

Time trends in the incidence of work-related
disease in the UK, 1996-2006: estimation from
ODIN/THOR surveillance data

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1. SUMMARY

The Health and Occupation Reporting network (THOR) and its constituent schemes or predecessor (ODIN) collects data on work related diseases (WRD) in the UK. This is the latest report comprising statistical analysis of the data for the purpose of investigating time trends in incidence of WRD in the UK. Data from the EPIDERM, SWORD, OPRA, SOSMI and MOSS surveillance schemes were used to estimate the true trend in the incidence of specialist diagnosed, work-related disease in the UK over the period 1996-2006 (1999-2006 for SWORD, MOSS and SOSMI). As agreed, additional work regarding the impact of membership time (fatigue) on reporting patterns will be provided in a separate report.

2. METHODS

The methods proposed and used previously to analyse THOR surveillance data has been described in previous documents including that of 9 May 2007 entitled 'Surveillance and reporter fatigue'. This section comments on the previous methods of analyses and describes some new approaches.

2.1 TYPE OF MODEL

Within reporter change over time

We have argued that we need to measure 'within reporter' change in incidence over time to avoid potential bias due to changes in reporter characteristics over time.

ML Models

In the past, the main estimates of change over time have been derived from a 2-level version of the general multi-level model framework. A 2-level model maintains the 2-level structure (reporter, time) of the data in the analysis. The model used was a very simple version of a ML model which is also referred to in the literature as a 'random intercept' model.

2.1.1. The ML random intercept (or, more generally, 'random effects') model

Our model which assumes a constant (relative) change in incidence over time has the following form:

$$\text{Log (no of cases from reporter } i \text{ at time } t) = \alpha_i + \beta t + (\text{terms for different months} + \text{terms representing first } m\text{th/first core } m\text{th} + \text{term indicating a core reporter})$$

What makes this a 'random intercept' model is the assumption that the term α_i varies randomly across reporters. Differences between reporters in this term could reflect different case densities for example.

The coefficient β , is the main focus of the analysis and is estimated from the data. The result is expressed as $(e^\beta - 1) * 100$, the average change per year in incidence.

In the equation above, β can be viewed as a measure of within-reporter change over time. However, it does not follow that an *estimate of β using ML RE software* is purely determined by within-reporter contrasts. This point was not fully appreciated in our original methodology proposal but was brought out in a more recent document.

According to Rabe-Hesketh and Skrondal, (for normally distributed linear models, but findings are likely to be approximately true for log linear models such as 1):

(i) RE models implicitly assume that ‘between’ and ‘within’ effects of a factor are equal;

(ii) the estimates of effects from such models¹ will be equivalent to a weighted average of the ‘between’ and ‘within’ effects.

If ‘between’ and ‘within’ effects are not equal, the RE analysis yields something which is a weighted average of the two. It would be helpful to understand the weight given to each component but we cannot provide this at this stage.

2.1.2. Fixed effect models

An alternative to the ML RE models is a ML ‘fixed effect’ model. The general form of the equation for this model is identical to the above but now α_i is a fixed effect; and there is no particular assumption made about how it varies among reporters. It is not immediately clear why this should change anything. **However the estimate of β from this type of model is entirely based on within-reporter contrasts.** Factors which do not vary within the set of data for a given reporter cannot be included in this type of model. (See also Section 2.3 - Fatigue).

2.1.3. RE vs FE

The FE model would seem to correspond more closely to the aims of the study; however in fitting these models, the (STATA) software first omits all reporters who had reported only zero cases throughout the study period. A priori, one might expect that these omissions would cause trends to be exaggerated. On the other hand a previous sensitivity analysis conducted in OPRA suggested that inclusion or exclusion of such people, although numerous, did not greatly affect the estimates of trends over time.

For this final report therefore we have included results from both RE and FE models. The STATA software command `xtnbreg` was used to fit longitudinal, negative binomial (ie over-dispersed) Poisson models of the type (*) above with fixed or random effects.

2.2 TREATMENT OF CORE-SAMPLE DIFFERENCES

Results have been presented for core and sample separately but in many instances the combined results will be of most interest. We note here some differences between schemes in the way that the ‘core variable (yes/no) has been handled in the combined data analyses. These differences reflect to some extent our evolving understanding of how this variable ‘affects’ the data.

EPIDERM, SOSMI, MOSS

In the RE models it was important to include this variable as a predictor of overall differences in case density: core reporters – who are a selected group – usually reported a much higher density than sample reporters.

¹ This is only strictly true for one method of estimation for these models, the generalised least squares estimator but these subtleties are unimportant here.

Data from reporters who became core reporters in the course of the study were split and treated as if originating from two different reporters.

SWORD

The treatment in SWORD was similar except that we distinguished three groups: high density core reporters, lower density core reporters and sample reporters.

OPRA

The treatment in OPRA was fundamentally different from the other schemes for several reasons. There had not been a self selected core group in this scheme (until 2006). In 2004, a randomised crossover trial was set up to study the impact of core reporting in OPRA. Volunteering reporters were randomly allocated to one of two groups: those who were to be core in 2004 and those who would be core in 2005. The trial finished in December 2005, when reporters were asked if they would like to continue to be core; over half the OPRA members in the trial agreed and a few others also. Thus there were 30, 30 and 38 core reporters in the years 2004, 2005 and 2006; at most a reporter acted as core for only two years.

Separate analysis of the trial data revealed a very sharp decline in the monthly incidence rates for core reporters from January to December, which was over and above any seasonal variation expected. We interpreted this as possibly due to a short-term fatigue effect.

In view of these differences from the other schemes, and the observed short-term decline, we decided to treat all core reporters as though they were sample only by using their data from one month only chosen at random from the 12. In the models, we allowed for possibly different behaviour in the core month of each year by including the core variable as a within-reporter predictor of incidence. The models produced evidence that, on average, incidence was reduced in the core month compared to the same reporter's sample average before the crossover study and sometimes after it.

Other special features of OPRA data - Prior to 2004, there were two main groups reporting to the OPRA scheme, namely sample reporters (reporting one sample month per year) and HSE reporters (reporting monthly). All cases reported by HSE reporters are excluded from the present analysis as it was felt that there might be special influences determining the patterns in their data.

2.3 FATIGUE

2.3.1 Background to date

If reporters suffer from fatigue – which manifests as an increasing return of zero cases over time - then trends over time will be biased downwards compared to the situation if there were no fatigue. Fatigue could also manifest as a report of fewer cases than actually existed rather than as a zero case report. While we believe that we have produced a satisfactory method of eliminating bias due to the short term fatigue of OPRA core reporters (see above), this is not necessarily true generally. We summarise again our approaches and the inherent problem.

Our efforts in this regard have been two-fold:

(i) to provide descriptive data (on non-response, on the occurrence of zeros, and on mean cases) which might help us, informally, to form an opinion on whether there is reporting fatigue. This was done in most detail for OPRA but is now being extended to the other schemes.

(ii) to address this problem through formal modelling.

We used membership time as a surrogate for likelihood of fatigue. The statistical problem in (ii) was then how to separate the influences of membership time and calendar time on, say, zero occurrences or number of cases reported.

Fatigue and Fixed Effect (FE) models

In a pure 'within reporter' analysis, such as in the FE models, it is not possible to separate the influences of membership time and calendar time since, within a reporter, they are perfectly correlated.

Fatigue and Random Effect (RE) models

The two factors (membership time and calendar time) are strongly correlated but not perfectly correlated across the whole data set. This enabled us to fit RE models which ostensibly separated effects on incidence due to calendar time and due to membership time but the confidence intervals were extremely wide and suggested instability in the fitting process. Also, the meaning of these results is not entirely clear since we know that a within-reporter estimate alone would be impossible. The suspicion is that these estimates arise from 'between-reporter' differences.

2.3.2 New analyses

The absence of a perfect solution does not make the problem disappear. Evidence from our previous analyses, at least from some schemes, has suggested that some fatigue is present even if the extent is less clear. In the second part of our report which addresses fatigue, we propose to present the following new data:

(i), descriptive analysis for all schemes using the FATCATS/CALCATS approach previously used for OPRA and based on all cases combined. i.e. FATCATS (categorisation of 'Membership Time' - in 2 year intervals) / CALCATS (Categorisation of Calendar Year - in 2 year intervals)

(ii) an RE modelling approach (again based on all cases combined) which departs from the previous assumption that fatigue increases smoothly over time and aims to judge whether there is a period of time after becoming a reporter when fatigue does not affect reporting

(iii) RE and FE model results (all cases), as in the main analysis, but restricted to those with memberships less than 2 years, less than 4 years, and on on.

2.4 CONFIDENCE INTERVALS

The CIs shown are those produced by software under the usual assumption that the data included are a sample of an infinitely large population. For finite population a finite population correction factor (FPCF) can be applied which would reduce the width of the CI. We have previously shown that this would reduce the Standard Error by half if 75% of the potential ‘population’ were included.

The (FPCF) would be applied to the SE of β and would reduce its CI symmetrically; it should not be applied directly to the “% change” in incidence CI. We have not applied any such corrections in this report.

2.5 CORRECTION FOR CHANGES IN DENOMINATOR OVER TIME

We have assumed that the size of the working population base covered by reporters in each scheme has remained constant over the period of the study. Under this assumption, estimates of changes in case counts can be interpreted as changes in incidence rate or incidence rate ratios (IRRs). In fact, data from the GB Labour Force Survey for 1996-2004 showed a fairly regular increase in the size of the working population of the order of 1% a year. One might perhaps expect to see an increase in cases over time of this order even if true incidence *rates* remained constant. We made no allowance for this increase or any other change in the population base. A rough correction for the 1% yearly population increase could be made by subtracting one point from the percentage change figures shown in the Tables, eg 3% would become 2%.

3. RESULTS

3.1. OVERVIEW OF SCHEMES

3.1.1. EPIDERM

The numbers of core and sample members in EPIDERM over time are shown in Figure 1. Around 70% of core members joined at the scheme’s inception, whereas entry by sample reporters was more spread out over time (Figure 2). Reporting efficiency, that is the percentage of months when a reporter returned their card, was on average 94% for core reporters and 80% for sample members (Table 1). For each reporter, the percentage of returned cards which were blank was also calculated; on average this was 16% among core reporters and 62% for sample reporters.

The monthly number of active reporters during 1996-2006 is shown in Figure 3 whilst Figure 4 shows the mean number of cases per active reporter per month. The mean per month, averaged across the whole period, was 99.26 (all cases) while the means for contact dermatitis and for ‘other skin’ diseases were 79.7 and 19.6 respectively. When core and sample reporters are considered separately, it can be seen (Table 2) that the majority of cases were reported by core reporters – 90% (9497/10522) of dermatitis and 84% (2168/2591) of other skin diseases came from them. This is not surprising given that sample reporters were approached only once every 12 months, but the difference is not solely due to this factor. For the months when they did return a card, sample reporters reported fewer cases per month on average than core reporters: mean cases per active reporter per month were 0.91 for sample reporters and 4.01 for core reporters.

3.1.2. SWORD

This scheme started in 1989. The analyses are confined to data from 1999 –2006 only. The numbers of core and sample members in SWORD during 1999-2006 are shown in Figure 5. Membership varied over time as new members joined and others left. 43% of core members joined in the first month of the scheme, while 31% of sample reporters joined over the first year (Figure 6). During 1999-2006 reporting efficiency, that is the percentage of months when a reporter returned their card, was 90% on average for core reporters and 82% for sample members (Table 3). The percentage of a reporter's returned cards which were blank was also calculated; this was 28% on average for core reporters and 72% for sample reporters.

The monthly number of active reporters during 1996-2006 is shown in Figure 7 whilst Figure 8 shows the mean number of cases per active reporter per month; the mean per month across the whole period was 86.51. The corresponding figures for the disease sub-categories in order of magnitude were 37.82 (non-malignant pleural disease), 16.88 (mesothelioma) 16.88 (asthma), 8.6 (other respiratory not included elsewhere) and 6.98 (pneumoconiosis). Eighty-three percent of all cases were reported by core reporters; the highest percentage contribution from sample reporters was 27% for mesothelioma (Table 4). Higher figures for core reporters are expected given that sample reporters were approached only once every 12 months, but the difference is not solely due to this factor. For the months when they did return a card, sample participants reported fewer cases per month on average than core reporters: the mean numbers of cases per active reporter per month were 0.5 and 3.69 respectively for sample and core reporters.

3.1.3. OPRA

The numbers of core and sample members in OPRA over time are shown in Figure 9. Around 66% of sample members joined at the scheme's inception (Figure 10). Reporting efficiency, that is the percentage of months when a reporter returned their card, was on average 90% for core reporters and 84% for sample members (Table 5). For each reporter, the percentage of returned cards which were blank was also calculated; on average this was 23% among core reporters and 52% for sample reporters.

The monthly numbers of cases, from all reporters combined, during 1996-2006 is shown in Figure 12. If all the data from core reporters is included, the mean per month, averaged across the whole period, was 102.1 (all cases). When core and sample reporters are considered separately, it can be seen (Table 6) that the majority of cases were reported by sample reporters: 73% (9904/13478). The mean number of cases per active reporter per month was 1.94 for sample reporters and 3.42 for core reporters.

If core data for only one randomly selected month per year is included, the mean per month, averaged across the whole period, was 77.2 (Table 7). The mean cases per active reporter per month were 1.9 for sample reporters and 3.3 for core reporters.

3.1.4. MOSS

The numbers of core and sample members in MOSS over time are shown in Figure 13. Around 79% of core members and 58% of sample members joined at the scheme's inception (Figure 14). Reporting efficiency, that is the percentage of months when a reporter returned their card, was on average 80% for core reporters and 77% for sample members (Table 8). For each reporter, the percentage of returned cards which were blank was also calculated; on average this was 37% among core reporters and 63% for sample reporters.

The monthly numbers of cases, from all reporters combined, during 1996-2006 is shown in Figure 16. The mean per month, averaged across the whole period, was 26.14 (all cases) while the means for upper limb disorders was 19.04. When core and sample reporters are considered separately, it can be seen (Table 9) that the majority of cases were reported by sample reporters – 57% (14385/2509) of all cases and 57% (1040/1828) of upper limb disorders came from them. The mean cases per active reporter per month were 0.89 for sample reporters and 1.59 for core reporters.

3.1.5. SOSMI

The numbers of core and sample members in SOSMI over time are shown in Figure 17. Around 89% of core members joined at the scheme's inception, whereas entry by sample reporters was more spread out over time (Figure 18). Reporting efficiency, that is the percentage of months when a reporter returned their card, was on average 69% for core reporters and 72% for sample members (Table 10). For each reporter, the percentage of returned cards which were blank was also calculated; on average this was 77% among core reporters and 75% for sample reporters.

The monthly numbers of cases, from all reporters combined, during 1996-2006 is shown in Figure 20. The mean per month, averaged across the whole period, was 30.3 (all cases) while the means for anxiety & depression was 21.1. When core and sample reporters are considered separately, it can be seen (Table 11) that the majority of cases were reported by sample reporters – 61% (1765/2907) of all cases and 62% (1259/2030) of anxiety and depression cases came from them. The mean cases per active reporter per month were 0.4 for sample reporters and 2.3 for core reporters.

Table 1 Reporting activity of reporters in EPIDERM, 1996-2006

	CORE	SAMPLE
Total reporters ever in 1996-2006	41	334
Total active* reporters in 1996-2006	40	306
Response rate**	94%	80%
% of returns that are blank	16%	62%
Number of reporters who responded at least once but never returned a case	0	104
Number of reporters who have never responded	1	28

* Active reporter is someone who returns a card

**Response rate = cards returned/cards sent out

Table 2 Cases reported per month by disease category and type of reporter, EPIDERM, 1996-2006

Statistic	All Reporters			Core reporters			Sample reporters					
	Min	Max	SD	Min	Max	SD	Min	Max	SD			
Total active reporters ever in 1996-2006	346			40			306					
Mean no. of active* reporters per month	34.05	23	42	3.15	22.10	16	26	1.95	11.95	4	20	2.82
Disease group												
All cases												
Total cases	13103				11655				1448			
Mean cases per month	99.26	36	152	20.91	88.29	31	150	20.28	10.96	0	33	6.91
Mean cases per active reporter per month	2.93	1.12	6.08	0.67	4.01	1.57	7.89	0.93	0.91	0	3.13	0.53
Dermatitis												
Total cases	10522				9497				1025			
Mean cases per month	79.71	29	124	18.97	71.94	25	122	18.47	7.76	0	23	5.02
Mean cases per active reporter per month	2.35	0.97	4.96	0.59	3.26	1.35	6.42	0.83	0.65	0	2.0	0.41
Other skin*												
Total cases	2591				2168				423			
Mean cases per month	19.62	5	36	6.14	16.42	5	28	4.98	3.20	0	15	3.46
Mean cases per active reporter per month	0.58	0.15	1.12	0.18	0.75	0.22	1.50	0.24	0.26	0	1.15	0.26
Urticaria												
Total cases	677				643				34			
Mean cases per month	5.12	0	15	2.85	4.87	0	14	2.79	0.25	0	3	0.57
Mean cases per active reporter per month	0.15	0	0.42	0.83	0.22	0	0.78	0.13	0.02	0	0.27	0.05
Neoplasia												
Total cases	1628				1331				297			
Mean cases per month	12.33	3	28	4.98	10.08	1	20	3.63	2.25	0	15	3.08
Mean cases per active reporter per month	0.36	0.09	0.80	0.15	0.46	0.05	1.05	0.17	0.18	0	1.15	0.23

* Other than contact dermatitis

Figure 1 Number of reporters in EPIDERM by year and reporter type.

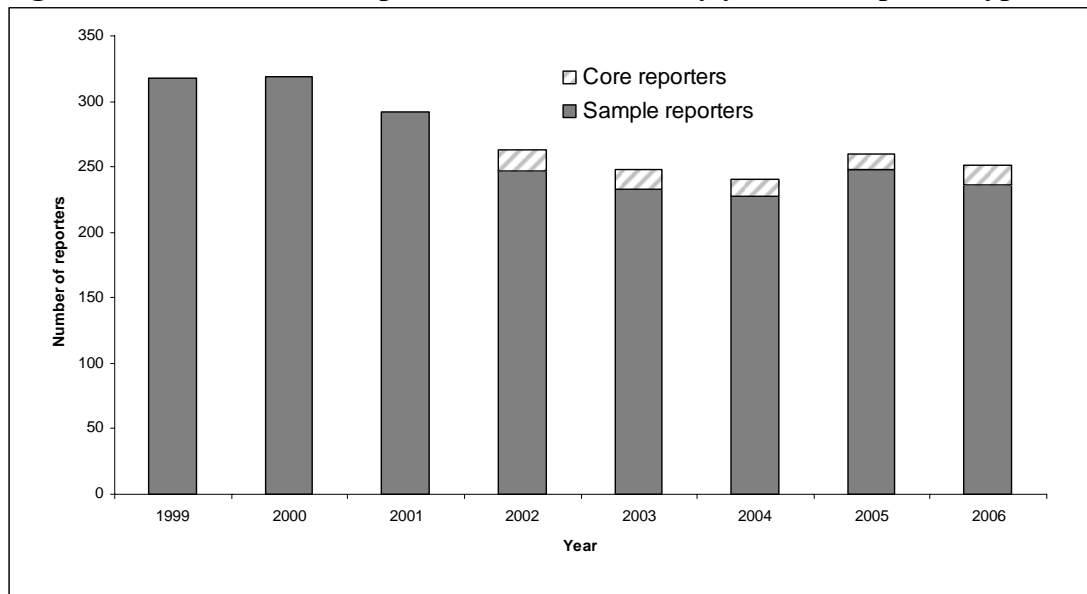
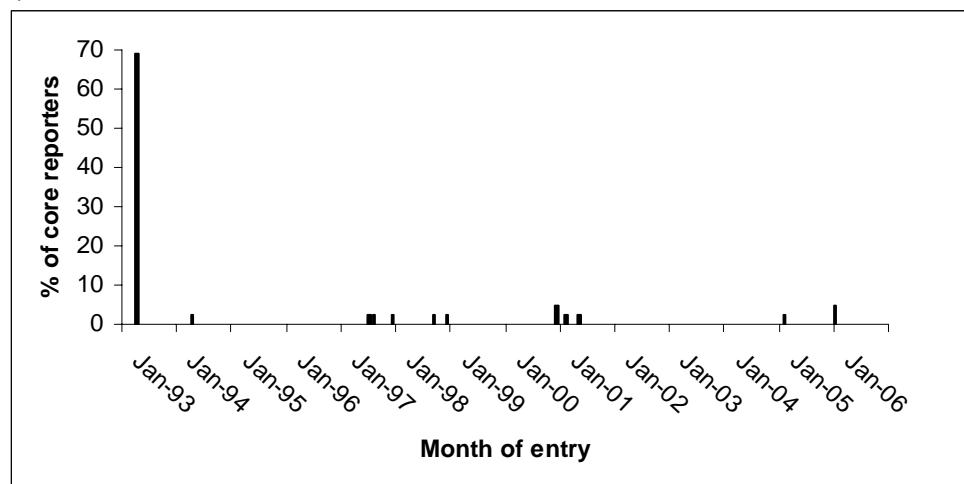


Figure 2 Percentage of reporters (reporting anytime during 1996-2006) by date of entry to scheme – EPIDERM

a) Core



b) Sample

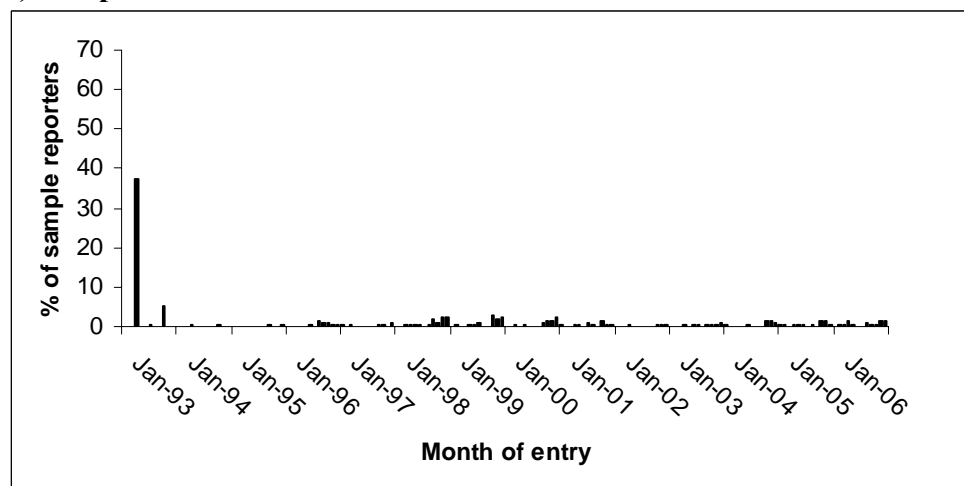


Figure 3 **Number of active reporters per month - EPIDERM**

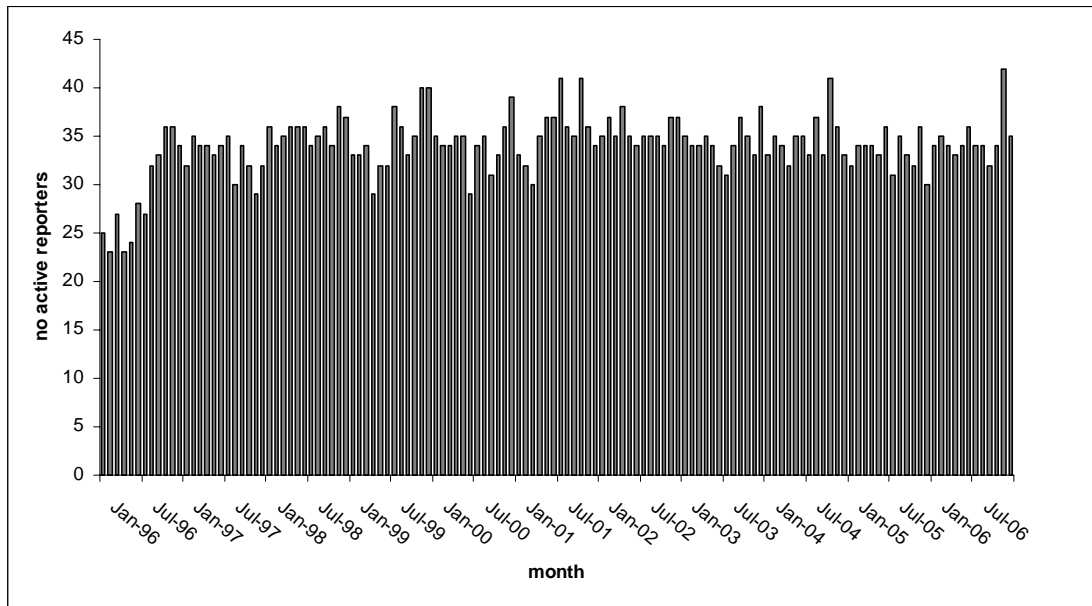
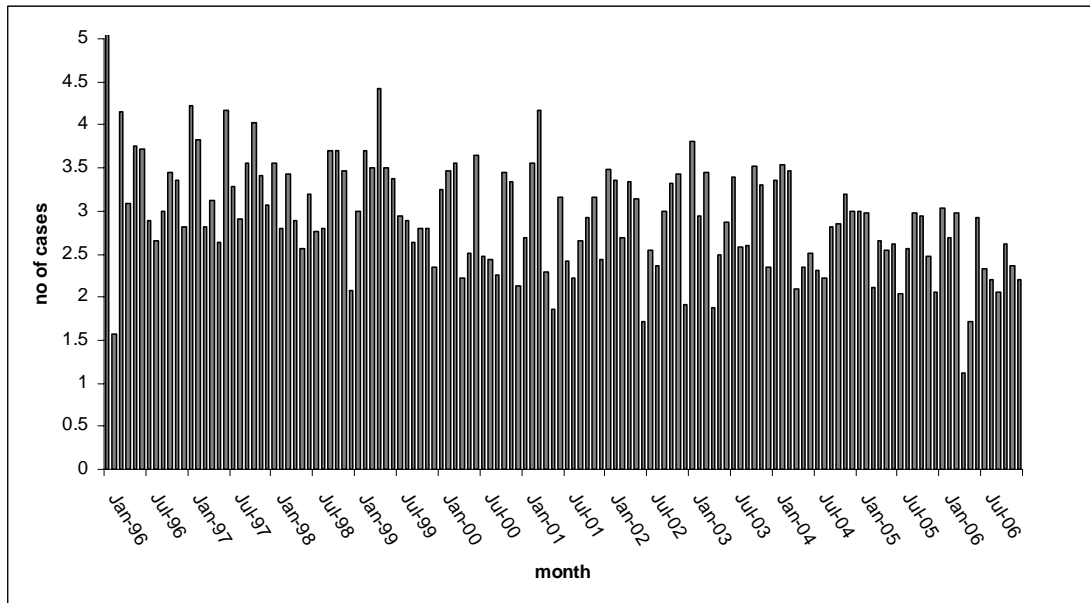
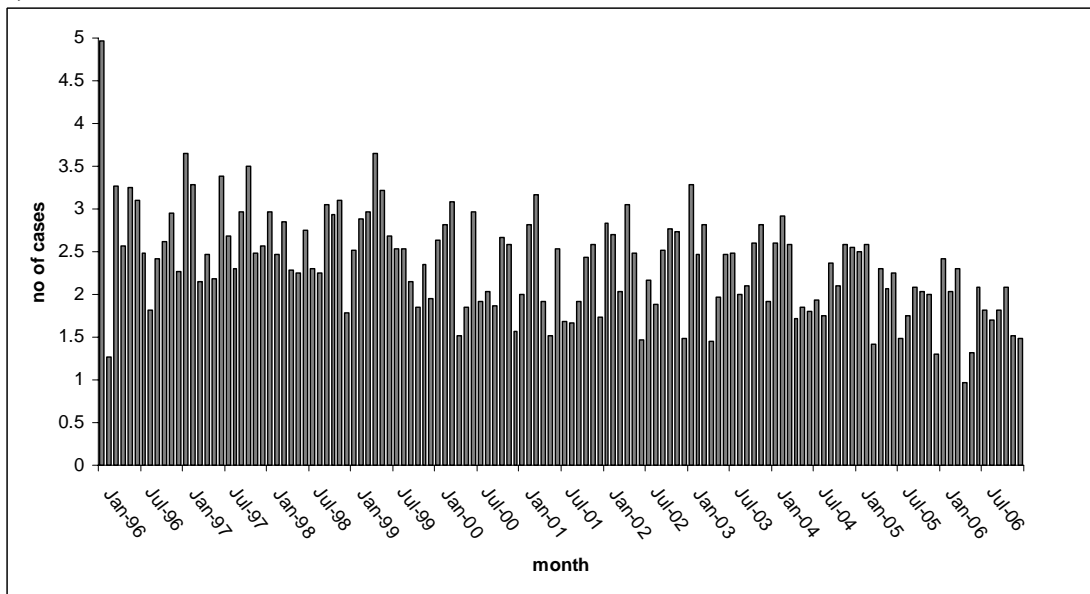


Figure 4 Cases per active reporter per month - EPIDERM

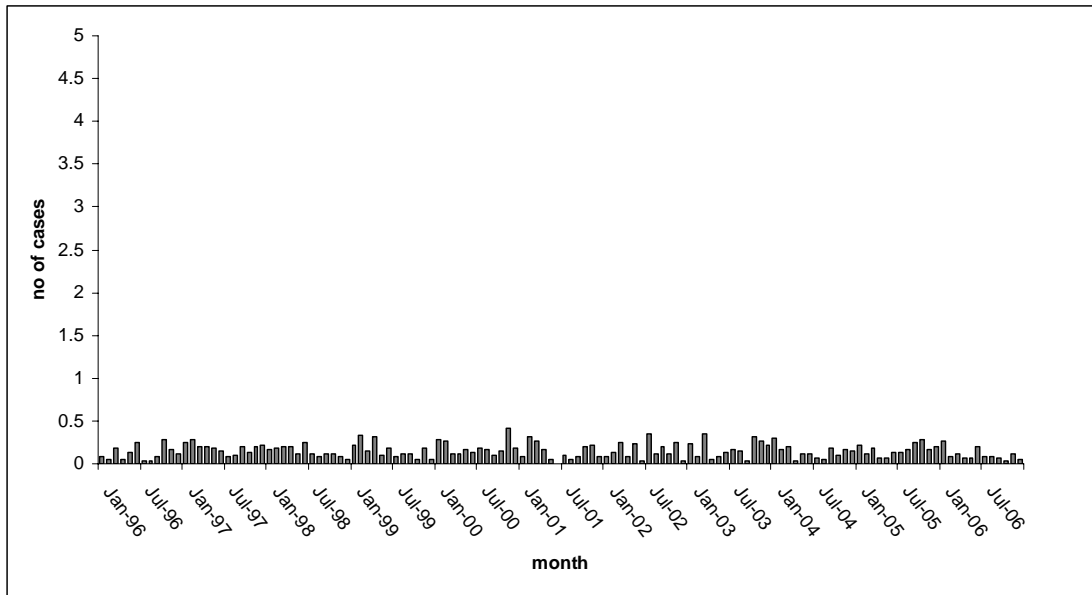
a) Total cases



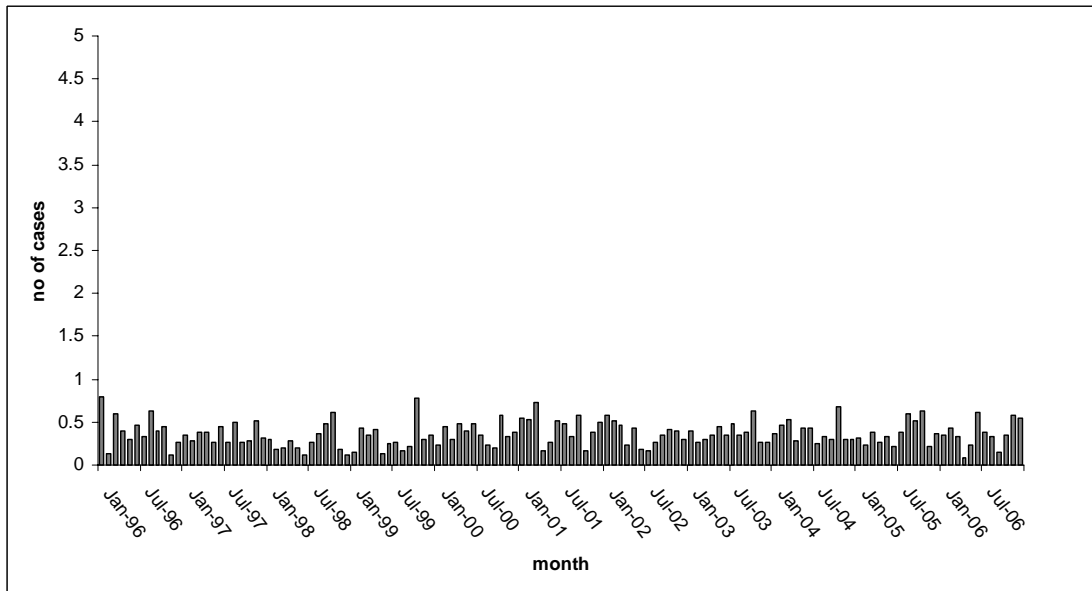
b) Contact dermatitis



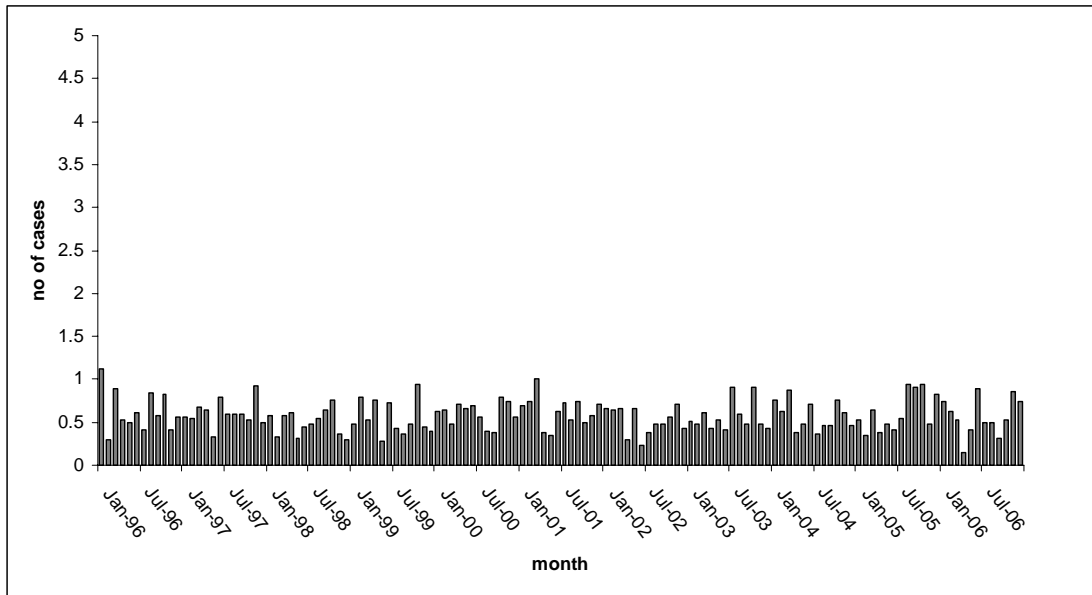
c) Contact urticaria



d) Neoplasia



e) Other skin*



*Other than contact dermatitis

Table 3 Reporting activity of reporters in SWORD, 1999-2006

	CORE	SAMPLE
Total reporters ever in 1996-2006	41	639
Total active* reporters in 1996-2006	39	604
Response rate**	90%	82%
% of returns that are blank	28%	72%
Number of reporters who responded at least once but never returned a case	1	229
Number of reporters who have never responded	2	35

* Active reporter is someone who returns a card

**Response rate = cards returned/cards sent out

Table 4 Cases reported per month by disease category and type of reporter, SWORD, 1999-2006

Statistic	All Reporters			Core reporters			Sample reporters					
	Min	Max	SD	Min	Max	SD	Min	Max	SD			
Total active reporters ever in 1996-2006	680			41			639					
Mean no. of active* reporters per month	49.97	38	59	3.95	19.46	15	23	1.64	30.51	20	38	3.57
Disease group												
All cases	8305			6870			1435					
Mean cases per month	86.51	42	133	16.20	71.56	36	112	16.09	14.94	3	35	6.46
Mean cases per active reporter per month	1.73	0.98	2.71	0.32	3.69	1.89	5.83	0.83	0.49	0.09	1.03	0.19
Asthma	1621			1440			181					
Mean cases per month	16.88	5	42	6.39	15.00	3	42	5.89	1.88	0	9	1.72
Mean cases per active reporter per month	0.34	0.10	0.76	0.13	0.78	0.16	2.33	0.32	0.63	0	0.28	0.56
Mesothelioma	1621			1177			444					
Mean cases per month	16.88	3	36	6.63	12.26	1	27	5.35	4.62	0	11	2.81
Mean cases per active reporter per month	0.34	0.06	0.70	0.13	0.63	0.06	1.69	0.29	0.15	0	0.39	0.09
Non malignant pleural plaques	3631			3127			504					
Mean cases per month	37.82	14	60	9.23	32.57	13	59	9.42	5.25	0	17	3.43
Mean cases per active reporter per month	0.76	0.33	1.25	0.18	1.67	0.68	2.84	0.45	0.17	0	0.49	0.10
Pneumoconiosis	671			539			132					
Mean cases per month	6.98	2	19	3.35	5.61	0	16	2.58	1.37	0	9	1.72
Mean cases per active reporter per month	0.14	0.04	0.42	0.68	0.29	0	0.89	0.13	0.45	0	0.26	0.55

Statistic		All Reporters			Core reporters			Sample reporters					
		Min	Max	SD	Min	Max	SD	Min	Max	SD			
Other cases	Total cases	851			675			176					
	Mean cases per month	8.86	1	20	4.18	7.03	1	20	3.85	1.83	0	13	2.11
	Mean cases per active reporter per month	0.18	0.02	0.41	0.83	0.37	0.05	1.11	0.21	0.59	0	0.45	0.70

Figure 5 Number of reporters in SWORD by year and reporter type.

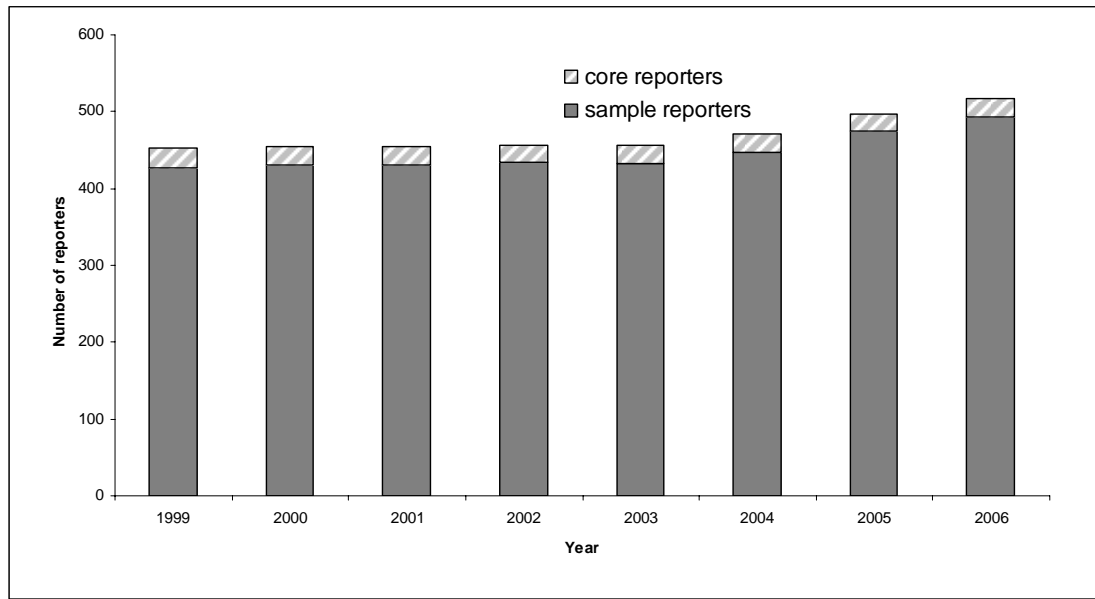
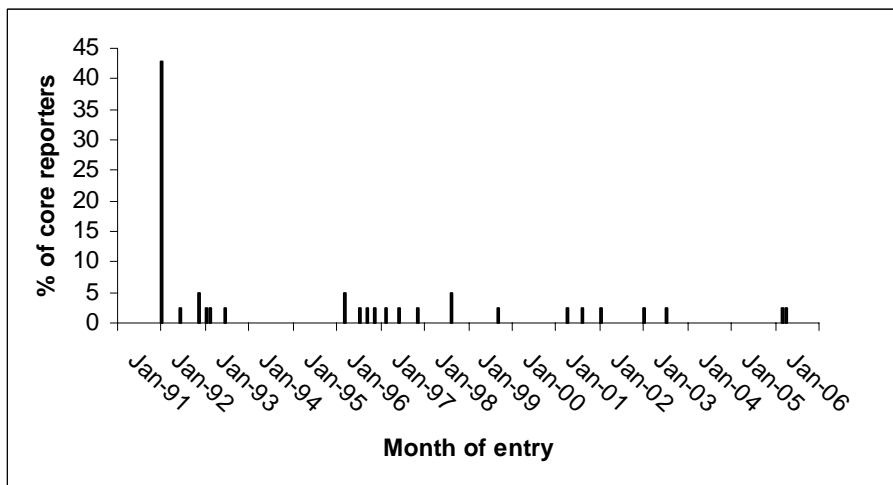


Figure 6 Percentage of reporters (reporting anytime between 1989 and 2006) by date of entry to scheme – SWORD

a) Core



b) Sample

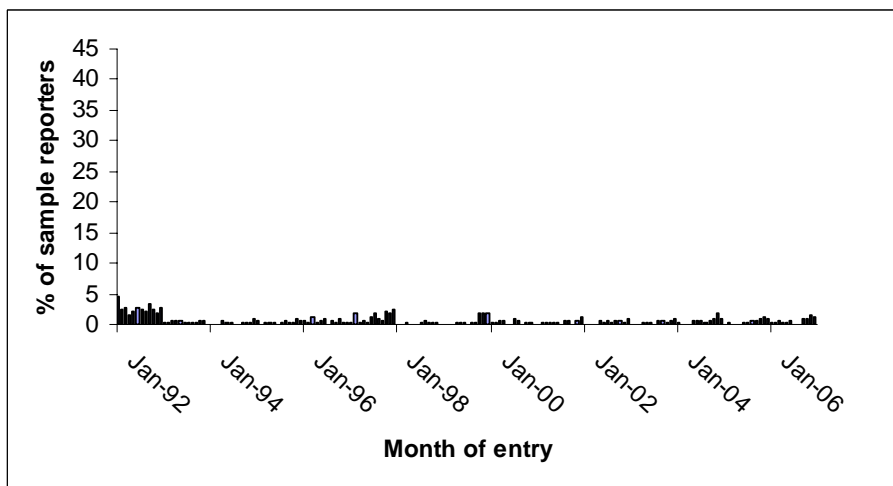


Figure 7 Number of active reporters per month - SWORD

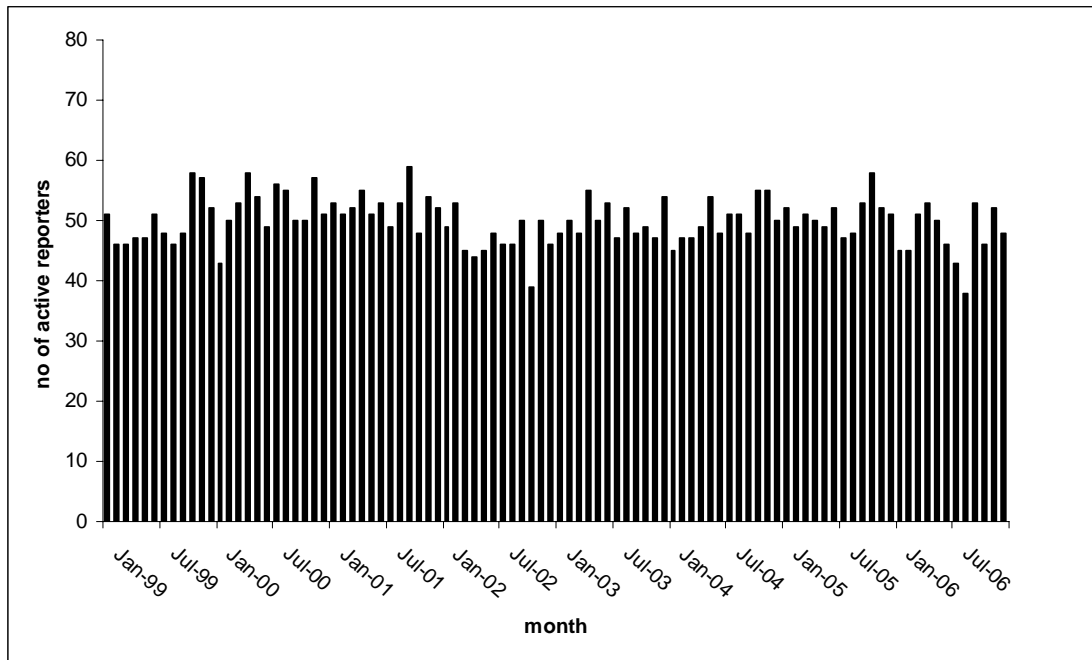
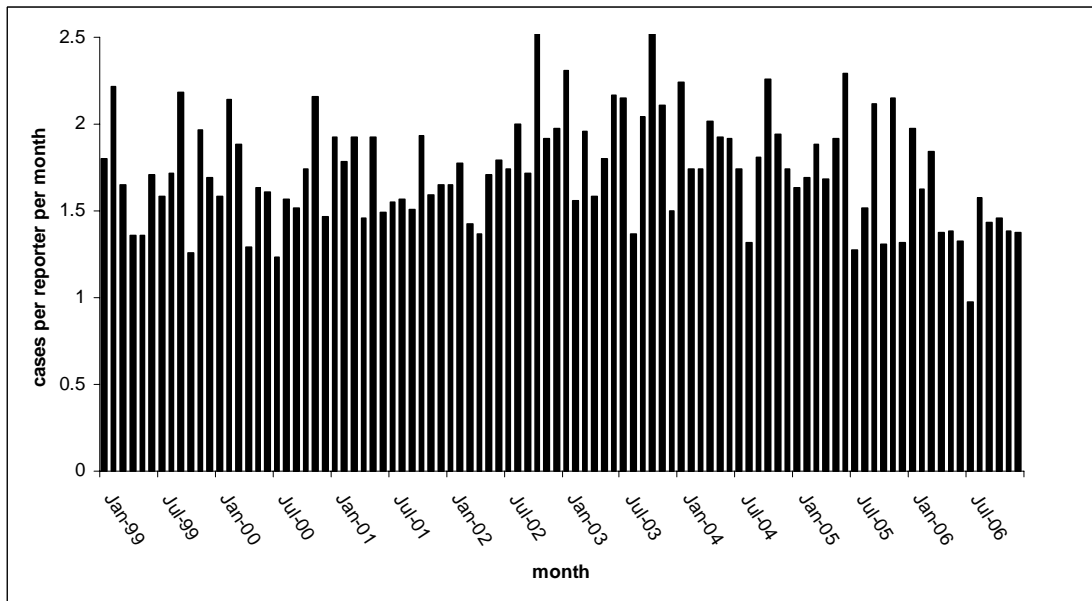
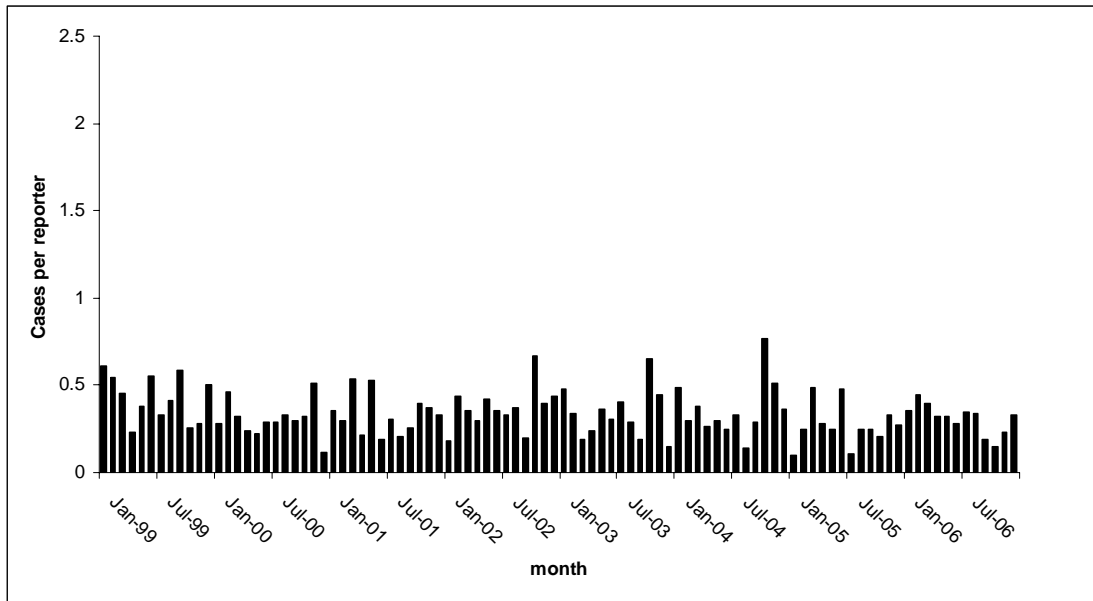


