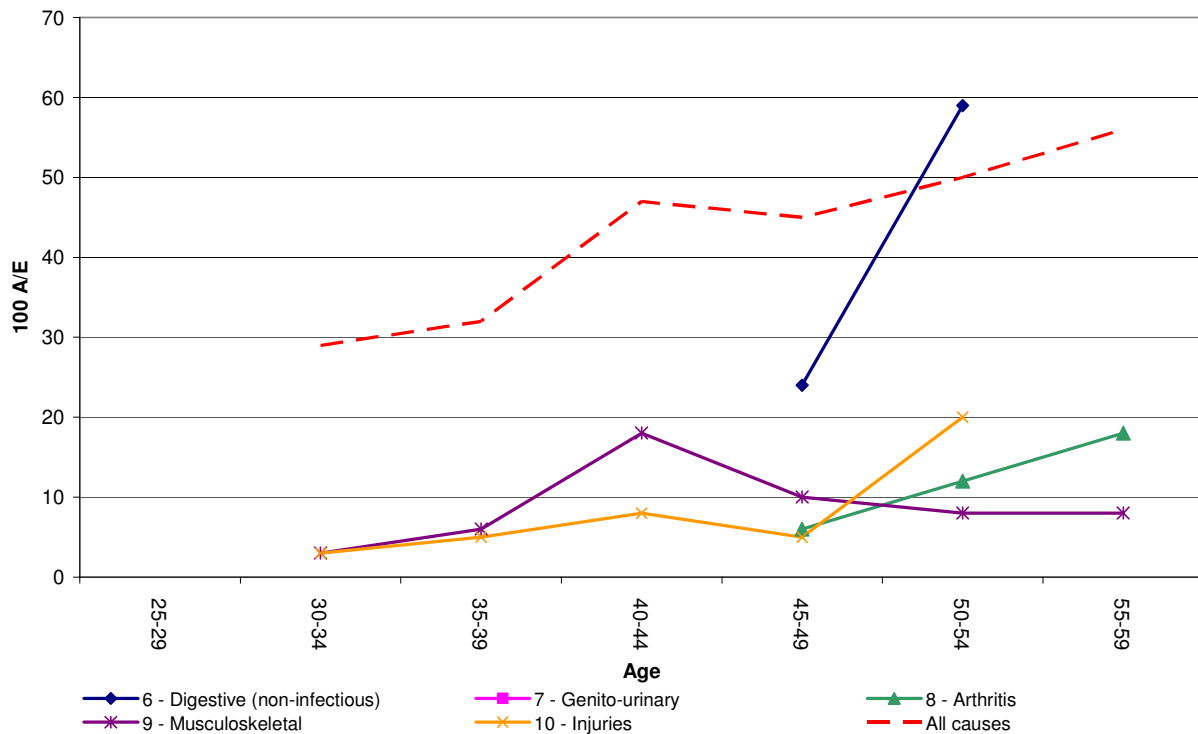
Figure C5.3c. Male deaths, cause groups 2 - Neoplasms

Figure C5.4. Female recoveries by age for each cause group for the 12-year period 1991-2002, individual policies, Standard* experience, deferred period 4-52 weeks, all occupational classes. Expected values based on SM1975-78

Figure C5.4a. Female recoveries, cause groups 1-5
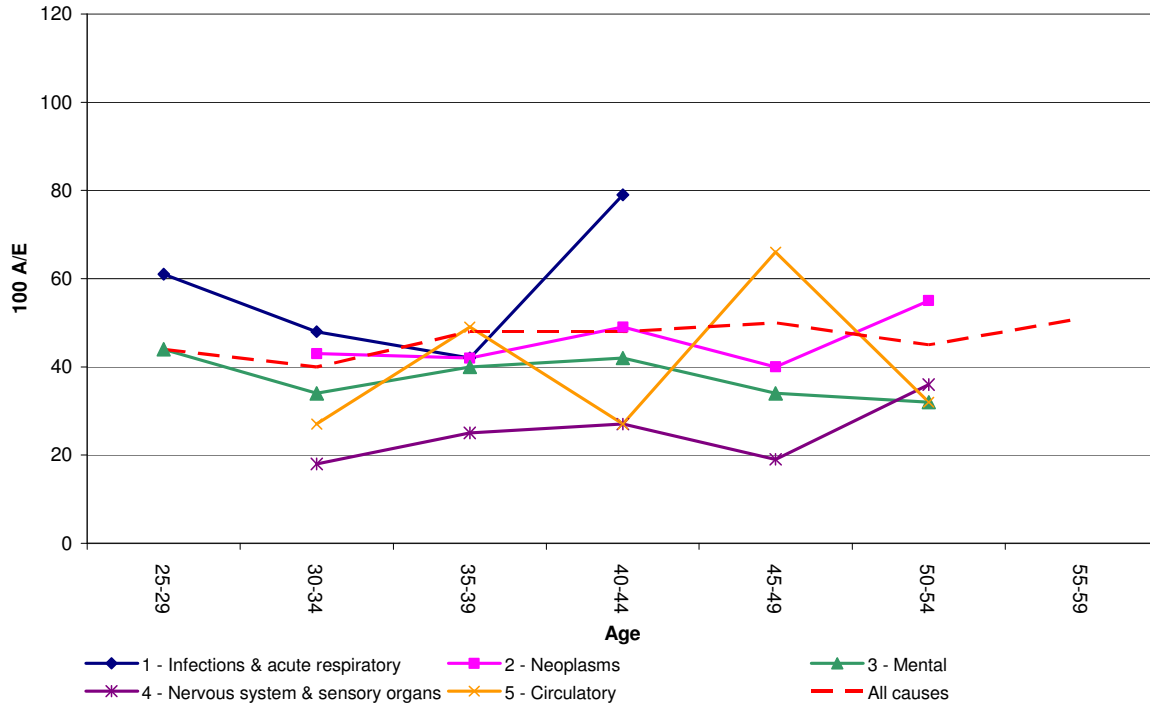
Figure C5.4b. Female recoveries, cause groups 6-10

Figure C5.5. Female deaths by age for each cause group for the 12-year period 1991-2002, individual policies, Standard* experience, deferred period 4-52 weeks, all occupational classes. Expected values based on SM1975-78