Figure 8 Cases per active reporter per month - SWORD

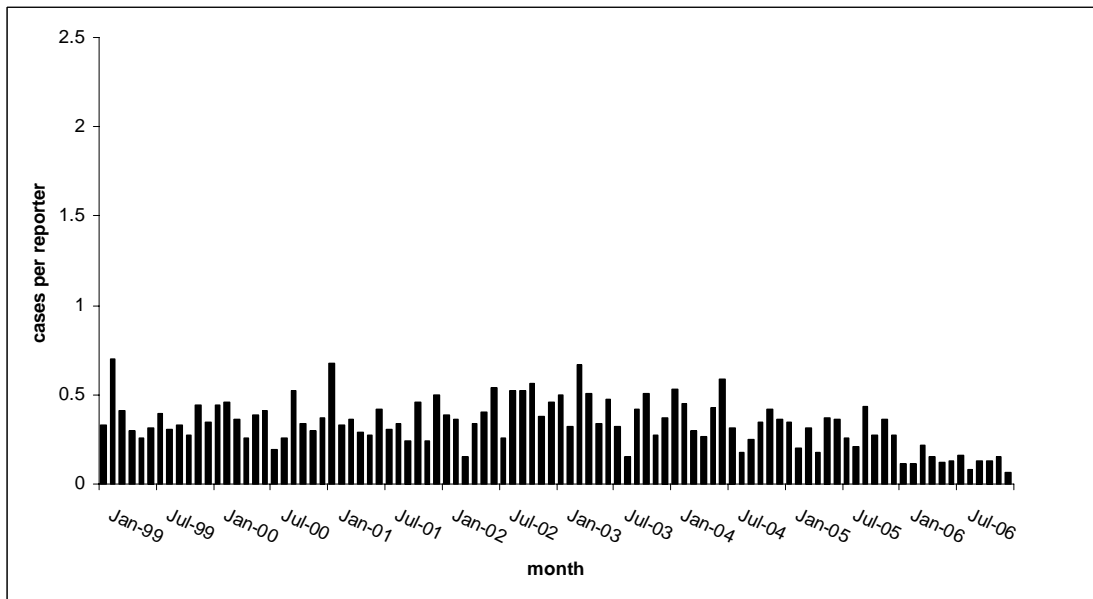
a) Total cases



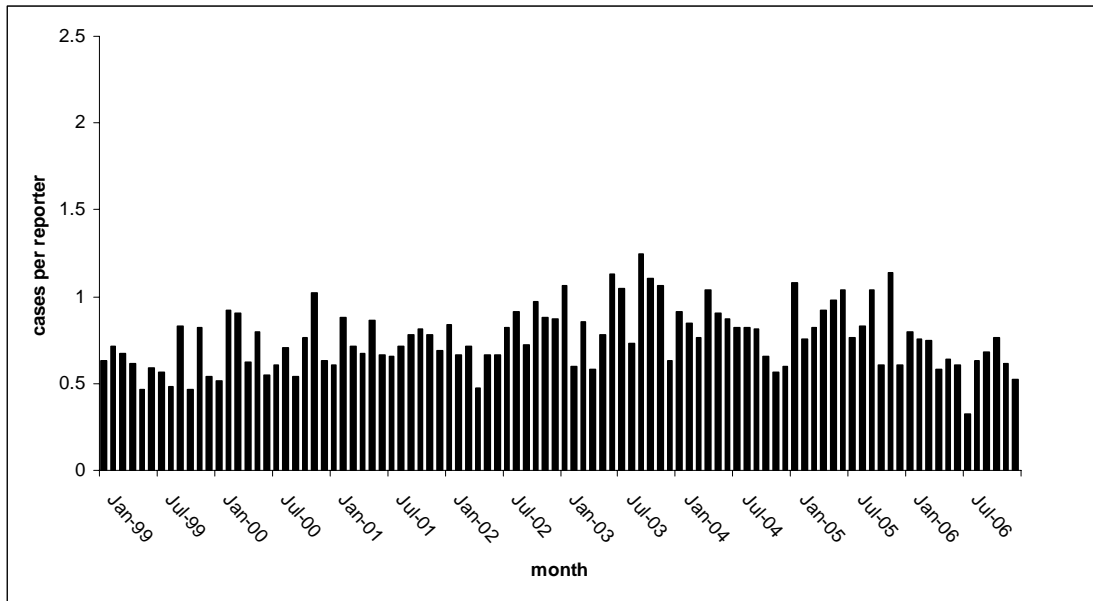
b) Asthma



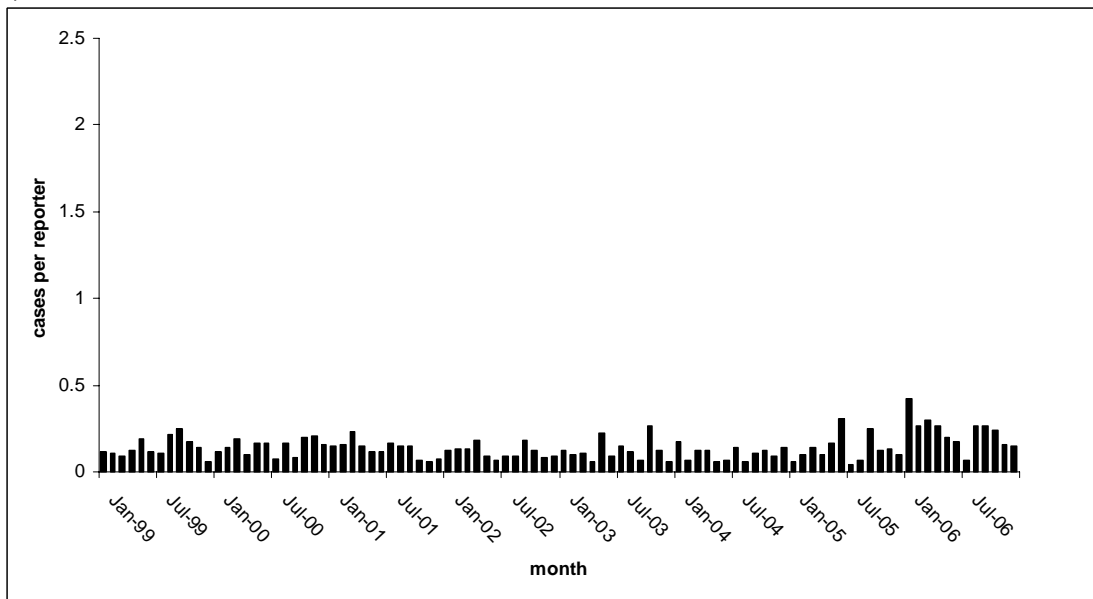
c) Mesothelioma



d) Non-malignant pleural disease



e) Pneumoconiosis



f) Other respiratory

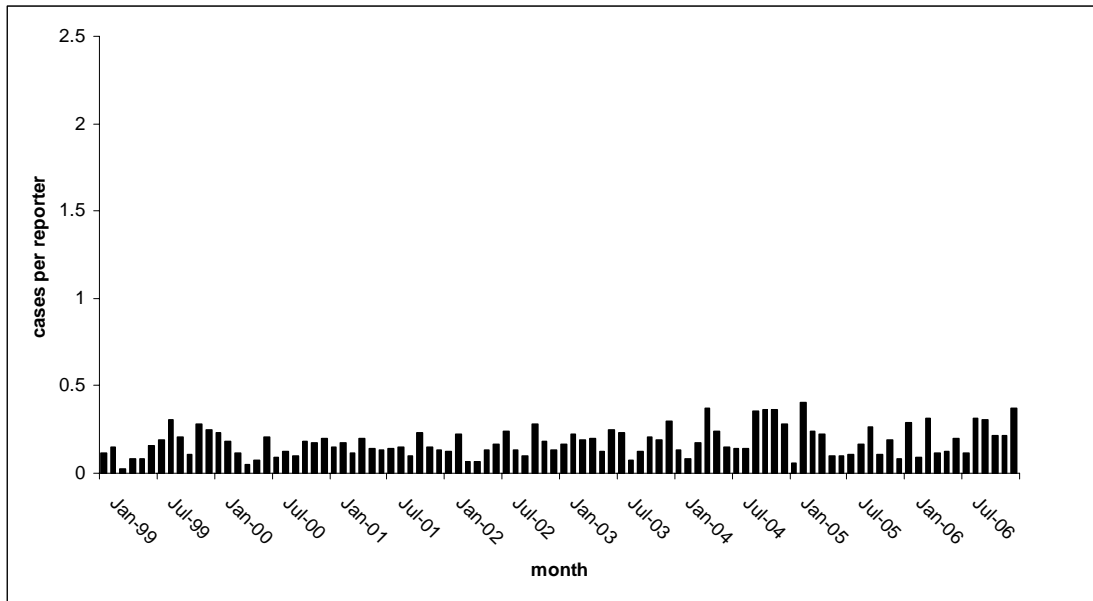


Table 5 Reporting activity of reporters in OPRA, 1996-2006

	CORE***	SAMPLE
Total reporters ever in 1996-2006	60	928
Total active* reporters in 1996-2006	60	900
Response rate**	90%	84%
% of returns that are blank	23%	52%
Number of reporters who responded at least once but never returned a case	2	257
Number of reporters who have never responded	0	28

* Active reporter is someone who returns a card

**Response rate = cards returned/cards sent out

*** Core group started reporting in 2004 as part of the core sample crossover study (i.e. all core reporters were sample reporters prior to this date)

Table 6 Cases reported per month by disease category and type of reporter, OPRA, 1996-2006 (all core data included)

Statistic	All Reporters			Core reporters			Sample reporters					
	Min	Max	SD	Min	Max	SD	Min	Max	SD			
Total active reporters ever in 1996-2006	987			60			928					
Mean no. of active* reporters per month	47.30	30	68	8.83	29.31	23	38	3.12	39.30	23	57	7.67
Disease group												
All cases	13478			3574			9904					
Mean cases per month	102.1	28	294	47.61	99.3	57	162	22.61	75.03	20	179	28.0
Mean cases per active reporter per month	2.12	0.78	4.94	0.78	3.42	1.9	5.9	0.9	1.94	0.7	5.0	0.72
All respiratory	645			99			546					
Mean cases per month	4.89	0	16	3.38	2.75	0.0	10	2.35	4.14	0.0	16	3.22
Mean cases per active reporter per month	0.11	0.0	0.41	0.73	0.1	0.0	0.4	0.08	0.10	0.0	0.41	0.1
Asthma	311			43			268					
Mean cases per month	2.36	0	9	1.76	1.2	0.0	5	1.4	2.03	0.0	9	1.8
Mean cases per active reporter per month	0.05	0.0	0.23	0.39	0.04	0.0	0.2	0.05	0.1	0.0	0.23	0.42
Mesothelioma	12			2			10					
Mean cases per month	0.1	0	1	0.29	0.56	0.0	1	0.23	0.08	0.0	1	0.3
Mean cases per active reporter per month	0.002	0.0	0.03	0.01	0.002	0.0	0.04	0.01	0.02	0.0	0.03	0.01
Non-malignant Pleural disease	24			3			21					
Mean cases per month	0.19	0	2	0.42	0	1	0.3		0.16	0.0	2	0.41
Mean cases per active reporter per month	0.004	0.0	0.1	0.01	0.003	0.0	0.04	0.01	0.04	0.0	0.1	0.10
Pneumoconiosis	15			0			15					

	Statistic	All Reporters			Core reporters			Sample reporters					
		Min	Max	SD	Min	Max	SD	Min	Max	SD			
	Mean cases per month	0.11	0	2	0.40	0	0	0	0	0.11	0.0	2	0.43
	Mean cases per active reporter per month	0.003	0.0	0.1	0.01	0	0	0	0	0.003	0.0	0.4	0.01
Other respiratory	Total cases	304			53			251					
	Mean cases per month	2.30	0	12	2.25	1.5	0.0	5	1.61	1.9	0.0	12	2.0
	Mean cases per active reporter per month	0.49	0.0	0.3	0.05	0.1	0.0	0.2	0.06	0.05	0.0	0.3	0.05
All Skin	Total cases	1577			220			1357					
	Mean cases per month	11.95	1	47	6.21	6.11	2.0	14	2.7	10.3	1	47	6.9
	Mean cases per active reporter per month	0.26	0.02	1.02	0.14	0.21	0.06	0.5	0.1	0.3	0.02	1.02	0.15
Contact dermatitis	Total cases	1293			180			1113					
	Mean cases per month	9.79	0	40	5.35	5.0	2	9	2.03	8.43	0.0	40	5.91
	Mean cases per active reporter per month	0.21	0.0	0.9	0.12	0.17	0.06	0.33	0.74	0.21	0.0	0.9	0.13
Other skin cases	Total cases	282			40			242					
	Mean cases per month	2.14	0	8	1.94	1.1	0.0	8	1.6	1.8	0.0	8	1.9
	Mean cases per active reporter per month	0.46	0.0	0.2	0.43	0.04	0.0	0.29	0.54	0.04	0.0	0.2	0.04
All Musculoskeletal	Total cases	5635			1369			4266					
	Mean cases per month	42.69	6	97	20.87	38.03	19	71	13.0	32.32	6	97	16.51
	Mean cases per active reporter per month	0.89	0.2	2.5	0.4	1.32	0.69	2.52	0.50	0.83	0.2	2.5	0.41
Upper limb	Total cases	3201			750			2451					
	Mean cases per month	24.25	3	66	12.28	20.8	9	45	10.0	18.6	3	66	10.1
	Mean cases per active reporter per month	0.51	0.1	1.7	0.24	0.73	0.34	1.6	0.36	0.5	0.1	1.7	0.25

Statistic	All Reporters			Core reporters			Sample reporters						
	Min	Max	SD	Min	Max	SD	Min	Max	SD				
Spine/back	Total cases	1974				466				1508			
	Mean cases per month	14.95	2	44	8.31	13.0	3	30	5.14	11.42	1	44	7.2
	Mean cases per active reporter per month	0.31	0.1	1.1	0.17	0.45	0.13	1.11	0.2	0.3	0.0	1.1	0.18
All mental ill health	Total cases	4410				1154				3256			
	Mean cases per month	33.41	1	112	23.24	32.1	0.0	79	25.1	24.7	1	68	11.8
	Mean cases per active reporter per month	0.7	0.02	2.0	0.41	1.1	0.0	2.93	0.85	0.7	0.02	1.94	0.35
Anxiety / depression	Total cases	2931				1060				1871			
	Mean cases per month	22.20	0	68	16.81	29.4	14	44	8.0	14.2	0.0	46	8.45
	Mean cases per active reporter per month	0.45	0.0	1.31	0.3	1.00	0.44	1.52	0.26	0.38	0.0	1.31	0.24
PTSD	Total cases	175				62				113			
	Mean cases per month	1.33	0	7	1.6	1.72	0.0	6	1.73	0.9	0.0	6	1.1
	Mean cases per active reporter per month	0.03	0.0	0.14	0.03	0.06	0.0	0.21	0.58	0.21	0.0	0.14	0.03
Other work stress	Total cases	2088				743				1345			
	Mean cases per month	15.82	0	65	12.87	20.64	11	41	6.14	10.2	0.0	26	6.34
	Mean cases per active reporter per month	0.32	0.0	1.2	0.22	0.71	0.34	1.52	0.23	0.3	0.0	1.0	0.2
Other psych cases	Total cases	144				52				92			
	Mean cases per month	1.1	0	7	1.4	1.44	0.0	52	1.23	0.7	0.0	5	1.0
	Mean cases per active reporter per month	0.21	0.0	0.12	0.3	0.05	0.0	0.15	0.04	0.02	0.0	0.2	0.03

Table 7 Cases reported per month by disease category and type of reporter, OPRA, 1996-2006 (one randomly selected month per year of core data included)

Statistic	All Reporters			Core reporters			Sample reporters					
	Min	Max	SD	Min	Max	SD	Min	Max	SD			
Total active reporters ever in 1996-2006	988					60				928		
Mean no. of active* reporters per month	39.9	24	57	6.9	2.5	1	5	1.1	39.3	23	57	7.7
Disease group												
All cases												
Total cases	10187					270				9917		
Mean cases per month	77.2	27	179	27.3	7.7	0.0	35	7.1	75.0	20	179	28.0
Mean cases per active reporter per month	1.9	0.8	4.9	0.7	3.3	0.0	12.0	2.9	1.9	0.7	5.0	0.7
All respiratory												
Total cases	557					11				546		
Mean cases per month	4.2	0	16	3.2	0.3	0.0	2.0	0.6	4.1	0.0	16	3.2
Mean cases per active reporter per month	0.1	0.0	0.4	0.1	0.1	0.0	1.0	0.3	0.1	0.0	0.41	0.1
Asthma												
Total cases	275					7				268		
Mean cases per month	2.1	0	9	1.8	0.2	0.0	2.0	0.5	2.0	0.0	9	1.8
Mean cases per active reporter per month	0.1	0.0	0.2	0.0	0.1	0.0	1.0	0.3	0.1	0.0	0.2	0.4
Mesothelioma												
Total cases	10					0				10		
Mean cases per month	0.1	0	1	0.3	0.0	0.0	0.0	0.0	0.1	0.0	1	0.3
Mean cases per active reporter per month	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NM pleural												
Total cases	21					0.0				21		
Mean cases per month	0.2	0	2	0.4	0.0	0.0	0.0	0.0	0.2	0.0	2	0.4
Mean cases per active reporter per month	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1

	Statistic	All Reporters			Core reporters			Sample reporters					
		Min	Max	SD	Min	Max	SD	Min	Max	SD			
Pneumoconiosis	Total cases	15				0.0				15			
	Mean cases per month	0.1	0	2	0.4	0.0	0.0	0.0	0.0	0.1	0.0	2	0.4
	Mean cases per active reporter per month	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0
Other respiratory	Total cases	255				4				251			
	Mean cases per month	1.9	0	12	1.9	0.1	0.0	1.0	0.3	1.9	0.0	12	2.0
	Mean cases per active reporter per month	0.0	0.0	0.3	0.0	0.0	0.0	1.0	0.1	0.1	0.0	0.3	0.1
All Skin	Total cases	1371				14				1357			
	Mean cases per month	10.4	1	47	6.8	0.4	0.0	3.0	0.8	10.3	1	47	6.9
	Mean cases per active reporter per month	0.3	0.0	1.0	0.1	0.1	0.0	1.0	0.3	0.3	0.0	1.0	0.2
Contact dermatitis	Total cases	1124				11				1113			
	Mean cases per month	8.5	0	40	5.9	0.3	0.0	3.0	0.7	8.4	0.0	40	5.9
	Mean cases per active reporter per month	0.2	0.0	0.9	0.1	0.1	0.0	0.7	0.2	0.2	0.0	0.9	0.1
Other skin cases	Total cases	245				3				242			
	Mean cases per month	1.9	0	8	1.9	0.1	0.0	2.0	0.4	1.8	0.0	8	1.9
	Mean cases per active reporter per month	0.0	0.0	0.2	0.0	0.0	0.0	1.0	0.2	0.0	0.0	0.2	0.0
All Musculoskeletal	Total cases	4373				97				4276			
	Mean cases per month	33.1	6	97	16.3	2.8	0.0	11.0	3.0	32.3	6	97	16.5
	Mean cases per active reporter per month	0.8	0.2	2.5	0.4	1.2	0.0	6.0	1.3	0.8	0.2	2.5	0.4
Upper limb	Total cases	2514				53				2451			
	Mean cases per month	19.0	3	66	9.9	1.5	0.0	6.0	1.6	18.6	3	66	10.1

	Statistic	All Reporters			Core reporters			Sample reporters					
		Min	Max	SD	Min	Max	SD	Min	Max	SD			
Spine/back	Mean cases per active reporter per month	0.5	0.1	1.7	0.2	0.6	0.0	4.0	0.8	0.5	0.1	1.7	0.3
	Total cases	1545				36				1509			
	Mean cases per month	11.7	1	44	7.1	1.0	0.0	6.0	1.5	11.4	1	44	7.2
	Mean cases per active reporter per month	0.3	0.0	1.0	0.2	0.4	0.0	2.0	0.6	0.3	0.0	1.1	0.2
All mental ill health	Total cases	3352				93				3259			
	Mean cases per month	25.4	1	68	12.2	2.7	0.0	17.0	3.6	24.7	1	68	11.8
	Mean cases per active reporter per month	0.7	0.0	1.9	0.4	1.3	0.0	9.0	2.2	0.7	0.0	1.9	0.4
Anxiety / depression	Total cases	1954				80				1874			
	Mean cases per month	14.8	0	46	8.7	2.3	0.0	16.0	3.1	14.2	0.0	46	8.5
	Mean cases per active reporter per month	0.4	0.0	1.3	0.3	0.9	0.0	5.0	1.3	0.4	0.0	1.3	0.2
PTSD	Total cases	117				4				113			
	Mean cases per month	0.9	0	6	1.1	0.1	0.0	2.0	0.4	0.9	0.0	6	1.1
	Mean cases per active reporter per month	0.0	0.0	0.1	0.0	0.1	0.0	1.0	0.2	0.2	0.0	0.1	0.0
Other work stress	Total cases	1407				62				1345			
	Mean cases per month	10.7	0	29	6.8	1.8	0.0	10.0	2.3	10.2	0.0	26	6.3
	Mean cases per active reporter per month	0.3	0.0	0.9	0.2	0.8	0.0	5.0	1.3	0.3	0.0	1.0	0.2
Other psych cases	Total cases	96				4				92			
	Mean cases per month	0.7	0	5	1.0	0.1	0.0	2.0	0.4	0.7	0.0	5	1.0
	Mean cases per active reporter per month	0.2	0.0	0.2	0.0	0.1	0.0	1.0	0.2	0.0	0.0	0.2	0.0

Figure 9 Number of reporters in OPRA by year and reporter type.

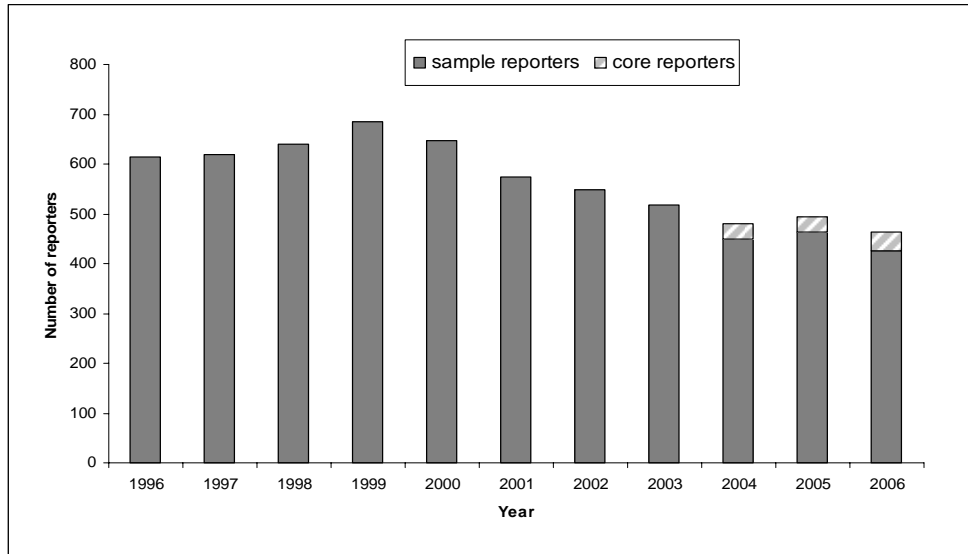


Figure 10 Percentage of reporters (reporting anytime during 1996 to 2006) by date of entry to scheme – OPRA

a) Sample

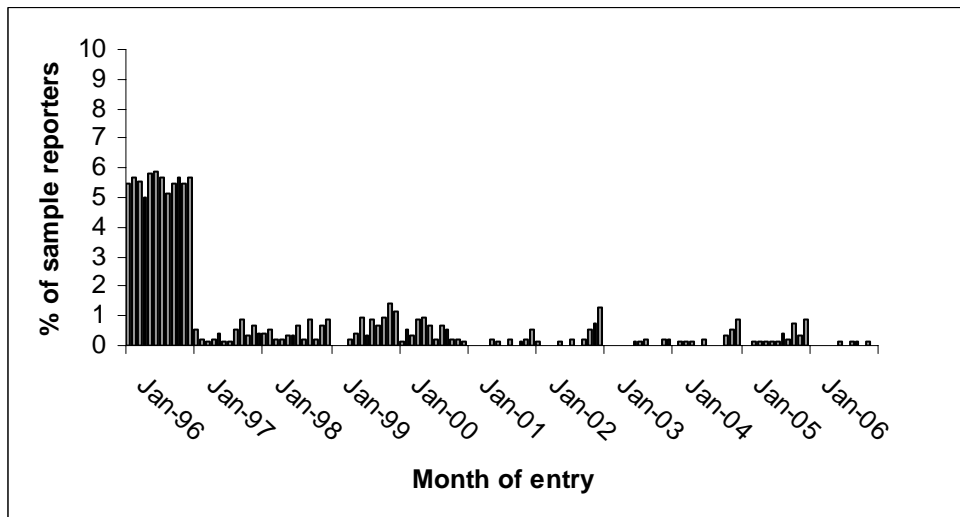


Figure 11 Number of active reporters per month - OPRA

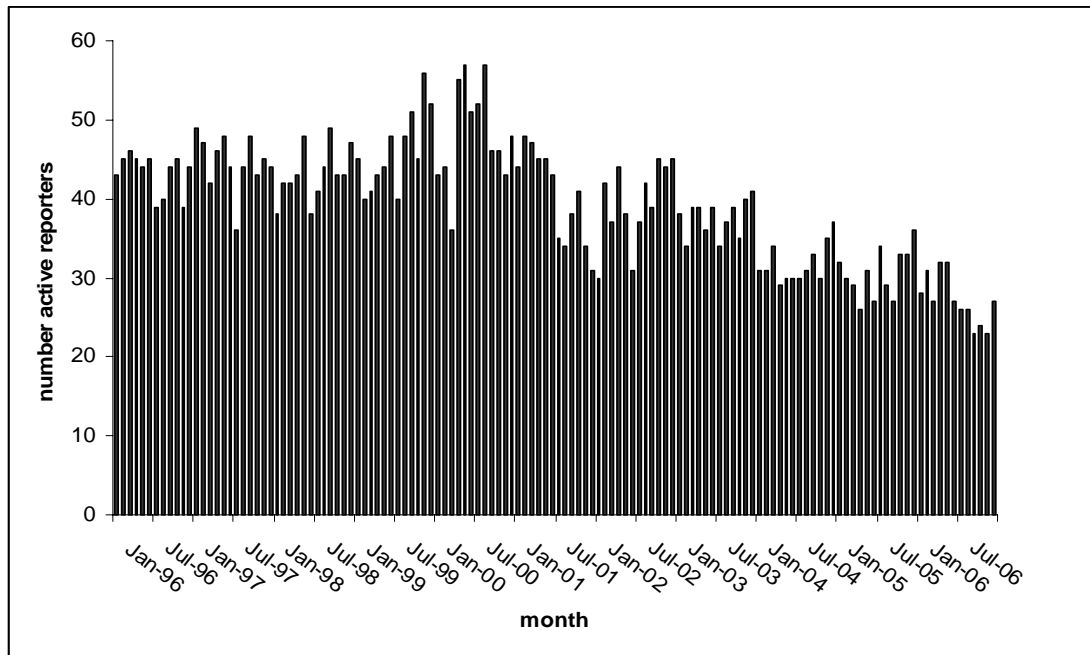
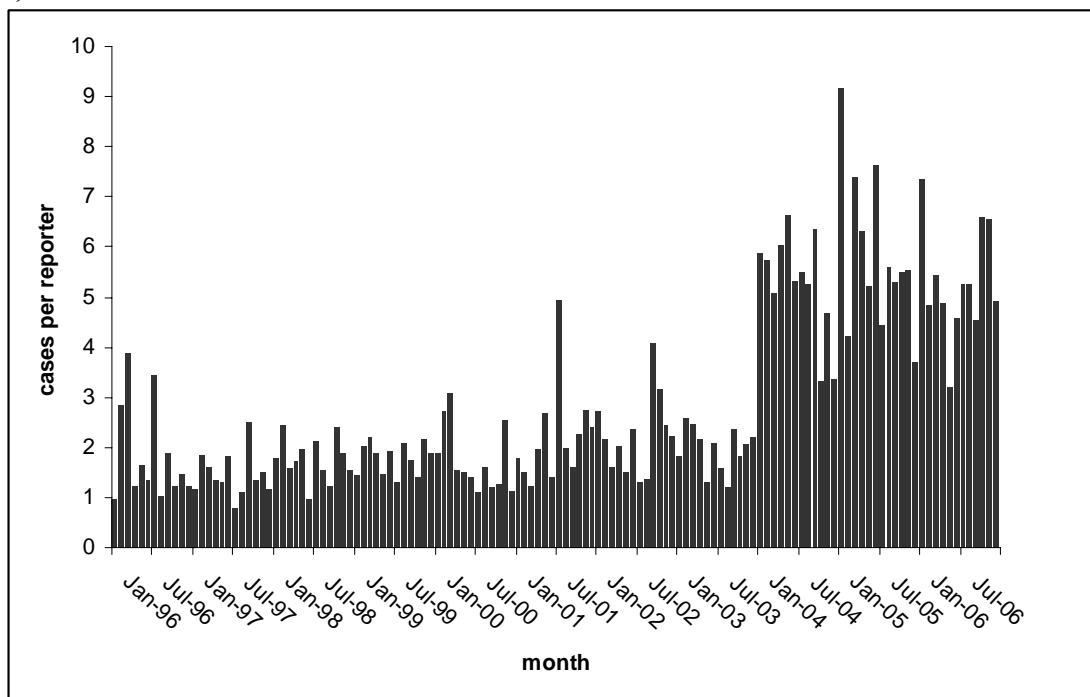


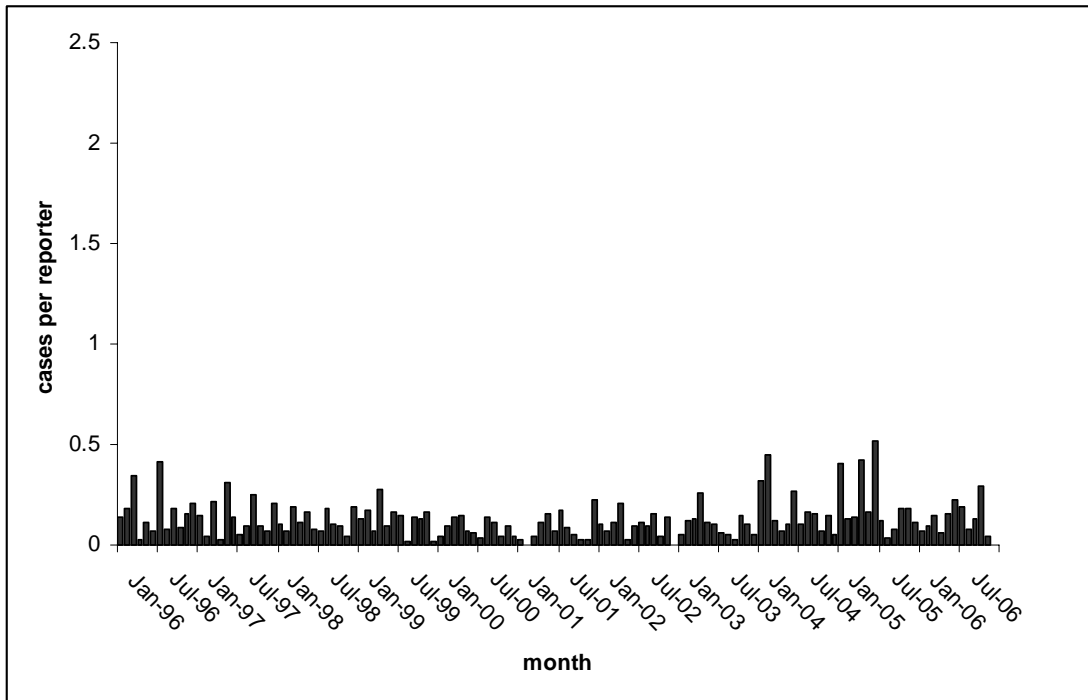
Figure 12 Cases per active reporter per month - OPRA

a) Total cases

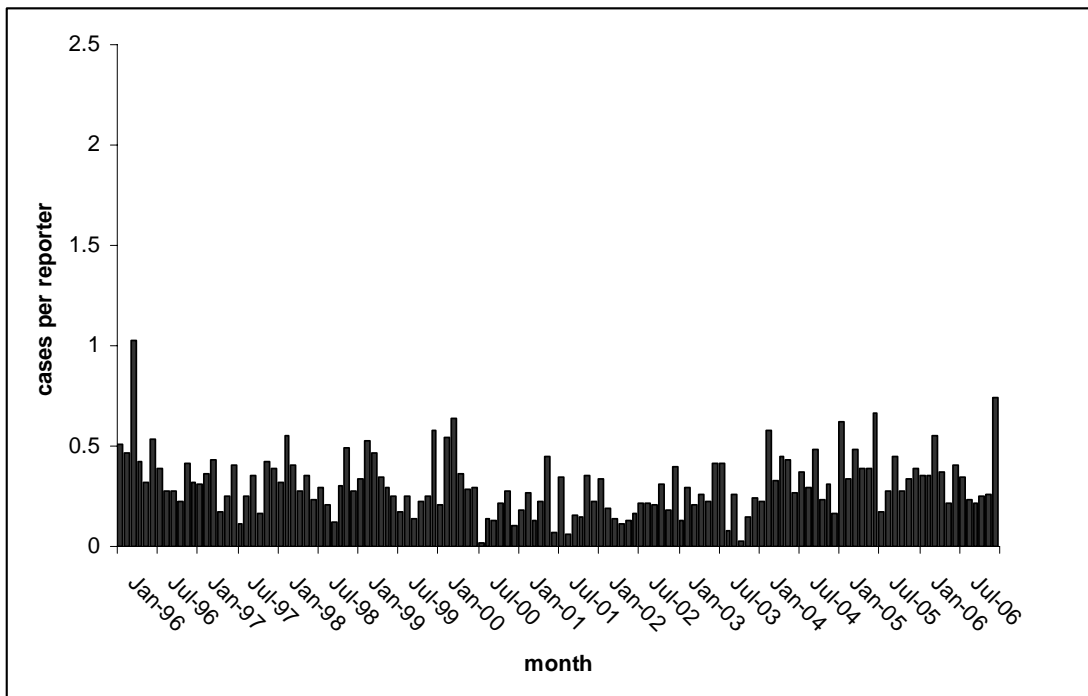


NOTE: Core group started in January 2004 as part of the core sample crossover study

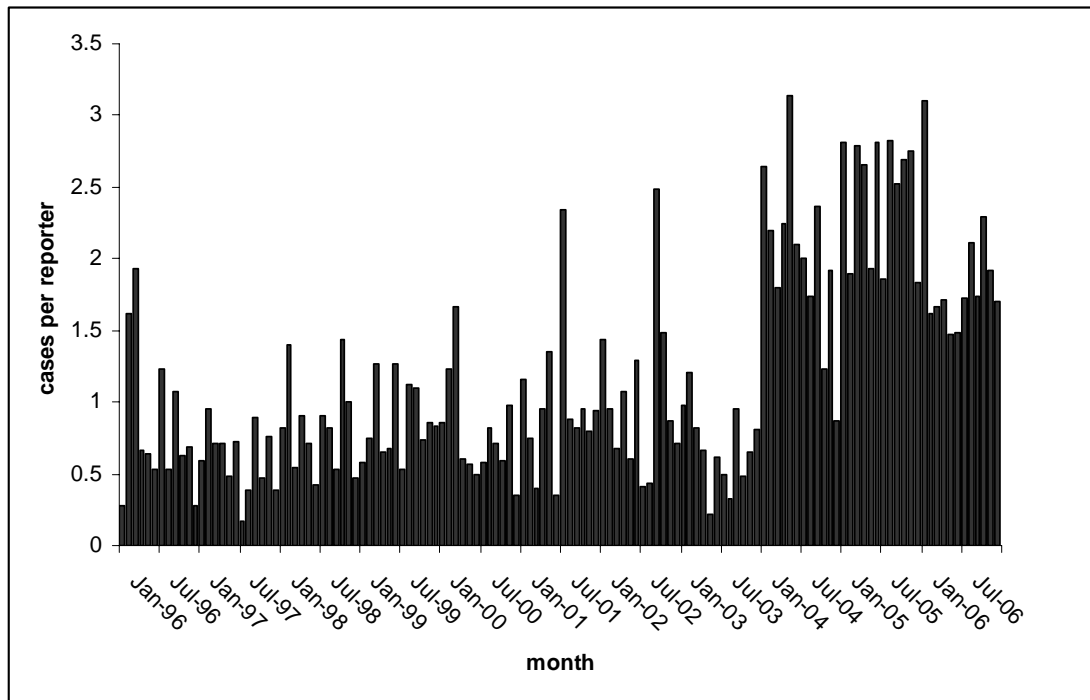
b) Total respiratory cases



c) Total skin cases



d) Total musculoskeletal cases



e) Total mental ill health cases

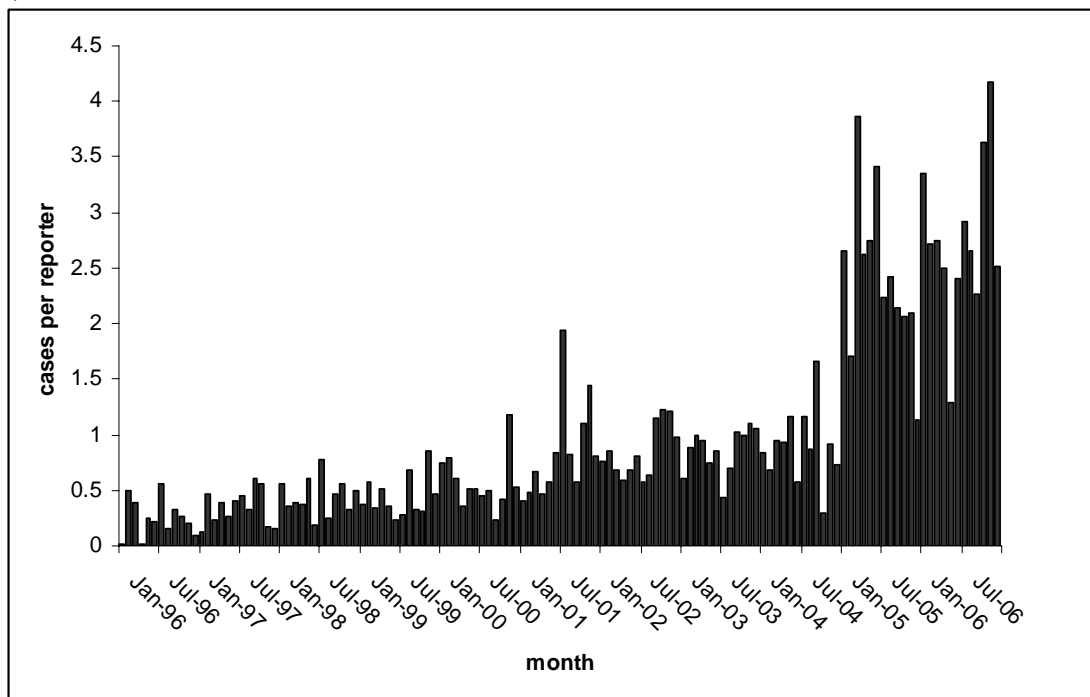


Table 8 Reporting activity of reporters in MOSS, 1999-2006

	CORE	SAMPLE
Total reporters ever in 1999-2006	19	391
Total active* reporters in 1999-2006	17	362
Response rate**	80%	77%
% of returns that are blank	37%	63%
Number of reporters who responded at least once but never returned a case	0	127
Number of reporters who have never responded	2	29

* Active reporter is someone who returns a card

**Response rate = cards returned/cards sent out

Table 9 Cases reported per month by disease category and type of reporter, MOSS, 1999-2006

Statistic	All Reporters			Core reporters			Sample reporters					
	Min	Max	SD	Min	Max	SD	Min	Max	SD			
Total active reporters ever in 1999-2006	379			17			362					
Mean no. of active* reporters per month	24.0	15	33	4.1	13.9	12	16	1.6	17.1	10	28	3.6
Disease group												
All cases												
Total cases	2509	/	/	/	1071	/	/	/	1438	/	/	/
Mean cases per month	26.14	7	72	11.51	17.85	6	42	6.83	14.97	3	41	7.55
Mean cases per active reporter per month	1.08	0.44	2.54	0.40	1.59	0.60	3.50	0.52	0.89	0.19	3.15	0.46
Upper limb disorders												
Total cases	1828	/	/	/	788	/	/	/	1040	/	/	/
Mean cases per month	19.04	4	54	8.68	13.13	5	33	5.40	10.83	3	25	5.18
Mean cases per active reporter per month	0.78	0.22	1.71	0.30	1.17	0.50	2.75	0.41	0.64	0.18	1.92	0.32
Spine/back disorders												
Total cases	548	/	/	/	235	/	/	/	313	/	/	/
Mean cases per month	5.71	0	17	3.73	3.92	0	11	2.41	3.26	0	14	2.98
Mean cases per active reporter per month	0.24	0	0.85	0.15	0.35	0	1.10	0.21	0.19	0	1.00	0.18
Lower limb disorders												
Total cases	218	/	/	/	109	/	/	/	109	/	/	/
Mean cases per month	2.27	0	8	1.74	1.82	0	5	1.33	1.12	0	6	1.23
Mean cases per active reporter per month	0.94	0	0.30	0.71	0.17	0	0.50	0.12	0.07	0	0.38	0.08
Other musculoskeletal												
Total cases	123	/	/	/	80	/	/	/	43	/	/	/
Mean cases per month	1.28	0	9	1.32	1.33	0	4	1.08	0.35	0	9	0.56
Mean cases per active reporter per month	0.53	0	0.39	0.55	0.12	0	0.44	0.11	0.02	0	0.12	0.03

* active reporter is someone who returns a card

/ not applicable

Mean cases per month=total cases/96

Mean cases per active reporter per month= Mean cases per month/mean number of active reporters per month

Figure 13 Number of reporters in MOSS by year and reporter type.

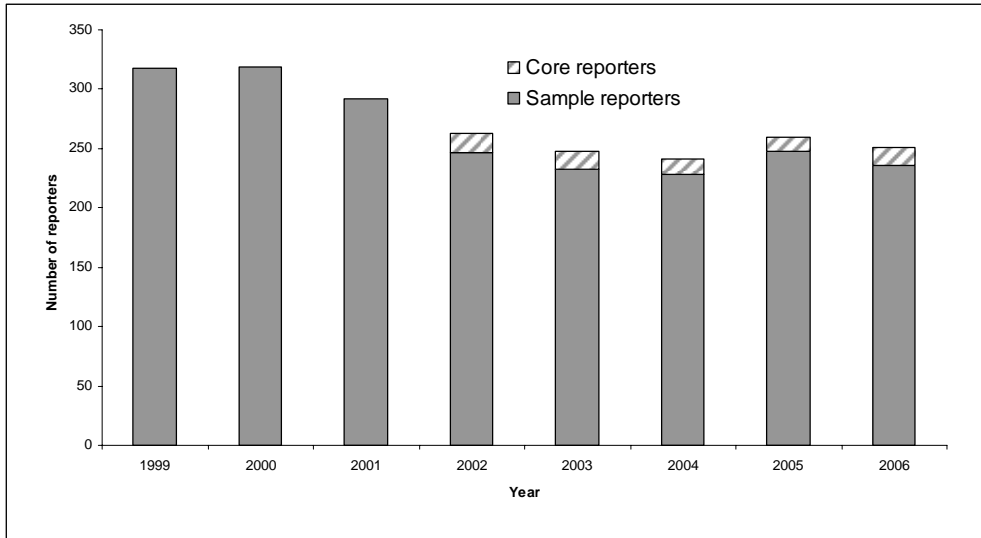
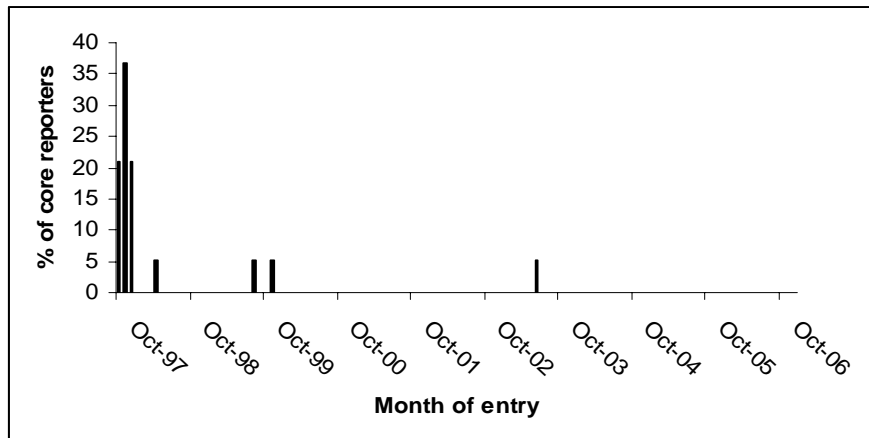


Figure 14 Percentage of reporters (reporting anytime between 1999 and 2006) by date of entry to scheme – MOSS

a) Core



b) Sample

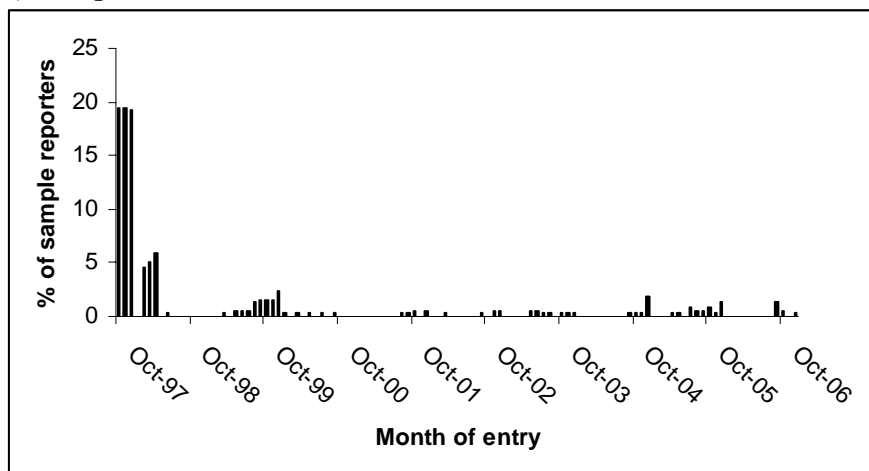


Figure 15 Number of active reporters per month - MOSS

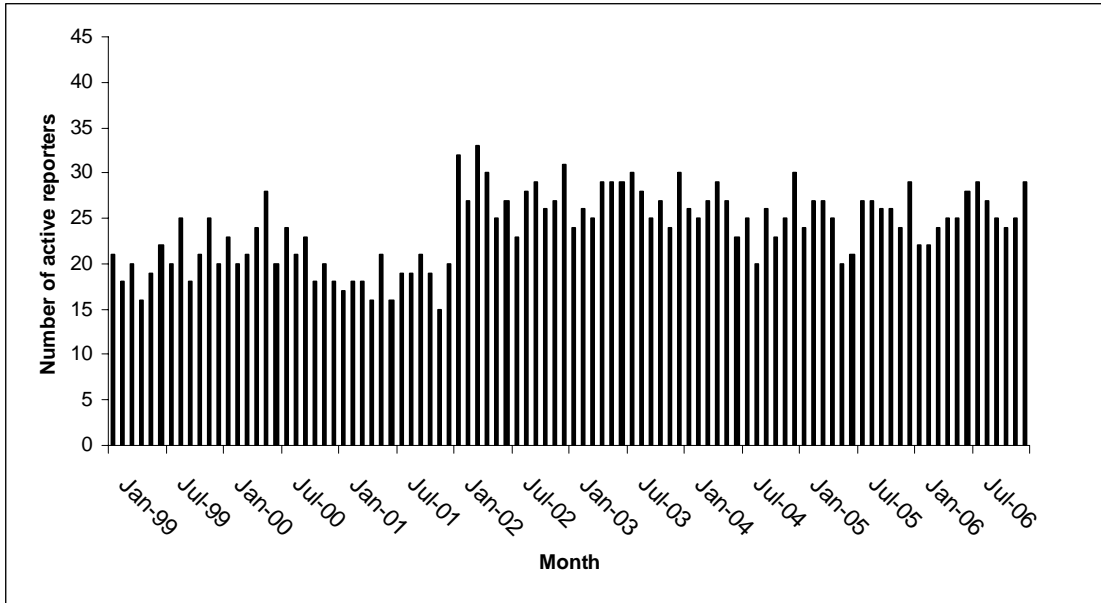
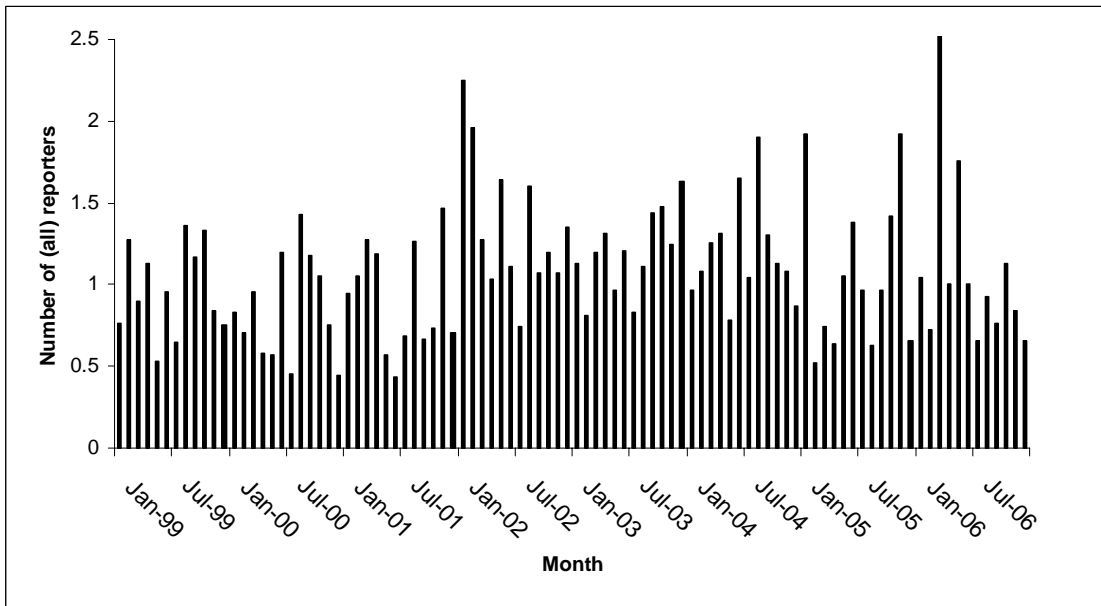
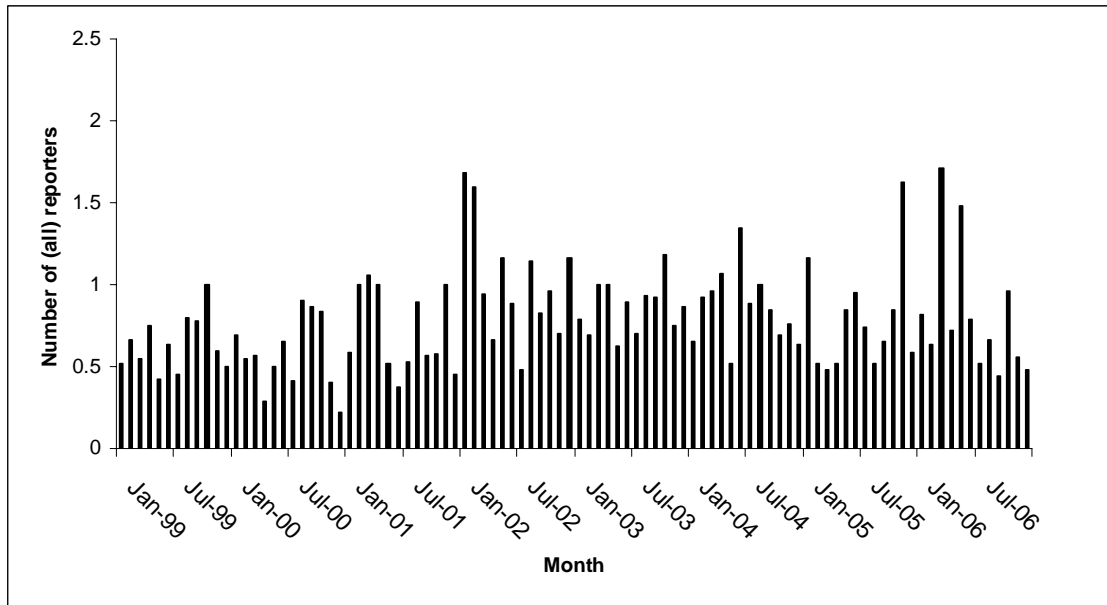


Figure 16 Cases per active reporter per month - MOSS

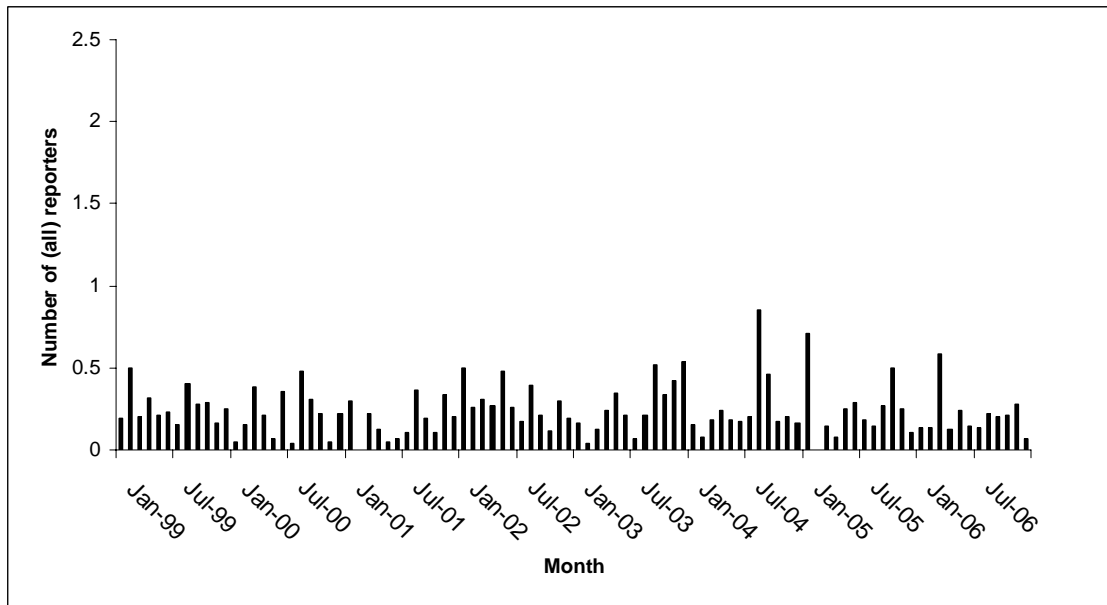
a) Total cases



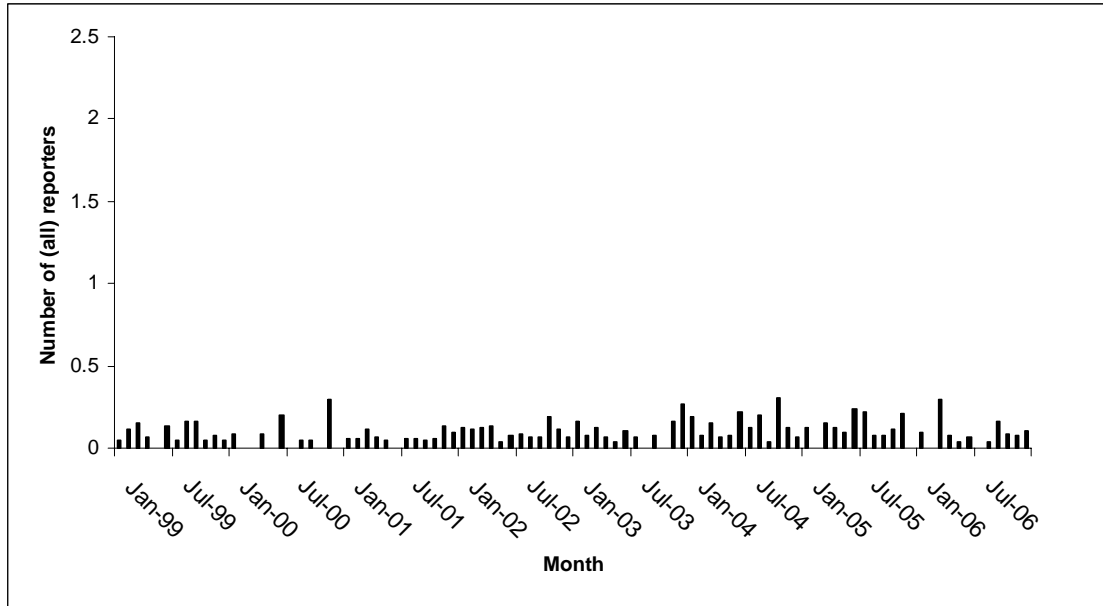
b) Upper limb disorders



c) Spine/back disorders



d) Lower limb disorders



e) Other musculoskeletal disorders

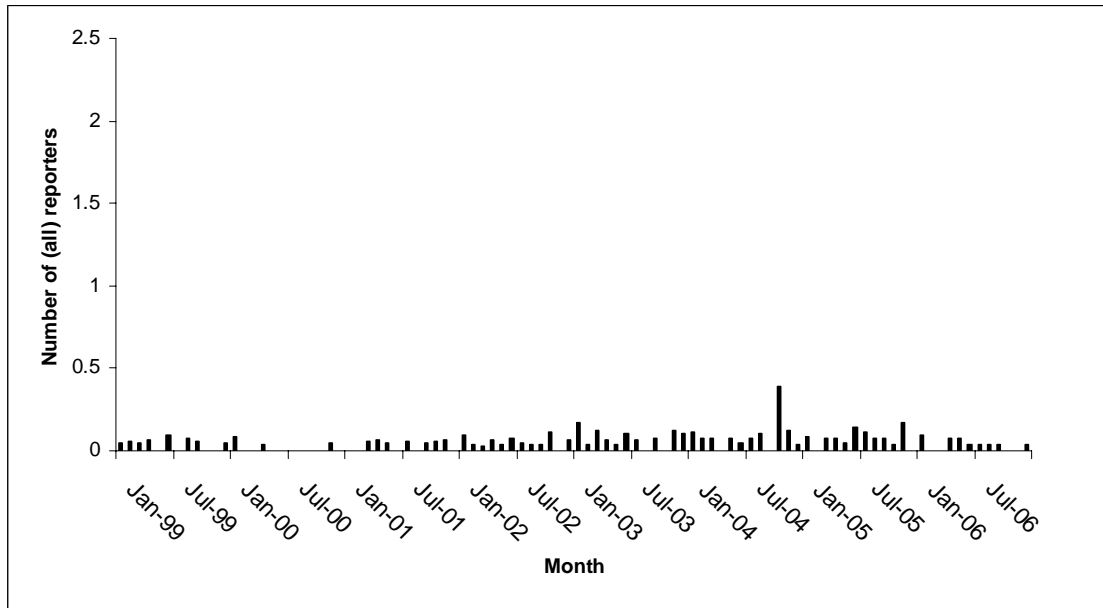


Table 10 Reporting activity of reporters in SOSMI, 1999-2006

	CORE	SAMPLE
Total reporters ever in 1999-2006	19	998
Total active* reporters in 1999-2006	19	916
Response rate**	69%	77%
% of returns that are blank	40%	75%
Number of reporters who responded at least once but never returned a case	1	456
Number of reporters who have never responded	0	82

* Active reporter is someone who returns a card

**Response rate = cards returned/cards sent out

Table 11 Cases reported per month by disease category and type of reporter, SOSMI, 1999-2006

Statistic	All Reporters			Core reporters			Sample reporters					
	Min	Max	SD	Min	Max	SD	Min	Max	SD			
Total active reporters ever in 1999-2006	935					19				916		
Mean no. of active* reporters per month	46.6	31	66	7.6	8.7	6	15	2.4	41.2	24	66	9.4
Disease group												
All cases												
Total cases	2907	/	/	/	1142	/	/	/	1765	/	/	/
Mean cases per month	30.3	8	54	9.4	19.0	6	29	4.7	18.4	4	54	9.5
Mean cases per active reporter per month	0.7	0.2	1.2	0.2	2.3	1.0	3.9	0.8	0.4	0.12	1.04	0.2
Anxiety & depression												
Total cases	2030	/	/	/	771	/	/	/	1259	/	/	/
Mean cases per month	21.1	5	38	6.9	12.9	3	22	3.9	13.1	3	38	7.1
Mean cases per active reporter per month	0.5	0.1	1.0	0.2	1.6	0.5	3.1	0.6	0.3	0.09	0.67	0.13
Other work stress												
Total cases	165	/	/	/	69	/	/	/	96	/	/	/
Mean cases per month	1.7	0	6	1.3	1.2	0	5	1.1	1.0	0	3	0.9
Mean cases per active reporter per month	0.04	0	0.2	0.03	0.1	0	0.7	0.2	0.05	0	0.17	0.04
PTSD												
Total cases	322	/	/	/	140	/	/	/	182	/	/	/
Mean cases per month	3.4	0	11	2.2	2.3	0	9	1.7	1.9	0	7	1.7
Mean cases per active reporter per month	0.1	0	0.3	0.1	0.3	0	1.3	0.2	0.02	0	0.10	0.02
Alcohol or Drug abuse												
Total cases	219	/	/	/	56	/	/	/	163	/	/	/
Mean cases per month	2.3	0	9	1.9	0.9	0	5	1.1	1.7	0	9	1.8
Mean cases per active reporter per month	0.1	0	0.2	0.04	0.1	0	0.7	0.1	0.04	0	0.21	0.04
Psychotic episode												
Total cases	70	/	/	/	16	/	/	/	54	/	/	/
Mean cases per month	0.7	0	5	1.0	0.3	0	3	0.5	0.6	0	5	0.9
Mean cases per active reporter per month	0.02	0	0.1	0.02	0.03	0	0.3	0.06	0.01	0	0.10	0.02

Statistic	All Reporters			Core reporters			Sample reporters					
	Min	Max	SD	Min	Max	SD	Min	Max	SD			
Other Total cases	230	/	/	/	131	/	/	/	99	/	/	/
psychiatric Mean cases per month	2.4	0	10	2.0	2.2	0	6	1.5	1.0	0	6	1.3
disorders Mean cases per active reporter per month	0.05	0	0.2	0.05	0.3	0	1	0.2	0.03	0	0.14	0.03

* active reporter is someone who returns a card

/ not applicable

Mean cases per month=total cases/96

Mean cases per active reporter per month= Mean cases per month/mean number of active reporters per month

Figure 17 Number of reporters in SOSMI by year and reporter type

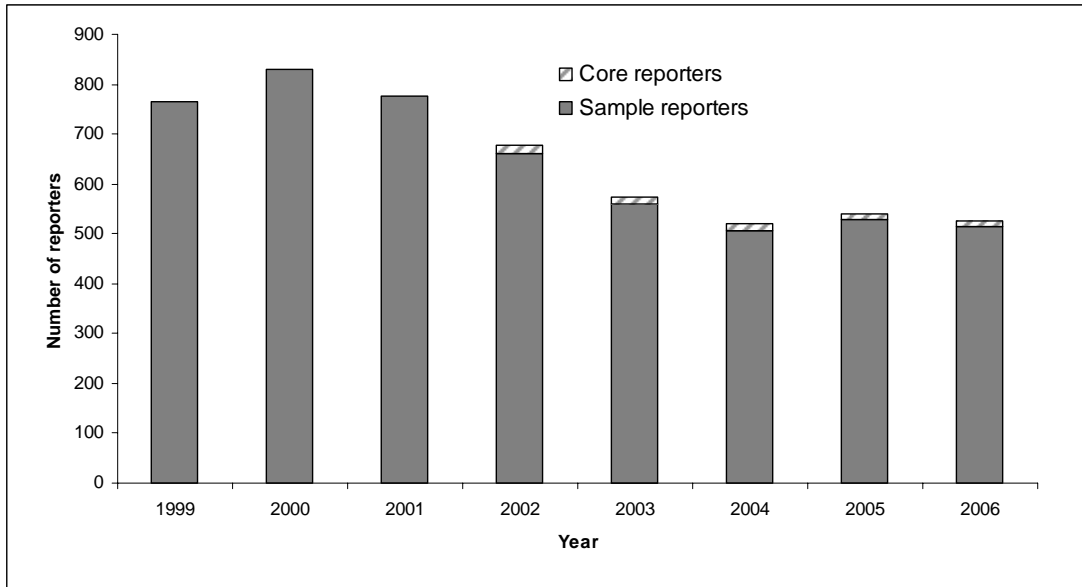
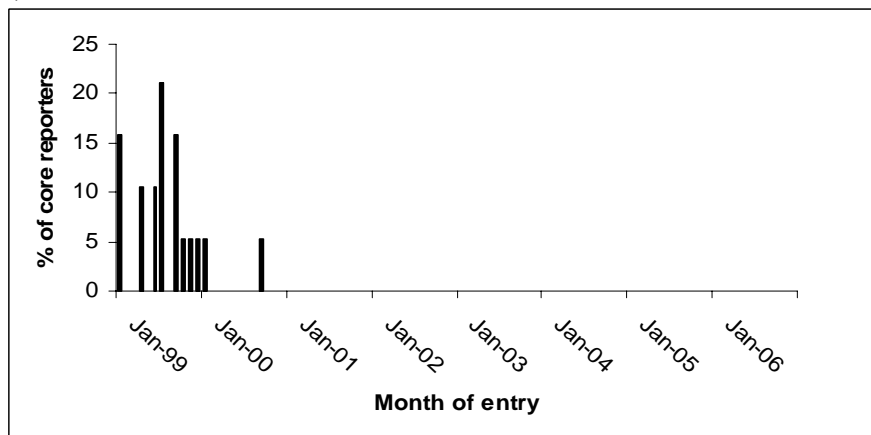


Figure 18 Percentage of reporters by date of entry to scheme – SOSMI

a) Core



b) Sample

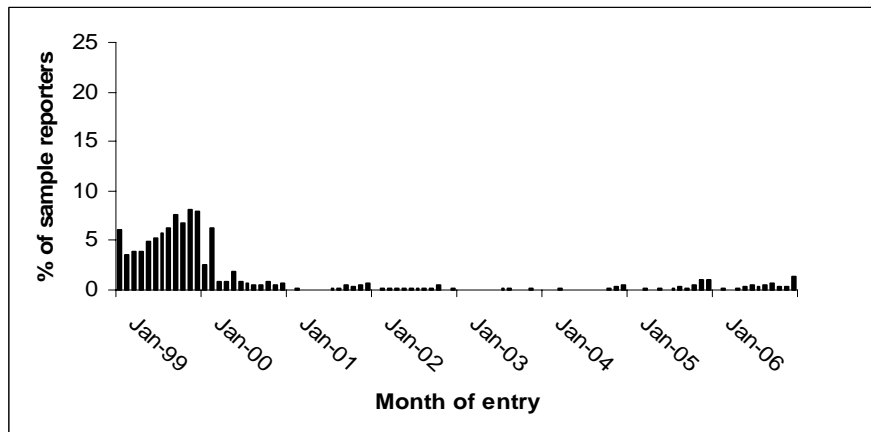


Figure 19 Number of active reporters per month - SOSMI

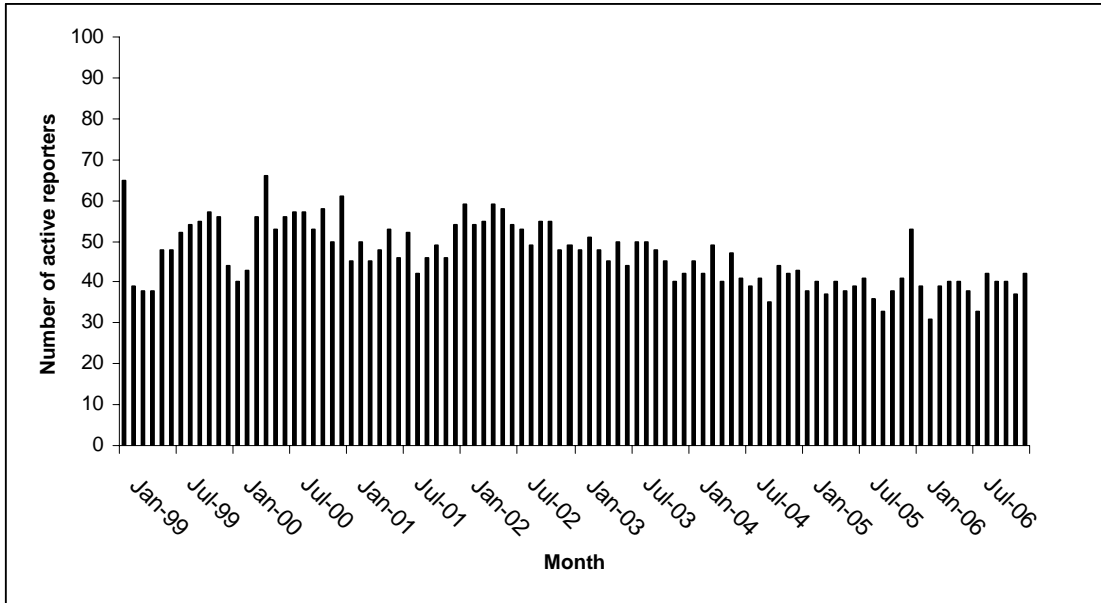
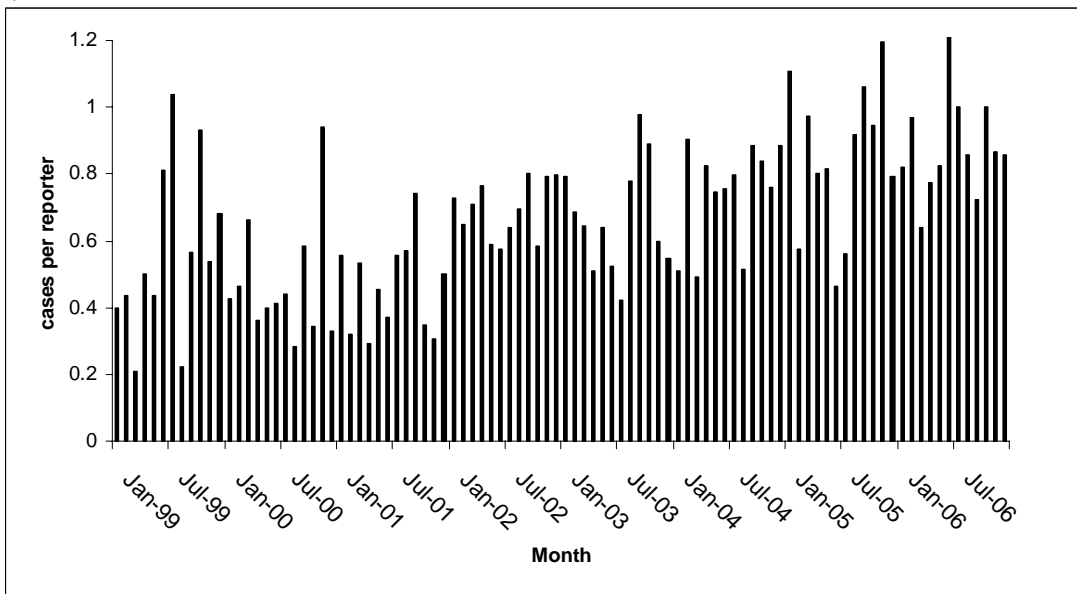
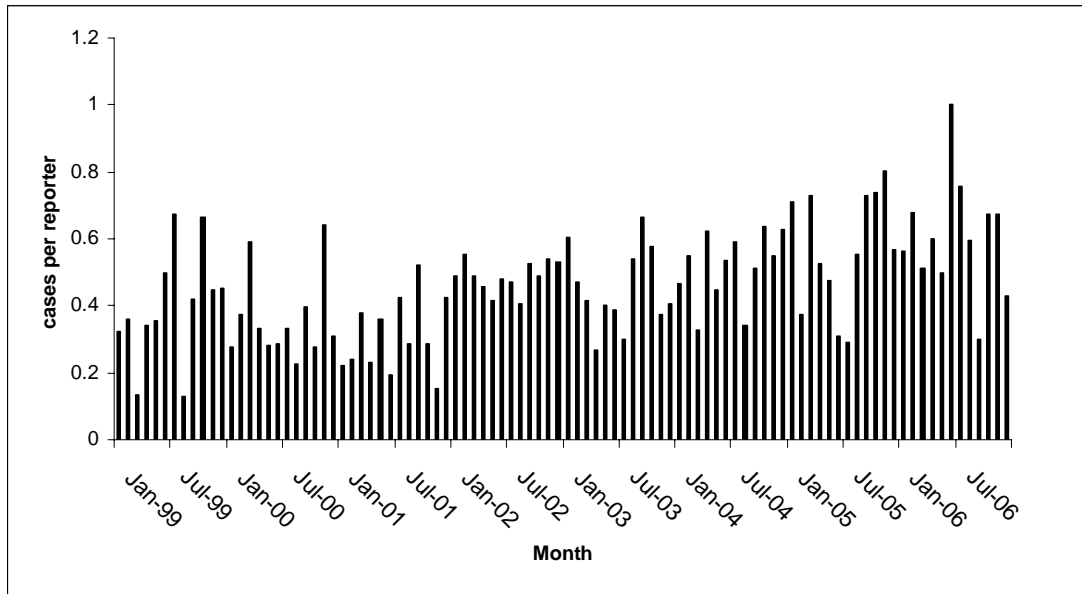


Figure 20 Cases per active reporter per month - SOSMI

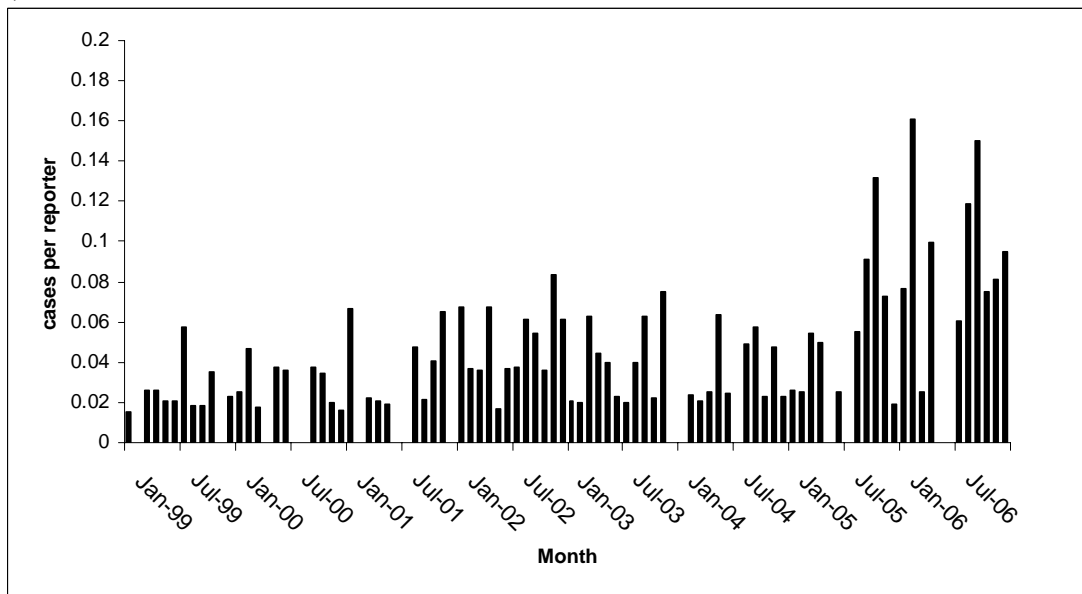
a) Total cases



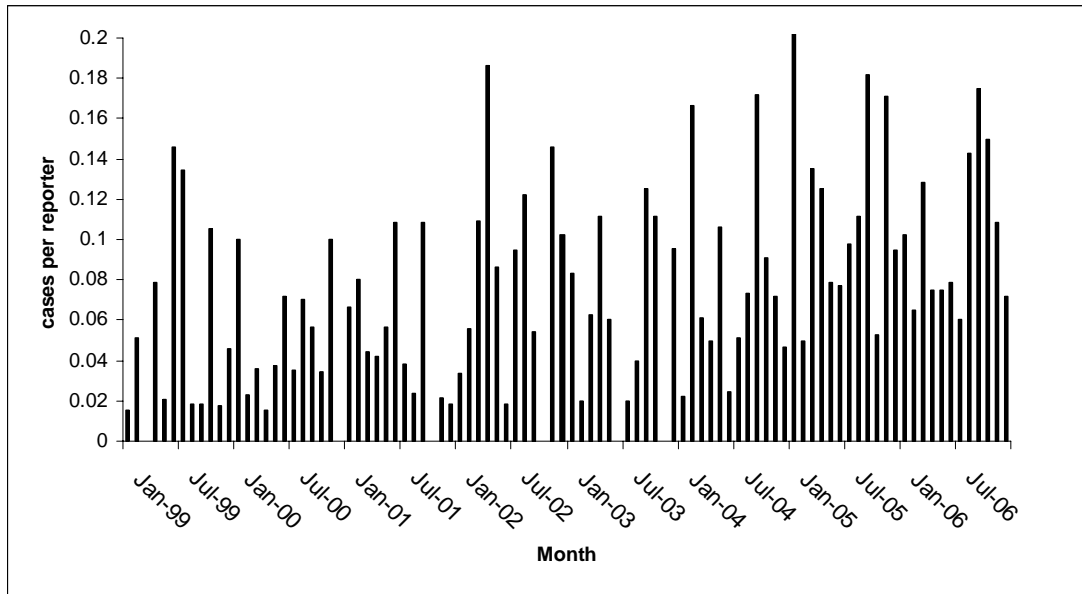
b) Anxiety and depression



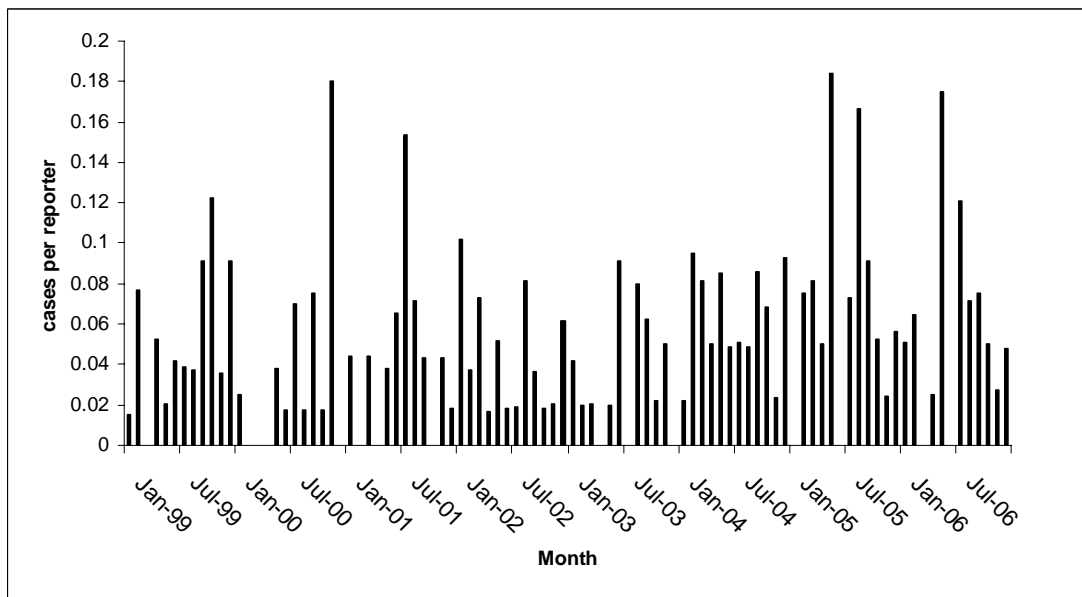
c) Other work stress



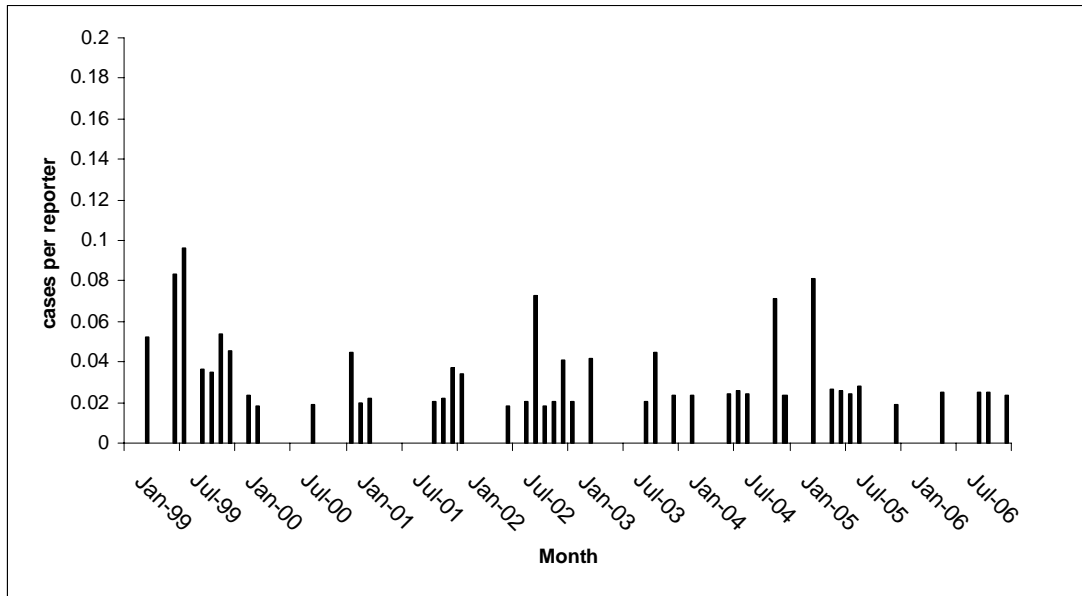
d) Post traumatic stress disorder



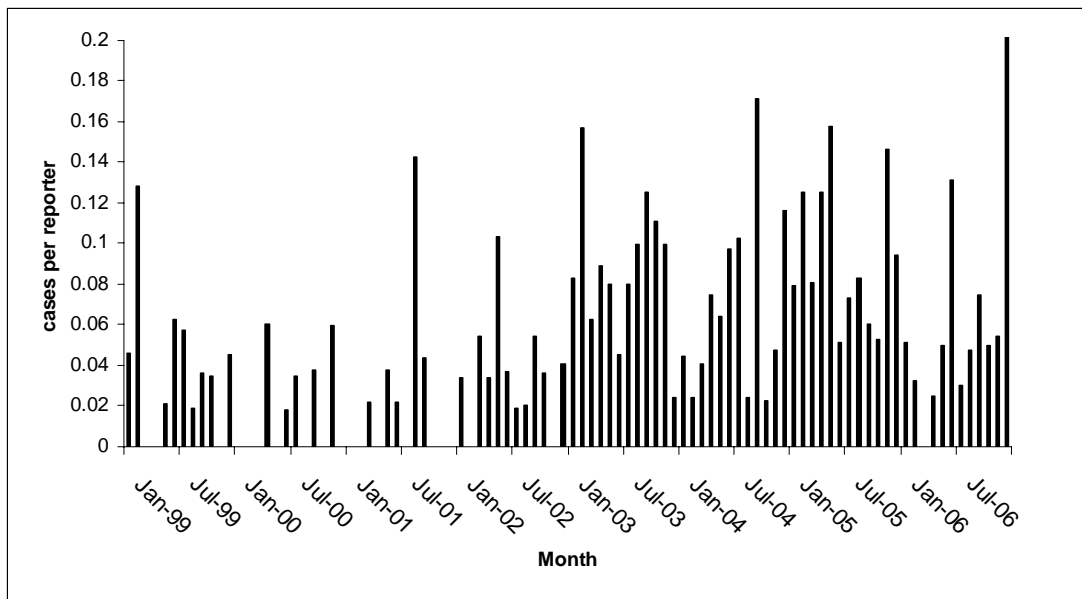
e) Alcohol and drug abuse



f) Psychotic episode



g) Other psychiatric problems



3.2. TIME TRENDS BY DISEASE CATEGORY

3.2.1. Skin disease

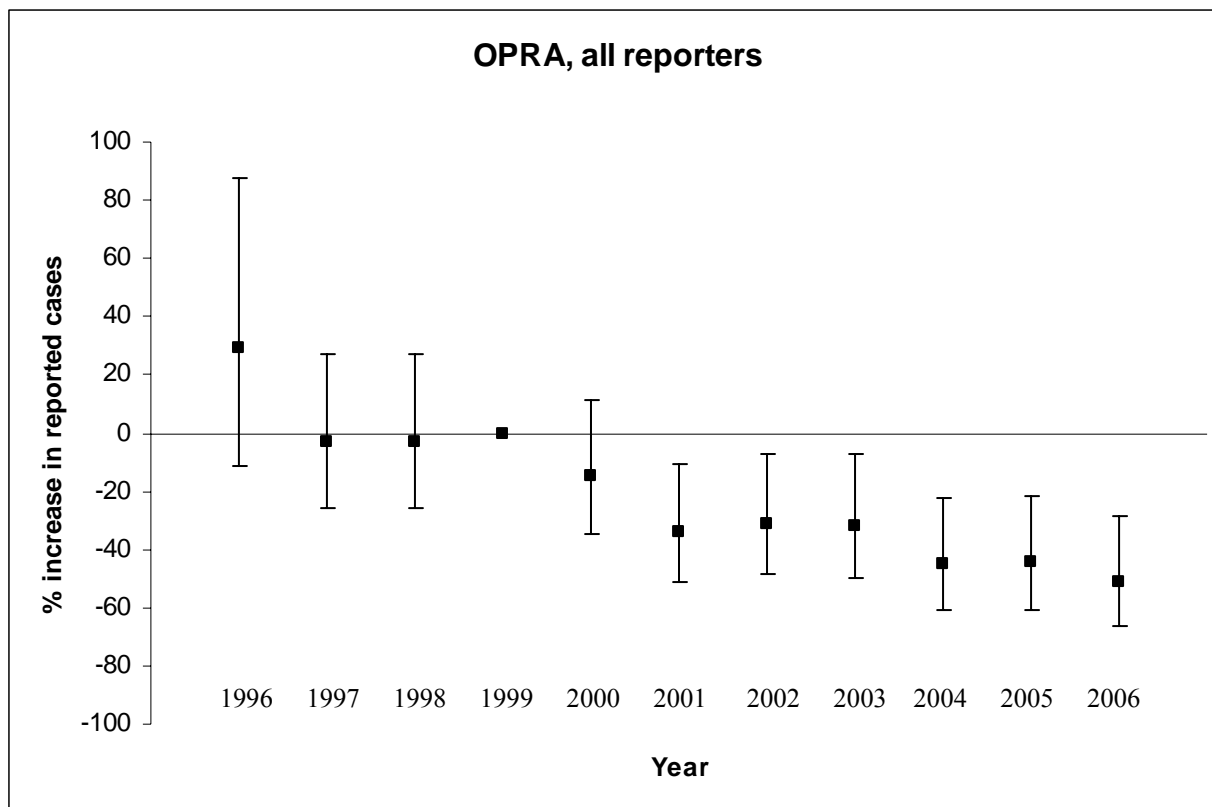
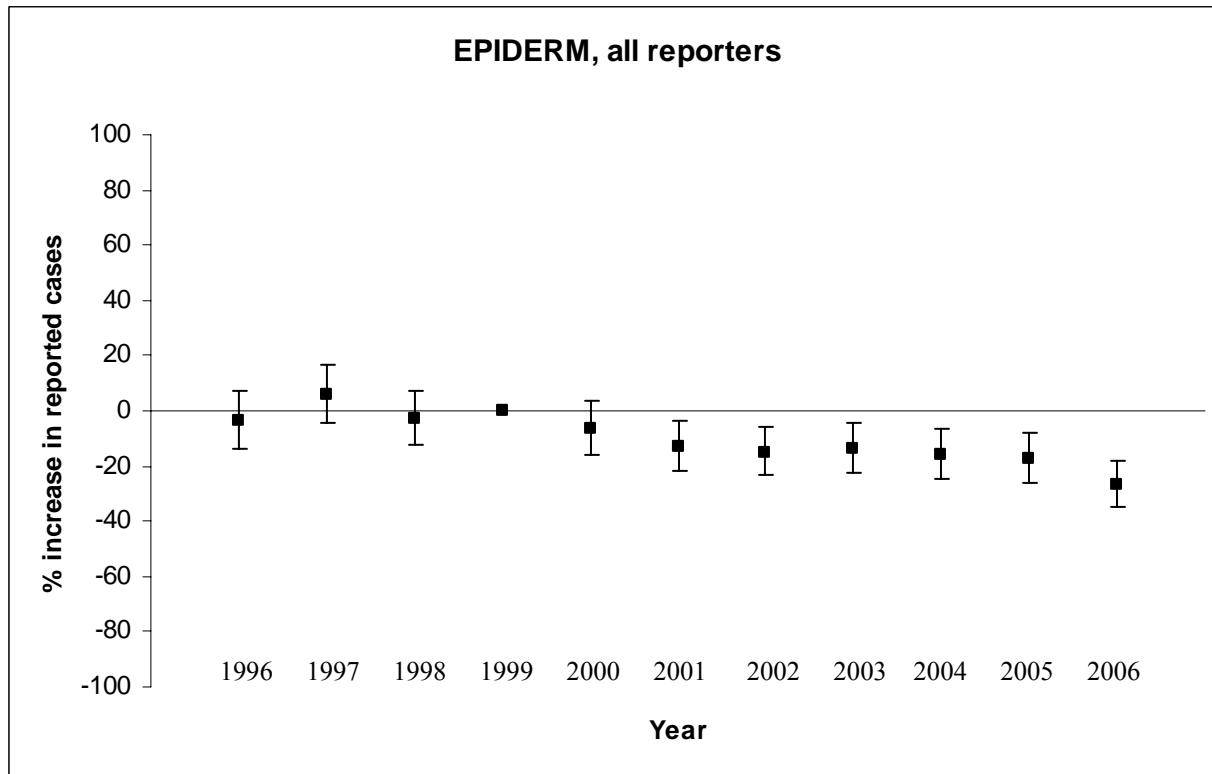
Table 12 Percentage change in incidence of (total) skin cases