Figure C5.5. Female deaths, all cause groups
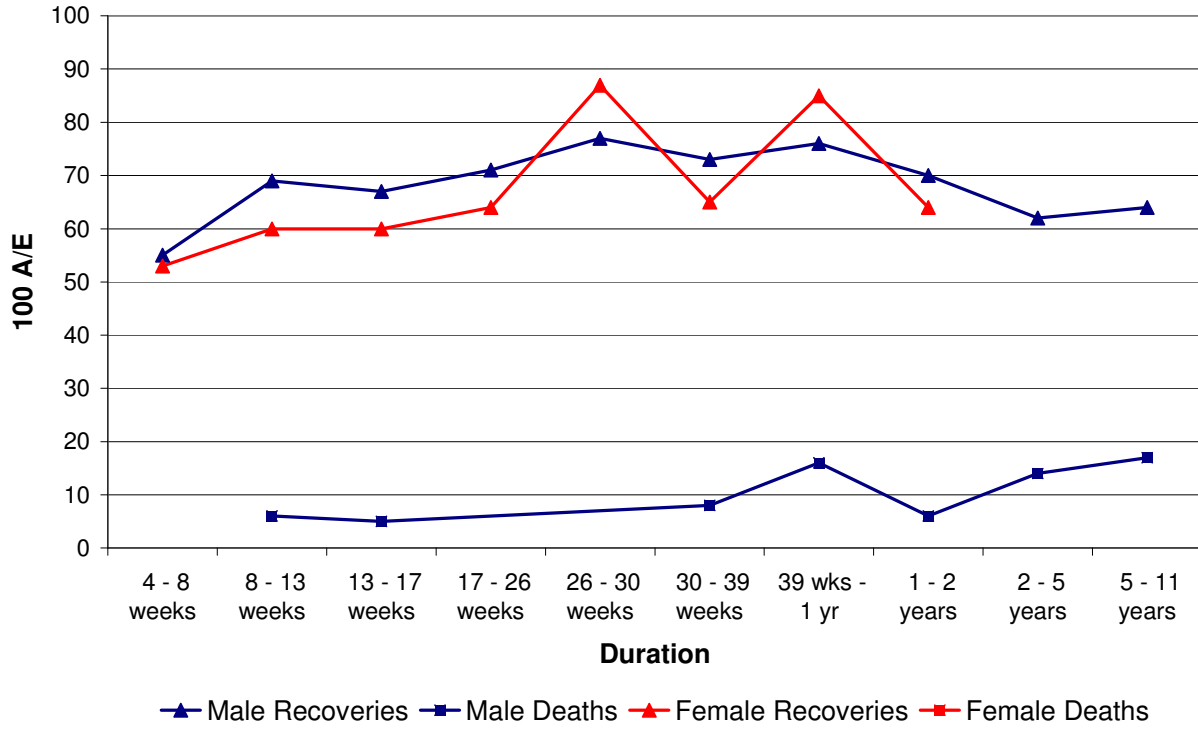
Appendix C6: Claim terminations by sickness duration

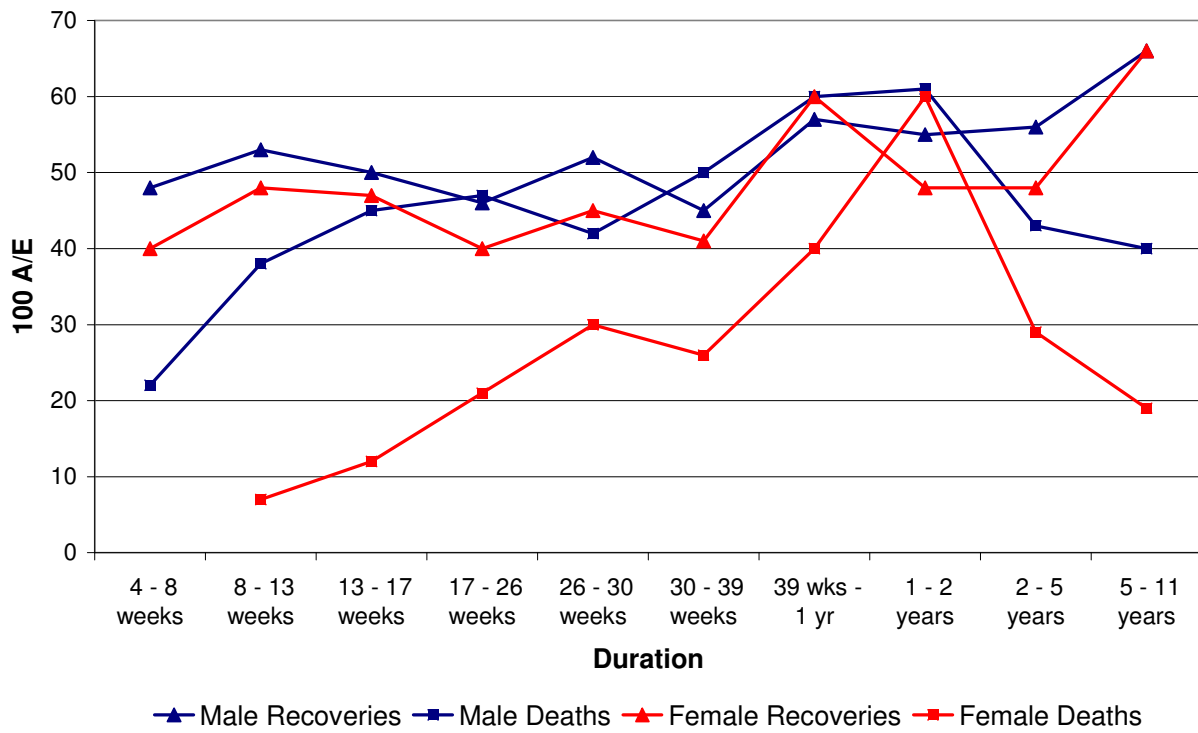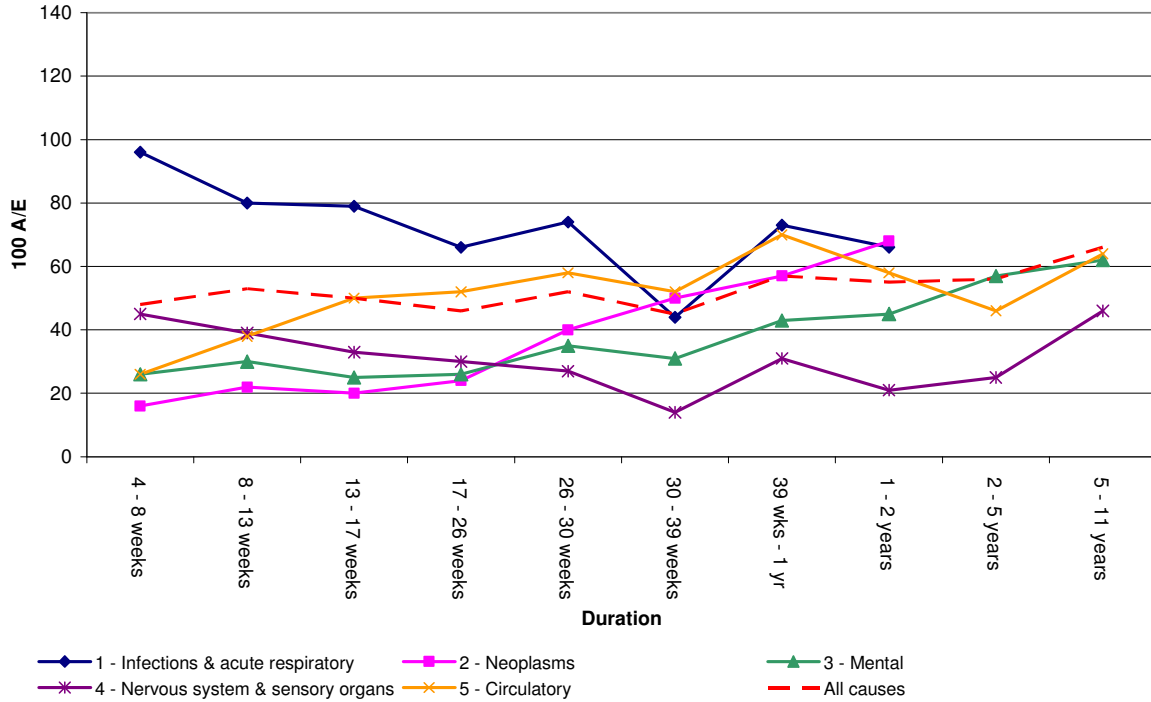Figure C6.1. Males and females, terminations by duration for each cause group for the 12-year period 1991-2002, individual policies, Standard* experience, deferred period 4-52 weeks, all occupational classes. Expected values based on SM1975-78

Figure C6.1a. Infections and acute respiratory (Cause group 1)

Figure C6.1b. Neoplasms (Cause group 2) – Recoveries only

Figure C6.1c. Neoplasms (Cause group 2) – Deaths only

Figure C6.1d. Mental (Cause group 3)

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Figure C6.1e. Nervous system & sensory organs (Cause group 4)
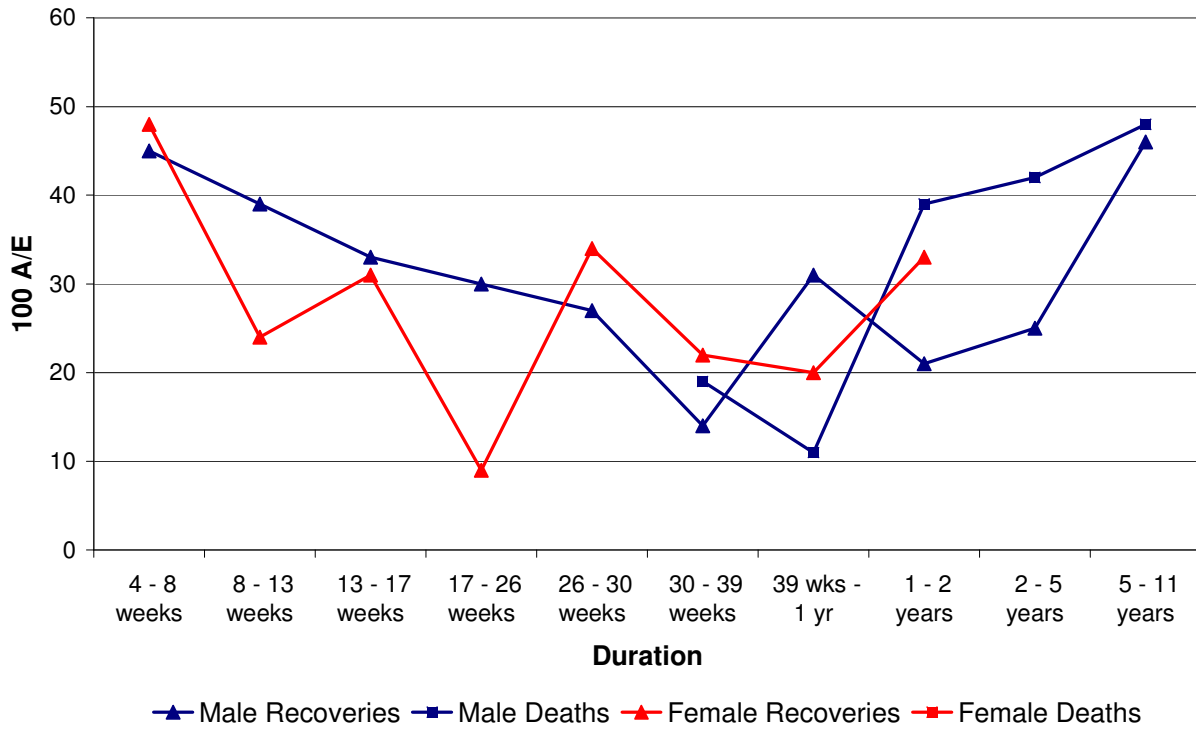