Reporter Group	Year (categorical)	EPIDERM		OPRA		
		Random effects % change	Fixed effects % change	Random effects % change	Fixed effects % change	
All	1996	-3.8 (-13.7, 7.2)	-3.5 (-13.5, 7.6)	29.1 (-11.3, 87.9)	62.2 (5.5, 149.4)	
	1997	5.8 (-4.4, 17.0)	6.6 (-3.7, 17.9)	-2.9 (-25.7, 26.9)	4.9 (-20.2, 37.9)	
	1998	-2.8 (-12.2, 7.5)	-2.0 (-11.4, 8.4)	-2.8 (-25.8, 27.2)	3.0 (-21.6, 35.2)	
	1999	REFERENCE				
	2000	-6.5 (-15.7, 3.8)	-6.0 (-15.3, 4.3)	-14.7 (-34.7, 11.4)	-15.3 (-35.5, 11.2)	
	2001	-12.9 (-21.5, -3.3)	-12.8 (-21.4, -3.1)	-33.7 (-50.9, -10.5)	-37.2 (-53.8, -14.7)	
	2002	-14.9 (-23.4, -5.5)	-15.2 (-23.7, -5.8)	-31.0 (-48.7, -7.0)	-33.8 (-51.2, -10.2)	
	2003	-13.7 (-22.4, -4.1)	-14.3 (-22.9, -4.8)	-31.7 (-49.7, -7.3)	-33.0 (-51.0, -8.4)	
	2004	-15.9 (-24.3, -6.5)	-16.4 (-24.8, -7.1)	-44.7 (-60.7, -22.1)	-44.3 (-60.8, -20.8)	
	2005	-17.5 (-26.1, -8.0)	-18.5 (-27.0, -9.0)	-44.6 (-60.8, -21.8)	-45.6 (-62.2, -21.9)	
	2006	-27.0 (-34.9, -18.2)	-28.7 (-36.5, -20.0)	-51.1 (-66.5, -28.7)	-51.7 (-67.6, -28.2)	
		Year continuous ^a	-2.8 (-3.7, -2.0)	-3.1 (-3.9, -2.3)	-8.1 (-10.5, -5.5)	-9.1 (-11.8, -6.2)
		Year continuous ^b	-3.5 (-4.8, -2.3)	-3.9 (-5.2, -2.6)	-8.5 (-12.2, -4.6)	-8.1 (-12.2, -3.9)
	Core	1996	-2.5 (-13.1, 9.3)	-2.4 (-13.0, 9.5)		
1997		6.6 (-4.1, 18.6)	6.8 (-3.9, 18.8)			
1998		-2.2 (-12.1, 8.8)	-2.1 (-12.0, 9.0)			
1999		REFERENCE				
2000		-4.3 (-14.3, 6.9)	-4.5 (-14.5, 6.7)			
2001		-12.6 (-21.8, -2.4)	-12.8 (-22.0, -2.6)			
2002		-15.1 (-24.1, -5.2)	-15.4 (-24.3, -5.4)			
2003		-11.3 (-20.6, -0.9)	-11.5 (-20.8, -1.1)			
2004		-15.8 (-24.7, -5.9)	-16.1 (-24.9, -6.1)			
2005		-17.1 (-26.2, -6.9)	-17.2 (-26.3, -7.0)			
2006		-29.1 (-37.3, -19.9)	-29.6 (-37.8, -20.4)			
		Year continuous ^a	-3.0 (-3.9, -2.2)	-3.1 (-3.9, -2.2)		
		Year continuous ^b	-3.8 (-5.1, -2.5)	-3.9 (-5.2, -2.5)		
Sample		1996	-30.6 (-51.8, -0.0)	-28.5 (-50.9, 4.2)		
	1997	4.7 (-24.5, 45.2)	11.4 (-19.8, 54.7)			
	1998	-8.2 (-32.3, 24.6)	-1.5 (-27.6, 34.0)			
	1999	REFERENCE				
	2000	-20.4 (-41.0, 7.4)	-18.0 (-39.5, 11.3)			
	2001	-10.7 (-33.8, 20.5)	-10.1 (-33.7, 22.0)			
	2002	-9.5 (-34.0, 24.0)	-12.4 (-36.5, 21.0)			
	2003	-33.9 (-53.1, -7.0)	-37.8 (-56.3, -11.4)			
	2004	-17.7 (-40.2, 13.3)	-22.4 (-44.3, 8.1)			
	2005	-17.9 (-40.8, 13.8)	-25.2 (-47.0, 5.5)			
	2006	-4.6 (-30.4, 31.0)	-17.5 (-41.7, 16.7)			
		Year continuous ^a	-0.4 (-3.1, 2.3)	-2.4 (-5.4, 0.6)		
		Year continuous ^b	-1.6 (-5.5, 2.4)	-4.6 (-8.7, -0.2)		

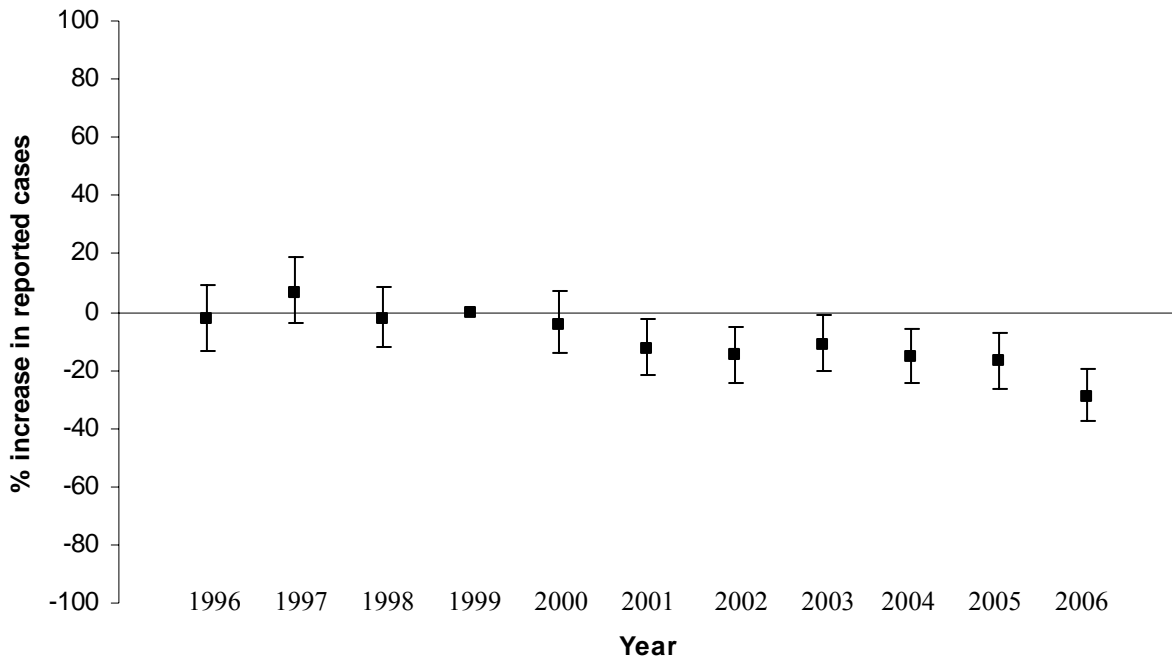
^a Calendar year continuous 1996-2006

^c Calendar year continuous 1999-2006

Figure 21 Percentage change (and 95% confidence intervals) in the incidence of total skin diseases



EPIDERM, core reporters



EPIDERM, sample reporters

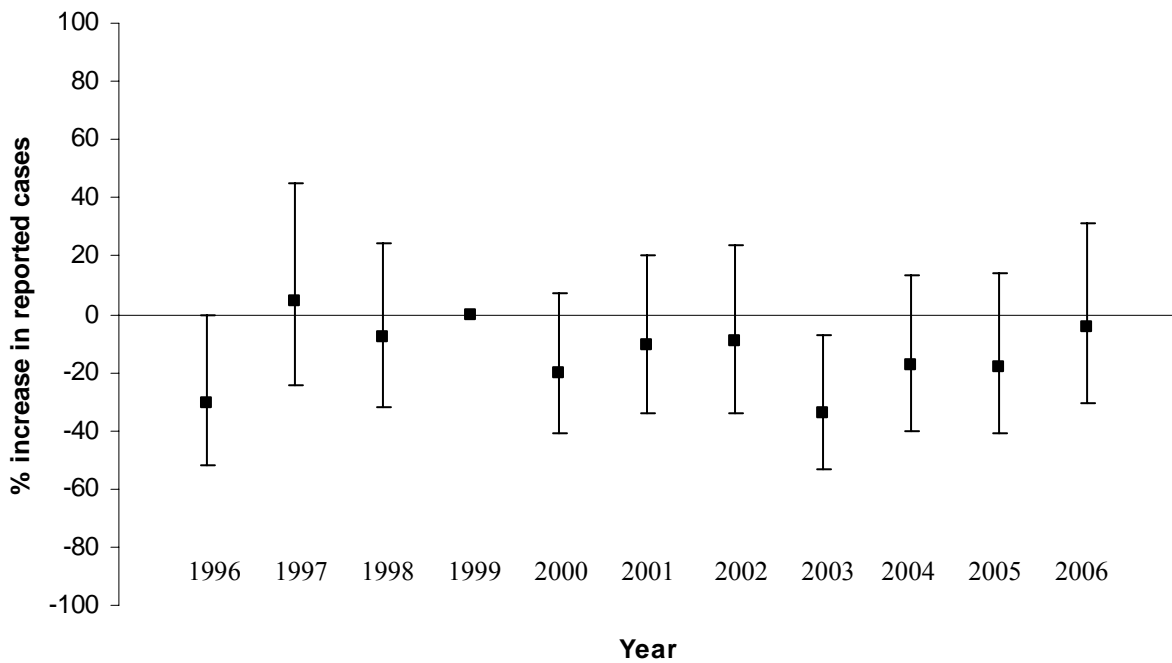


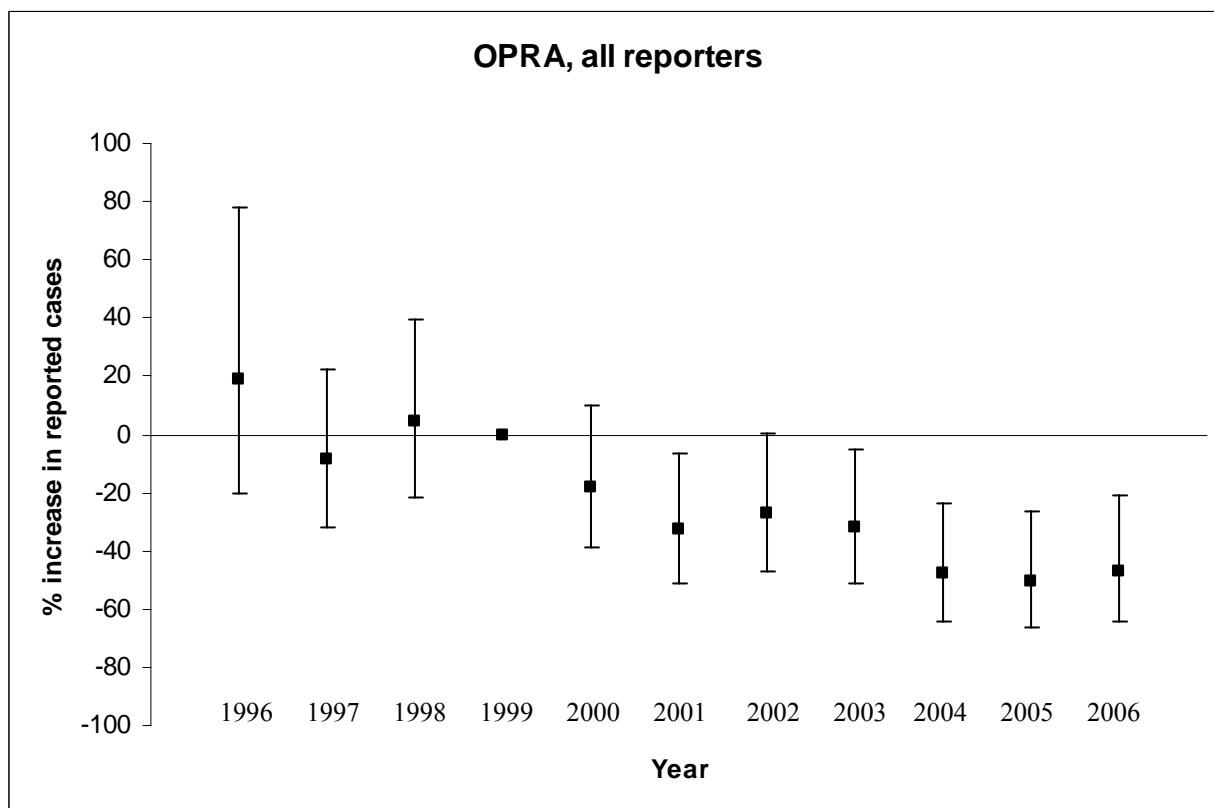
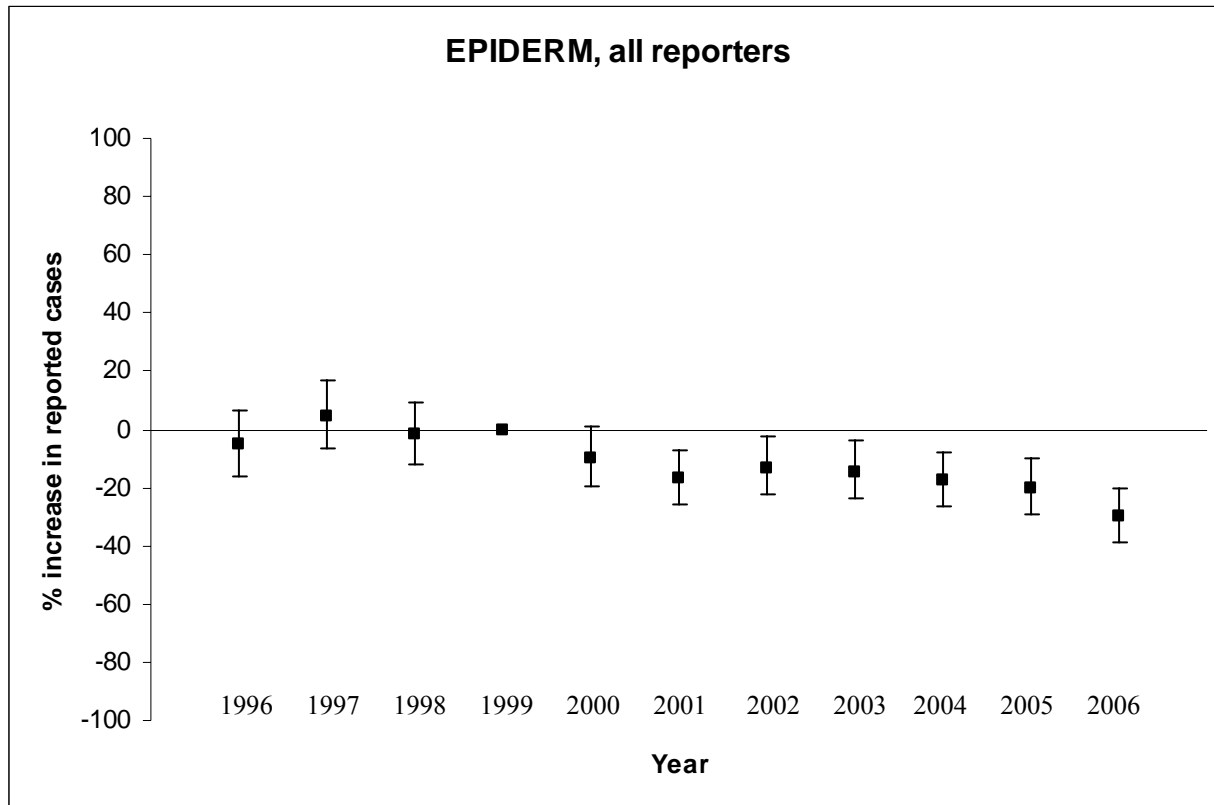
Table 13 Percentage change in incidence of contact dermatitis cases

Reporter Group	Year (categorical)	EPIDERM		OPRA	
		Random effects % change	Fixed effects % change	Random effects % change	Fixed effects % change
All	1996	-5.4 (-16.0, 6.5)	-5.3 (-16.0, 6.6)	19.1 (-20.2, 77.8)	51.6 (-4.5, 140.7)
	1997	4.5 (-6.3, 16.6)	5.2 (-5.7, 17.4)	-8.8 (-32.2, 22.6)	-0.5 (-26.5, 34.7)
	1998	-1.9 (-12.1, 9.4)	-1.2 (-11.4, 10.3)	4.5 (-21.6, 39.2)	11.7 (-16.6, 49.5)
	1999	REFERENCE			
	2000	-9.8 (-19.5, 1.1)	-9.5 (-19.3, 1.4)	-18.2 (-39.0, 9.8)	-18.2 (-39.4, 10.6)
	2001	-17.1 (-26.1, -7.0)	-17.0 (-26.1, -6.8)	-32.6 (-51.4, -6.7)	-36.3 (-54.3, -11.1)
	2002	-13.2 (-22.5, -2.7)	-13.3 (-22.7, -2.8)	-27.0 (-46.9, 0.4)	-30.0 (-49.6, -2.7)
	2003	-14.6 (-23.9, -4.1)	-15.2 (-24.5, -4.7)	-31.9 (-51.3, -4.9)	-33.6 (-52.9, -6.3)
	2004	-17.7 (-26.7, -7.6)	-18.1 (-27.1, -7.9)	-47.7 (-64.3, -23.4)	-47.3 (-64.4, -22.0)
	2005	-20.4 (-29.5, -10.2)	-21.1 (-30.2, -10.8)	-50.4 (-66.4, -26.7)	-51.1 (-67.5, -26.3)
	2006	-30.1 (-38.5, -20.6)	-31.4 (-39.7, -21.8)	-47.0 (-64.4, -21.2)	-48.2 (-66.0, -21.0)
		Year continuous ^a	-3.1 (-4.0, -2.2)	-3.3 (-4.2, -2.3)	-7.9 (-10.6, -5.1)
	Year continuous ^b	-3.9 (-5.3, -2.5)	-4.2 (-5.6, -2.8)	-9.1 (-13.1, -4.9)	-8.9 (-13.3, -4.4)
Core	1996	-4.0 (-15.3, 9.0)	-3.7 (-15.1, 9.3)		
	1997	6.7 (-5.0, 19.8)	7.0 (-4.8, 20.2)		
	1998	0.4 (-10.6, 12.8)	0.5 (-10.5, 12.9)		
	1999	REFERENCE			
	2000	-7.0 (-17.7, 5.1)	-7.1 (-17.8, 4.9)		
	2001	-14.4 (-24.3, -3.2)	-14.5 (-24.4, -3.3)		
	2002	-11.6 (-21.7, -0.2)	-11.8 (-21.9, -0.4)		
	2003	-10.3 (-20.6, 1.4)	-10.4 (-20.7, 1.2)		
	2004	-14.6 (-24.4, -3.5)	-14.7 (-24.6, -3.6)		
	2005	-18.6 (-28.5, -7.3)	-18.6 (-28.5, -7.4)		
	2006	-28.9 (-38.0, -18.4)	-29.4 (-38.5, -18.9)		
		Year continuous ^a	-2.9 (-3.9, -2.0)	-3.0 (-3.9, -2.0)	
	Year continuous ^b	-3.8 (-5.3, -2.3)	-3.8 (-5.3, -2.3)		
Sample	1996	-33.7 (-54.9, -2.6)	-32.4 (-54.4, 0.3)		
	1997	-9.0 (-35.6, 28.7)	-4.1 (-32.2, 35.6)		
	1998	-18.7 (-41.4, 12.8)	-12.7 (-37.1, 21.1)		
	1999	REFERENCE			
	2000	-28.7 (-48.1, -2.0)	-27.8 (-47.7, -0.3)		
	2001	-33.7 (-52.4, -7.7)	-34.9 (-53.5, -9.0)		
	2002	-21.9 (-44.3, 9.6)	-25.6 (-47.4, 5.1)		
	2003	-46.8 (-63.5, -22.4)	-51.1 (-66.8, -27.9)		
	2004	-42.4 (-60.2, -16.6)	-46.6 (-63.6, -21.7)		
	2005	-34.2 (-53.9, -5.9)	-41.2 (-59.6, -14.3)		
	2006	-36.7 (-56.0, -9.1)	-45.7 (-63.5, -19.1)		
		Year continuous ^a	-3.4 (-6.3, -0.4)	-5.3 (-8.5, -1.9)	
	Year continuous ^b	-5.7 (-9.9, -1.2)	-8.4 (-12.9, -3.6)		

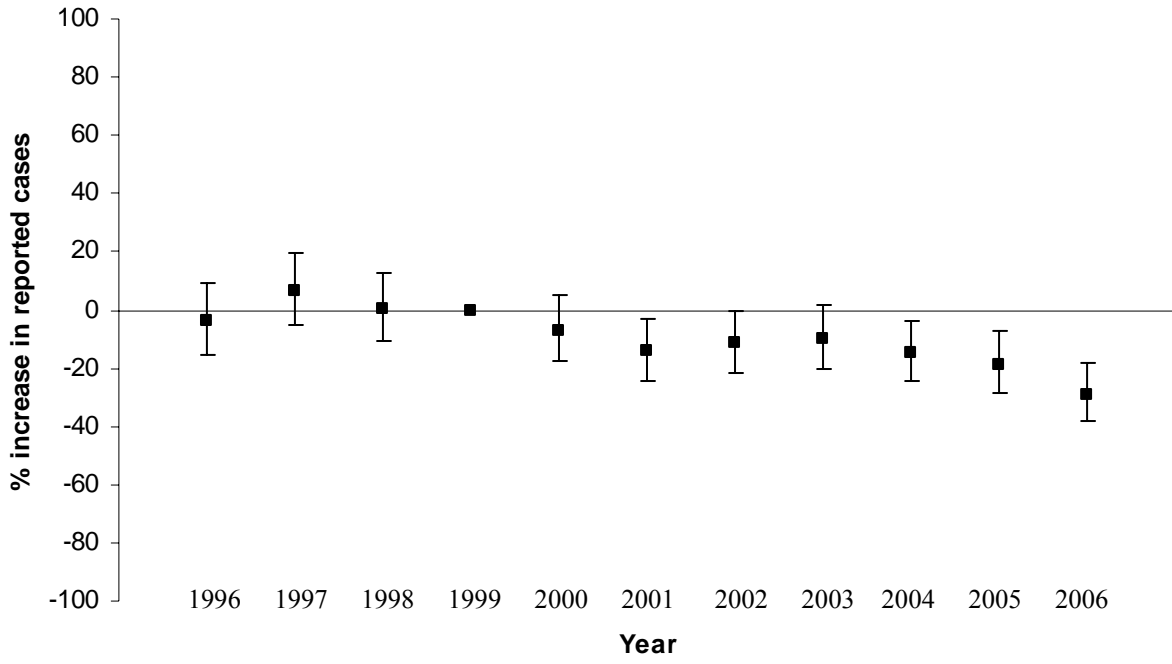
^a Calendar year continuous 1996-2006

^c Calendar year continuous 1999-2006

Figure 22 Percentage change (and 95% confidence intervals) in the incidence of contact dermatitis



EPIDERM, core reporters



EPIDERM, sample reporters

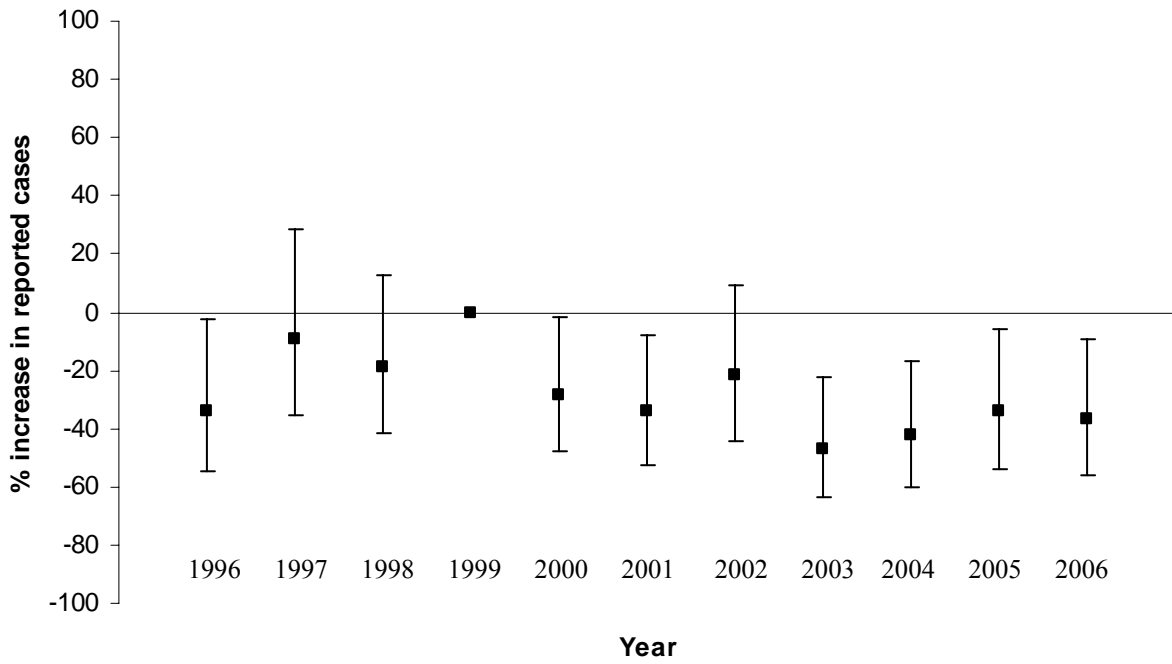


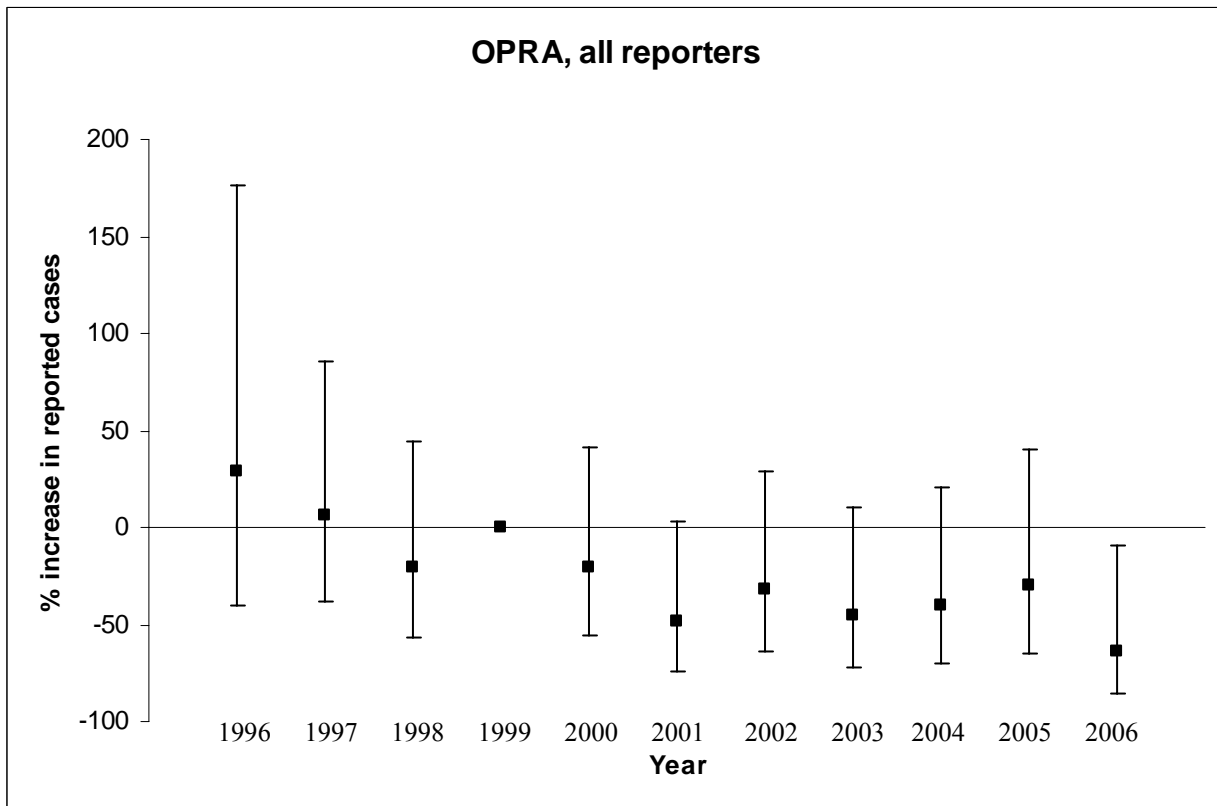
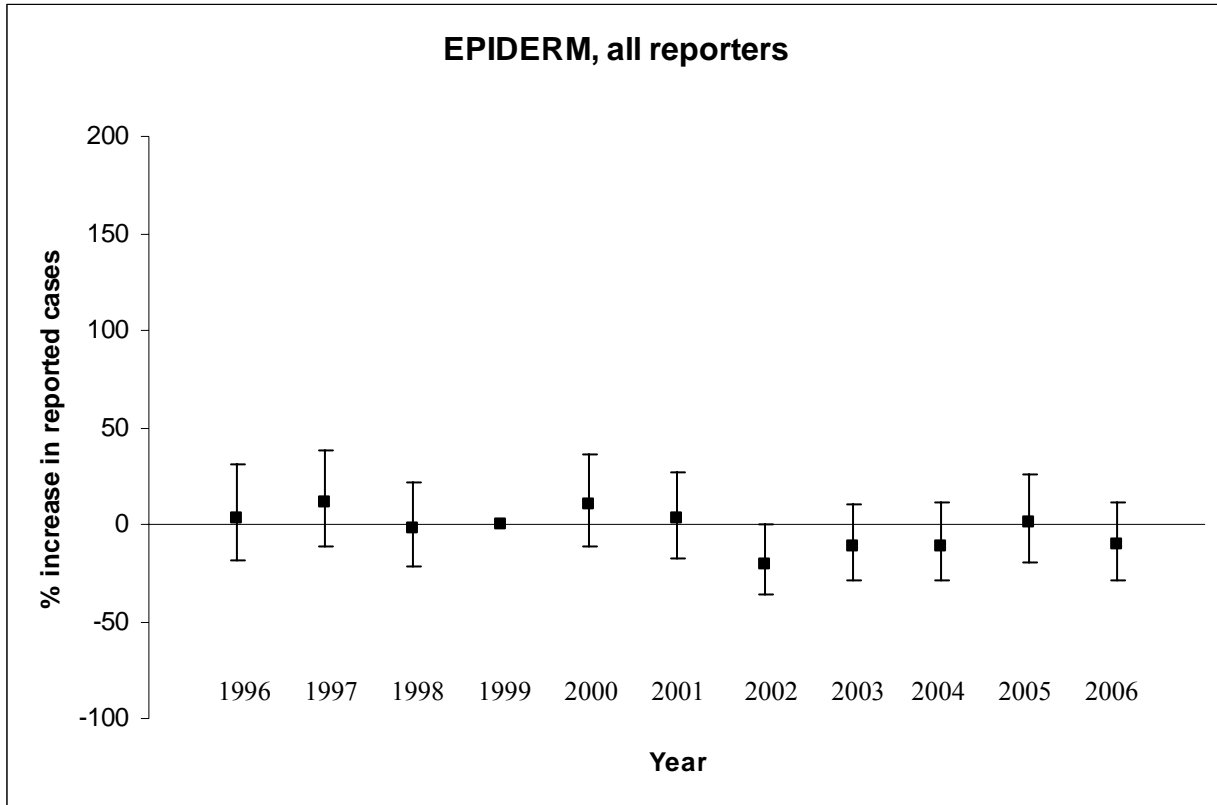
Table 14 Percentage change in incidence of other (other than contact dermatitis) cases

Reporter Group	Year (categorical)	EPIDERM		OPRA	
		Random effects % change	Fixed effects % change	Random effects % change	Fixed effects % change
All	1996	3.5 (-18.1, 30.8)	4.1 (-17.1, 30.8)	28.8 (-40.0, 176.4)	67.2 (-34.6, 327.6)
	1997	11.1 (-11.0, 38.5)	11.2 (-10.3, 38.0)	6.7 (-38.6, 85.3)	8.4 (-39.8, 95.3)
	1998	-2.1 (-21.4, 21.9)	-2.5 (-21.3, 20.8)	-21.0 (-56.8, 44.4)	-19.4 (-56.7, 50.2)
	1999	REFERENCE			
	2000	10.1 (-11.1, 36.4)	10.5 (-10.2, 36.1)	-21.1 (-55.8, 41.0)	-26.1 (-59.7, 35.3)
	2001	2.7 (-17.1, 27.3)	1.7 (-17.4, 25.3)	-48.4 (-74.2, 3.1)	-50.3 (-75.6, 1.4)
	2002	-20.3 (-36.4, 0.0)	-21.9 (-37.3, -2.7)	-32.3 (-64.4, 28.7)	-34.8 (-66.4, 26.4)
	2003	-11.7 (-29.2, 10.2)	-13.6 (-30.3, 7.1)	-45.2 (-72.6, 9.8)	-47.2 (-74.3, 8.4)
	2004	-11.1 (-28.8, 11.0)	-13.5 (-30.3, 7.4)	-40.2 (-70.4, 20.5)	-37.0 (-69.9, 31.9)
	2005	0.7 (-19.1, 25.3)	-2.7 (-21.4, 20.4)	-29.5 (-64.5, 40.0)	-28.2 (-65.8, 50.6)
	2006	-10.8 (-28.8, 11.7)	-17.3 (-33.9, 3.4)	-63.5 (-85.3, -9.2)	-58.4 (-84.3, 10.4)
		Year continuous ^a	-1.7 (-3.3, -0.1)	-2.3 (-3.9, -0.7)	-8.3 (-13.5, -2.8)
	Year continuous ^b	-1.7 (-4.2, 0.9)	-2.7 (-5.1, -0.2)	-5.8 (-14.0, 3.1)	-3.4 (-12.7, 6.8)
Core	1996	4.8 (-17.5, 33.0)	4.0 (-18.1, 32.1)		
	1997	5.0 (-16.3, 31.8)	4.7 (-16.6, 31.4)		
	1998	-9.4 (-27.8, 13.8)	-9.3 (-27.7, 13.9)		
	1999	REFERENCE			
	2000	9.9 (-11.8, 36.9)	9.4 (-12.1, 36.2)		
	2001	-5.0 (-23.9, 18.5)	-5.5 (-24.2, 17.9)		
	2002	-25.9 (-41.2, -6.6)	-26.3 (-41.5, -7.1)		
	2003	-16.1 (-33.1, 5.1)	-16.6 (-33.4, 4.5)		
	2004	-21.1 (-37.3, -0.7)	-21.4 (-37.5, -1.2)		
	2005	-3.8 (-23.0, 20.3)	-3.9 (-23.1, 20.0)		
	2006	-28.2 (-43.5, -8.7)	-28.4 (-43.7, -9.0)		
		Year continuous ^a	-2.9 (-4.6, -1.2)	-2.9 (-4.6, -1.2)	
	Year continuous ^b	-3.3 (-5.9, -0.7)	-3.4 (-5.9, -0.7)		
Sample	1996	-21.0 (-62.9, 68.1)	-15.3 (-61.1, 84.6)		
	1997	70.4 (-9.9, 222.1)	94.3 (0.52, 75.7)		
	1998	42.9 (-21.0, 158.4)	56.4 (-15.3, 188.8)		
	1999	REFERENCE			
	2000	6.3 (-42.3, 96.0)	21.0 (-35.3, 126.0)		
	2001	63.5 (-9.2, 194.3)	90.8 (3.42, 52.1)		
	2002	23.5 (-35.1, 135.0)	30.1 (-33.3, 153.7)		
	2003	7.1 (-43.9, 104.6)	8.5 (-45.1, 114.4)		
	2004	76.7 (-1.8, 218.0)	83.3 (-1.7, 241.8)		
	2005	25.8 (-34.4, 141.3)	27.8 (-36.4, 156.9)		
	2006	167.1 (51.8, 370.1)	159.1 (37.1, 389.5)		
		Year continuous ^a	6.2 (1.3, 11.3)	4.3 (-1.4, 10.2)	
	Year continuous ^b	8.5 (1.3, 16.1)	5.3 (-2.7, 14.0)		

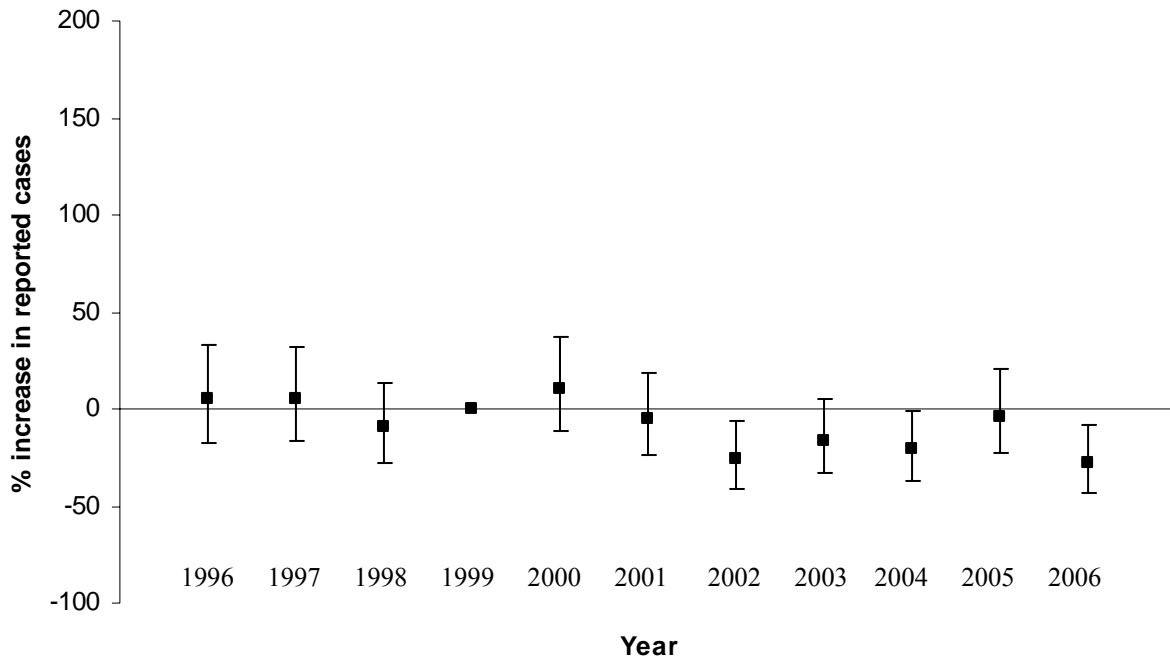
^a Calendar year continuous 1996-2006

^c Calendar year continuous 1999-2006

Figure 23 Percentage change (and 95% confidence intervals) in the incidence of other (other than contact dermatitis) skin disease



EPIDERM, core reporters



EPIDERM, sample reporters

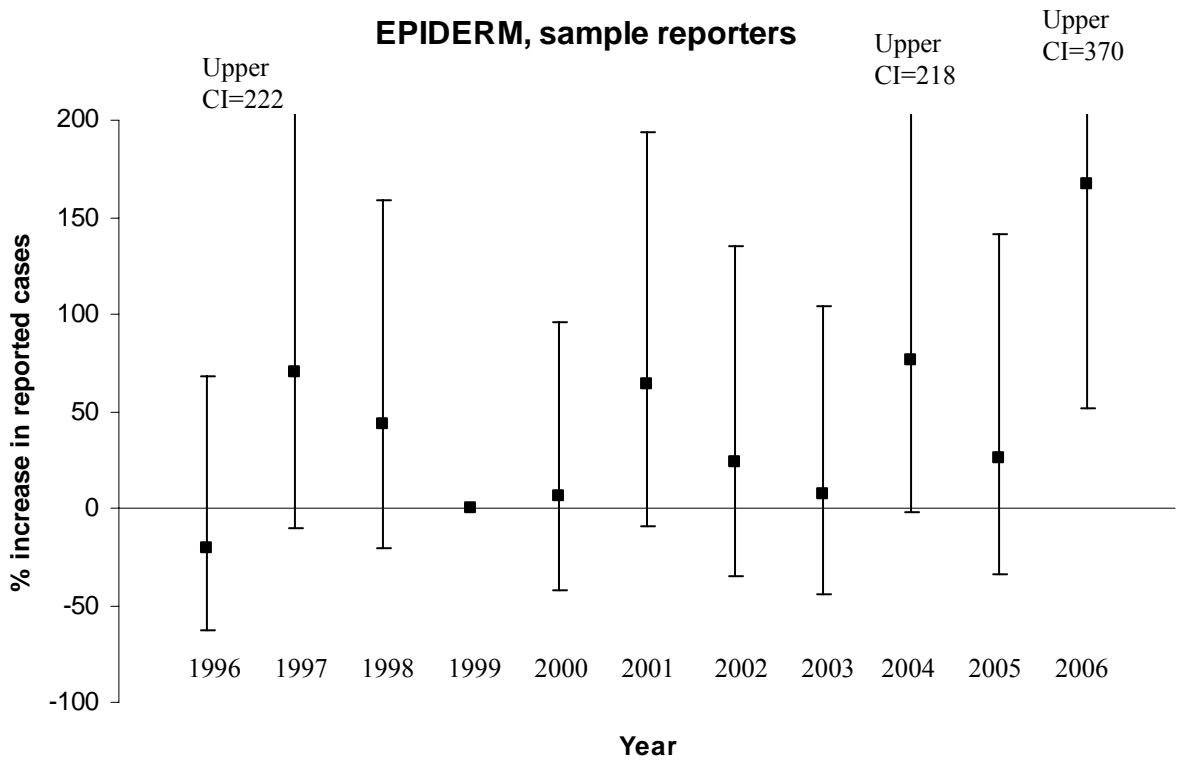


Table 15 Percentage change in incidence of contact urticaria cases

		EPIDERM		
Reporter Group	Year (categorical)	Random effects % change	Fixed effects % change	
All	1996	-14.4 (-45.6, 34.7)	-13.8 (-45.2, 35.6)	
	1997	24.5 (-15.3, 83.1)	26.6 (-13.9, 86.1)	
	1998	-0.3 (-33.4, 49.3)	1.0 (-32.6, 51.2)	
	1999	REFERENCE		
	2000	38.0 (-5.4, 101.2)	36.6 (-6.3, 99.2)	
	2001	-13.5 (-42.6, 30.5)	-13.4 (-42.7, 30.7)	
	2002	-3.6 (-35.4, 43.8)	-4.4 (-36.0, 42.9)	
	2003	6.4 (-28.2, 57.6)	5.7 (-28.8, 56.8)	
	2004	-14.9 (-43.7, 28.6)	-15.3 (-44.0, 28.2)	
	2005	16.5 (-22.2, 74.6)	16.7 (-22.3, 75.3)	
	2006	-27.8 (-54.4, 14.3)	-30.1 (-56.4, 11.9)	
		Year continuous^a	-1.7 (-4.7, 1.3)	-2.0 (-4.9, 1.1)
		Year continuous^b	-3.4 (-7.9, 1.3)	-3.6 (-8.1, 1.2)
Core	1996	-11.4 (-45.0, 42.7)	-10.2 (-44.2, 44.6)	
	1997	32.2 (-11.6, 97.6)	33.7 (-10.6, 99.8)	
	1998	4.3 (-31.7, 59.2)	4.9 (-31.3, 60.1)	
	1999	REFERENCE		
	2000	48.8 (0.31, 120.9)	47.0 (-0.9, 118.1)	
	2001	-10.2 (-41.7, 38.1)	-11.8 (-42.7, 35.7)	
	2002	4.0 (-31.4, 57.6)	2.4 (-32.4, 55.2)	
	2003	14.8 (-23.8, 72.8)	12.9 (-25.0, 70.0)	
	2004	-12.3 (-43.1, 35.2)	-13.5 (-43.9, 33.4)	
	2005	24.5 (-18.4, 89.9)	24.2 (-18.6, 89.4)	
	2006	-32.2 (-58.6, 11.0)	-35.1 (-60.9, 7.5)	
		Year continuous^a	-2.0 (-5.0, 1.2)	-2.2 (-5.3, 0.9)
		Year continuous^b	-4.0 (-8.6, 0.9)	-4.0 (-8.7, 0.9)
Sample	1996	-43.7 (-89.5, 203.2)	-76.8 (-97.2, 93.8)	
	1997	-43.7 (-89.5, 201.3)	-60.8 (-94.5, 181.2)	
	1998	-37.5 (-85.3, 166.2)	-48.0 (-89.6, 161.6)	
	1999	REFERENCE		
	2000	-49.4 (-88.3, 118.0)	-57.1 (-91.4, 115.4)	
	2001	-45.3 (-87.3, 135.5)	-37.7 (-89.3, 261.1)	
	2002	-77.6 (-97.5, 96.3)	-70.9 (-97.3, 213.3)	
	2003	-78.1 (-97.5, 93.5)	-82.9 (-98.5, 99.9)	
	2004	-35.4 (-84.9, 176.5)	21.4 (-79.3, 612.2)	
	2005	-53.2 (-91.1, 146.3)	-39.4 (-91.8, 349.4)	
	2006	39.3 (-61.4, 402.7)	166.0 (-43.0, 1141.0)	
		Year continuous^a	1.4 (-10.2, 14.5)	9.2 (-8.8, 30.8)
		Year continuous^b	4.1 (-13.5, 25.2)	9.3 (-14.8, 40.3)

^a Calendar year continuous 1996-2006

^c Calendar year continuous 1999-2006

Figure 24 Percentage change (and 95% confidence intervals) in the incidence of contact urticaria