Figure C6.1f. Circulatory (Cause group 5)
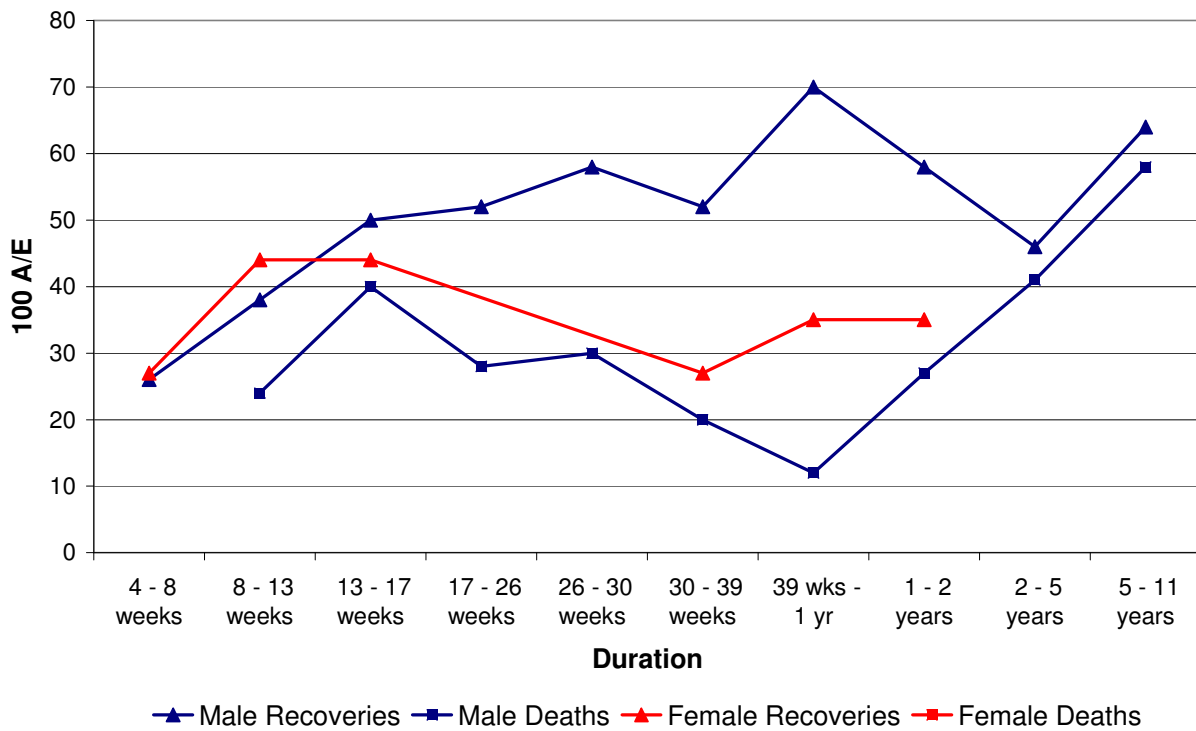
Figure C6.1g. Digestive (non-infectious) (Cause group 6)
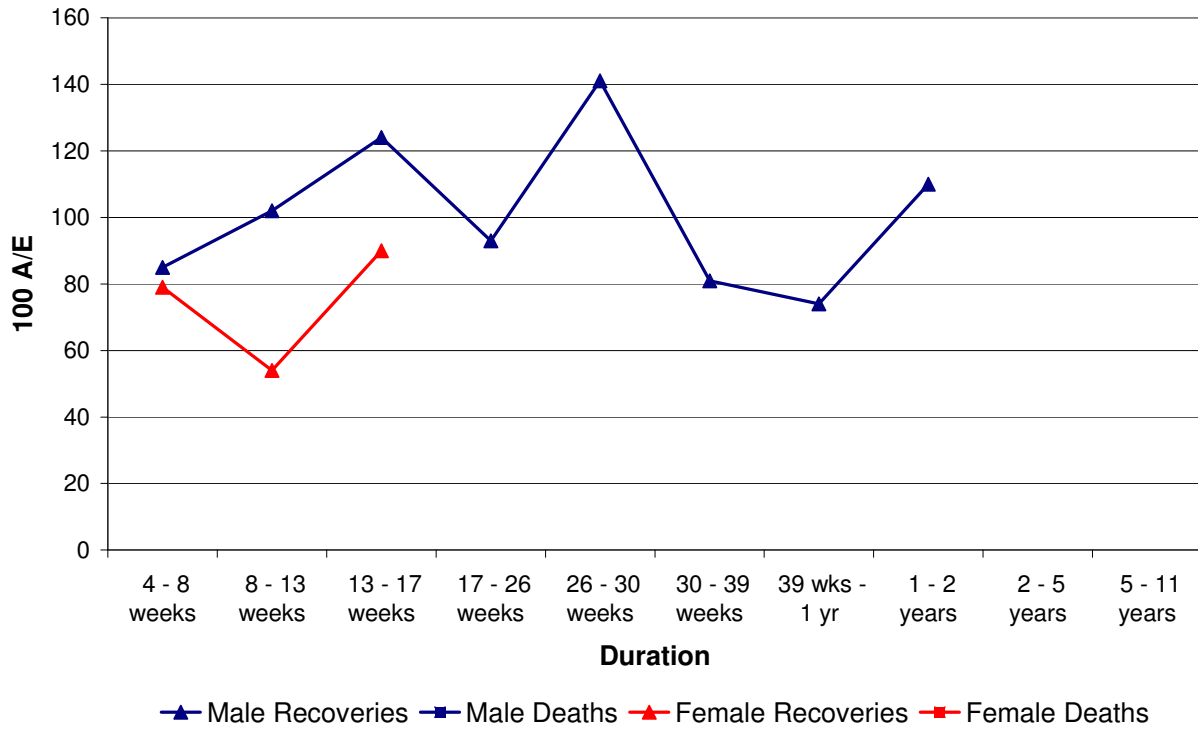
Figure C6.1h. Genito-urinary (Cause group 7)
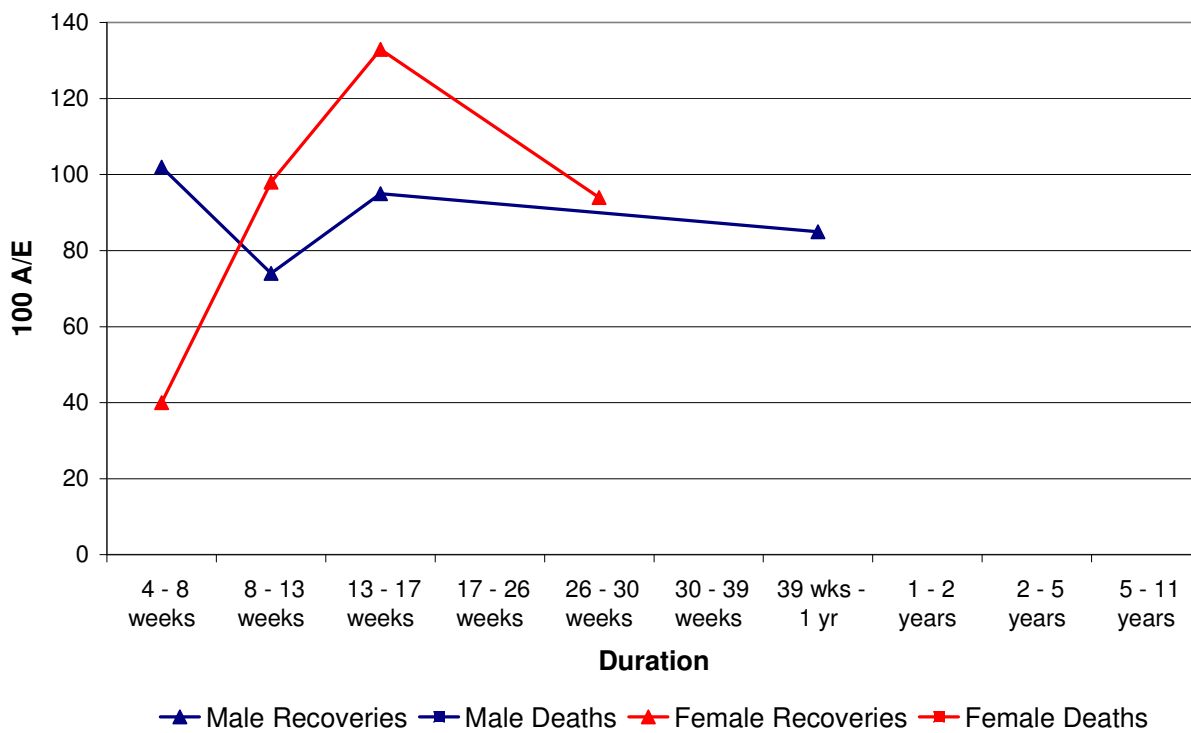
Figure C6.1i. Arthritis (Cause group 8)
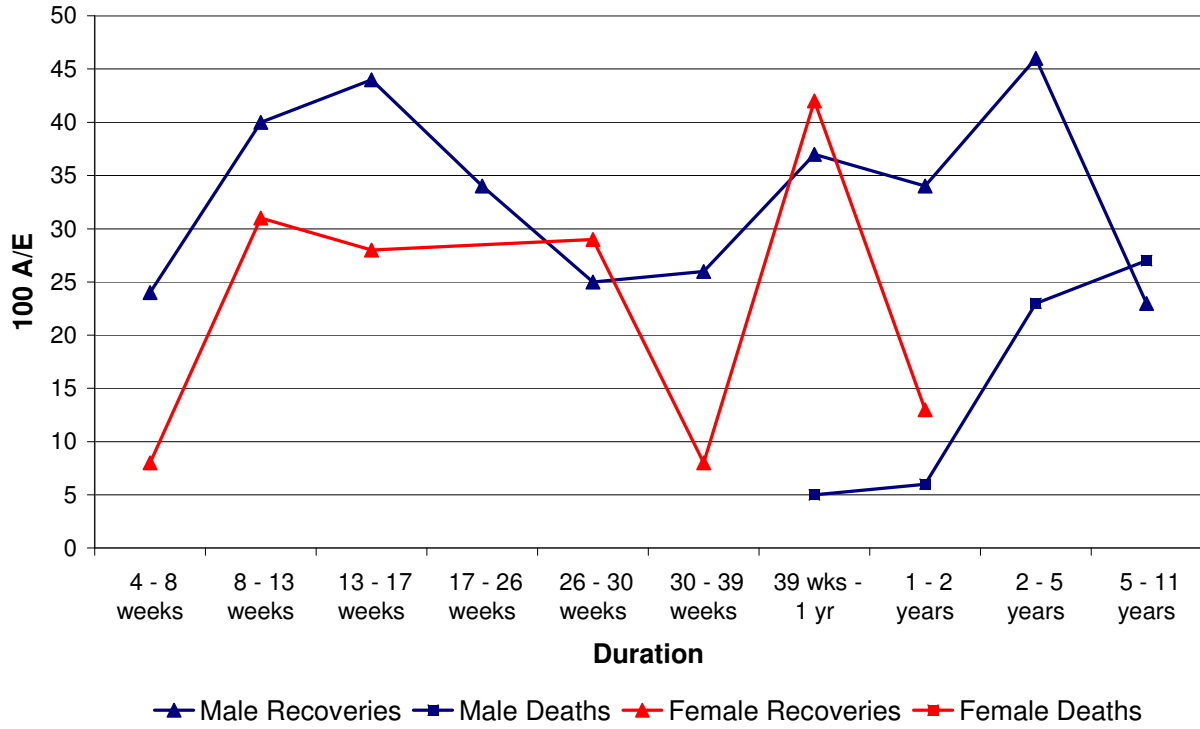
Figure C6.1j. Musculoskeletal (Cause group 9)

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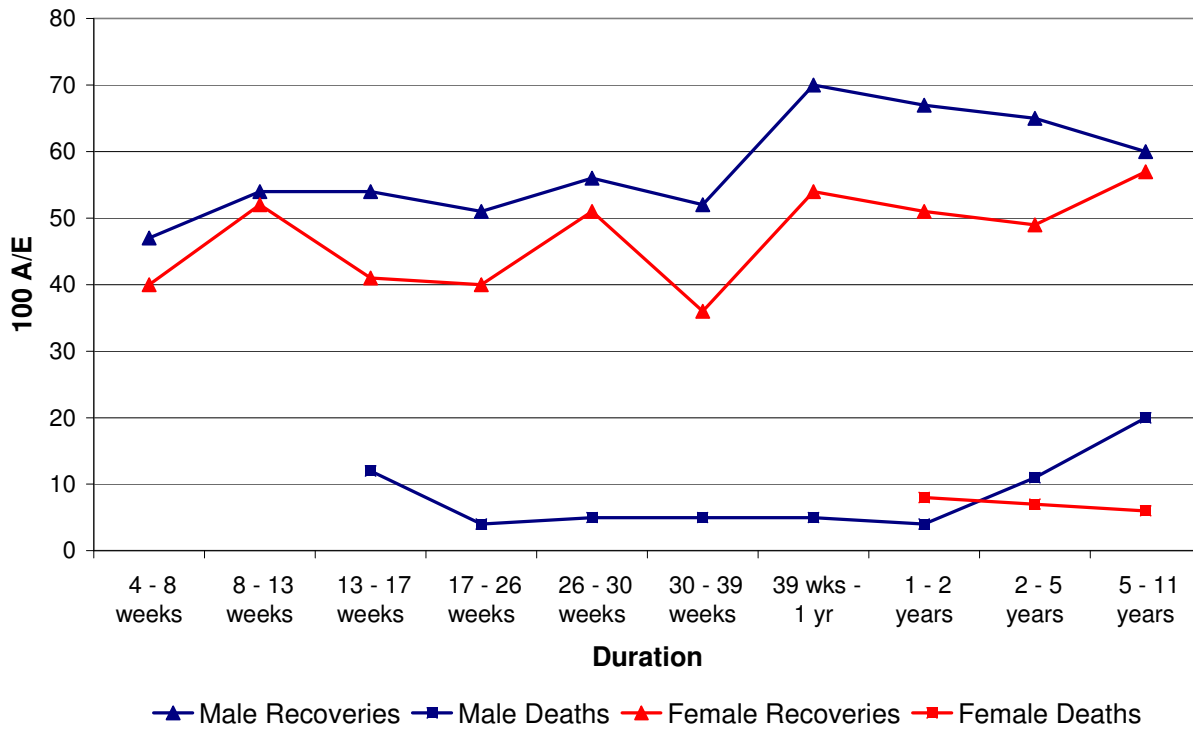
Figure C6.1k. Injuries (Cause group 10)
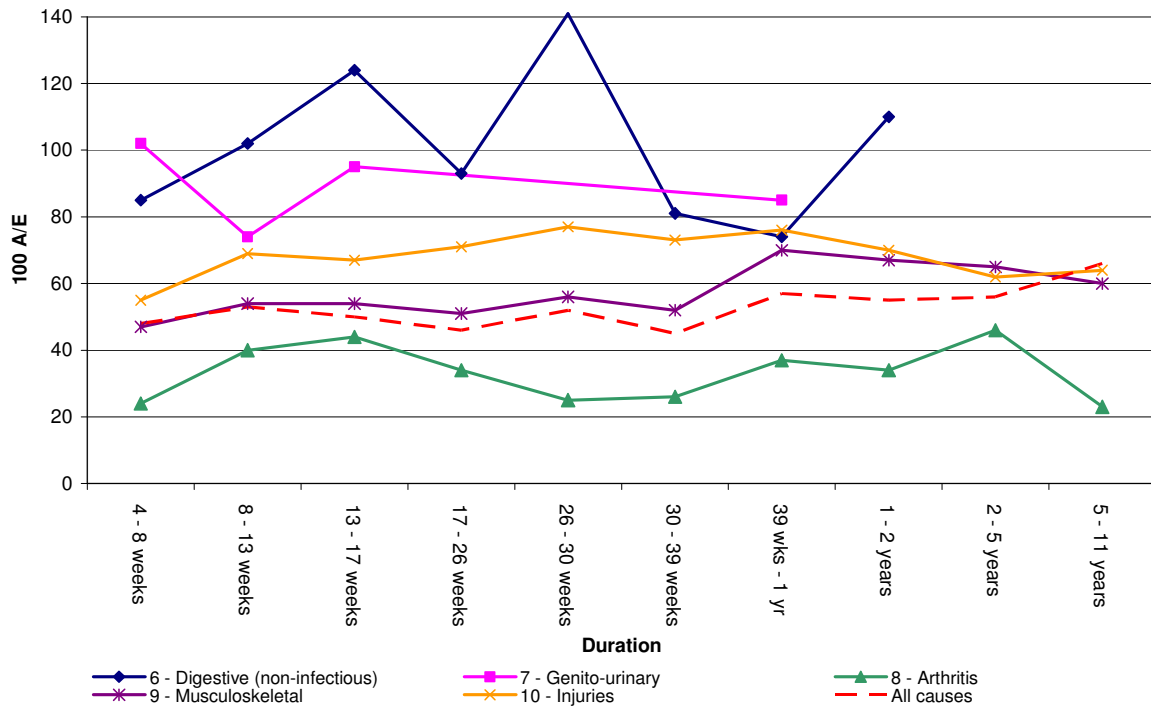