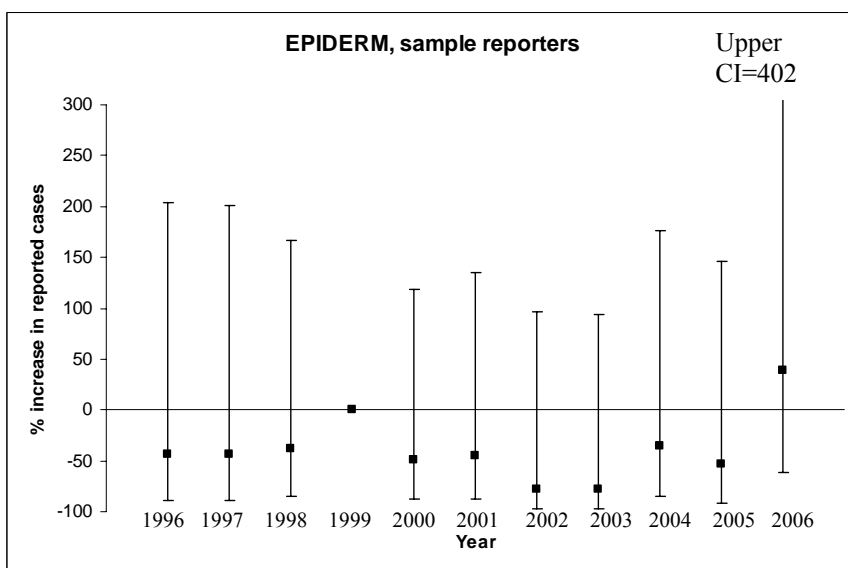
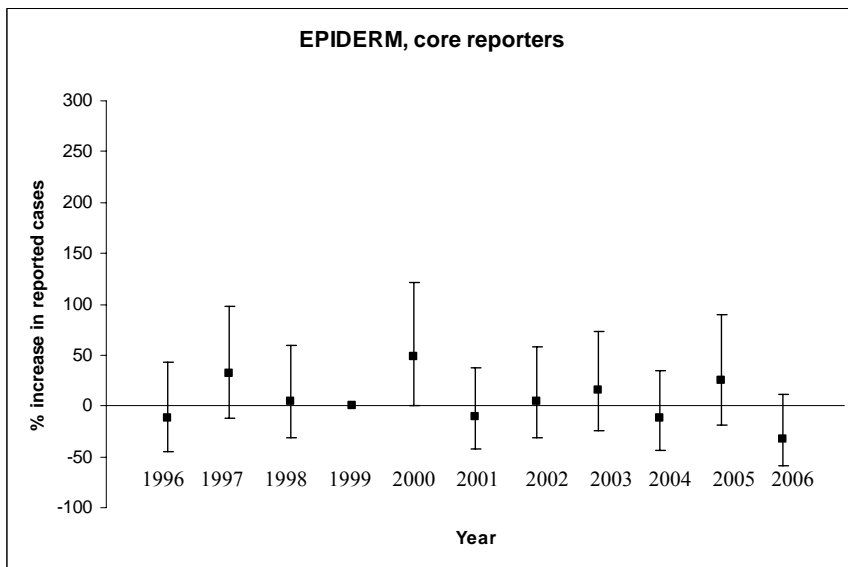
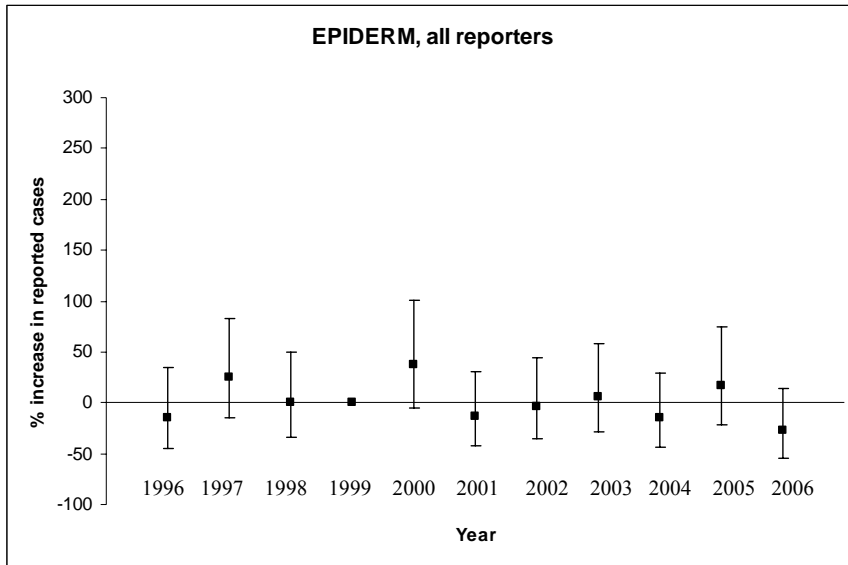


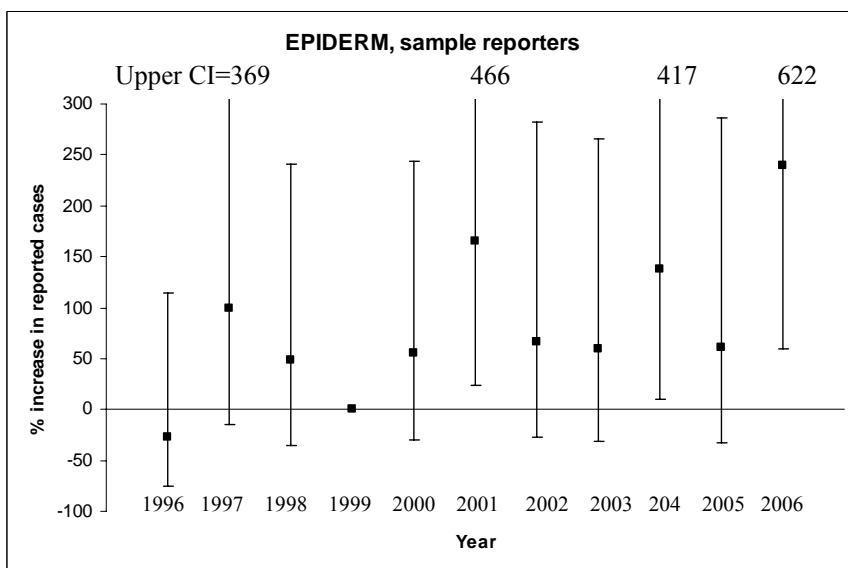
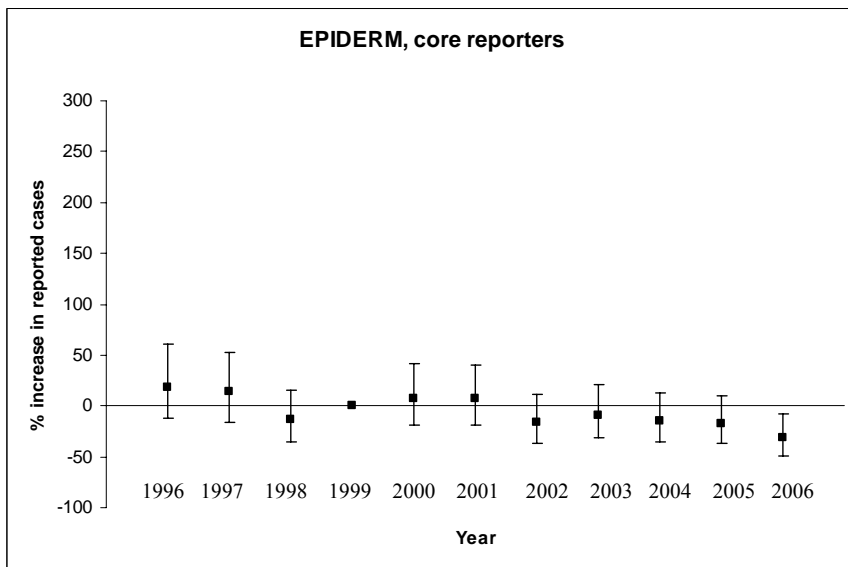
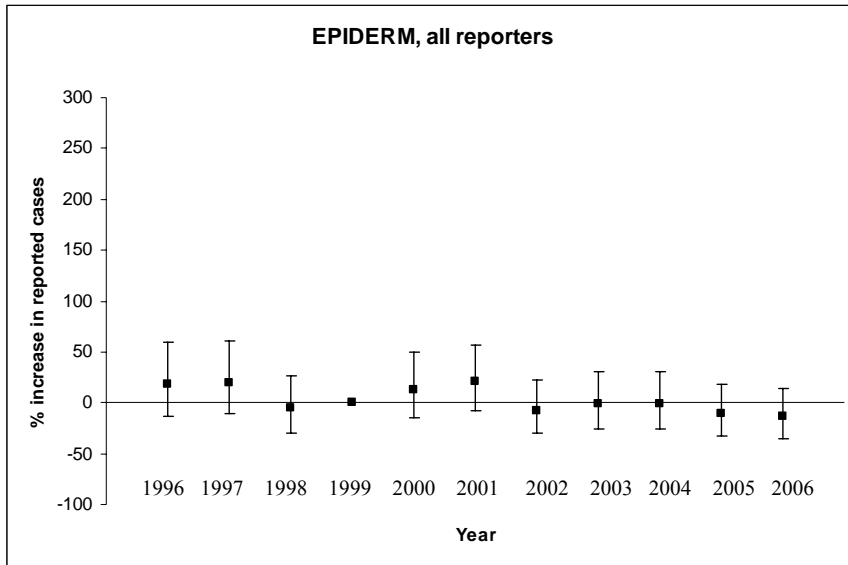
Table 16 Percentage change in incidence of neoplasia cases

		EPIDERM	
Reporter Group	Year (categorical)	Random effects % change	Fixed effects % change
All	1996	17.6 (-13.0, 58.9)	17.6 (-12.2, 57.4)
	1997	20.2 (-10.3, 60.9)	20.2 (-9.4, 59.4)
	1998	-5.5 (-29.4, 26.4)	-6.5 (-29.5, 24.1)
	1999	REFERENCE	
	2000	13.1 (-14.3, 49.2)	12.7 (-13.8, 47.3)
	2001	20.4 (-7.9, 57.3)	18.9 (-8.1, 53.9)
	2002	-7.6 (-30.2, 22.4)	-9.2 (-30.8, 19.0)
	2003	-1.2 (-25.1, 30.3)	-2.6 (-25.4, 27.2)
	2004	-1.3 (-25.3, 30.4)	-4.1 (-26.8, 25.6)
	2005	-11.3 (-33.2, 17.9)	-13.6 (-34.3, 13.7)
	2006	-13.9 (-35.2, 14.4)	-19.4 (-39.0, 6.5)
		Year continuous^a	-2.5 (-4.5, -0.5)
	Year continuous^b	-3.5 (-6.5, -0.4)	-4.2 (-7.1, -1.2)
Core	1996	18.5 (-12.4, 60.4)	18.2 (-12.7, 60.0)
	1997	13.6 (-15.5, 52.7)	13.5 (-15.6, 52.7)
	1998	-13.8 (-36.0, 15.9)	-13.7 (-35.9, 16.1)
	1999	REFERENCE	
	2000	7.2 (-19.1, 41.9)	7.1 (-19.2, 41.9)
	2001	7.2 (-18.3, 40.6)	7.0 (-18.5, 40.4)
	2002	-15.7 (-36.4, 11.8)	-15.9 (-36.6, 11.6)
	2003	-8.9 (-31.0, 20.4)	-9.0 (-31.2, 20.3)
	2004	-15.0 (-36.0, 12.9)	-15.1 (-36.1, 12.8)
	2005	-16.9 (-37.4, 10.4)	-16.9 (-37.5, 10.4)
	2006	-31.8 (-49.3, -8.3)	-31.7 (-49.2, -8.1)
		Year continuous^a	-3.9 (-6.0, -1.9)
	Year continuous^b	-5.0 (-8.0, -1.8)	-5.0 (-8.0, -1.8)
Sample	1996	-27.5 (-75.5, 114.7)	-15.0 (-72.2, 160.1)
	1997	99.8 (-15.0, 369.3)	119.9 (-10.5, 440.6)
	1998	48.5 (-35.3, 241.1)	66.6 (-30.7, 300.4)
	1999	REFERENCE	
	2000	55.4 (-29.7, 243.4)	77.5 (-22.3, 305.6)
	2001	165.0 (24.0, 466.3)	208.8 (38.7, 587.6)
	2002	66.0 (-27.8, 282.1)	78.7 (-25.3, 327.7)
	2003	59.1 (-30.7, 265.3)	73.6 (-27.4, 315.4)
	2004	138.3 (9.7, 417.7)	154.2 (11.2, 481.1)
	2005	60.9 (-32.9, 285.8)	59.6 (-37.6, 308.1)
	2006	239.6 (59.5, 622.9)	224.0 (40.4, 647.8)
		Year continuous^a	8.8 (2.5, 15.5)
	Year continuous^b	8.0 (-0.8, 17.6)	5.2 (-4.3, 15.6)

^a Calendar year continuous 1996-2006

^c Calendar year continuous 1999-2006

Figure 25 Percentage change (and 95% confidence intervals) in the incidence of neoplasia



3.2.2. Respiratory disease

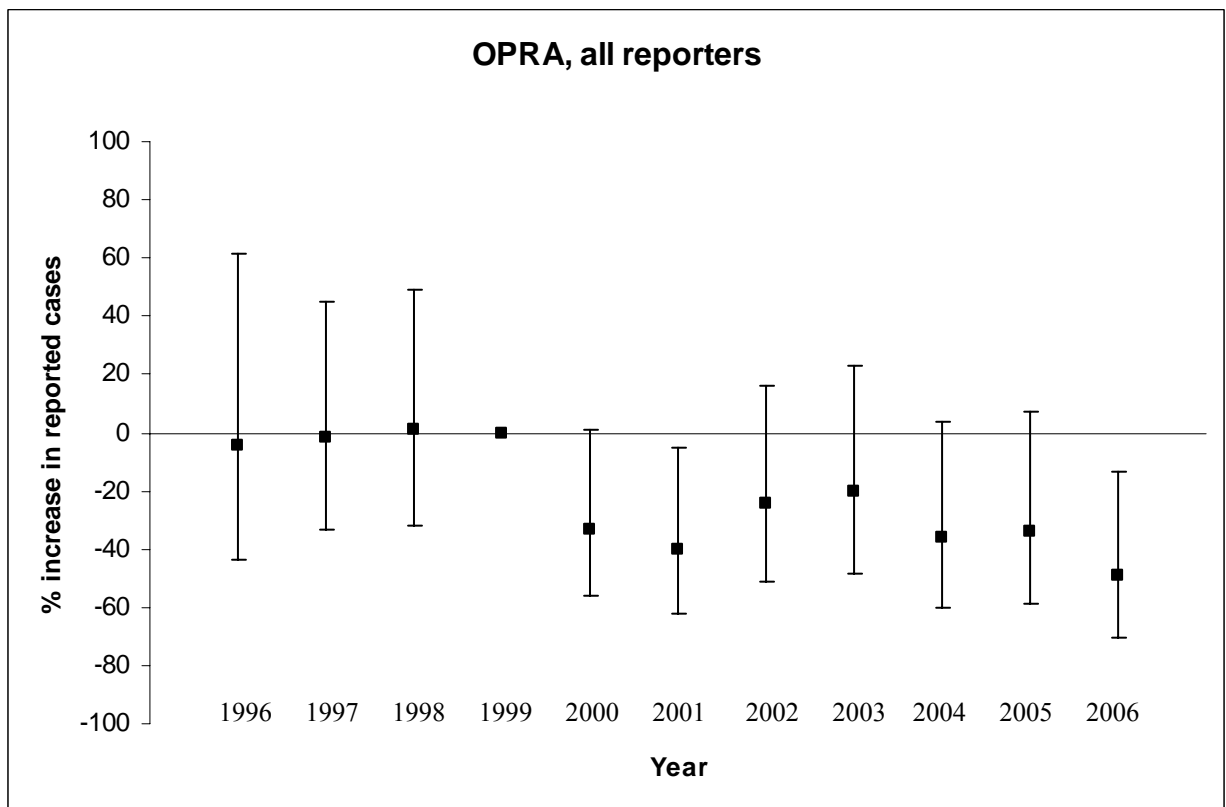
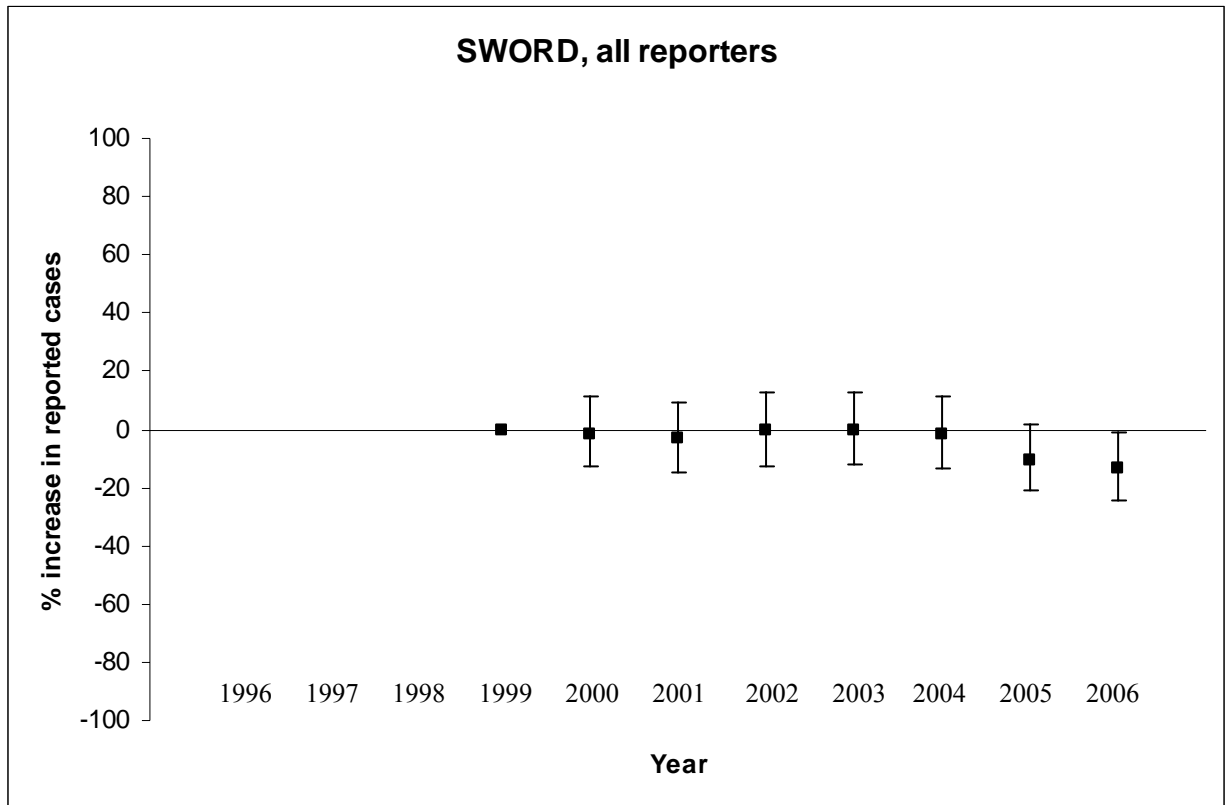
Table 17 Percentage change in incidence of (total) respiratory cases

Reporter Group	Year (categorical)	SWORD		OPRA	
		Random effects % change	Fixed effects % change	Random effects % change	Fixed effects % change
All	1996			-4.6 (-43.6, 61.3)	-28.5 (-60.7, 30.2)
	1997			-1.7 (-33.6, 45.3)	4.4 (-30.2, 56.2)
	1998			0.9 (-31.7, 49.0)	9.1 (-26.6, 62.2)
	1999			REFERENCE	
	2000	-1.4 (-12.7, 11.4)	-1.6 (-13.0, 11.3)	-33.5 (-56.3, 1.3)	-33.3 (-56.7, 2.6)
	2001	-3.4 (-14.5, 9.2)	-4.2 (-15.4, 8.5)	-40.1 (-62.2, -5.0)	-39.4 (-62.2, -3.1)
	2002	-0.6 (-12.4, 12.7)	-2.3 (-14.1, 11.1)	-24.6 (-51.1, 16.2)	-26.5 (-52.9, 14.7)
	2003	-0.4 (-12.1, 12.8)	-2.3 (-14.0, 10.9)	-20.5 (-48.5, 22.8)	-21.2 (-49.8, 23.6)
	2004	-1.7 (-13.3, 11.4)	-4.0 (-15.6, 9.2)	-35.8 (-60.3, 3.8)	-31.3 (-58.3, 13.3)
	2005	-10.4 (-21.1, 1.8)	-13.3 (-24.0, -1.0)	-33.7 (-59.0, 7.3)	-24.9 (-54.6, 24.1)
	2006	-13.6 (-24.7, -1.0)	-18.5 (-29.5, -5.9)	-49.4 (-70.5, -13.1)	-41.7 (-66.8, 2.2)
		Year continuous ^a	-1.7 (-3.1, -0.2)	-2.3 (-3.8, -0.8)	-6.0 (-9.5, -2.2)
	Year continuous ^b			-6.1 (-11.6, -0.4)	-6.0 (-11.7, 0.2)
Core	1996				
	1997				
	1998				
	1999			REFERENCE	
	2000	0.9 (-12.8, 16.7)	0.8 (-12.8, 16.5)		
	2001	0.3 (-13.2, 15.9)	0.1 (-13.3, 15.6)		
	2002	6.2 (-8.5, 23.2)	5.9 (-8.7, 22.9)		
	2003	8.8 (-5.9, 25.9)	8.5 (-6.2, 25.4)		
	2004	7.8 (-7.0, 25.0)	7.2 (-7.5, 24.2)		
	2005	-8.9 (-21.8, 6.2)	-9.9 (-22.6, 5.0)		
	2006	-13.6 (-26.8, 2.1)	-15.0 (-28.1, 0.4)		
		Year continuous ^a	-1.4 (-3.2, 0.4)	-1.6 (-3.3, 0.2)	
Sample	1996				
	1997				
	1998				
	1999			REFERENCE	
	2000	-10.1 (-28.8, 13.6)	-8.9 (-28.1, 15.4)		
	2001	-21.1 (-38.2, 0.7)	-21.4 (-38.7, 0.6)		
	2002	-24.5 (-41.3, -3.0)	-27.3 (-43.8, -6.0)		
	2003	-34.8 (-49.8, -15.3)	-39.5 (-53.8, -20.6)		
	2004	-33.2 (-48.5, -13.3)	-38.8 (-53.4, -19.5)		
	2005	-19.1 (-36.8, 3.7)	-28.4 (-45.2, -6.5)		
	2006	-18.3 (-36.7, 5.3)	-33.0 (-50.1, -10.1)		
		Year continuous ^a	-3.3 (-6.2, -0.4)	-6.3-9.5-3.0	

^a Calendar year continuous 1996-2006

^c Calendar year continuous 1999-2006

Figure 26 Percentage change (and 95% confidence intervals) in the incidence of total respiratory disease



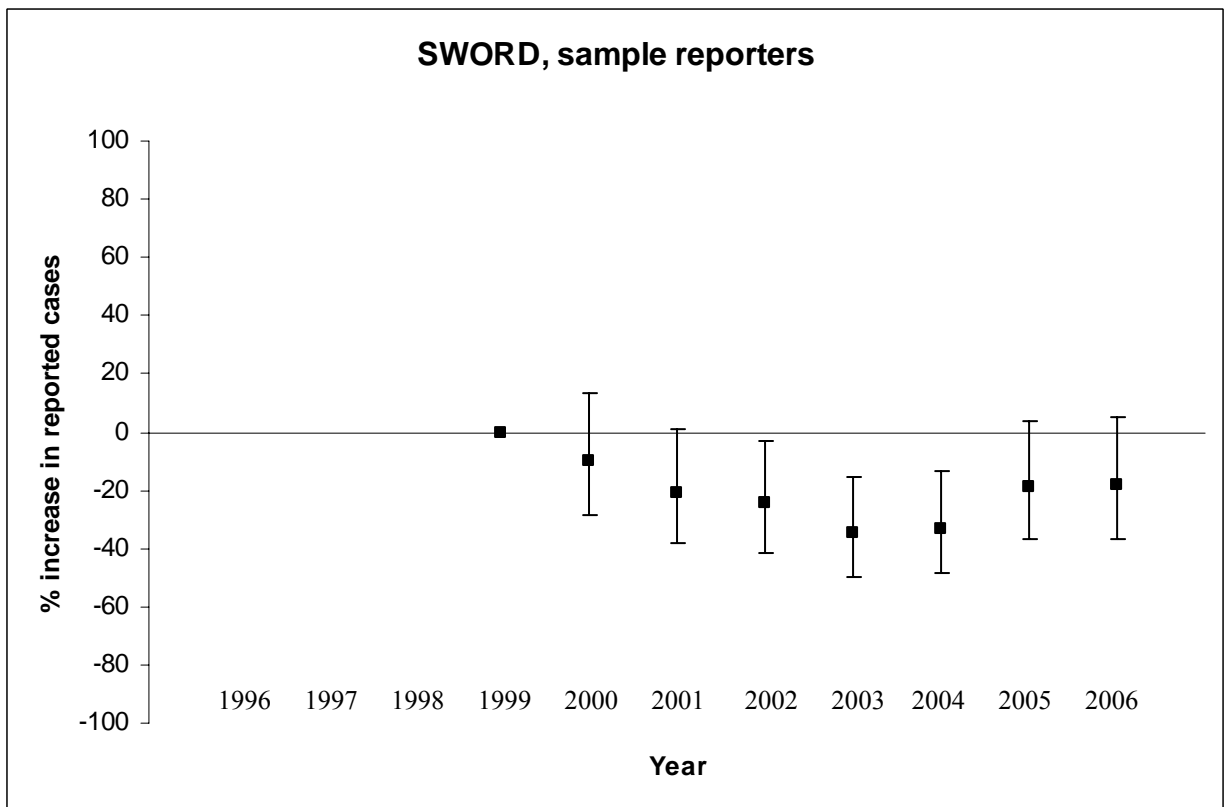
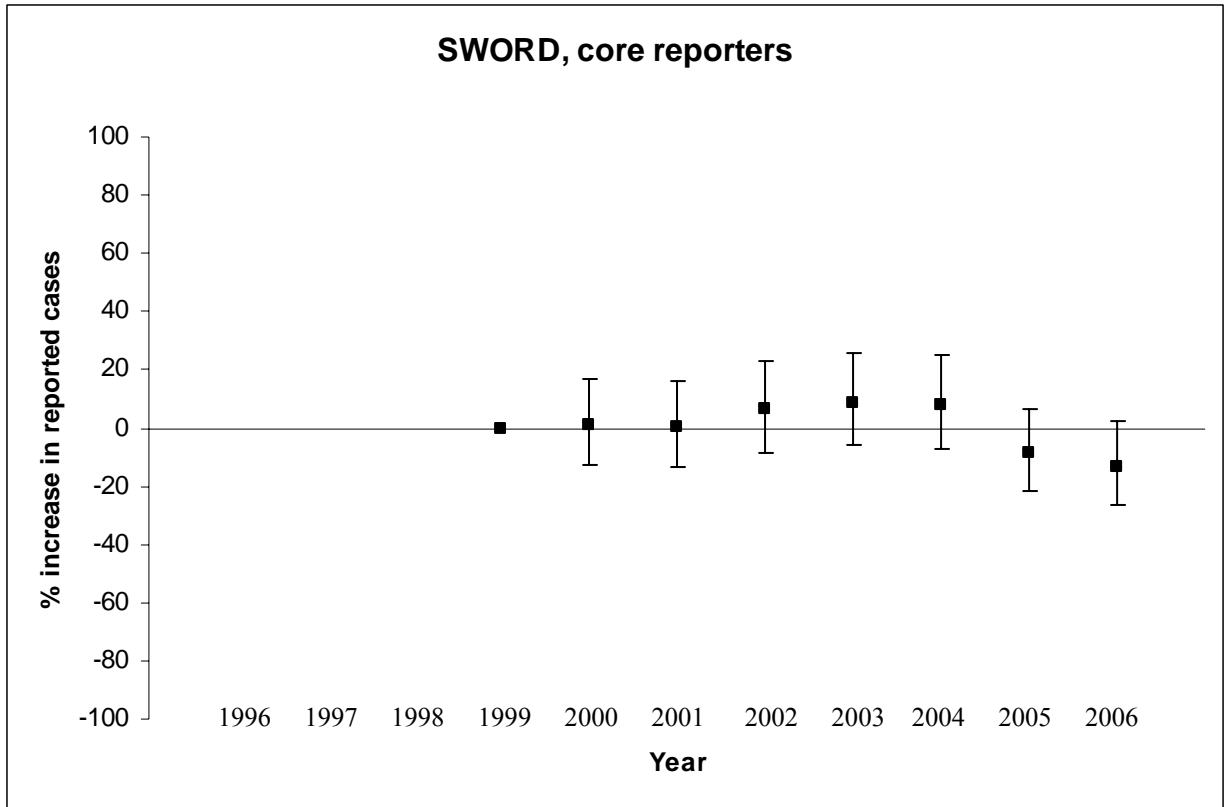


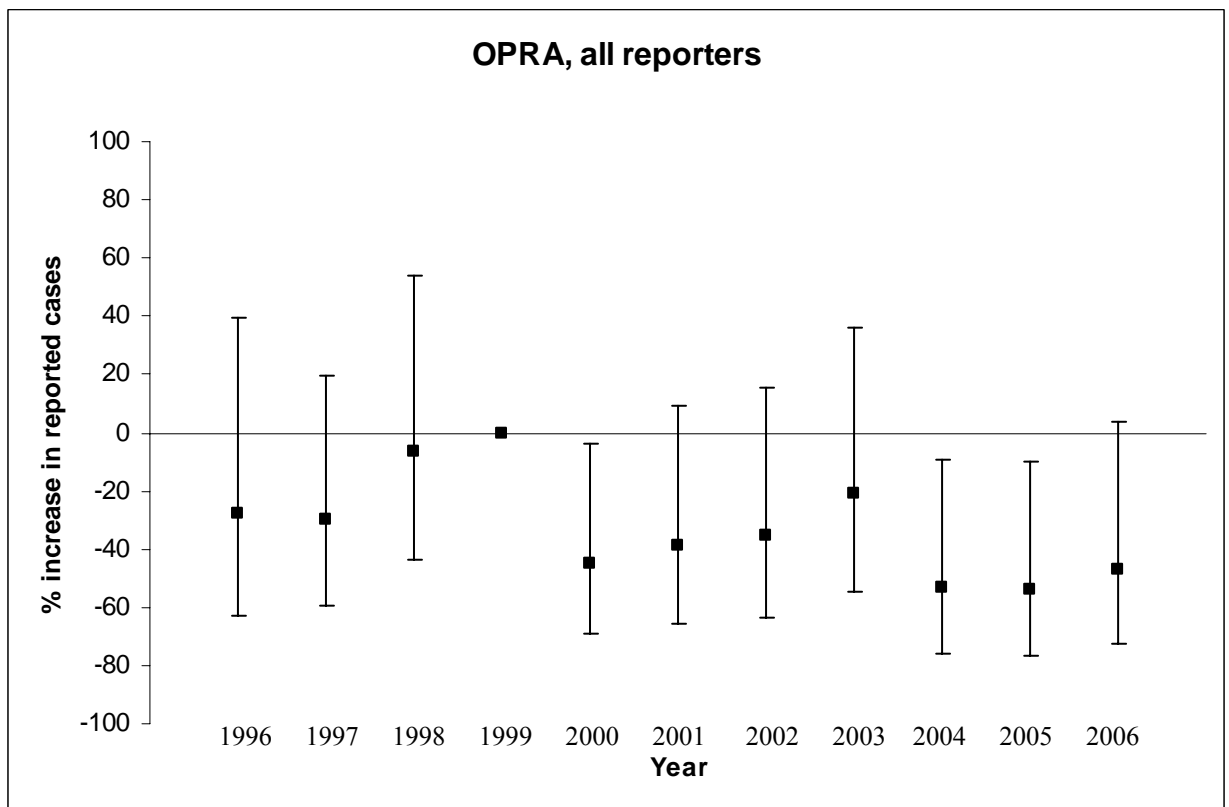
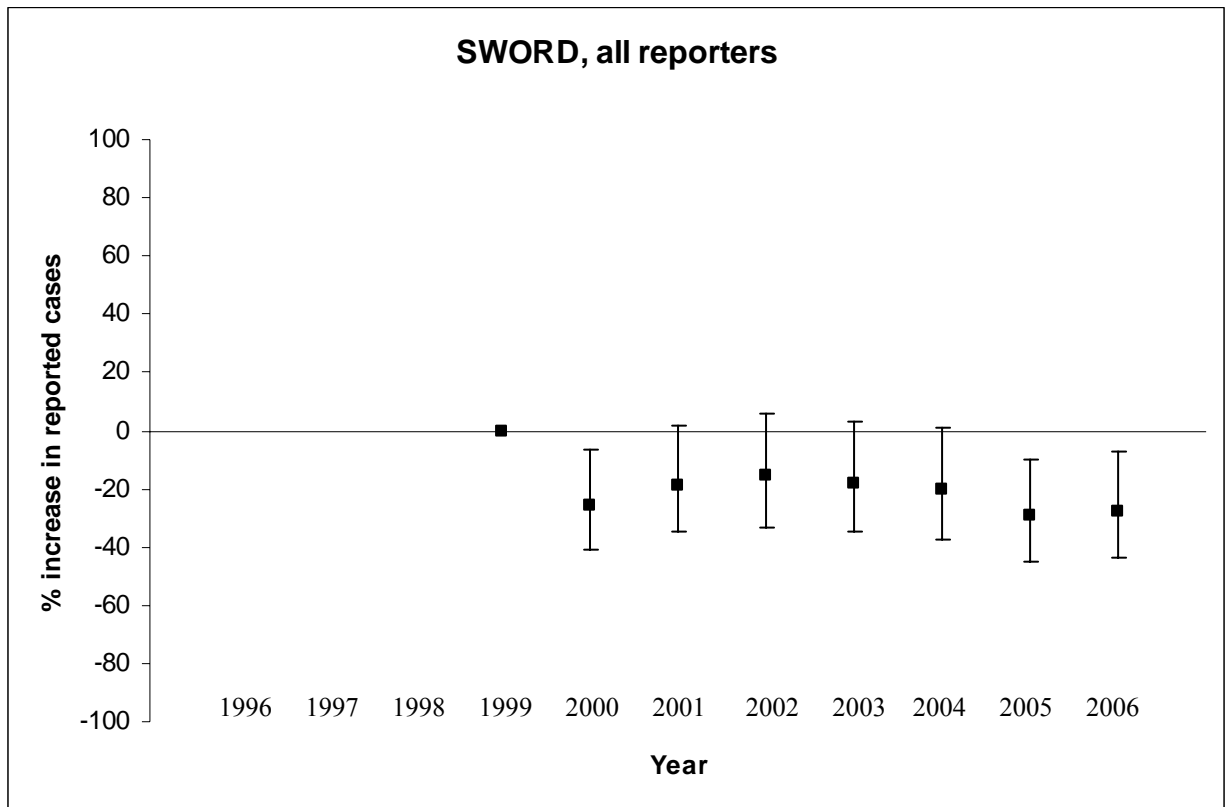
Table 18 Percentage change in incidence of asthma

Reporter Group	Year (categorical)	SWORD		OPRA	
		Random effects % change	Fixed effects % change	Random effects % change	Fixed effects % change
All	1996			-27.7 (-62.6, 39.6)	-30.9 (-68.0, 49.5)
	1997			-30.1 (-59.2, 19.6)	-22.3 (-55.4, 35.4)
	1998			-6.7 (-43.5, 53.8)	4.0 (-37.8, 73.7)
	1999			REFERENCE	
	2000	-25.6 (-40.7, -6.6)	-27.2 (-42.3, -8.1)	-45.2 (-68.8, -3.9)	-48.2 (-71.1, -7.2)
	2001	-18.6 (-34.8, 1.7)	-18.0 (-34.6, 2.8)	-38.7 (-65.6, 9.1)	-38.8 (-66.3, 11.2)
	2002	-15.8 (-33.1, 5.9)	-17.0 (-34.4, 5.0)	-35.1 (-63.5, 15.3)	-38.8 (-66.3, 11.3)
	2003	-17.9 (-34.8, 3.3)	-19.2 (-36.4, 2.6)	-21.2 (-54.5, 36.4)	-27.1 (-59.1, 30.1)
	2004	-20.5 (-37.5, 1.2)	-21.6 (-38.9, 0.7)	-53.1 (-75.7, -9.4)	-53.3 (-76.7, -6.7)
	2005	-29.4 (-44.8, -9.9)	-29.8 (-45.5, -9.5)	-54.2 (-76.6, -10.1)	-53.4 (-77.2, -4.8)
	2006	-27.7 (-43.5, -7.4)	-28.5 (-45.0, -7.1)	-46.8 (-72.8, 4.0)	-43.0 (-72.1, 16.4)
	Year continuous ^a	-3.1 (-5.8, -0.4)	-3.3 (-6.1, -0.4)	-5.2 (-9.9, -0.2)	-6.6 (-12.2, -0.6)
	Year continuous ^b			-8.4 (-15.3, -0.9)	-8.8 (-16.4, -0.5)
Core	1996				
	1997				
	1998				
	1999			REFERENCE	
	2000	-27.8 (-44.6, -5.9)	-27.9 (-44.6, -6.1)		
	2001	-10.5 (-30.2, 14.7)	-10.8 (-30.4, 14.3)		
	2002	-7.5 (-28.6, 19.7)	-7.5 (-28.5, 19.5)		
	2003	-8.1 (-29.0, 19.0)	-8.2 (-29.0, 18.8)		
	2004	-10.2 (-31.3, 17.4)	-10.1 (-31.1, 17.4)		
	2005	-24.1 (-42.6, 0.2)	-24.0 (-42.4, 0.3)		
	2006	-25.0 (-43.6, -0.3)	-26.2 (-44.6, -1.6)		
	Year continuous ^a	-2.0 (-5.0, 1.1)	-2.1 (-5.1, 1.0)		
	Sample	1996			
1997					
1998					
1999				REFERENCE	
2000		-25.7 (-54.8, 22.2)	-28.7 (-57.8, 20.2)		
2001		-52.5 (-73.5, -14.7)	-52.4 (-74.0, -12.8)		
2002		-50.8 (-72.6, -11.5)	-55.9 (-76.0, -18.8)		
2003		-59.2 (-77.9, -24.7)	-67.2 (-83.3, -35.7)		
2004		-64.3 (-81.4, -31.4)	-69.1 (-84.8, -37.3)		
2005		-53.2 (-73.8, -16.4)	-62.2 (-80.3, -27.5)		
2006		-38.5 (-65.1, 8.4)	-49.3 (-74.1, -0.6)		
Year continuous ^a		-9.6 (-15.9, -2.9)	-13.5 (-20.7, -5.6)		

^a Calendar year continuous 1996-2006

^c Calendar year continuous 1999-2006

Figure 27 Percentage change (and 95% confidence intervals) in the incidence of asthma



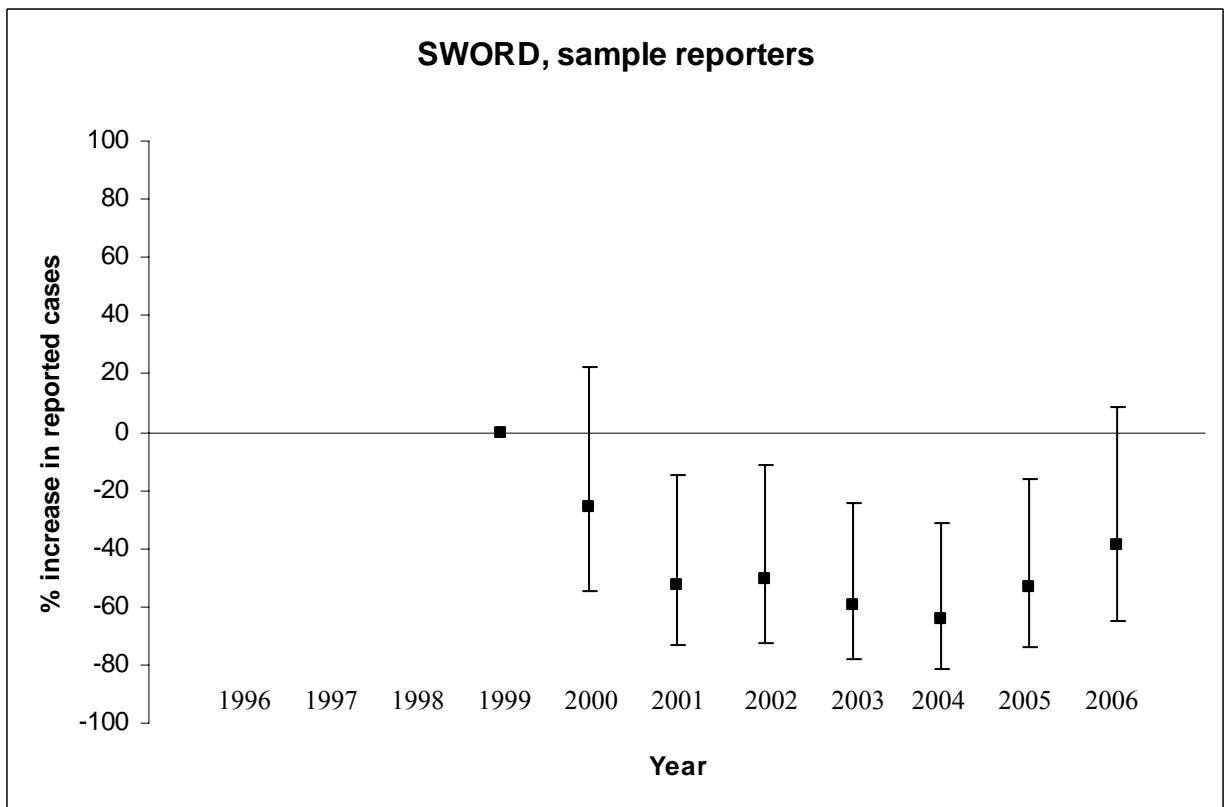
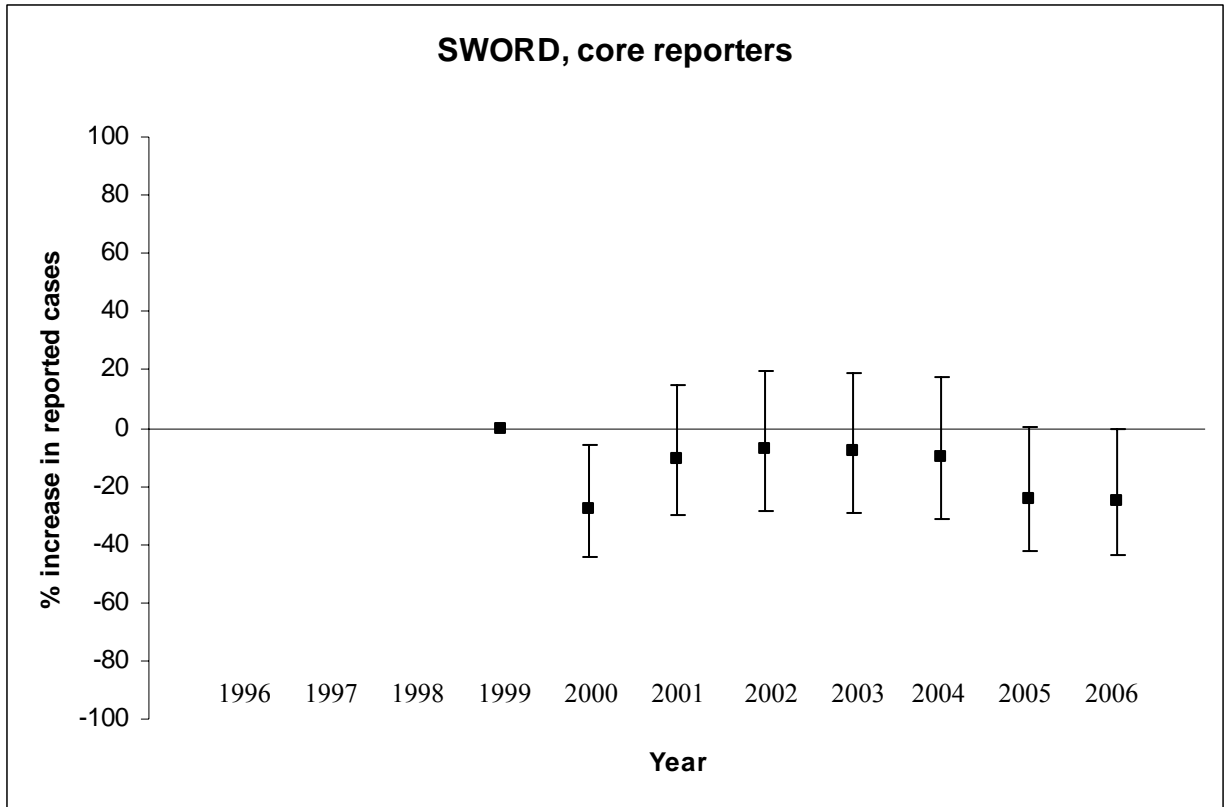


Table 19 Percentage change in incidence of mesothelioma

		SWORD	
Reporter Group	Year (categorical)	Random effects % change	Fixed effects % change
All	1999	REFERENCE	
	2000	-0.5 (-20.0, 23.9)	-0.7 (-20.5, 24.2)
	2001	-1.6 (-20.9, 22.5)	-4.0 (-23.3, 20.2)
	2002	-0.9 (-20.8, 24.1)	-4.5 (-24.4, 20.5)
	2003	-4.0 (-23.4, 20.2)	-8.2 (-27.4, 16.2)
	2004	-10.8 (-28.8, 11.8)	-14.9 (-32.7, 7.6)
	2005	-24.2 (-40.2, -3.9)	-27.7 (-43.6, -7.3)
	2006	-24.8 (-41.8, -2.7)	-28.3 (-45.5, -5.6)
	Year continuous^a	-4.1 (-6.7, -1.5)	-4.8 (-7.6, -2.0)
Core	1999	REFERENCE	
	2000	5.1 (-21.3, 40.4)	5.3 (-20.8, 40.0)
	2001	1.3 (-24.3, 35.6)	1.6 (-23.7, 35.4)
	2002	4.5 (-22.3, 40.5)	4.7 (-21.7, 40.1)
	2003	3.6 (-22.9, 39.2)	4.0 (-22.2, 39.0)
	2004	2.9 (-23.0, 37.4)	1.8 (-23.5, 35.4)
	2005	-19.9 (-41.3, 9.5)	-20.0 (-41.2, 8.8)
	2006	-19.7 (-43.2, 13.5)	-21.3 (-44.4, 11.3)
	Year continuous^a	-3.1 (-6.5, 0.5)	-3.2 (-6.6, 0.3)
Sample	1999	REFERENCE	
	2000	-10.2 (-37.1, 28.2)	-6.5 (-35.1, 34.8)
	2001	-9.0 (-36.2, 29.8)	-10.6 (-38.1, 29.2)
	2002	-14.1 (-40.8, 24.7)	-17.9 (-44.5, 21.5)
	2003	-22.5 (-46.7, 12.7)	-29.5 (-52.5, 4.6)
	2004	-31.7 (-54.0, 1.6)	-40.5 (-61.3, -8.5)
	2005	-32.5 (-54.3, -0.4)	-40.5 (-61.3, -8.7)
	2006	-34.4 (-56.3, -1.6)	-38.4 (-61.3, -2.0)
	Year continuous^a	-6.2 (-10.2, -1.9)	-8.1 (-12.9, -3.2)

^a Calendar year continuous 1999-2006

Figure 28 Percentage change (and 95% confidence intervals) in the incidence of mesothelioma

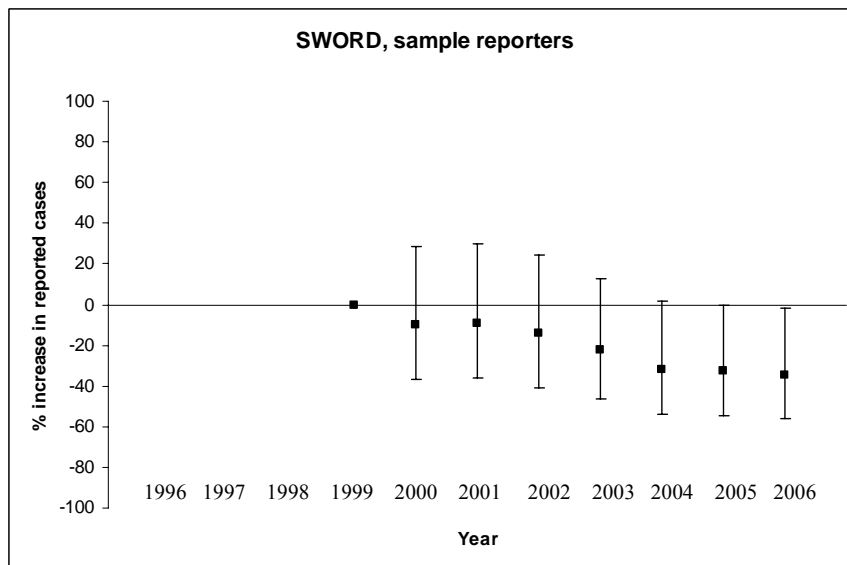
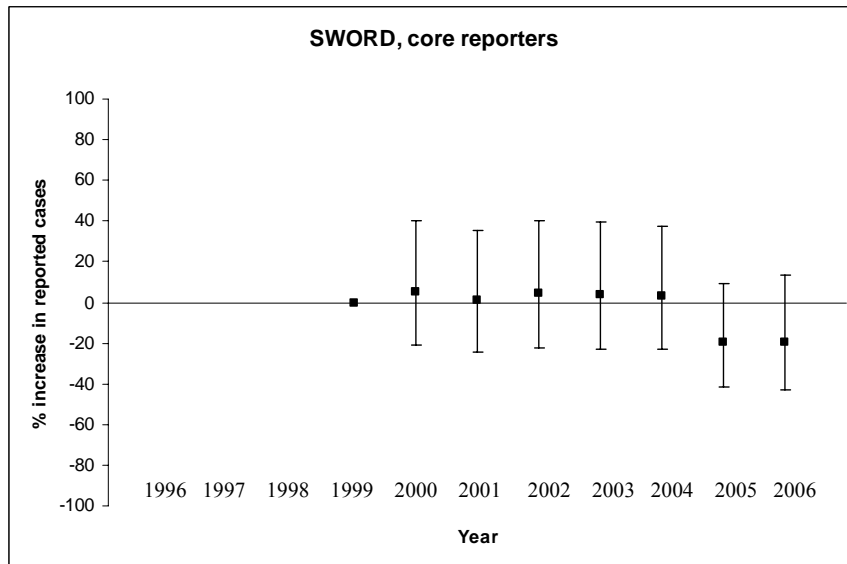
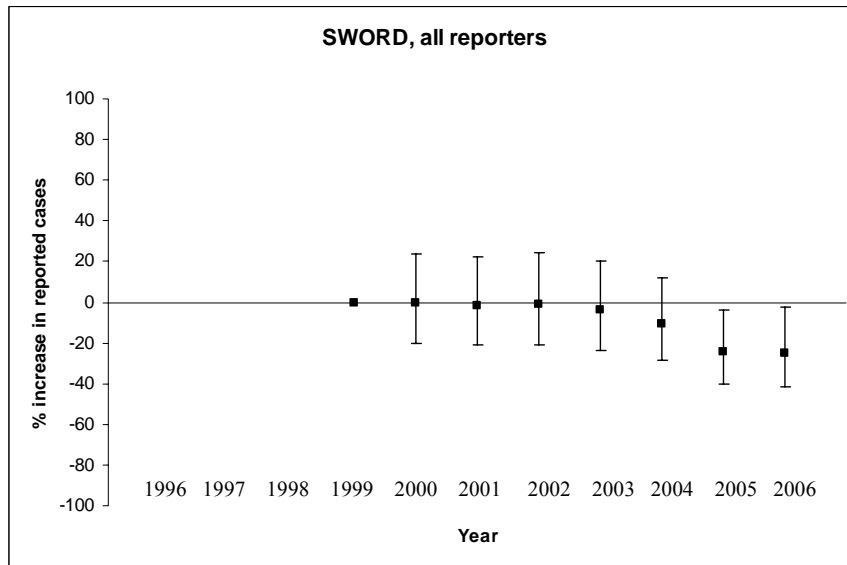


Table 20 Percentage change in incidence of non-malignant pleural disease

Reporter Group	Year (categorical)	SWORD	
		Random effects % change	Fixed effects % change
All	1999	REFERENCE	
	2000	24.8 (4.5, 49.2)	25.6 (4.9, 50.3)
	2001	17.4 (-1.9, 40.4)	17.2 (-2.2, 40.6)
	2002	19.8 (-0.4, 44.1)	19.1 (-1.3, 43.7)
	2003	28.0 (7.0, 53.1)	26.0 (5.0, 51.2)
	2004	21.9 (1.8, 46.1)	18.6 (-1.4, 42.7)
	2005	23.7 (3.3, 48.1)	18.9 (-1.1, 43.1)
	2006	11.1 (-8.9, 35.5)	2.2 (-17.0, 25.8)
	Year continuous ^a	1.1 (-1.0, 3.2)	0.1 (-2.0, 2.3)
Core	1999	REFERENCE	
	2000	30.5 (6.8, 59.4)	30.4 (6.8, 59.2)
	2001	25.5 (2.9, 53.1)	25.2 (2.7, 52.7)
	2002	27.9 (4.0, 57.2)	27.4 (3.7, 56.6)
	2003	35.7 (11.2, 65.7)	35.1 (10.7, 64.9)
	2004	27.4 (4.0, 56.0)	26.5 (3.3, 54.9)
	2005	19.3 (-2.8, 46.5)	17.8 (-4.1, 44.7)
	2006	-0.5 (-21.1, 25.6)	-2.4 (-22.8, 23.3)
	Year continuous ^a	-0.3 (-2.6, 2.0)	-0.5 (-2.8, 1.8)
Sample	1999	REFERENCE	
	2000	-0.5 (-34.0, 50.2)	2.4 (-32.4, 55.3)
	2001	-28.4 (-54.4, 12.5)	-26.7 (-53.8, 16.3)
	2002	-22.8 (-51.1, 21.9)	-23.5 (-52.4, 22.9)
	2003	-19.4 (-48.4, 25.9)	-24.1 (-52.3, 20.8)
	2004	-11.7 (-42.8, 36.2)	-21.5 (-50.7, 25.0)
	2005	32.6 (-11.0, 97.6)	19.3 (-22.9, 84.6)
	2006	32.6 (-11.5, 98.7)	8.0 (-32.8, 73.7)
	Year continuous ^a	5.60.610.8	1.8 (-4.0, 8.0)

^a Calendar year continuous 1999-2006

Figure 29 Percentage change (and 95% confidence intervals) in the incidence of non-malignant pleural disease

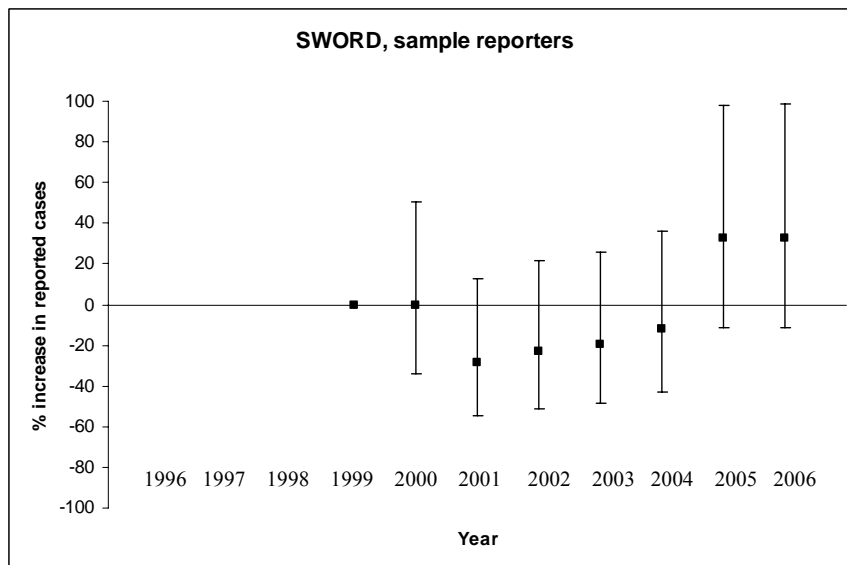
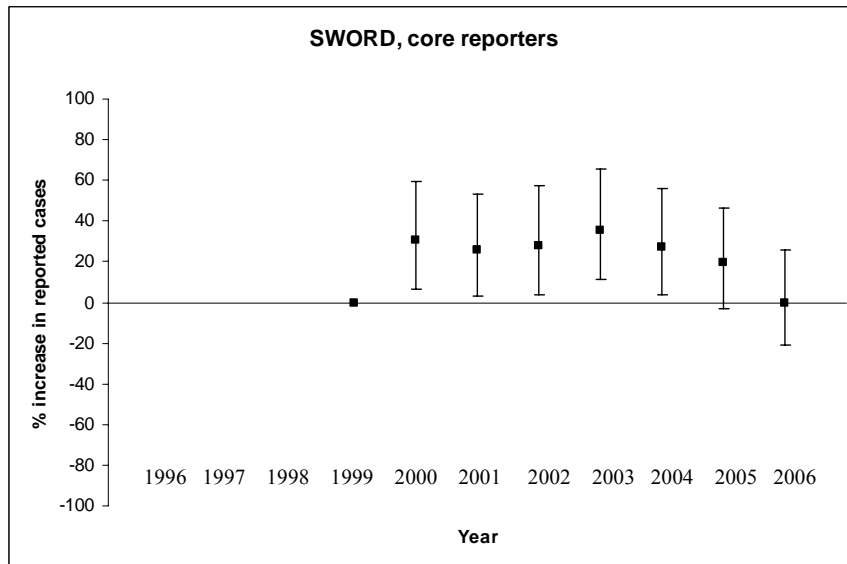
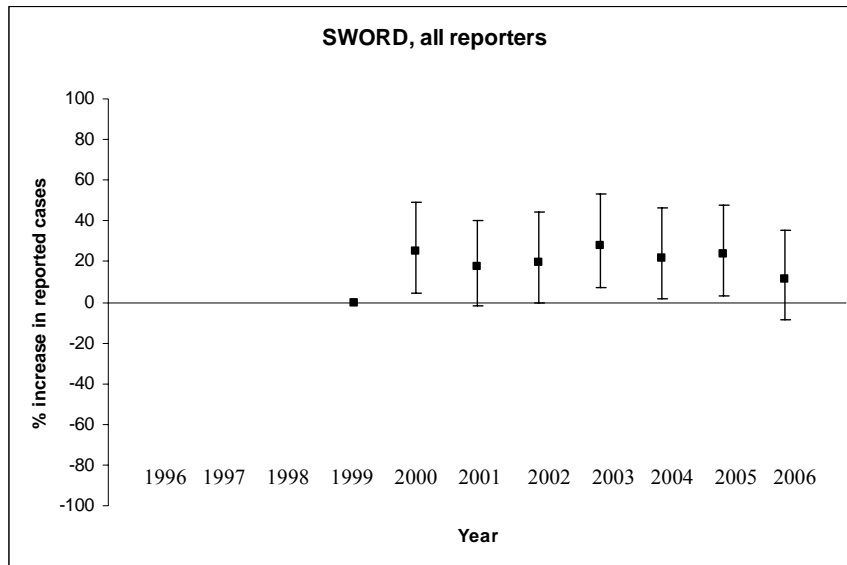


Table 21 Percentage change in incidence of pneumoconiosis

		SWORD	
Reporter Group	Year (categorical)	Random effects % change	Fixed effects % change
All	1999	REFERENCE	
	2000	-1.5 (-28.4, 35.6)	2.6 (-25.6, 41.7)
	2001	-9.9 (-34.9, 24.7)	-5.1 (-31.8, 32.2)
	2002	-21.3 (-44.5, 11.7)	-17.5 (-42.1, 17.7)
	2003	-16.6 (-40.5, 16.9)	-10.8 (-36.8, 25.8)
	2004	-29.4 (-50.7, 1.2)	-24.3 (-47.7, 9.4)
	2005	-20.1 (-43.3, 12.5)	-20.9 (-44.8, 13.3)
	2006	-1.5 (-31.3, 41.3)	-2.1 (-34.0, 45.1)
	Year continuous^a	-2.6 (-6.6, 1.5)	-3.0 (-7.3, 1.5)
Core	1999	REFERENCE	
	2000	11.9 (-22.1, 60.7)	12.0 (-22.0, 60.9)
	2001	-7.5 (-36.7, 35.3)	-7.2 (-36.5, 35.5)
	2002	-5.4 (-36.0, 39.8)	-5.2 (-35.9, 40.0)
	2003	0.6 (-31.2, 47.0)	0.0 (-31.6, 46.2)
	2004	-10.4 (-39.9, 33.6)	-11.1 (-40.5, 32.7)
	2005	-11.4 (-40.2, 31.3)	-17.1 (-44.6, 23.9)
	2006	13.3 (-25.6, 72.5)	11.3 (-27.8, 71.7)
	Year continuous^a	-0.8 (-5.5, 4.0)	-1.6 (-6.3, 3.4)
Sample	1999	REFERENCE	
	2000	-38.5 (-69.8, 25.4)	-30.7 (-67.4, 47.4)
	2001	-19.0 (-58.3, 57.1)	-4.7 (-54.9, 101.8)
	2002	-67.9 (-87.2, -19.9)	-67.6 (-87.8, -13.8)
	2003	-62.9 (-84.3, -12.1)	-62.8 (-85.5, -4.6)
	2004	-81.3 (-93.7, -44.7)	-79.8 (-93.9, -33.0)
	2005	-44.4 (-73.3, 15.6)	-50.3 (-80.2, 24.9)
	2006	-47.7 (-75.4, 11.5)	-65.3 (-88.1, 0.9)
	Year continuous^a	-11.3 (-19.3, -2.5)	-15.9 (-26.1, -4.2)

^a Calendar year continuous 1999-2006

Figure 30 Percentage change (and 95% confidence intervals) in the incidence of pneumoconiosis

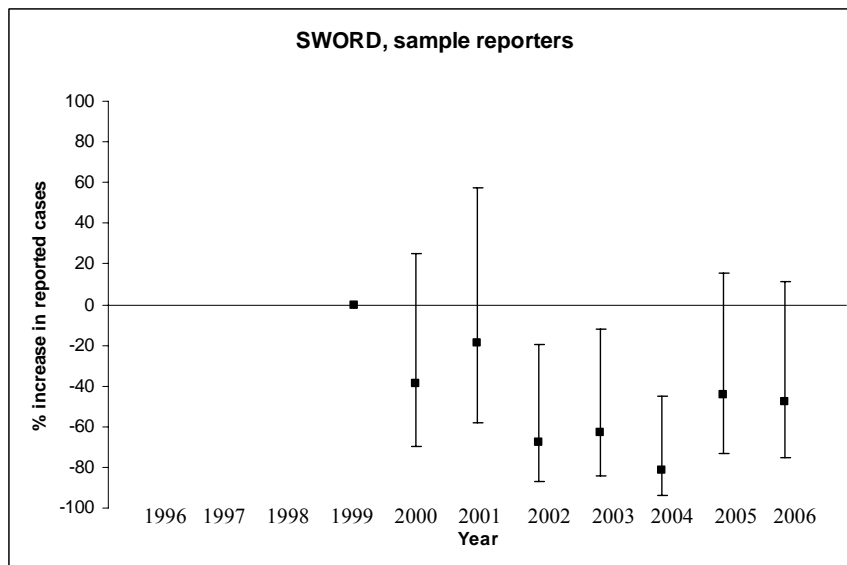
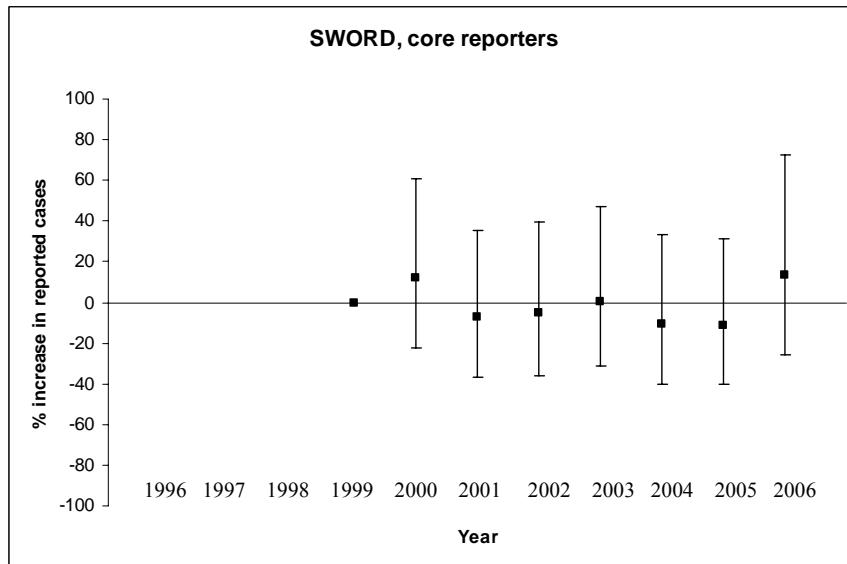
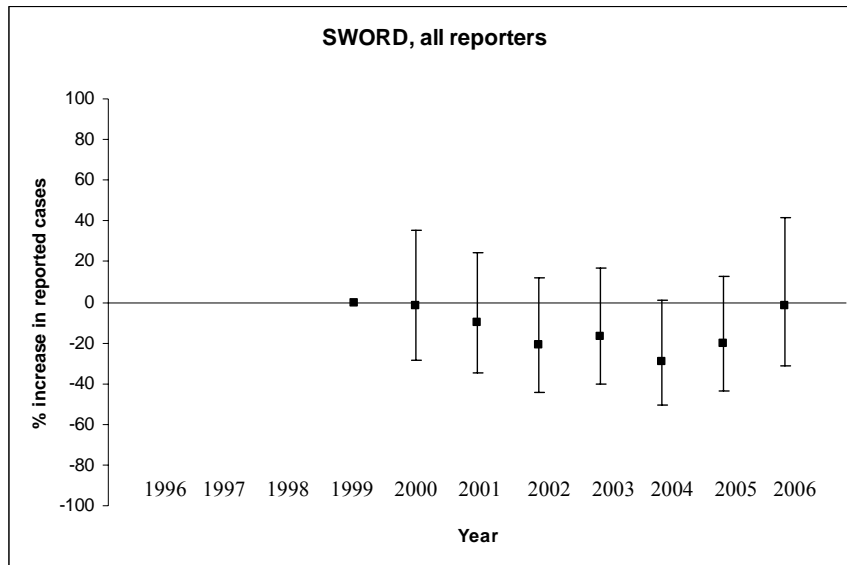


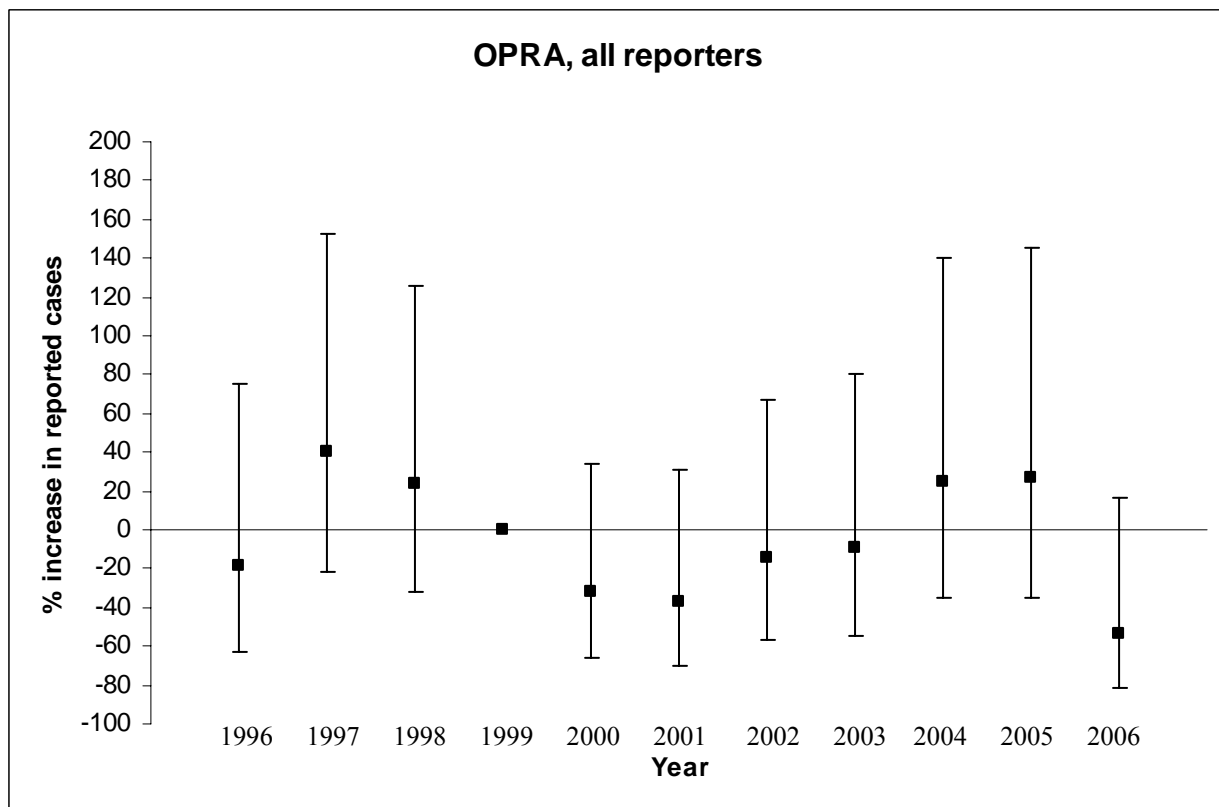
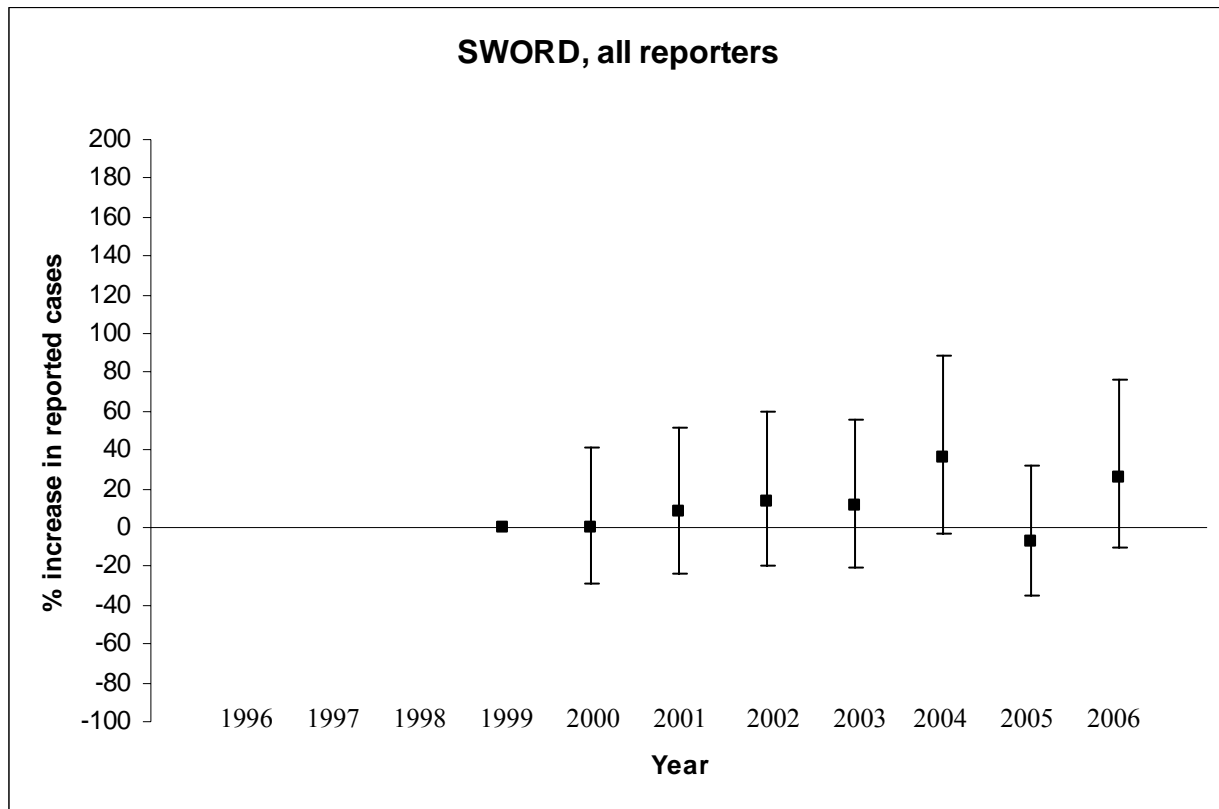
Table 22 Percentage change in incidence of other respiratory disease

Reporter Group	Year (categorical)	SWORD		OPRA	
		Random effects % change	Fixed effects % change	Random effects % change	Fixed effects % change
All	1996			-18.9 (-62.5, 75.5)	-36.3 (-74.0, 56.0)
	1997			40.5 (-21.9, 152.8)	49.7 (-18.5, 174.9)
	1998			23.8 (-32.2, 126.2)	37.5 (-26.1, 155.7)
	1999			REFERENCE	
	2000	0.1 (-29.0, 41.2)	-1.5 (-30.5, 39.4)	-32.3 (-65.9, 34.4)	-31.2 (-66.5, 41.3)
	2001	7.8 (-23.3, 51.5)	5.5 (-25.3, 49.0)	-37.6 (-70.3, 31.1)	-36.2 (-70.2, 36.5)
	2002	13.4 (-19.6, 59.8)	8.5 (-23.5, 54.0)	-14.8 (-56.7, 67.5)	-16.4 (-58.4, 67.8)
	2003	11.1 (-20.9, 55.9)	8.5 (-23.3, 53.6)	-9.3 (-54.5, 80.7)	-8.0 (-55.1, 88.4)
	2004	35.6 (-2.6, 88.9)	32.6 (-5.9, 86.9)	24.8 (-35.0, 139.8)	39.3 (-30.1, 177.6)
	2005	-7.1 (-34.8, 32.4)	-9.7 (-37.5, 30.3)	26.3 (-34.9, 144.9)	56.4 (-22.5, 215.4)
	2006	25.7 (-10.5, 76.6)	17.6 (-18.0, 68.7)	-54.1 (-81.9, 16.3)	-43.3 (-78.3, 48.1)
	Year continuous^a	2.3 (-1.6, 6.3)	1.7 (-2.5, 6.0)	-3.4 (-8.7, 2.3)	-2.8 (-9.0, 3.9)
	Year continuous^b			-0.1 (-8.3, 8.9)	0.9 (-8.0, 10.6)
Core	1996				
	1997				
	1998				
	1999			REFERENCE	
	2000	-14.8 (-42.9, 27.0)	-14.8 (-42.8, 26.8)		
	2001	-13.2 (-41.9, 29.6)	-13.8 (-42.2, 28.4)		
	2002	10.3 (-25.6, 63.4)	8.7 (-26.6, 61.0)		
	2003	1.3 (-31.5, 49.9)	-0.9 (-33.0, 46.6)		
	2004	25.2 (-14.8, 83.8)	21.2 (-17.5, 78.0)		
	2005	-18.0 (-45.8, 24.1)	-21.6 (-48.4, 18.9)		
	2006	19.6 (-19.4, 77.6)	13.3 (-24.1, 69.0)		
	Year continuous^a	2.6 (-2.1, 7.5)	1.7 (-3.0, 6.7)		
Sample	1996				
	1997				
	1998				
	1999			REFERENCE	
	2000	34.2 (-32.0, 164.7)	17.7 (-41.7, 137.6)		
	2001	48.4 (-24.4, 191.2)	45.4 (-27.0, 189.5)		
	2002	0.0 (-51.5, 106.4)	-16.6 (-60.2, 74.6)		
	2003	4.3 (-50.1, 118.1)	-0.6 (-53.4, 112.0)		
	2004	29.5 (-35.4, 159.6)	19.7 (-43.4, 153.3)		
	2005	11.3 (-46.2, 130.3)	1.7 (-54.1, 125.7)		
	2006	10.7 (-46.8, 130.5)	-14.0 (-64.6, 109.0)		
	Year continuous^a	-0.8 (-8.2, 7.2)	-2.5 (-11.3, 7.2)		

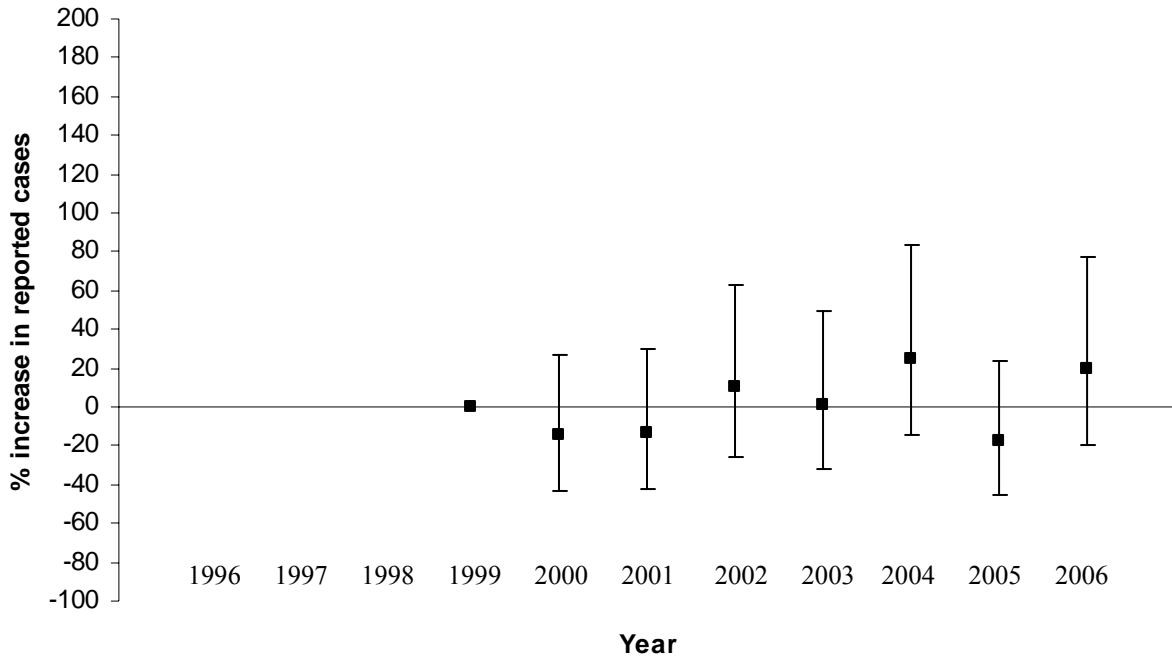
^a Calendar year continuous 1996-2006

^c Calendar year continuous 1999-2006

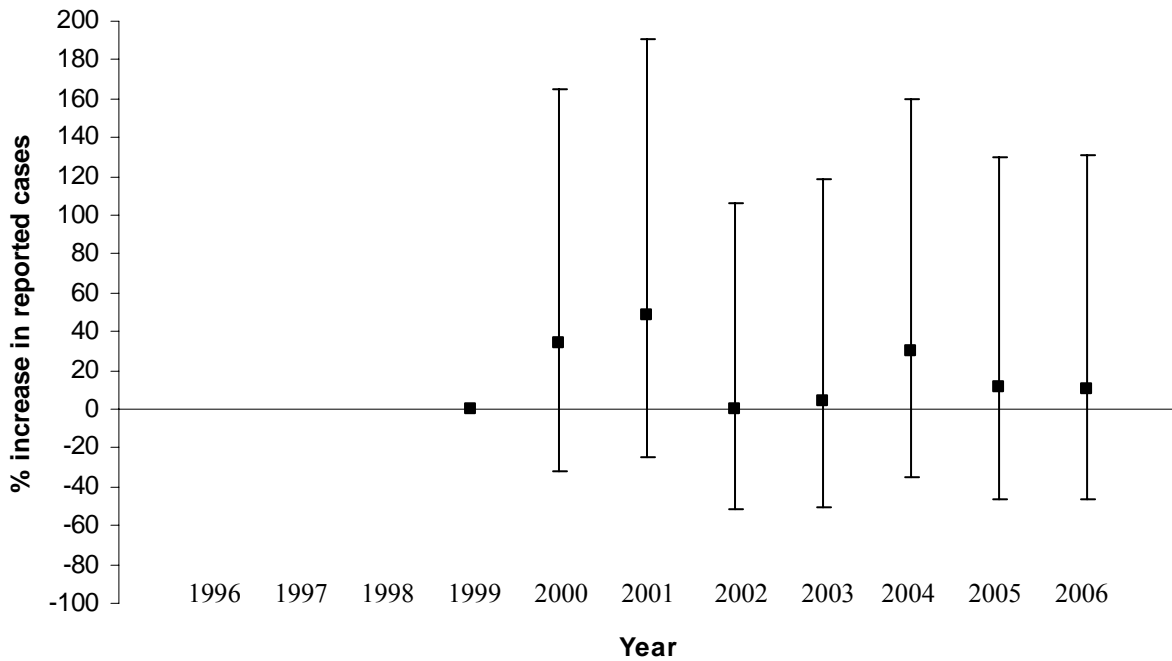
Figure 31 Percentage change (and 95% confidence intervals) in the incidence of other respiratory disease



SWORD, core reporters



SWORD, sample reporters



3.2.3. Musculoskeletal disease

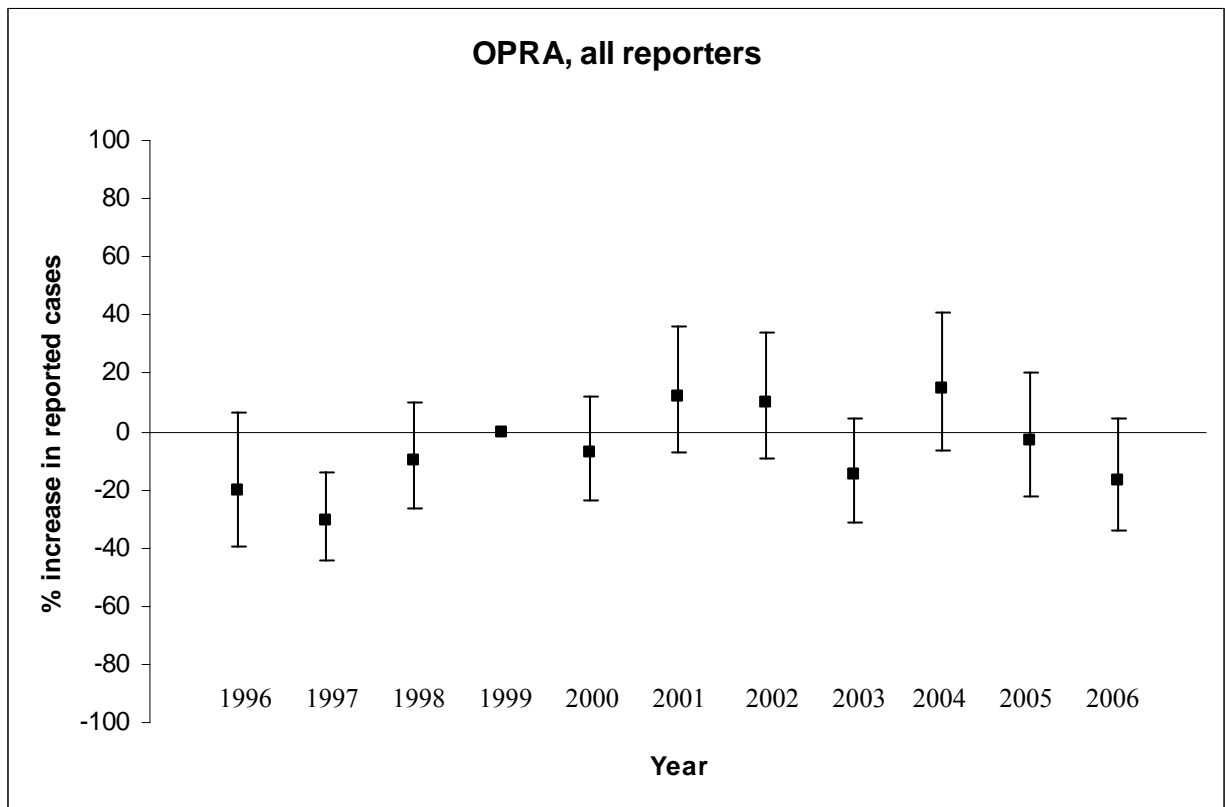
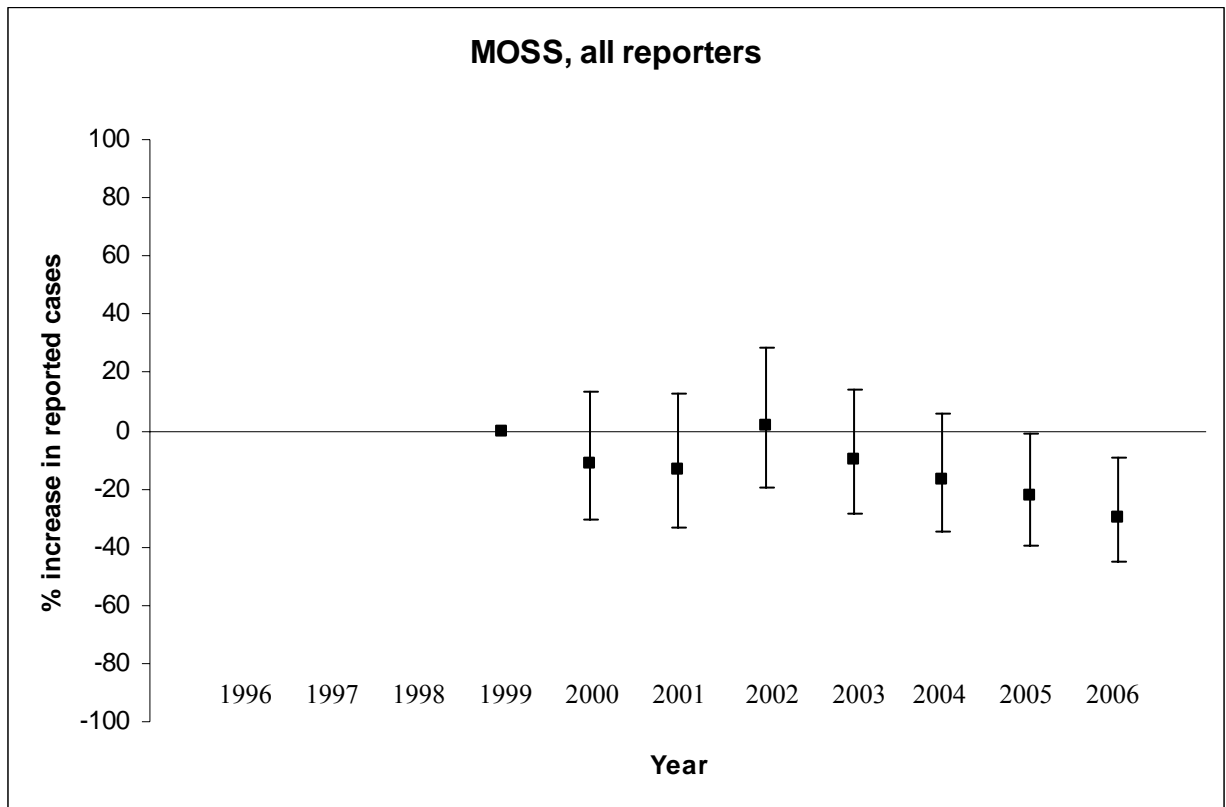
Table 23 Percentage change in incidence of (total) musculoskeletal cases

Reporter Group	Year (categorical)	MOSS		OPRA	
		Random effects % change	Fixed effects % change	Random effects % change	Fixed effects % change
All	1996			-20.0 (-39.8, 6.3)	-5.8 (-30.4, 27.5)
	1997			-30.7 (-44.2, -13.8)	-26.9 (-41.4, -9.0)
	1998			-10.0 (-26.5, 10.3)	-7.5 (-24.6, 13.4)
	1999			REFERENCE	
	2000	-11.4 (-30.9, 13.5)	-12.0 (-31.5, 13.1)	-7.4 (-23.7, 12.3)	-8.2 (-24.4, 11.5)
	2001	-13.4 (-33.3, 12.6)	-18.8 (-37.8, 6.0)	12.2 (-7.5, 36.1)	7.6 (-11.4, 30.8)
	2002	1.7 (-19.3, 28.3)	-5.2 (-25.5, 20.5)	10.3 (-9.2, 34.1)	4.2 (-14.5, 27.0)
	2003	-9.9 (-28.8, 14.1)	-16.6 (-34.6, 6.4)	-15.1 (-31.2, 4.7)	-19.3 (-34.7, -0.2)
	2004	-16.9 (-34.7, 5.8)	-23.4 (-40.4, -1.5)	14.5 (-6.8, 40.7)	9.3 (-11.3, 34.8)
	2005	-22.6 (-39.5, -0.9)	-30.7 (-46.5, -10.2)	-3.4 (-22.2, 20.0)	-8.9 (-27.1, 13.9)
	2006	-29.6 (-45.3, -9.3)	-36.4 (-51.2, -17.1)	-17.0 (-34.2, 4.8)	-21.6 (-38.3, -0.3)
	Year continuous ^a	-5.1 (-7.8, -2.4)	-6.7 (-9.5, -3.9)	1.8 (-0.0, 3.7)	0.5 (-1.5, 2.5)
	Year continuous ^b			-1.3 (-3.9, 1.2)	-1.9 (-4.5, 0.8)
Core	1996				
	1997				
	1998				
	1999				
	2000				
	2001				
	2002	REFERENCE			
	2003	-12.3 (-27.6, 6.2)	-12.6 (-27.9, 5.9)		
	2004	-20.2 (-34.9, -2.0)	-20.4 (-35.2, -2.3)		
	2005	-33.1 (-46.2, -16.7)	-33.3 (-46.4, -16.9)		
	2006	-34.6 (-47.5, -18.5)	-34.6 (-47.7, -18.3)		
	Year continuous ^a	-10.7 (-15.0, -6.2)	-10.7 (-15.1, -6.1)		
	Sample	1996			
1997					
1998					
1999				REFERENCE	
2000		-8.5 (-28.8, 17.6)	-9.5 (-29.7, 16.5)		
2001		-12.3 (-32.7, 14.4)	-17.9 (-37.2, 7.2)		
2002		-5.0 (-27.8, 25.1)	-9.8 (-31.7, 19.3)		
2003		-10.7 (-32.5, 18.2)	-16.4 (-37.2, 11.3)		
2004		-14.5 (-35.9, 14.0)	-22.0 (-42.2, 5.4)		
2005		-12.1 (-34.2, 17.4)	-23.0 (-43.3, 4.7)		
2006		-25.3 (-45.4, 2.3)	-33.9 (-52.8, -7.4)		
Year continuous ^a		-2.7 (-6.0, 0.7)	-4.5 (-8.0, -0.8)		

^a Calendar year continuous 1996-2006

^c Calendar year continuous 1999-2006

Figure 32 Percentage change (and 95% confidence intervals) in the incidence of (total) musculoskeletal disease



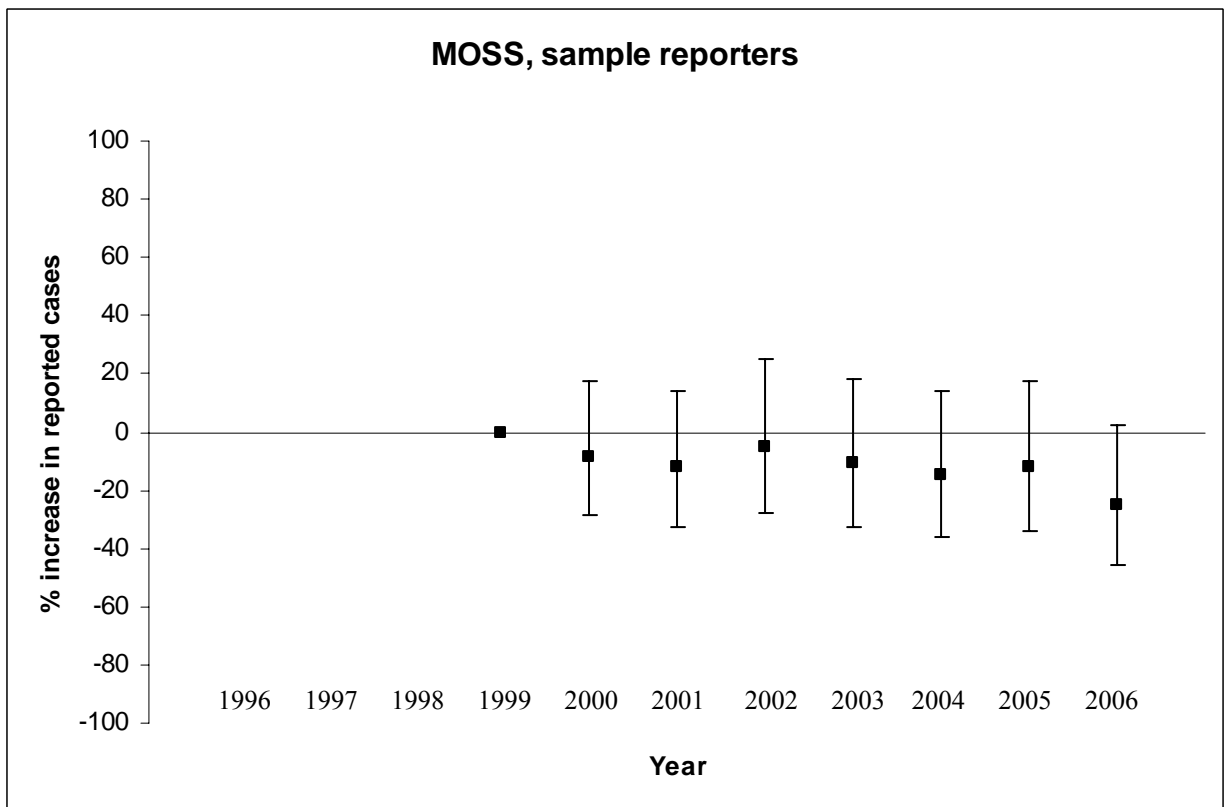
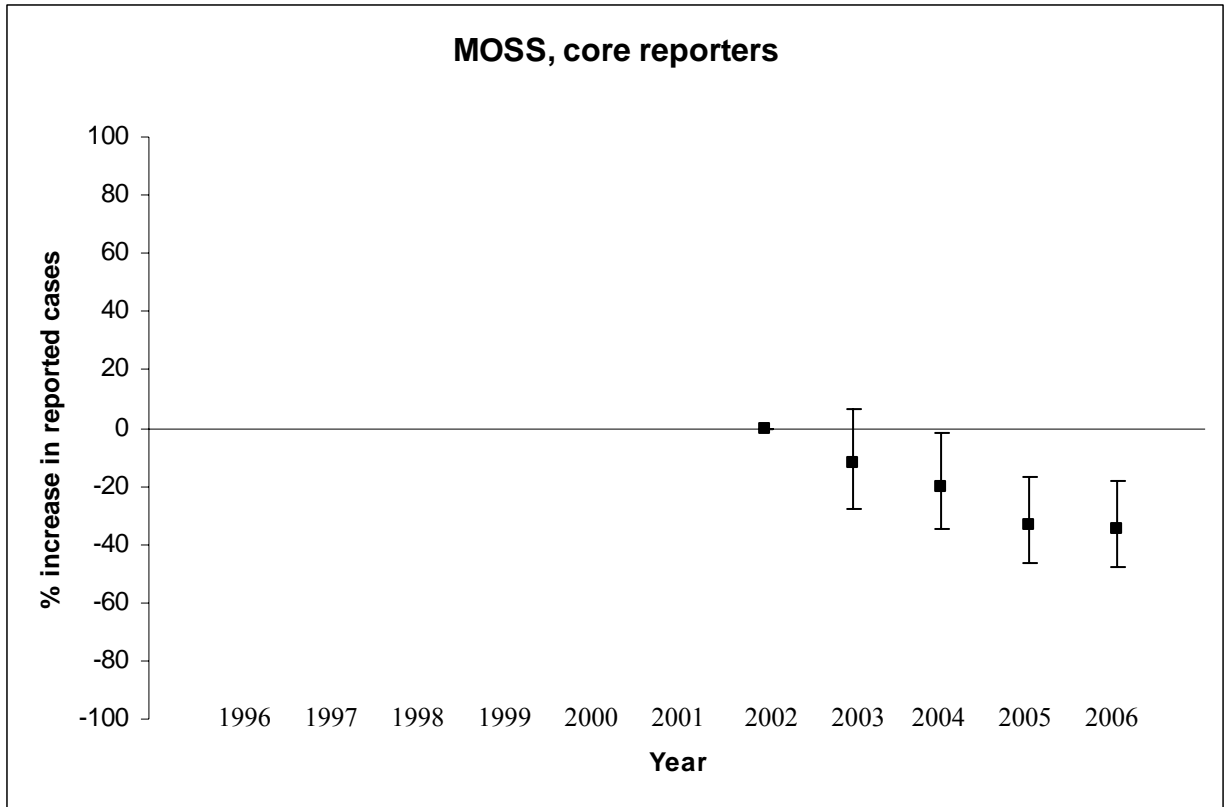