Figure C6.1l. All causes

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Figure C6.2. Male recoveries by duration for each cause group for the 12-year period 1991-2002, individual policies, Standard* experience, deferred period 4-52 weeks, all occupational classes. Expected values based on SM1975-78
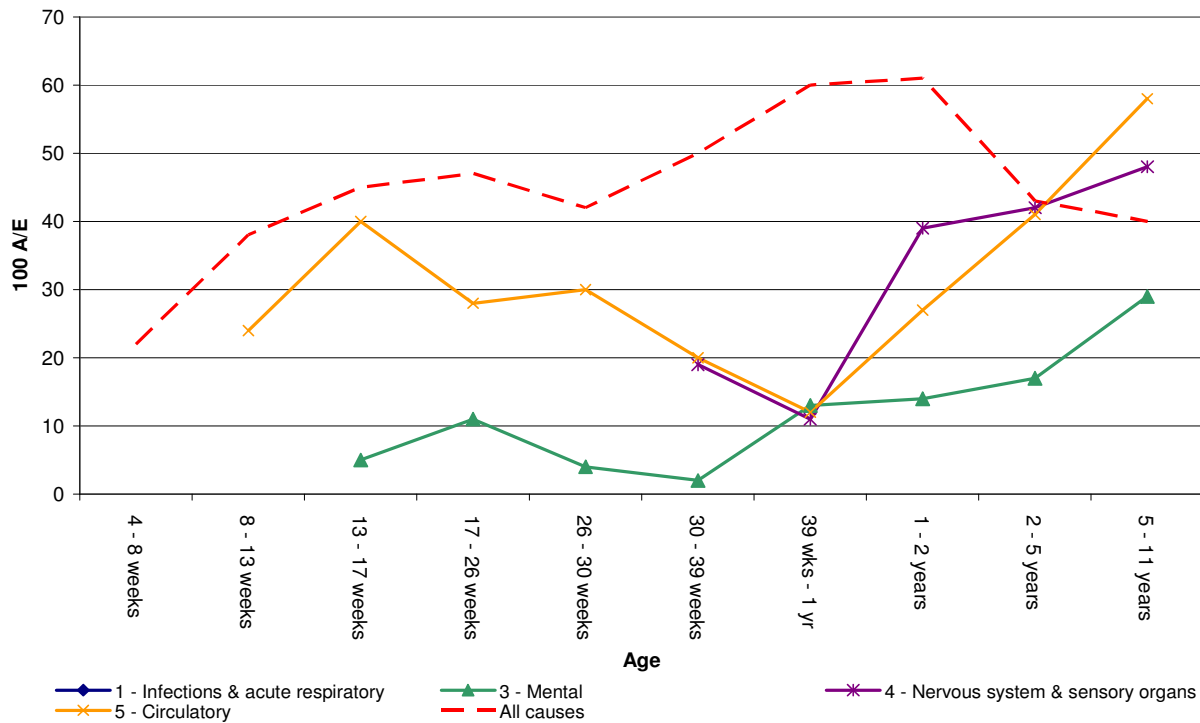
Figure C6.2a. Male recoveries, cause groups 1-5