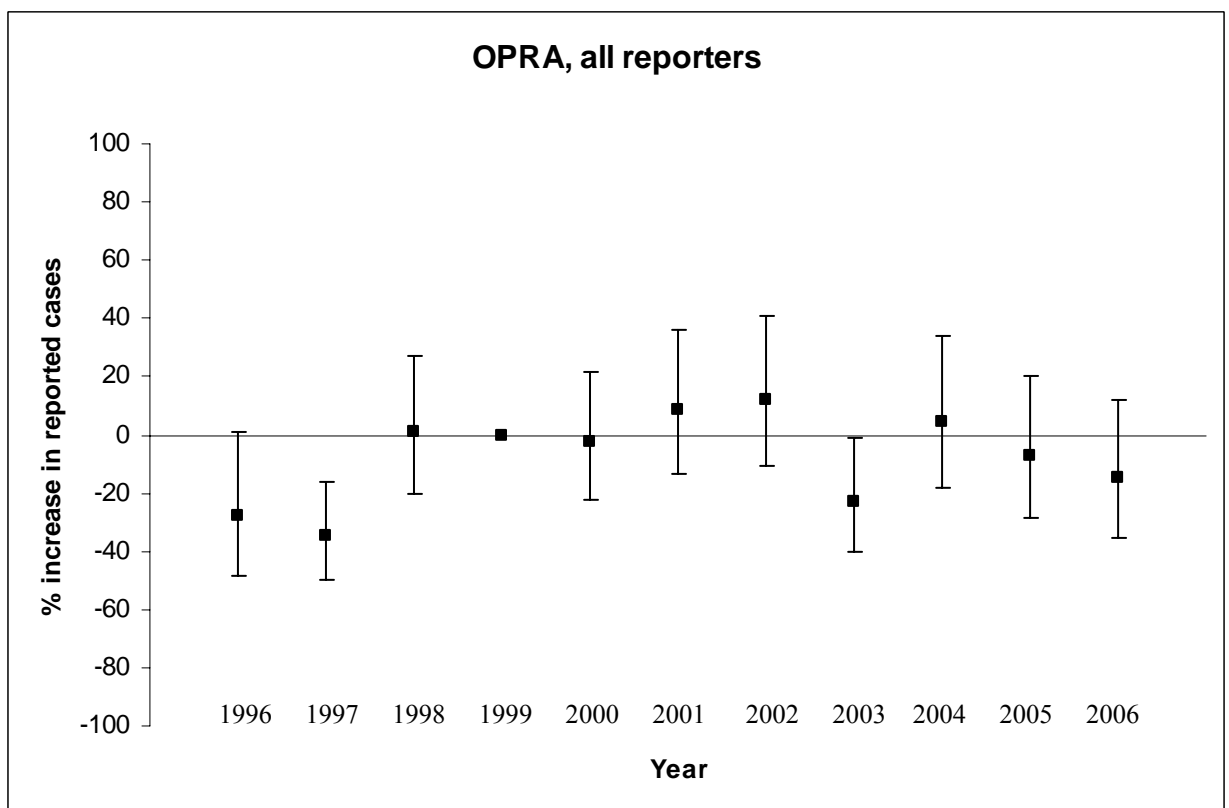
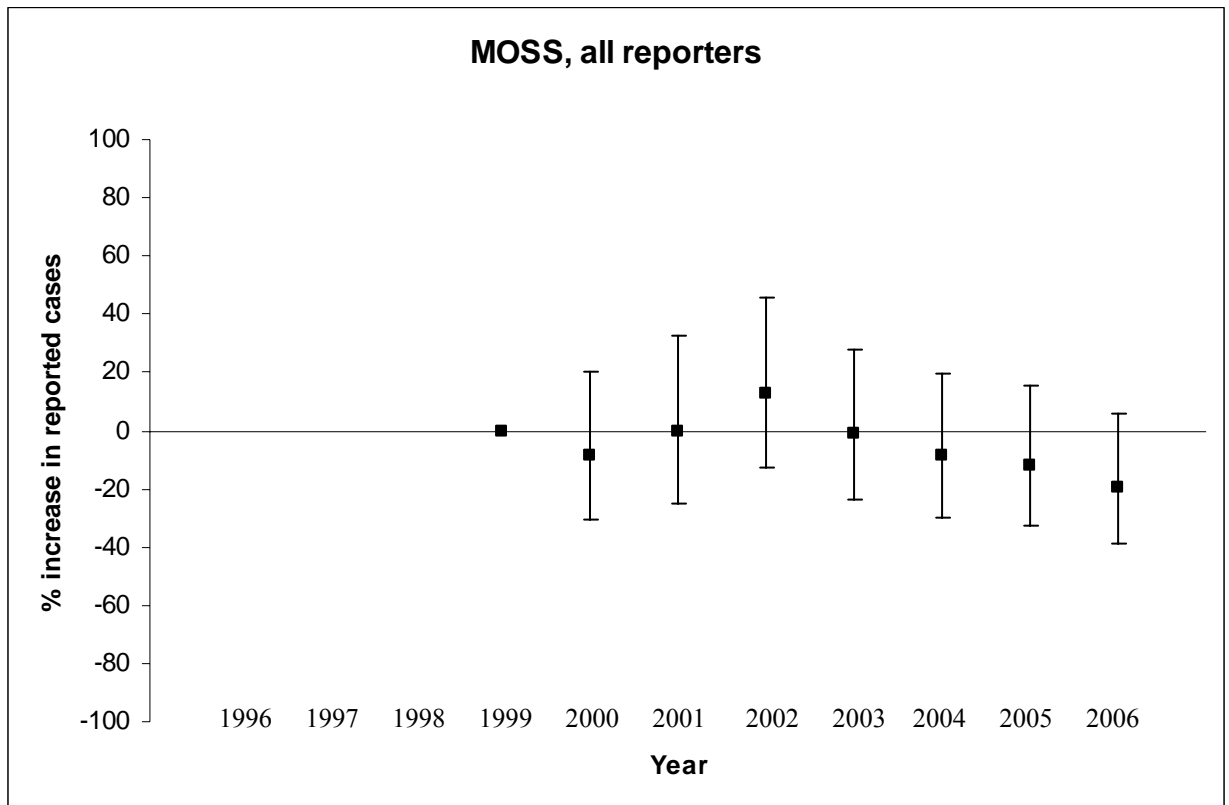
Table 24 Percentage change in incidence of upper limb disorders

Reporter Group	Year (categorical)	MOSS		OPRA	
		Random effects % change	Fixed effects % change	Random effects % change	Fixed effects % change
All	1996			-27.9 (-48.6, 1.0)	-14.8 (-40.7, 22.3)
	1997			-35.0 (-49.8, -15.9)	-31.3 (-47.1, -10.8)
	1998			0.7 (-20.1, 27.0)	3.2 (-18.3, 30.3)
	1999			REFERENCE	
	2000	-8.7 (-30.7, 20.3)	-10.2 (-32.0, 18.7)	-2.7 (-22.3, 21.9)	-2.6 (-22.4, 22.3)
	2001	-0.1 (-24.9, 32.9)	-6.6 (-30.1, 24.7)	8.6 (-13.5, 36.3)	3.9 (-17.4, 30.7)
	2002	13.0 (-12.4, 45.9)	4.3 (-20.0, 36.0)	12.1 (-10.7, 40.9)	5.9 (-16.0, 33.5)
	2003	-1.2 (-23.8, 28.0)	-9.4 (-30.9, 18.7)	-22.8 (-40.0, -0.7)	-26.4 (-43.0, -5.0)
	2004	-8.3 (-29.7, 19.5)	-16.6 (-36.9, 10.1)	4.8 (-18.2, 34.3)	1.6 (-21.1, 30.8)
	2005	-11.8 (-32.7, 15.5)	-21.5 (-41.0, 4.4)	-7.3 (-28.3, 20.0)	-10.6 (-31.4, 16.7)
	2006	-19.7 (-39.1, 5.9)	-28.8 (-46.9, -4.5)	-15.1 (-35.4, 11.7)	-17.6 (-37.9, 9.4)
	Year continuous ^a	-3.7 (-6.7, -0.7)	-5.5 (-8.6, -2.3)	1.3 (-0.9, 3.5)	0.1 (-2.3, 2.4)
	Year continuous ^b			-2.9 (-5.9, 0.1)	-3.2 (-6.3, 0.0)
Core	1996				
	1997				
	1998				
	1999			REFERENCE	
	2000				
	2001				
	2002	REFERENCE			
	2003	-16.5 (-33.1, 4.3)	-16.9 (-33.5, 3.8)		
	2004	-25.0 (-40.8, -4.9)	-25.4 (-41.2, -5.4)		
	2005	-33.0 (-47.8, -13.9)	-33.3 (-48.1, -14.2)		
	2006	-34.8 (-49.3, -16.2)	-35.3 (-50.0, -16.3)		
	Year continuous ^a	-10.5 (-15.5, -5.3)	-10.7 (-15.8, -5.3)		
	Sample	1996			
1997					
1998					
1999				REFERENCE	
2000		-6.7 (-29.3, 23.3)	-8.4 (-30.9, 21.3)		
2001		0.7 (-24.5, 34.3)	-5.5 (-29.3, 26.3)		
2002		1.2 (-25.2, 36.8)	-4.1 (-29.5, 30.4)		
2003		-1.7 (-27.5, 33.2)	-8.4 (-33.0, 25.1)		
2004		-3.5 (-29.3, 31.8)	-11.5 (-36.0, 22.5)		
2005		-1.7 (-28.1, 34.4)	-13.3 (-37.8, 20.9)		
2006		-14.6 (-38.9, 19.5)	-26.2 (-48.8, 6.2)		
Year continuous ^a		-1.0 (-4.5, 2.7)	-2.9 (-6.7, 1.2)		

^a Calendar year continuous 1996-2006

^c Calendar year continuous 1999-2006

Figure 33 Percentage change (and 95% confidence intervals) in the incidence of upper limb disorders



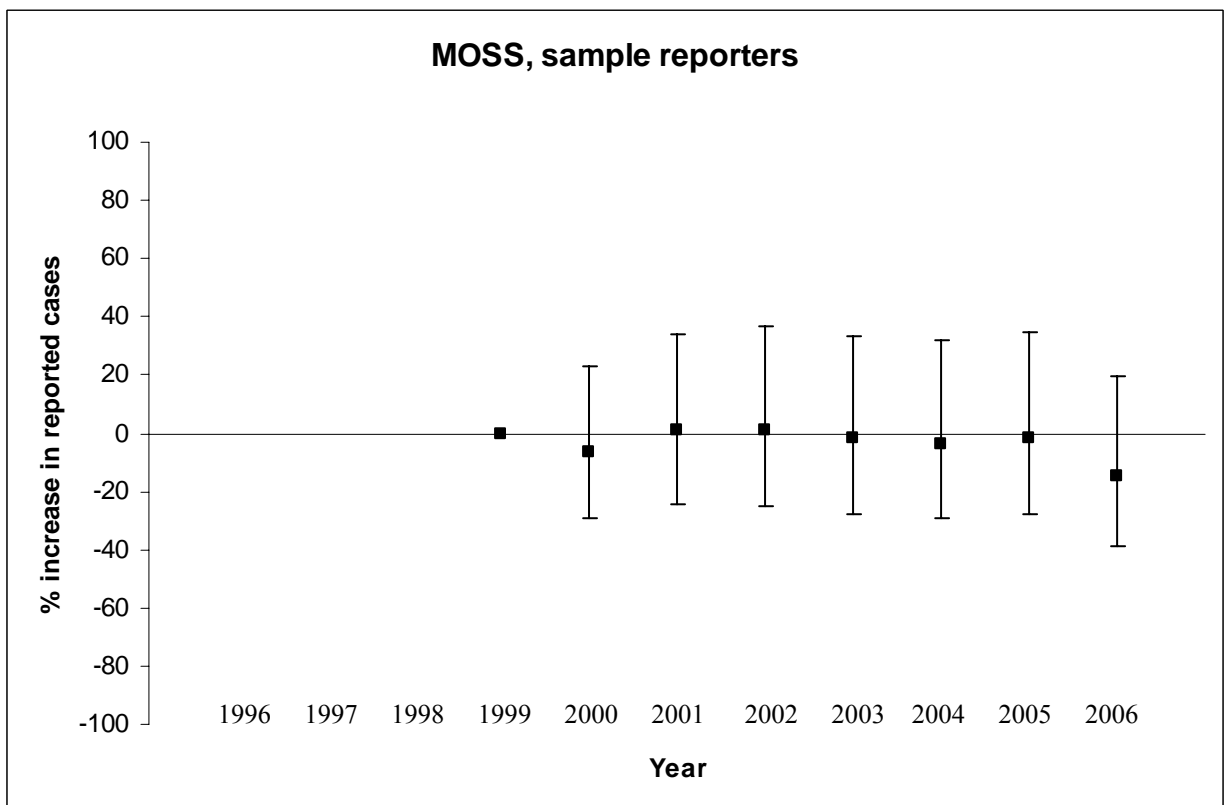
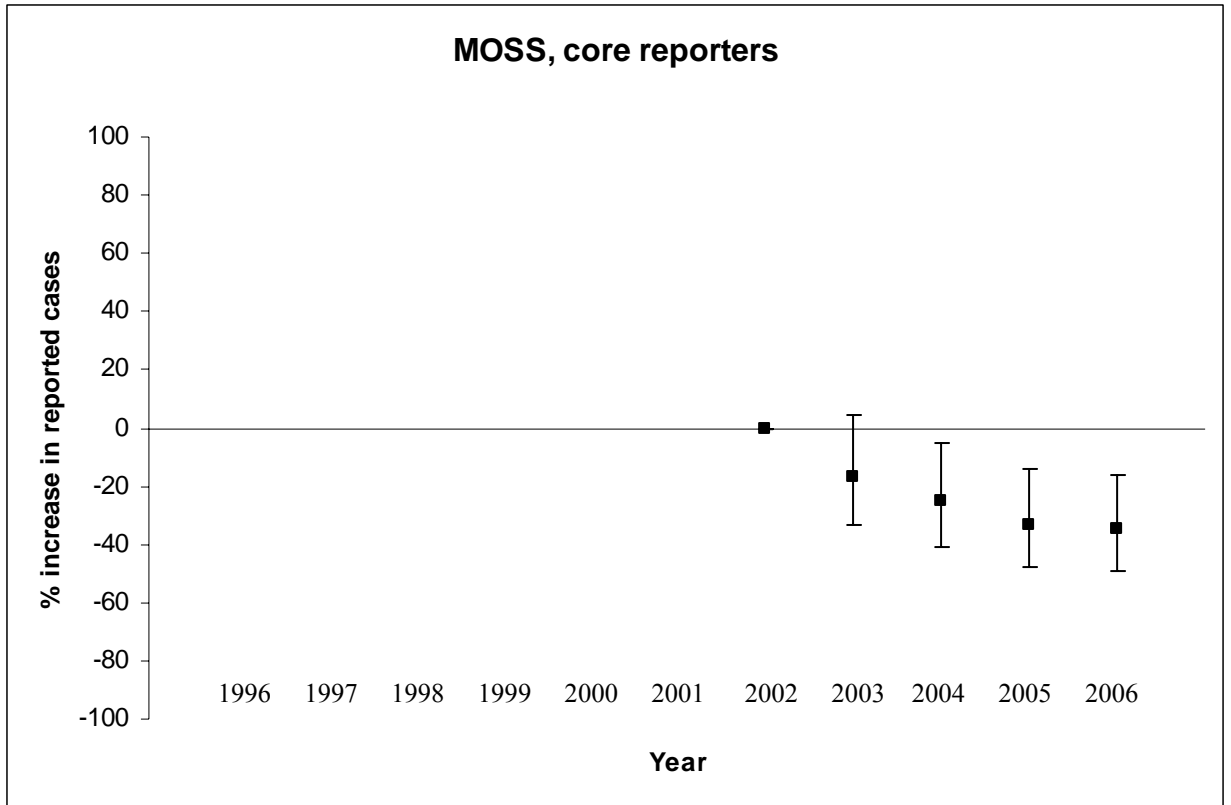


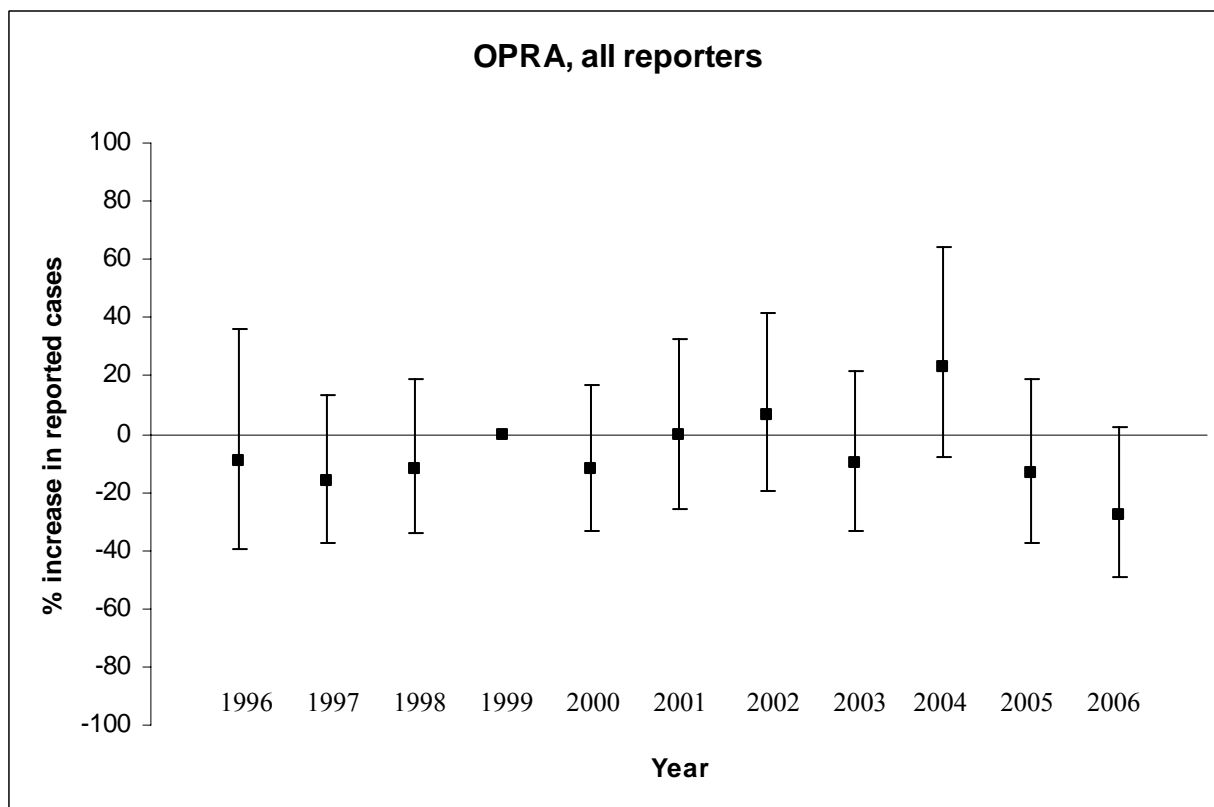
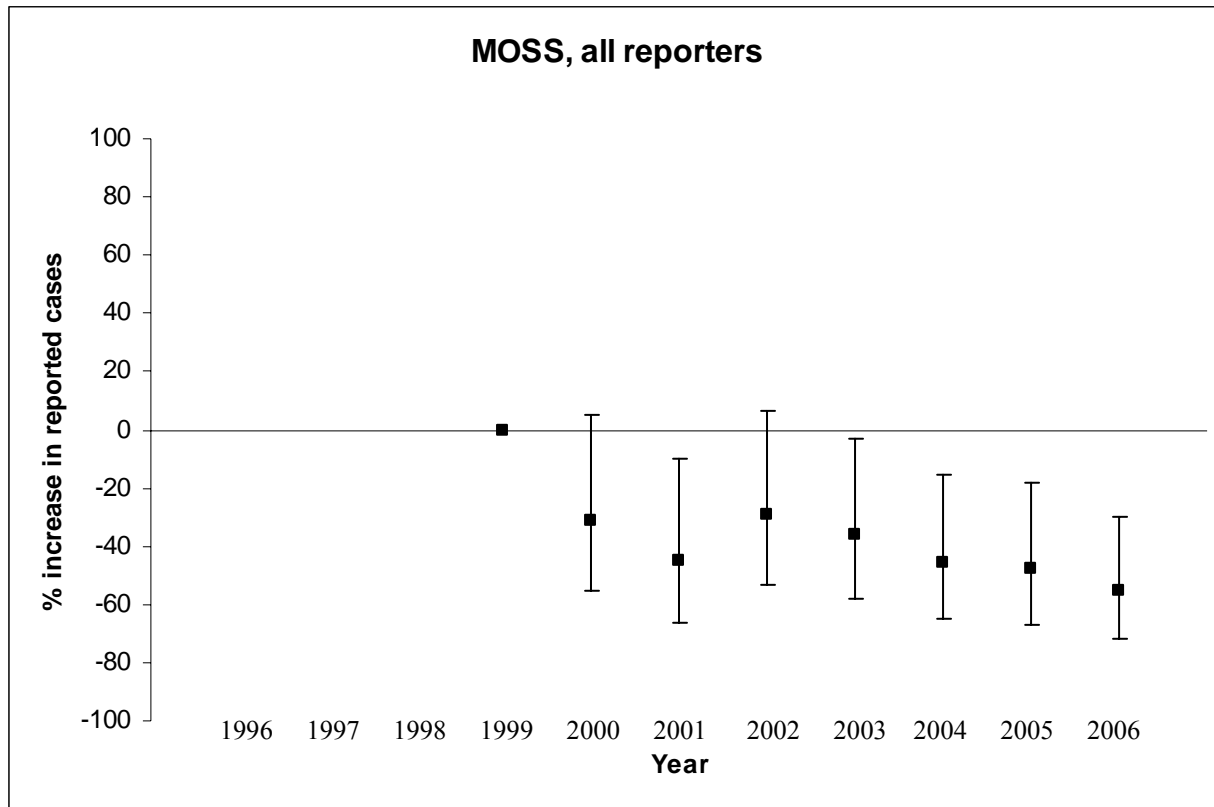
Table 25 Percentage change in incidence of spine/back disorders

Reporter Group	Year (categorical)	MOSS		OPRA	
		Random effects % change	Fixed effects % change	Random effects % change	Fixed effects % change
All	1996			-9.4 (-39.5, 35.8)	9.8 (-29.5, 70.8)
	1997			-15.9 (-37.7, 13.6)	-12.1 (-35.1, 19.2)
	1998			-11.7 (-34.3, 18.6)	-9.5 (-32.8, 21.8)
	1999			REFERENCE	
	2000	-31.3 (-55.3, 5.4)	-37.0 (-59.3, -2.6)	-11.8 (-33.5, 16.9)	-14.9 (-36.0, 13.3)
	2001	-45.0 (-66.3, -10.2)	-50.5 (-69.8, -18.9)	-0.6 (-25.7, 32.8)	-7.3 (-30.9, 24.4)
	2002	-29.4 (-53.2, 6.6)	-32.9 (-56.5, 3.4)	6.5 (-19.7, 41.4)	-1.9 (-26.4, 30.7)
	2003	-36.4 (-58.2, -3.4)	-40.5 (-61.8, -7.4)	-10.1 (-33.6, 21.6)	-16.9 (-38.9, 12.8)
	2004	-45.4 (-64.7, -15.7)	-49.4 (-68.1, -19.6)	23.0 (-7.8, 64.3)	14.0 (-15.1, 53.2)
	2005	-47.8 (-66.7, -18.4)	-51.9 (-70.3, -22.2)	-13.6 (-37.3, 19.1)	-23.9 (-45.4, 6.0)
	2006	-55.4 (-71.8, -29.6)	-60.5 (-75.8, -35.3)	-27.6 (-48.8, 2.3)	-36.9 (-56.0, -9.4)
		Year continuous ^a	-9.3 (-14.2, -4.1)	-10.6 (-15.9, -5.0)	0.3 (-2.3, 3.0)
	Year continuous ^b			-1.5 (-5.1, 2.3)	-2.8 (-6.6, 1.1)
Core	1996				
	1997				
	1998				
	1999				
	2000				
	2001				
	2002	REFERENCE			
	2003	-14.3 (-41.5, 25.5)	-14.8 (-42.0, 25.0)		
	2004	-18.1 (-44.9, 21.8)	-18.6 (-45.4, 21.2)		
	2005	-28.1 (-52.7, 9.4)	-28.6 (-53.2, 8.9)		
	2006	-44.9 (-64.9, -13.5)	-43.8 (-64.3, -11.4)		
		Year continuous ^a	-12.4 (-20.6, -3.4)	-12.1 (-20.4, -3.0)	
Sample	1996				
	1997				
	1998				
	1999			REFERENCE	
	2000	-28.6 (-53.8, 10.2)	-34.4 (-58.0, 2.2)		
	2001	-45.5 (-66.8, -10.6)	-52.2 (-71.0, -21.3)		
	2002	-34.0 (-60.0, 8.7)	-37.1 (-62.5, 5.6)		
	2003	-31.1 (-58.5, 14.4)	-33.2 (-60.4, 12.5)		
	2004	-53.2 (-73.5, -17.3)	-59.4 (-77.8, -25.4)		
	2005	-46.9 (-69.8, -6.8)	-55.1 (-76.1, -15.7)		
	2006	-47.9 (-70.6, -7.6)	-58.1 (-78.1, -20.2)		
		Year continuous ^a	-8.2 (-14.1, -2.0)	-10.4 (-17.0, -3.4)	

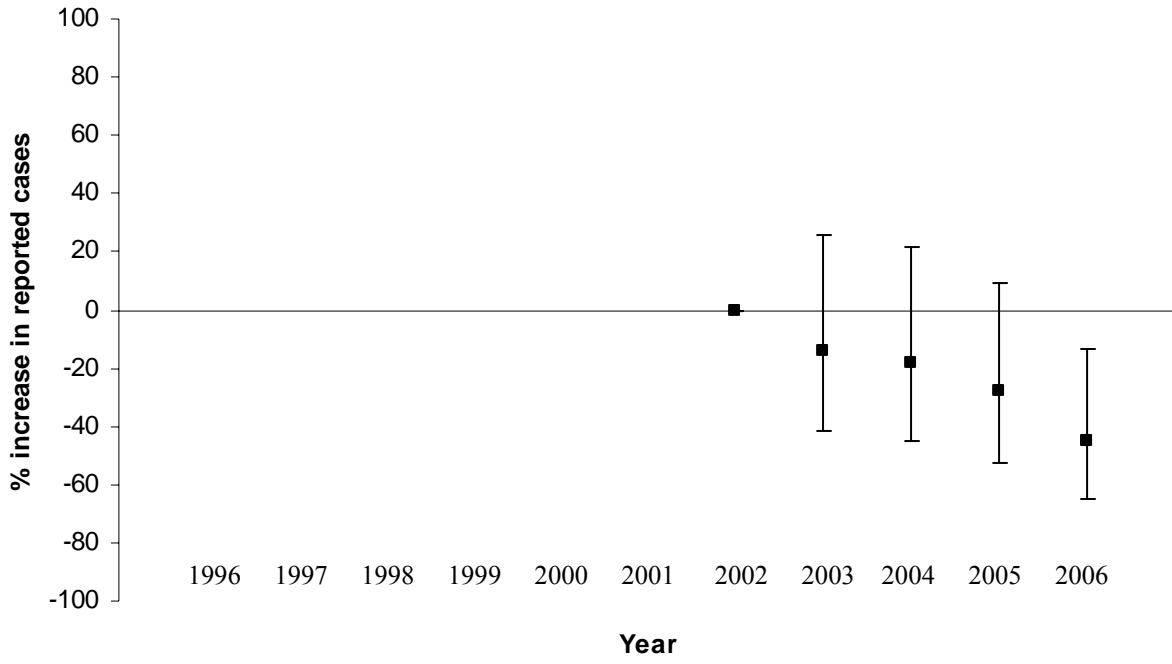
^a Calendar year continuous 1996-2006

^c Calendar year continuous 1999-2006

Figure 34 Percentage change (and 95% confidence intervals) in the incidence of spine/back disorders



MOSS, core reporters



MOSS, sample reporters

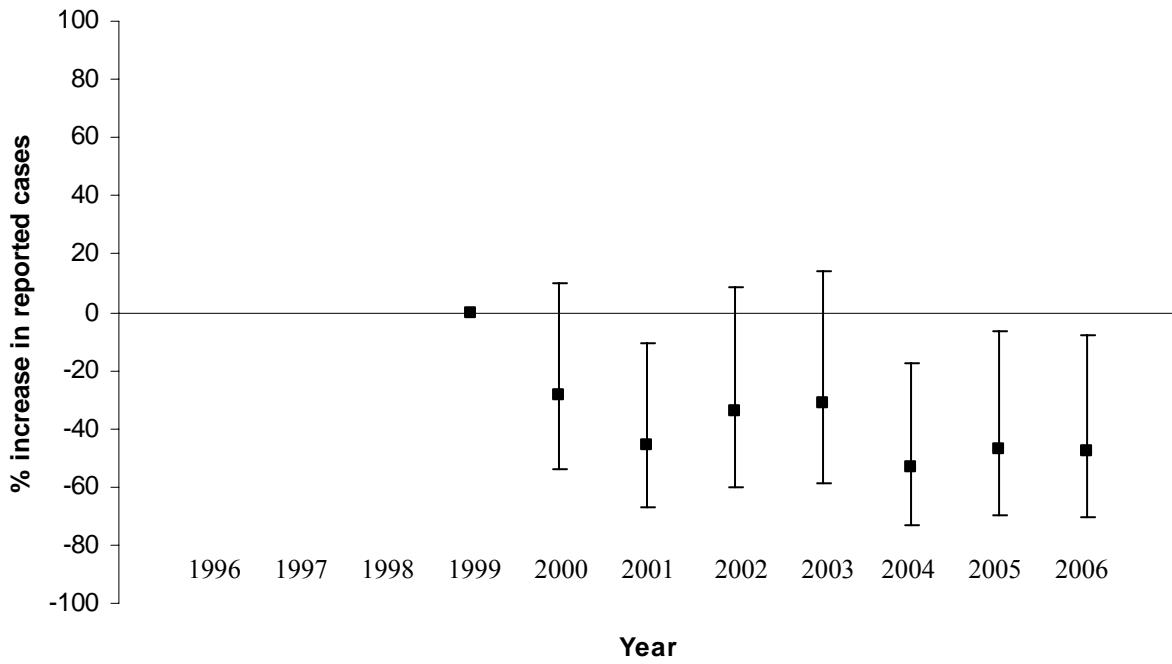
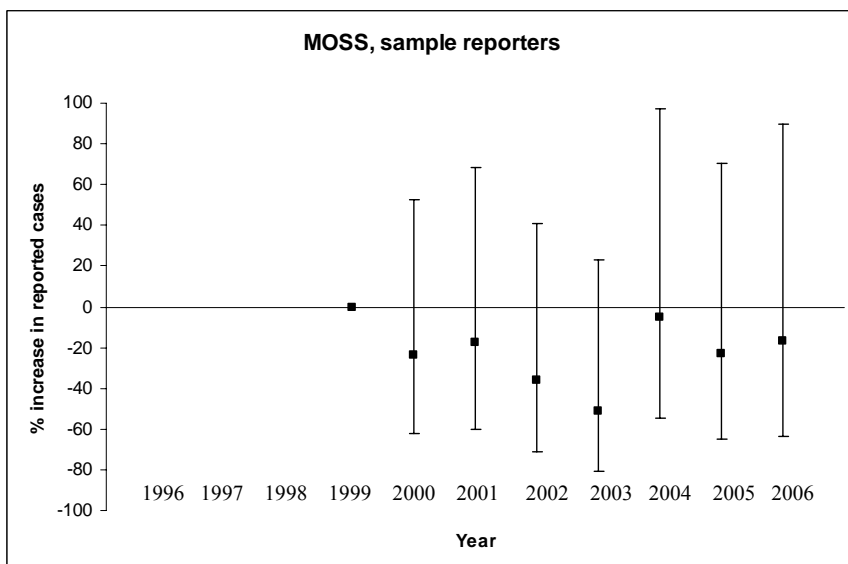
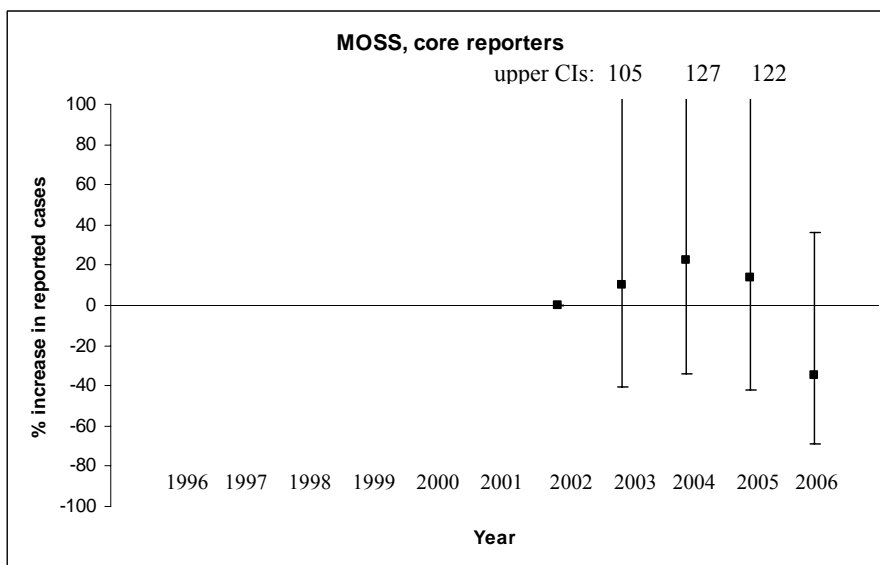
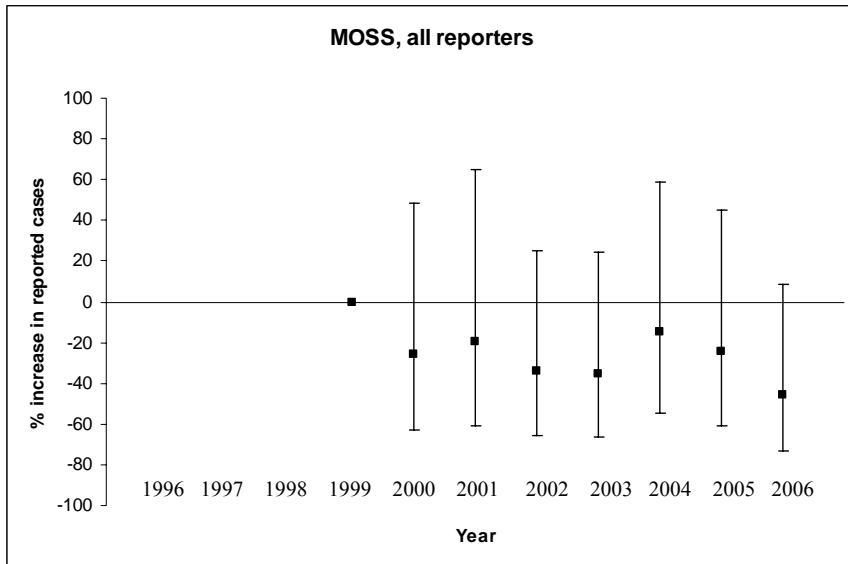


Table 26 Percentage change in incidence of lower limb disorders

Reporter Group	Year (categorical)	MOSS	
		Random effects % change	Fixed effects % change
All	1996		
	1997		
	1998		
	1999	REFERENCE	
	2000	-26.0 (-63.0, 48.4)	-29.6 (-66.2, 46.6)
	2001	-19.5 (-60.7, 64.8)	-26.1 (-64.5, 54.0)
	2002	-34.3 (-65.4, 25.1)	-46.0 (-73.1, 8.7)
	2003	-35.2 (-66.2, 24.2)	-47.1 (-74.2, 8.4)
	2004	-15.1 (-54.7, 58.9)	-33.6 (-67.1, 33.8)
	2005	-24.4 (-60.6, 45.2)	-44.4 (-73.3, 15.9)
	2006	-45.9 (-73.0, 8.4)	-57.0 (-80.2, -6.6)
	Year continuous ^a	-3.9 (-11.3, 4.1)	-6.9 (-15.0, 2.1)
Core	1996		
	1997		
	1998		
	1999		
	2000		
	2001		
	2002	REFERENCE	
	2003	10.1 (-40.9, 105.0)	7.0 (-42.5, 99.1)
	2004	22.4 (-34.0, 127.3)	19.5 (-35.6, 121.6)
	2005	13.6 (-41.8, 122.0)	11.6 (-42.9, 118.4)
	2006	-35.0 (-69.0, 36.2)	-33.0 (-68.4, 41.9)
	Year continuous ^a	-6.7 (-19.7, 8.4)	-6.0 (-19.4, 9.4)
Sample	1996		
	1997		
	1998		
	1999	REFERENCE	
	2000	-23.7 (-61.9, 52.7)	-29.1 (-66.9, 51.8)
	2001	-17.8 (-59.9, 68.2)	-19.8 (-62.0, 69.5)
	2002	-36.1 (-71.0, 40.7)	-43.7 (-75.6, 29.6)
	2003	-51.3 (-80.7, 23.0)	-56.6 (-84.3, 20.1)
	2004	-5.4 (-54.6, 97.1)	-24.2 (-66.7, 72.5)
	2005	-23.1 (-65.2, 70.2)	-47.7 (-79.4, 32.7)
	2006	-17.0 (-63.7, 89.7)	-33.8 (-75.1, 76.1)
	Year continuous ^a	-2.1 (-11.0, 7.8)	-6.3 (-16.6, 5.4)

^a Calendar year continuous 1996-2006

Figure 35 Percentage change (and 95% confidence intervals) in the incidence of lower limb disorders



3.2.4. Mental ill-health

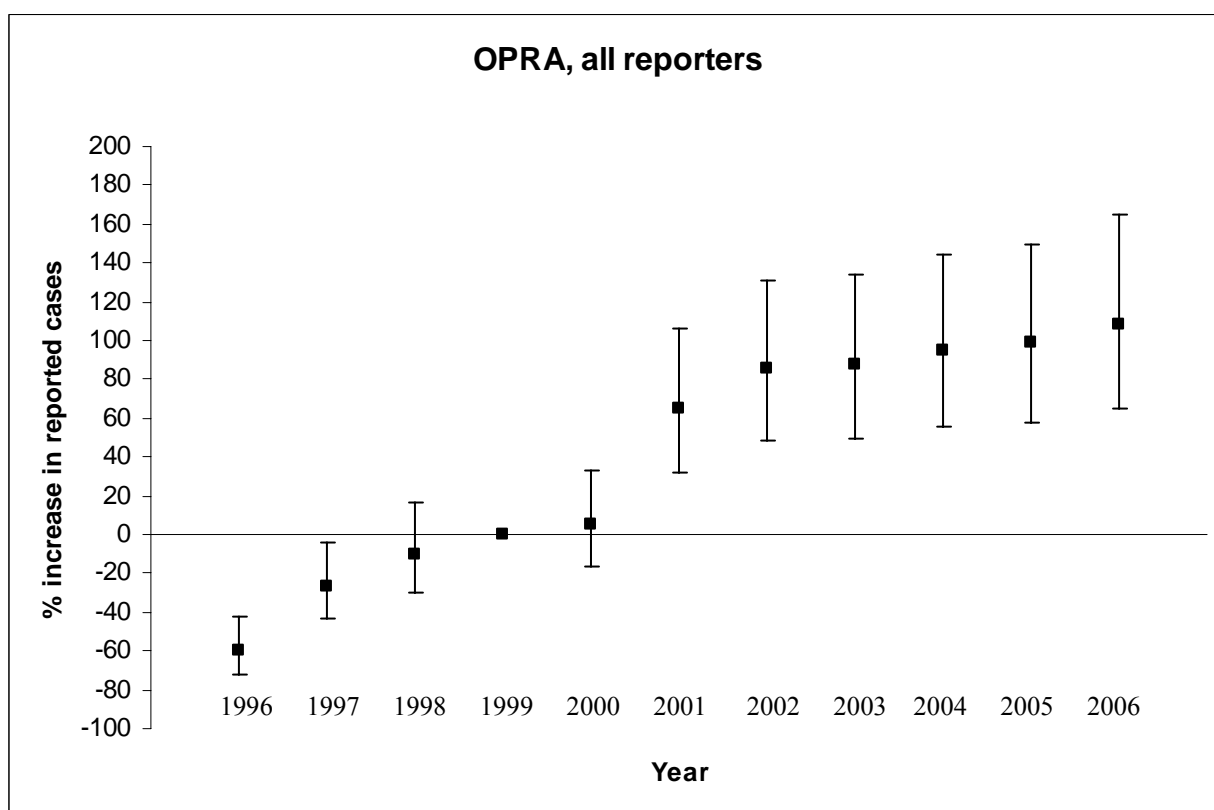
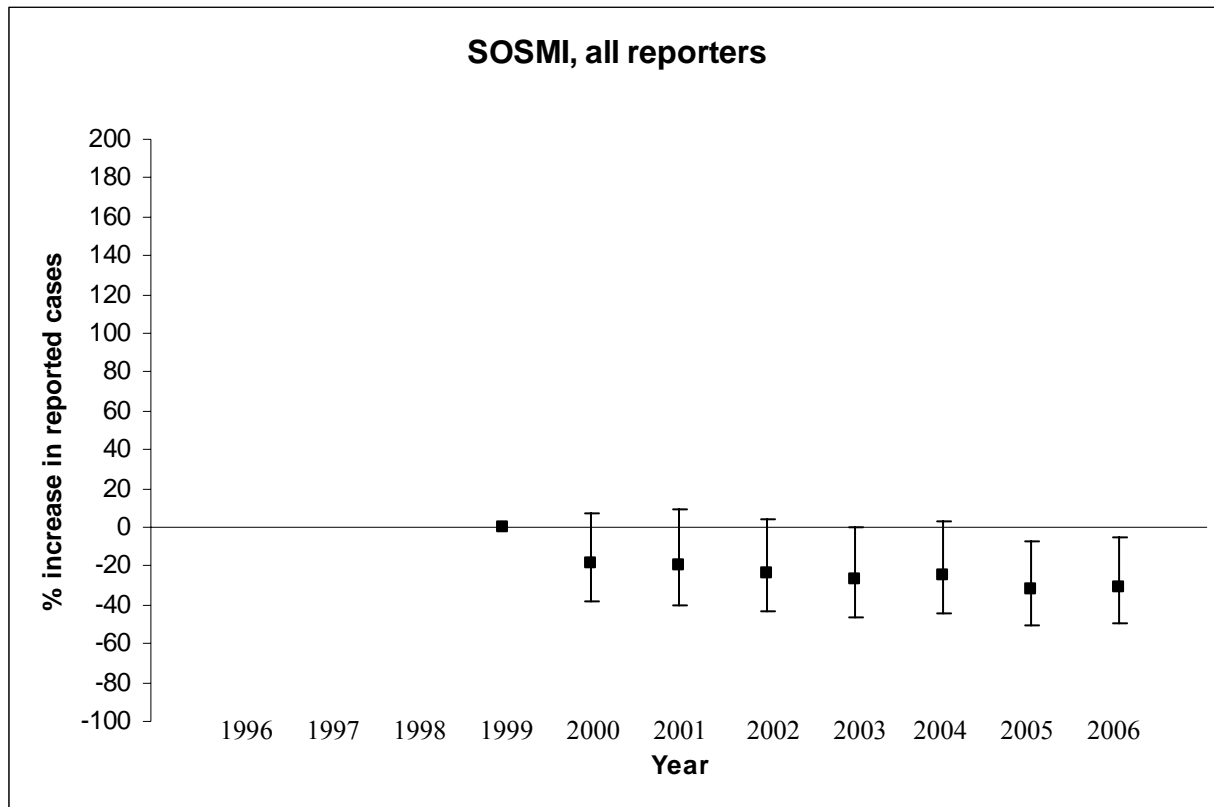
Table 27 Percentage change in incidence of (total) mental ill-health cases.