Figure C6.2b. Male recoveries, cause groups 6-10

Figure C6.3. Male deaths by duration for each cause group for the 12-year period 1991-2002, individual policies, Standard* experience, deferred period 4-52 weeks, all occupational classes. Expected values based on SM1975-78

Figure C6.3a. Male deaths, cause groups 1, 3, 4, 5

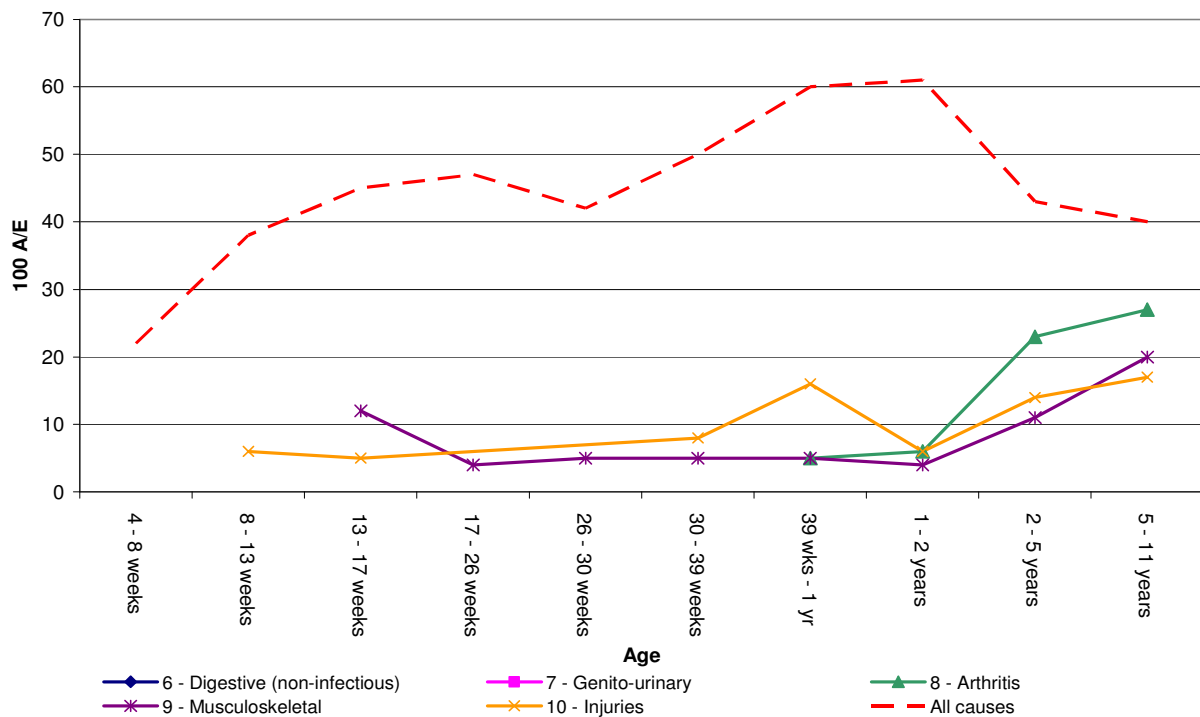Figure C6.3b. Male deaths, cause groups 6-10

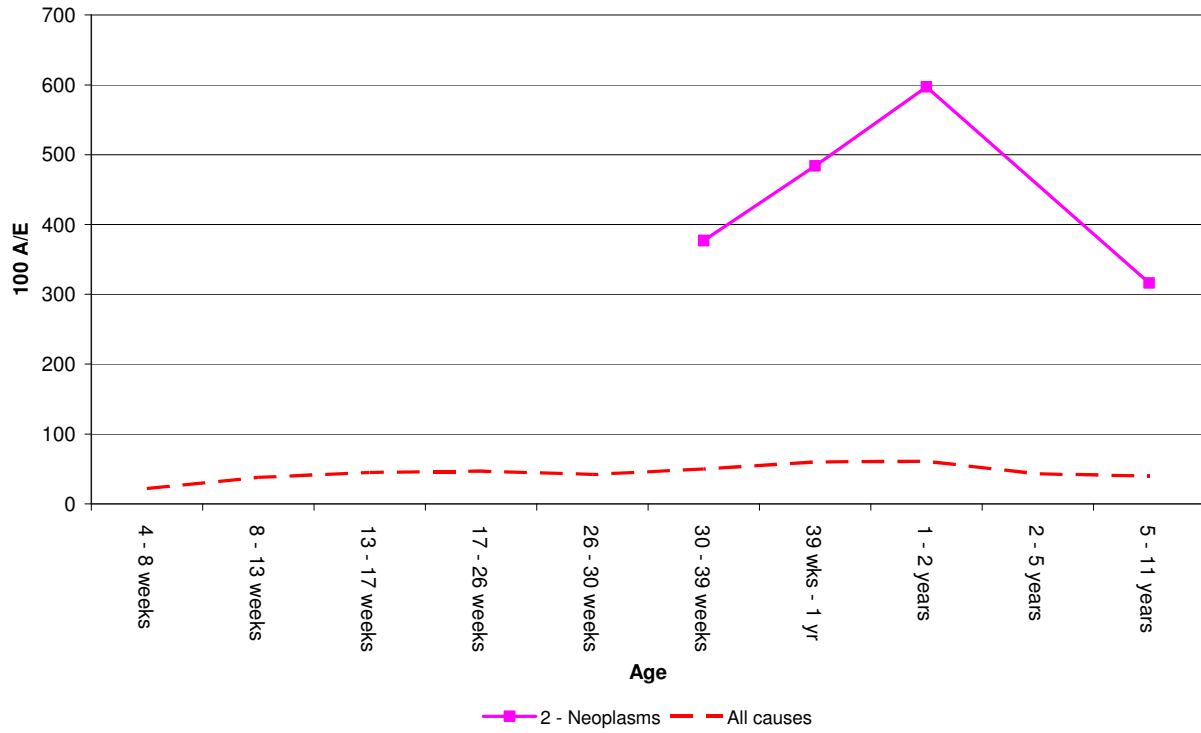Figure C6.3c. Male deaths, cause groups 2 - Neoplasms

Figure C6.4. Female recoveries by duration for each cause group for the 12-year period 1991-2002, individual policies, Standard* experience, deferred period 4-52 weeks, all occupational classes. Expected values based on SM1975-78

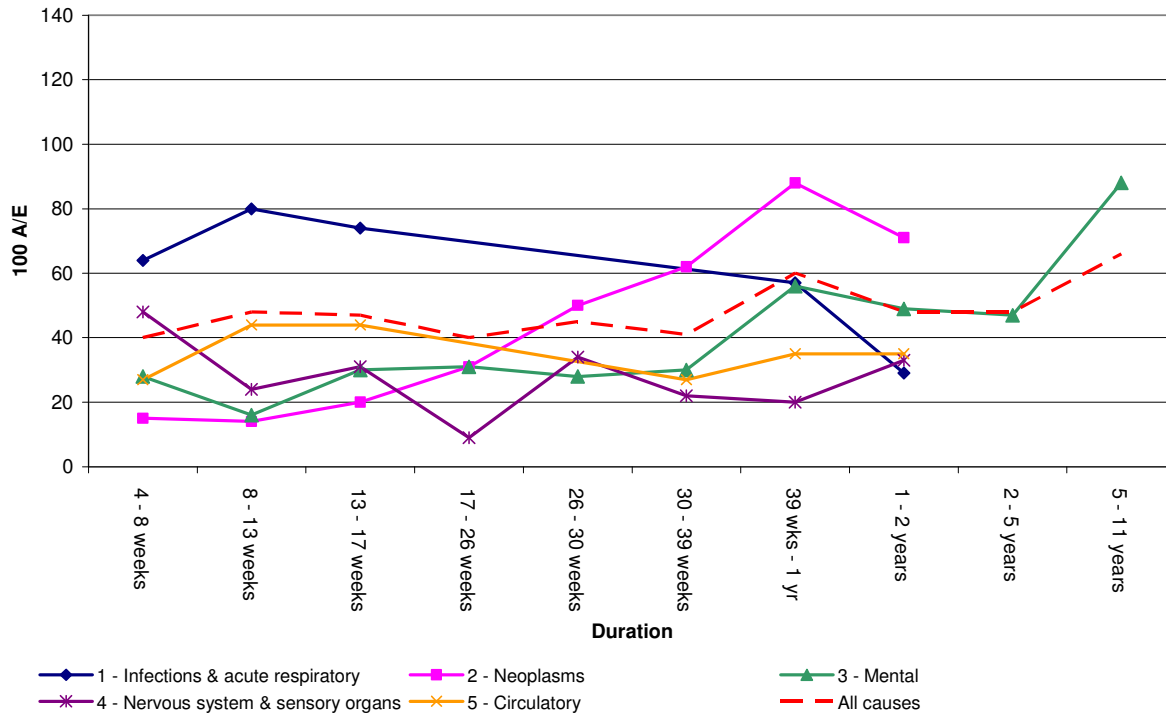Figure C6.4a. Female recoveries, cause groups 1-5

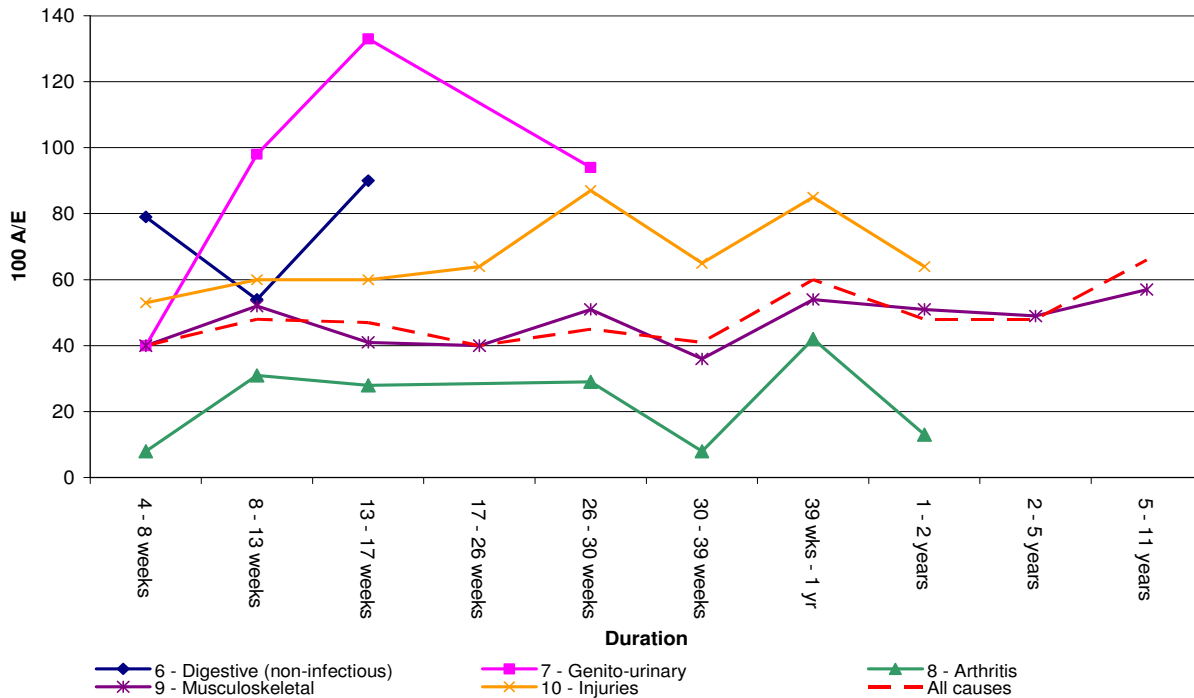Figure C6.4b. Female recoveries, cause groups 6-10

Figure C6.5. Female deaths by duration for each cause group for the 12-year period 1991-2002, individual policies, Standard* experience, deferred period 4-52 weeks, all occupational classes. Expected values based on SM1975-78

Figure C6.5. Female deaths, all cause groups