Reporter Group	Year (categorical)	SOSMI		OPRA	
		Random effects % change	Fixed effects % change	Random effects % change	Fixed effects % change
All	1996			-59.9 (-72.1, -42.4)	-52.9 (-67.8, -31.1)
	1997			-26.5 (-43.8, -3.8)	-19.5 (-38.7, 5.6)
	1998			-9.9 (-30.1, 16.0)	-5.1 (-26.5, 22.4)
	1999			REFERENCE	
	2000	-18.3 (-37.8, 7.3)	-29.0 (-46.7, -5.4)	5.3 (-16.8, 33.3)	6.0 (-16.4, 34.4)
	2001	-19.3 (-40.3, 9.0)	-32.3 (-50.7, -7.0)	65.3 (32.1, 106.7)	60.1 (27.6, 100.9)
	2002	-23.2 (-43.4, 4.3)	-33.2 (-52.1, -6.8)	85.2 (48.7, 130.6)	77.2 (41.8, 121.4)
	2003	-27.1 (-46.6, -0.4)	-38.8 (-56.6, -13.8)	87.2 (49.8, 133.9)	78.7 (42.5, 124.1)
	2004	-24.5 (-44.6, 2.8)	-35.7 (-54.1, -10.0)	95.1 (55.5, 144.8)	86.0 (47.6, 134.4)
	2005	-32.0 (-50.1, -7.3)	-43.7 (-60.0, -20.6)	98.9 (58.2, 150.0)	87.0 (47.8, 136.5)
	2006	-30.5 (-49.1, -5.0)	-44.2 (-61.2, -19.8)	108.7 (64.7, 164.5)	96.1 (53.5, 150.5)
		Year continuous ^a	-3.3 (-6.0, -0.5)	-4.2 (-7.1, -1.1)	13.1 (10.9, 15.4)
	Year continuous ^b			9.7 (6.9, 12.6)	8.7 (5.8, 11.7)
Core	1996				
	1997				
	1998				
	1999				
	2000				
	2001				
	2002	REFERENCE			
	2003	-2.6 (-20.5, 19.3)	-3.1 (-20.8, 18.6)		
	2004	-8.6 (-25.7, 12.5)	-9.8 (-26.6, 10.8)		
	2005	-13.8 (-30.3, 6.4)	-15.6 (-31.6, 4.1)		
	2006	-9.6 (-26.6, 11.5)	-11.5 (-28.2, 9.0)		
		Year continuous ^a	-3.0 (-7.7, 1.9)	-3.6 (-8.2, 1.3)	
Sample	1996				
	1997				
	1998				
	1999			REFERENCE	
	2000	-18.4 (-38.0, 7.4)	-32.8 (-51.3, -7.2)		
	2001	-19.0 (-40.2, 9.8)	-37.1 (-55.9, -10.3)		
	2002	-25.0 (-45.8, 3.8)	-41.4 (-60.0, -14.2)		
	2003	-28.8 (-49.2, -0.2)	-45.6 (-63.4, -19.1)		
	2004	-17.7 (-40.8, 14.6)	-37.4 (-57.5, -7.8)		
	2005	-30.4 (-50.4, -2.3)	-50.8 (-67.2, -26.2)		
	2006	-33.9 (-53.3, -6.3)	-56.2 (-72.1, -31.1)		
		Year continuous ^a	-3.4 (-6.5, -0.1)	-5.7 (-9.3, -2.0)	

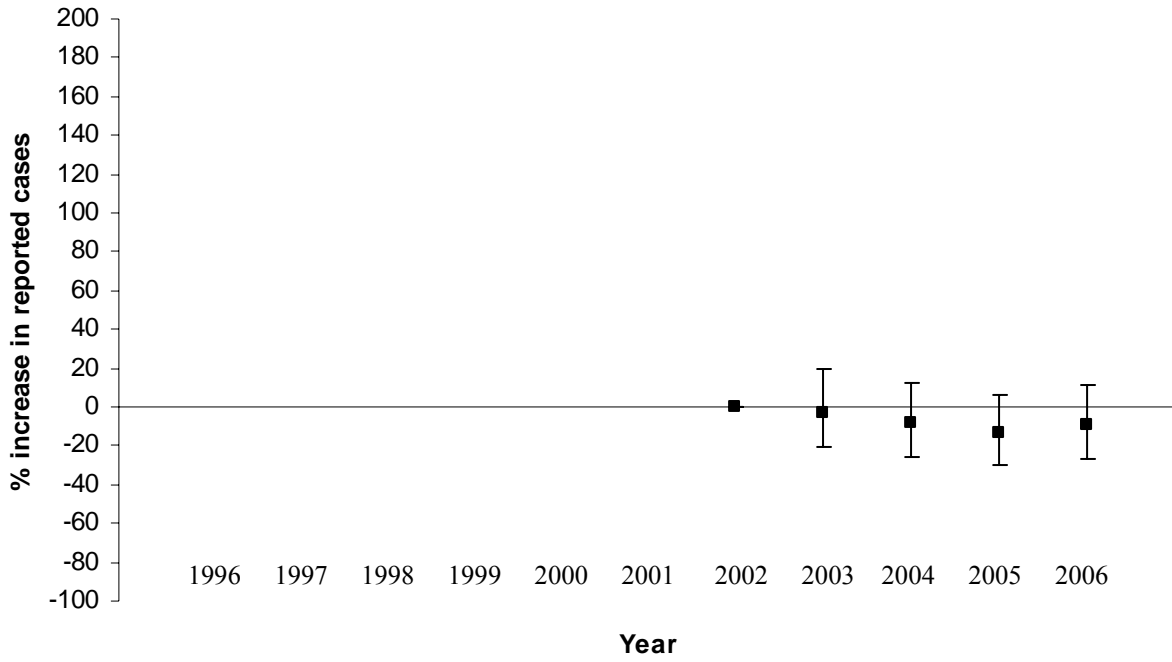
^a Calendar year continuous 1996-2006

^c Calendar year continuous 1999-2006

Figure 36 Percentage change (and 95% confidence intervals) in the incidence of total mental ill-health



SOSMI, core reporters



SOSMI, sample reporters

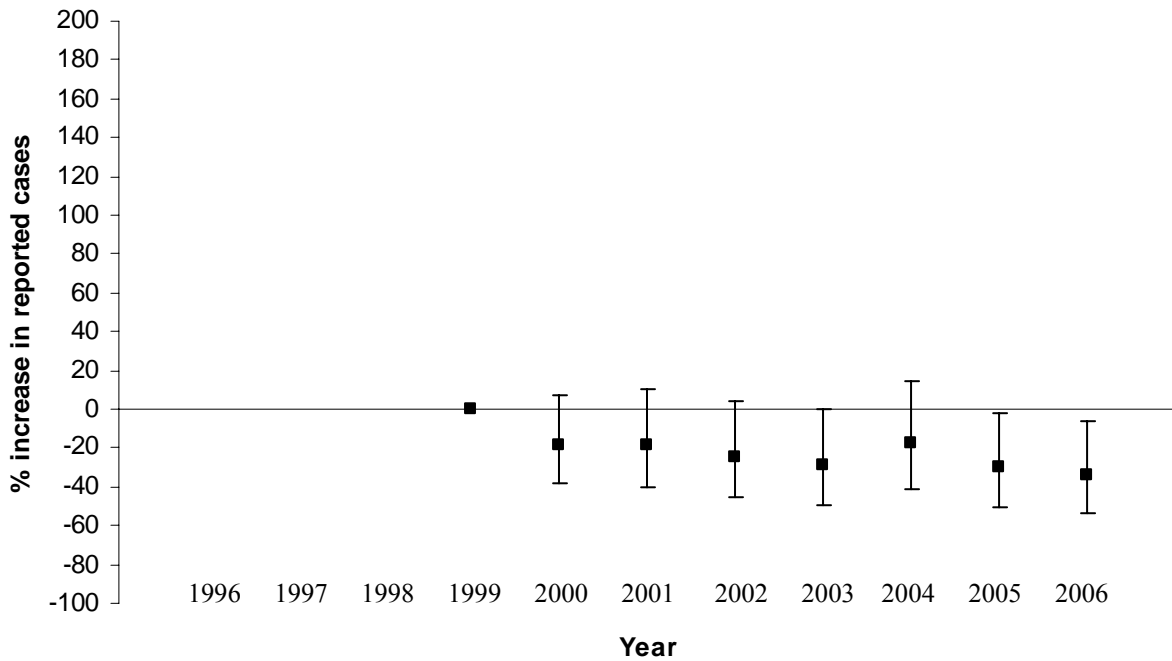


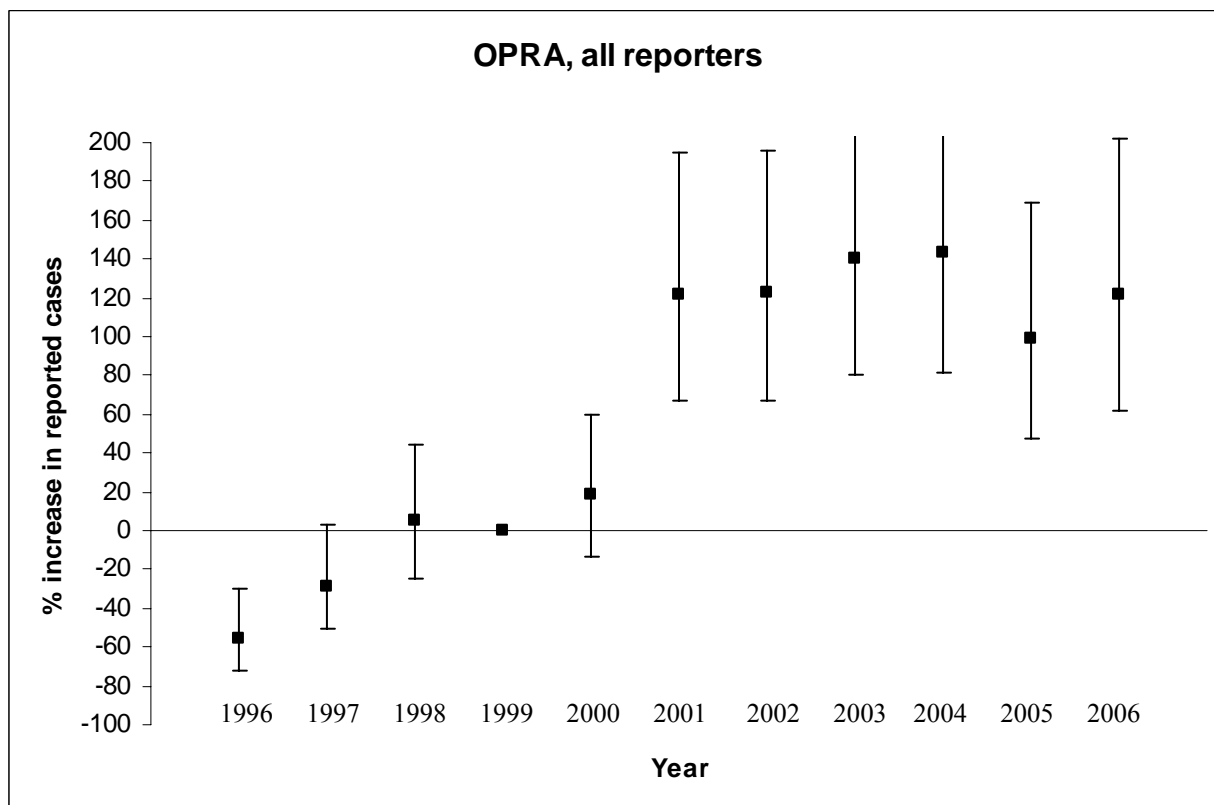
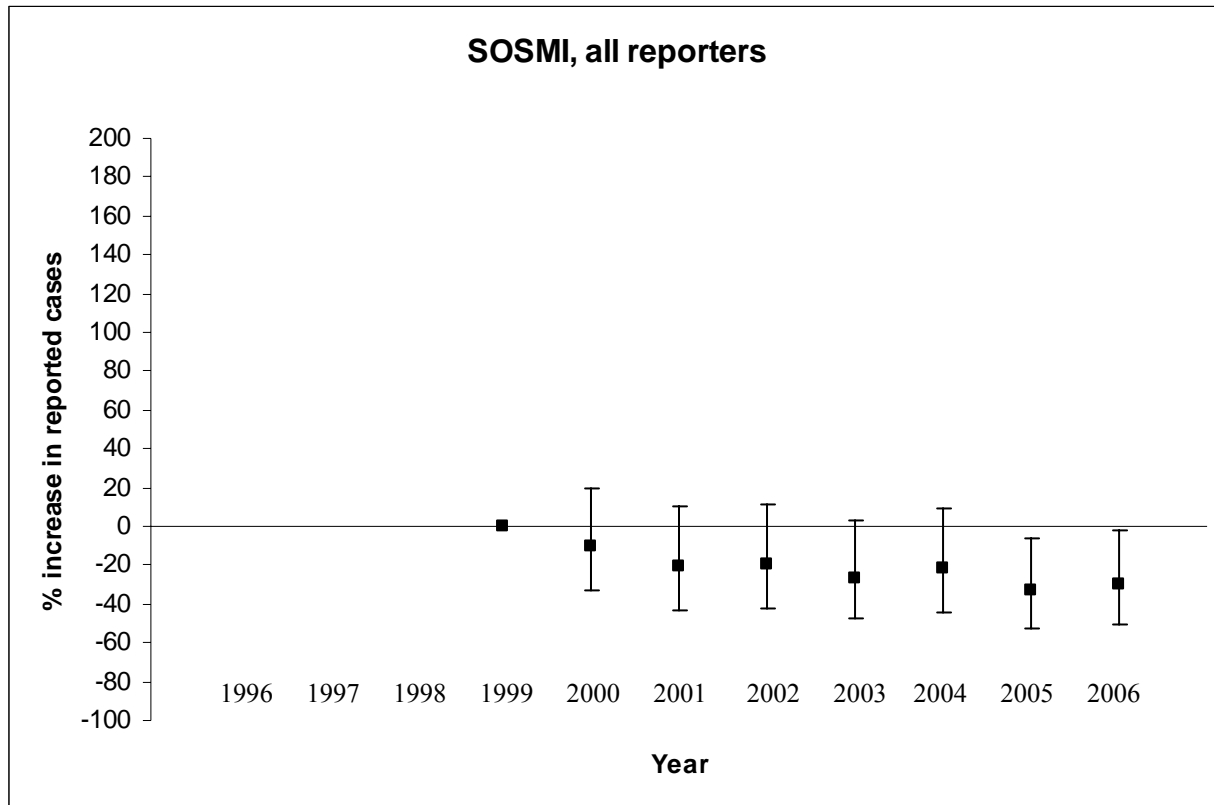
Table 28 Percentage change in incidence of anxiety and depression.

Reporter Group	Year (categorical)	SOSMI		OPRA		
		Random effects % change	Fixed effects % change	Random effects % change	Fixed effects % change	
All	1996			-55.7 (-71.9, -30.1)	-47.4 (-67.6, -14.6)	
	1997			-28.4 (-50.1, 2.8)	-19.4 (-44.1, 16.1)	
	1998			4.7 (-24.3, 44.8)	12.2 (-19.2, 55.8)	
	1999			REFERENCE		
	2000	-10.7 (-33.3, 19.6)	-19.7 (-41.4, 10.2)	18.1 (-13.0, 60.3)	20.2 (-11.8, 63.8)	
	2001	-20.8 (-42.9, 9.9)	-30.9 (-51.4, -1.7)	122.0 (66.9, 195.2)	115.7 (61.2, 188.7)	
	2002	-20.0 (-42.6, 11.4)	-28.6 (-50.8, 3.7)	122.5 (67.5, 195.4)	113.5 (59.6, 185.5)	
	2003	-26.3 (-47.4, 3.4)	-36.0 (-56.3, -6.2)	139.9 (80.1, 219.6)	130.5 (71.8, 209.4)	
	2004	-21.9 (-44.1, 9.2)	-31.8 (-53.1, -0.7)	143.1 (81.6, 225.4)	130.5 (70.6, 211.5)	
	2005	-33.2 (-52.4, -6.4)	-43.3 (-61.4, -16.7)	98.8 (47.0, 168.8)	85.0 (35.4, 152.9)	
	2006	-30.0 (-50.1, -1.8)	-42.0 (-61.2, -13.2)	121.5 (62.3, 202.3)	106.3 (49.0, 185.7)	
		Year continuous^a	-4.1 (-7.1, -1.0)	-5.1 (-8.4, -1.8)	13.3 (10.6, 16.1)	11.1 (8.2, 14.0)
		Year continuous^b			8.7 (5.3, 12.2)	7.4 (3.8, 11.0)
Core	1996					
	1997					
	1998					
	1999					
	2000					
	2001					
	2002	REFERENCE				
	2003	-10.8 (-29.7, 13.2)	-11.6 (-30.3, 12.2)			
	2004	-16.7 (-34.8, 6.5)	-18.3 (-36.1, 4.4)			
	2005	-29.8 (-45.6, -9.3)	-31.9 (-47.3, -12.1)			
	2006	-17.4 (-35.5, 5.7)	-20.1 (-37.7, 2.4)			
		Year continuous^a	-5.5 (-11.0, 0.3)	-6.3 (-11.8, -0.6)		
	Sample	1996				
1997						
1998						
1999				REFERENCE		
2000		-10.8 (-33.6, 19.8)	-23.0 (-45.4, 8.5)			
2001		-20.7 (-43.0, 10.3)	-34.4 (-55.3, -3.8)			
2002		-25.4 (-47.6, 6.2)	-37.1 (-58.4, -4.9)			
2003		-29.0 (-50.8, 2.3)	-42.2 (-62.4, -11.1)			
2004		-13.8 (-39.7, 23.1)	-29.6 (-53.7, 7.0)			
2005		-25.6 (-48.4, 7.3)	-43.7 (-63.8, -12.5)			
2006		-35.8 (-56.1, -6.2)	-52.4 (-71.0, -22.0)			
		Year continuous^a	-3.8 (-7.2, -0.2)	-5.5 (-9.5, -1.3)		

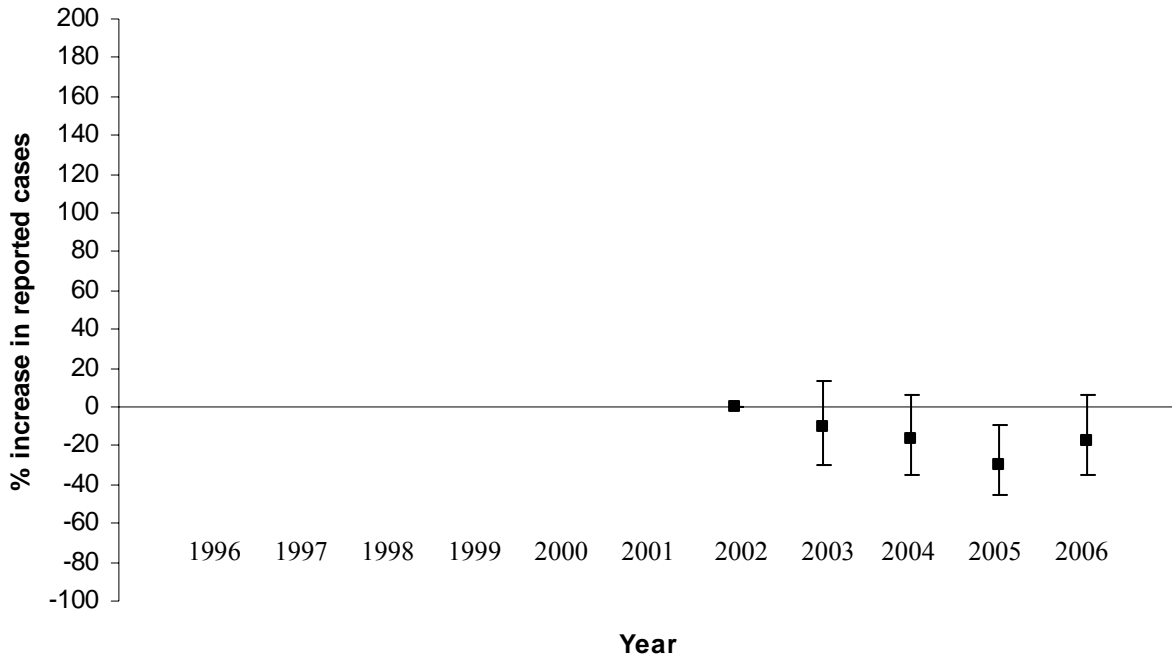
^a Calendar year continuous 1996-2006

^c Calendar year continuous 1999-2006

Figure 37 Percentage change (and 95% confidence intervals) in the incidence of anxiety and depression



SOSMI, core reporters



SOSMI, sample reporters

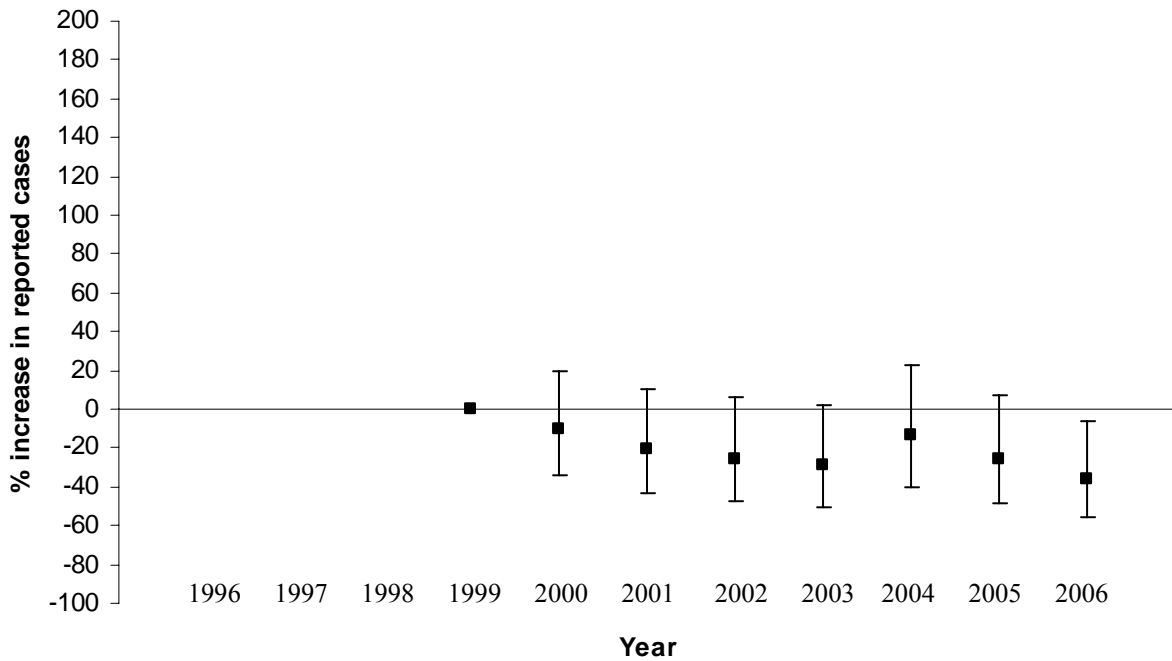


Table 29 Percentage change in incidence of post traumatic stress disorder

Reporter Group	Year (categorical)	SOSMI	
		Random effects % change	Fixed effects % change
All	1996		
	1997		
	1998		
	1999	REFERENCE	
	2000	18.9 (-40.1, 136.1)	-1.7 (-58.5, 132.5)
	2001	28.8 (-39.4, 173.7)	-9.8 (-64.3, 128.2)
	2002	18.5 (-44.1, 151.5)	-15.7 (-68.0, 122.2)
	2003	-16.5 (-62.2, 84.8)	-38.5 (-77.8, 69.9)
	2004	7.3 (-50.3, 132.0)	-25.0 (-72.4, 103.8)
	2005	31.5 (-37.3, 176.1)	-16.4 (-68.1, 119.4)
	2006	20.3 (-42.8, 153.2)	-22.5 (-72.9, 122.1)
	Year continuous ^a	1.3 (-5.8, 9.0)	-2.7 (-11.0, 6.4)
	Core	1996	
1997			
1998			
1999			
2000			
2001			
2002		REFERENCE	
2003		-45.4 (-73.3, 11.5)	-45.1 (-72.9, 11.5)
2004		2.2 (-44.6, 88.6)	-1.1 (-46.4, 82.6)
2005		11.0 (-39.0, 102.1)	3.1 (-43.7, 88.8)
2006		-8.5 (-50.7, 70.1)	-14.2 (-54.0, 60.1)
Year continuous ^a		3.6 (-10.6, 19.9)	1.7 (-12.3, 18.0)
Sample		1996	
	1997		
	1998		
	1999	REFERENCE	
	2000	20.1 (-39.7, 139.2)	8.7 (-56.2, 170.2)
	2001	34.1 (-37.1, 185.8)	2.3 (-62.0, 175.5)
	2002	21.3 (-46.2, 173.4)	-7.4 (-68.2, 169.9)
	2003	10.2 (-53.4, 161.0)	-9.0 (-70.8, 183.7)
	2004	-15.3 (-65.7, 109.1)	-30.1 (-77.9, 120.7)
	2005	29.6 (-42.8, 193.5)	-11.2 (-69.3, 156.4)
	2006	35.1 (-39.8, 203.2)	-10.0 (-75.3, 228.1)
	Year continuous ^a	0.6 (-7.5, 9.4)	-4.8 (-14.8, 6.3)

^a Calendar year continuous 1996-2006

^c Calendar year continuous 1999-2006

Figure 38 Percentage change (and 95% confidence intervals) in the incidence of post traumatic stress disorder

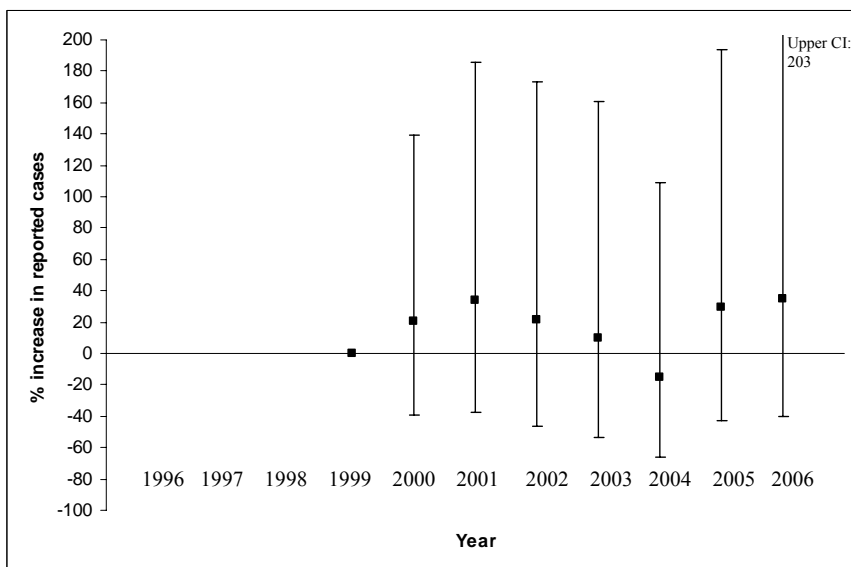
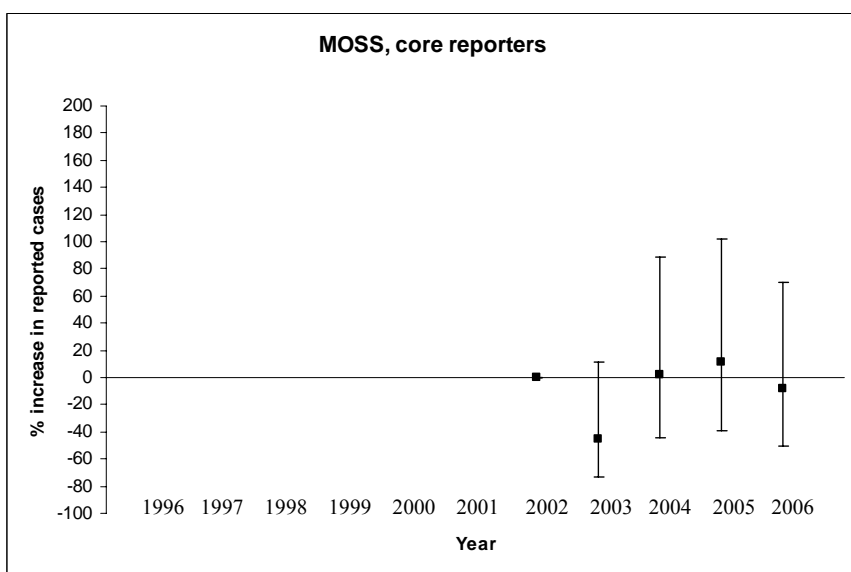
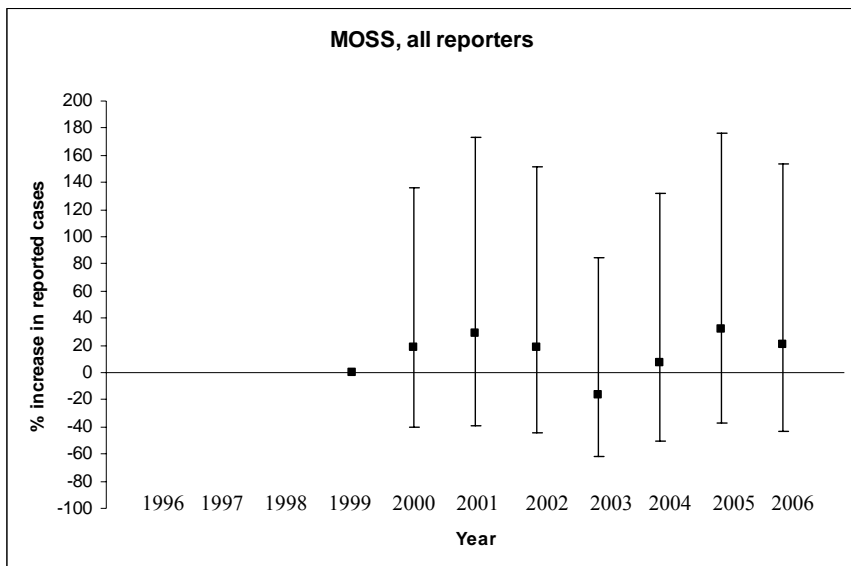


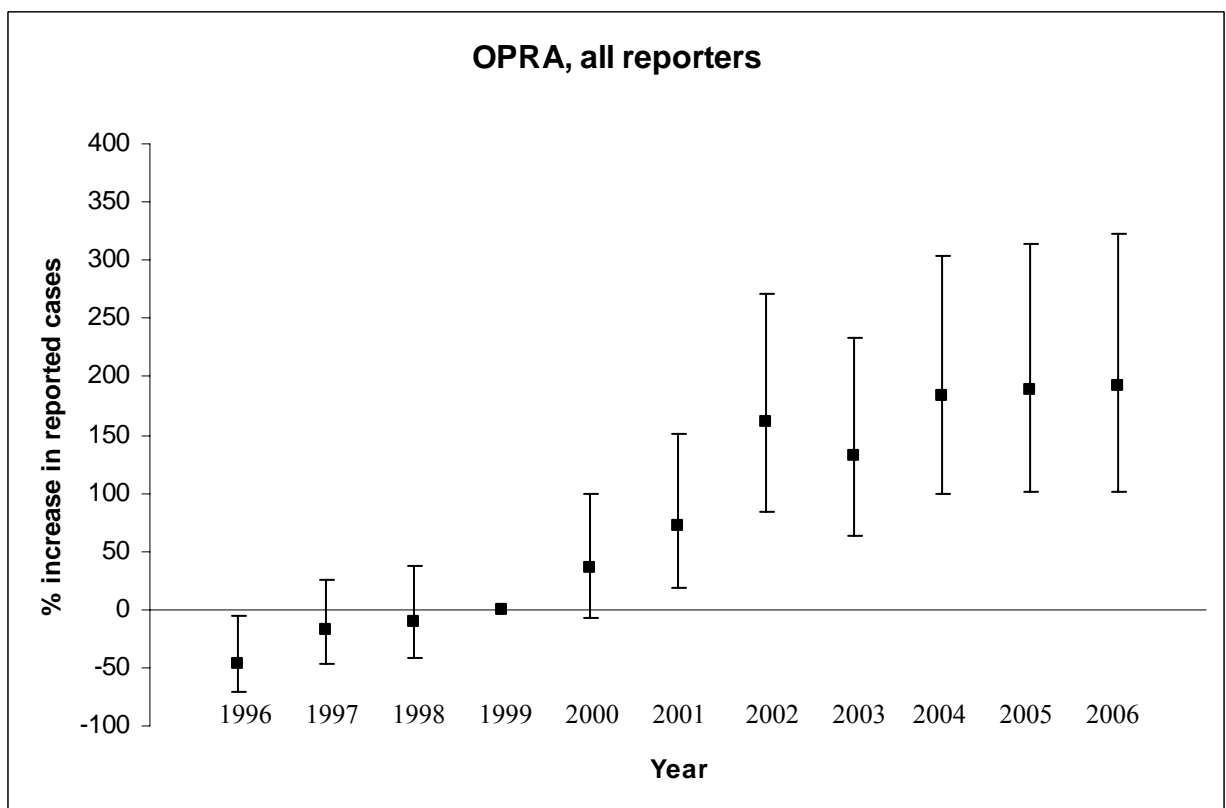
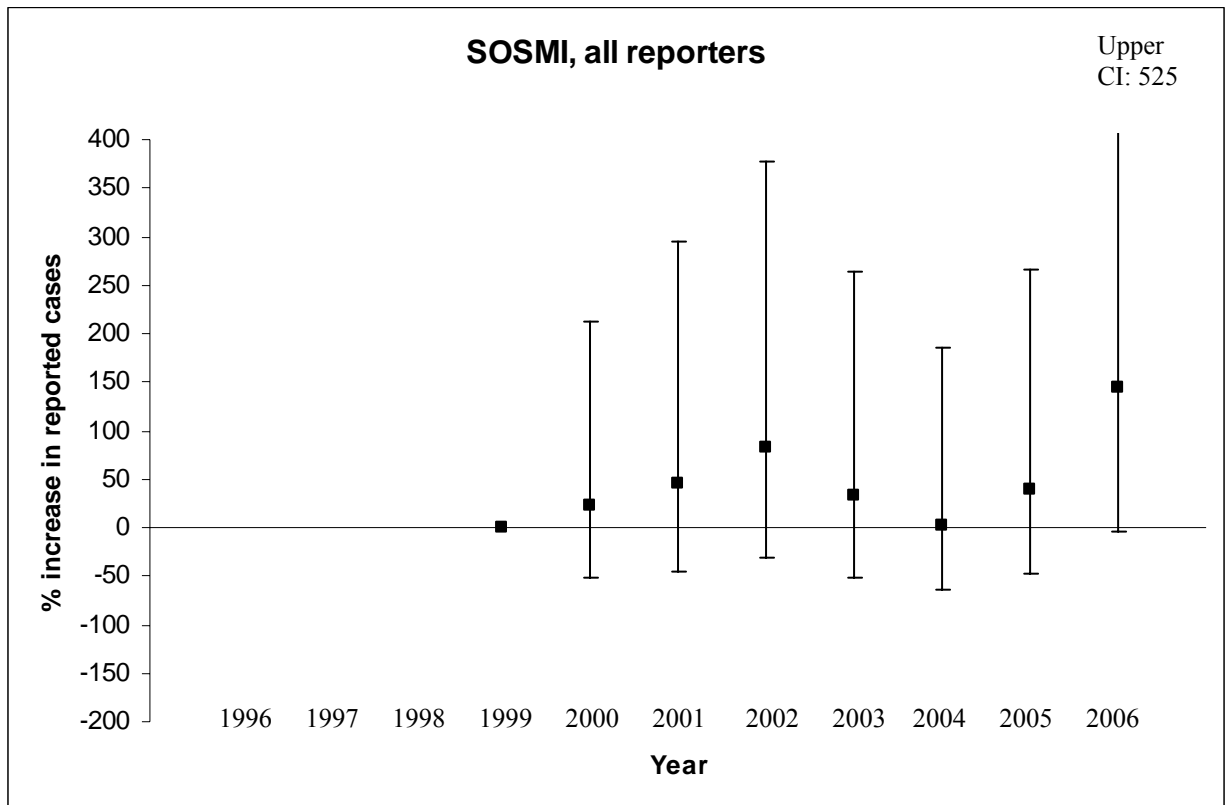
Table 30 Percentage change in incidence of work related stress

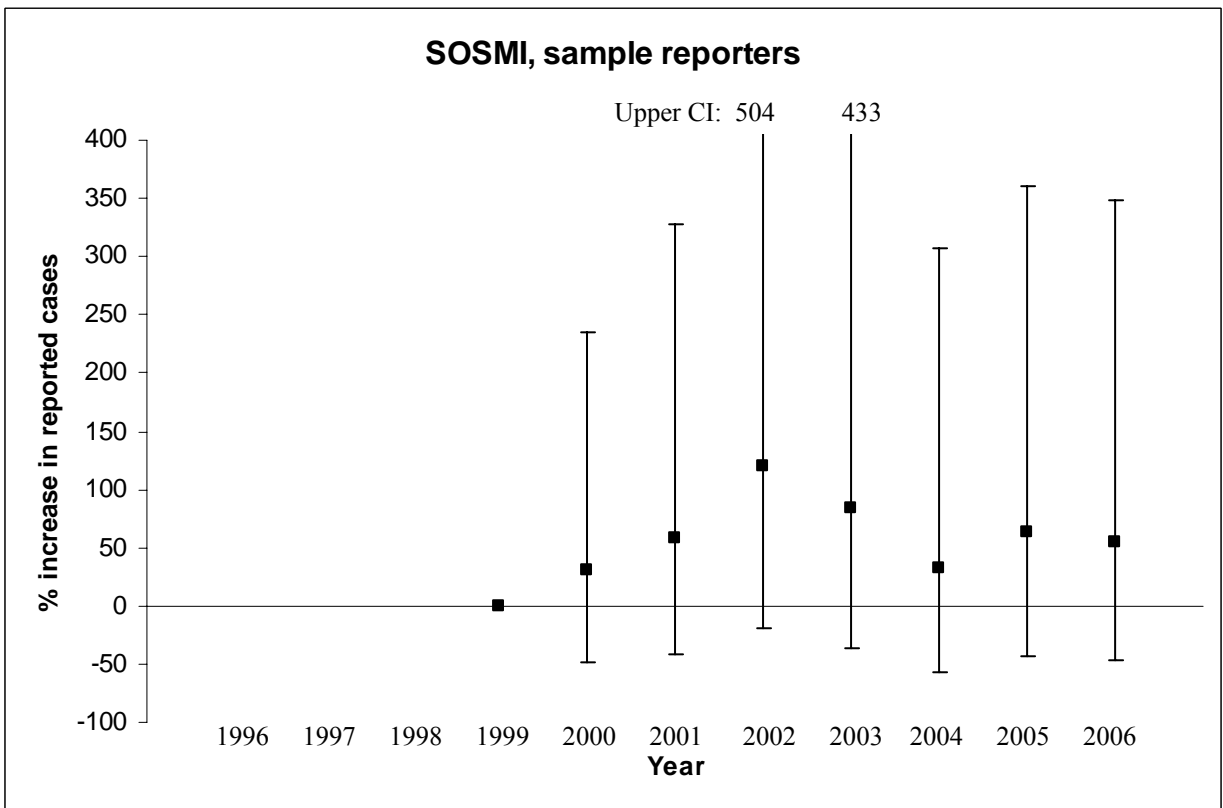
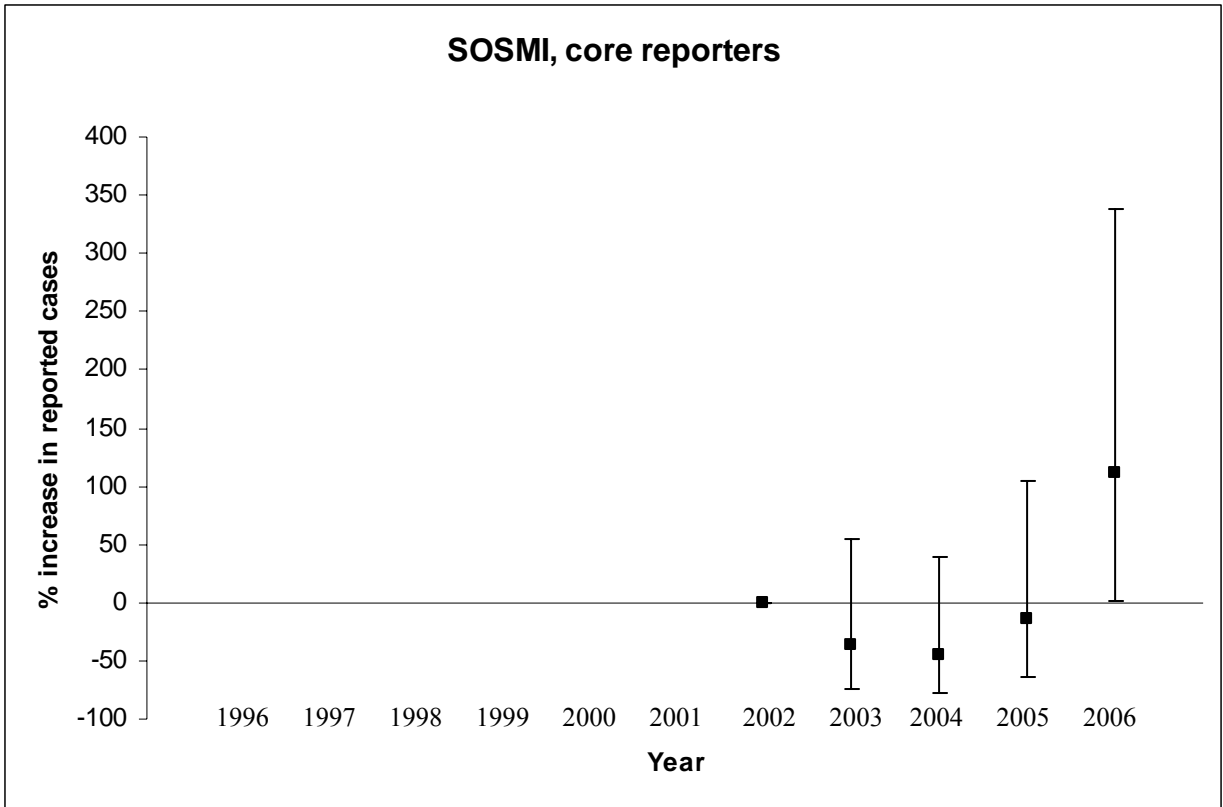
Reporter Group	Year (categorical)	SOSMI		OPRA	
		Random effects % change	Fixed effects % change	Random effects % change	Fixed effects % change
All	1996			-47.1 (-70.6, -4.9)	-36.2 (-65.5, 18.1)
	1997			-18.1 (-46.7, 25.8)	-10.3 (-42.1, 39.1)
	1998			-9.9 (-41.0, 37.5)	-3.7 (-37.1, 47.5)
	1999			REFERENCE	
	2000	22.4 (-52.1, 213.1)	-41.4 (-84.4, 120.2)	36.2 (-6.6, 98.6)	40.1 (-4.3, 105.0)
	2001	45.9 (-46.0, 294.0)	-26.8 (-81.5, 189.6)	72.4 (18.9, 150.2)	74.8 (19.8, 155.1)
	2002	81.9 (-30.7, 377.3)	-8.6 (-77.9, 277.2)	161.6 (84.6, 270.9)	158.3 (80.7, 269.1)
	2003	33.9 (-50.8, 264.7)	-35.8 (-85.0, 173.8)	132.8 (62.6, 233.3)	128.9 (58.7, 230.2)
	2004	2.8 (-63.1, 186.4)	-52.1 (-88.6, 102.0)	183.9 (99.6, 303.8)	177.6 (93.4, 298.5)
	2005	39.0 (-47.4, 267.0)	-46.8 (-87.4, 124.5)	188.8 (101.5, 314.0)	181.9 (94.1, 309.5)
	2006	144.7 (-4.3, 525.4)	4.1 (-76.4, 359.7)	192.1 (101.6, 323.1)	185.4 (94.0, 319.7)
	Year continuous ^a	7.4 (-1.6, 17.4)	1.3 (-9.6, 13.4)	17.3 (14.0, 20.8)	15.8 (12.2, 19.6)
	Year continuous ^b			14.2 (9.9, 18.7)	13.6 (9.1, 18.3)
Core	1996				
	1997				
	1998				
	1999			REFERENCE	
	2000				
	2001				
	2002	REFERENCE			
	2003	-36.5 (-73.9, 54.5)	-39.6 (-75.0, 45.6)		
	2004	-44.8 (-78.2, 39.9)	-49.4 (-79.9, 26.9)		
	2005	-13.6 (-63.5, 104.6)	-22.6 (-67.0, 81.9)		
	2006	110.5 (1.2, 338.1)	89.7 (-7.9, 290.9)		
	Year continuous ^a	27.7 (5.0, 55.3)	24.2 (2.1, 51.1)		
	Sample	1996			
1997					
1998					
1999				REFERENCE	
2000		31.2 (-48.5, 234.2)	-60.4 (-91.0, 73.7)		
2001		58.2 (-41.5, 328.0)	-50.3 (-89.2, 128.3)		
2002		120.0 (-19.9, 504.3)	-28.4 (-85.4, 250.5)		
2003		84.1 (-36.4, 433.1)	-45.8 (-89.3, 174.6)		
2004		32.9 (-56.7, 307.8)	-58.0 (-91.5, 108.1)		
2005		62.7 (-42.6, 360.7)	-75.2 (-95.5, 36.1)		
2006		54.7 (-46.6, 348.1)	-79.2 (-97.5, 69.5)		
Year continuous ^a		2.5 (-7.5, 13.7)	-9.4 (-21.7, 4.9)		

^a Calendar year continuous 1996-2006

^c Calendar year continuous 1999-2006

Figure 39 Percentage change (and 95% confidence intervals) in the incidence of other work related stress





4. DISCUSSION

This report is at or close to the climax of methodological development in presenting temporal trends in incidence of physician reported occupational disease and work related ill health. The methods proposed and used previously to analyse THOR surveillance data has been described in previous documents. This report builds on the McNamee et al report submitted to HSE in February 2006¹ plus subsequent reports relating to methodological issues²⁻⁵. Moreover in this document we have commented above on the previous methods of analyses and described some new approaches. So far as we are aware no methodological development of comparable sophistication as applied to these kinds of surveillance data has been published.

We shall be imminently sending to HSE for its perusal and attention the first of a series of submissions, intended for peer-review publication, on the subject of time trends in the incidence of work-related disease in the UK. The working title and authorship of the first one is: '*Trends in UK incidence of work-related skin and respiratory diseases, 1996-2005, McNamee R, Carder M, Chen Y, Agius RM*'.

As described above, data from the EPIDERM (skin), SWORD (respiratory), SOSMI (mental) and MOSS (musculoskeletal) surveillance schemes of NHS hospital based specialist consultants and from OPRA, consisting of specialist occupational physicians (only some of whom work in the NHS) were used to estimate the true trend in the incidence of specialist diagnosed, work-related disease in the UK over the period 1996-2006 (1999-2006 for SWORD, MOSS and SOSMI). As agreed, additional work regarding the impact of membership time (fatigue) on reporting patterns will be provided in a separate report. 'Fatigue' has long been highlighted as a non-trivial determinant of the quality of physician based reporting and is likely to be an important factor influencing correct interpretation of the data.

Since the interest of HSE is in diseases by organ system the 'OPRA' data and interpretation is being interpreted as far as feasible alongside the data from the respective organ systems i.e. EPIDERM (skin), SWORD (respiratory), SOSMI (mental) and MOSS (musculoskeletal). Although results have been presented for core and sample separately, in many instances the combined results are of most interest. Reporter behaviour and selection will influence differences between 'core' and 'sample' results.

Special methodological aspects particularly in relation to OPRA have been commented upon above (in the methods section) so as to enable easier reading of the document. Those comments will not be separately or repeatedly discussed here. Moreover so as to avoid overinterpreting the data, subtle differences between core and sample reporters will not be discussed at this stage.

An abridged commentary by clinical scheme / organ system follows:

EPIDERM (Skin)

The data show a significant downward trend in incidence of occupational skin disease whether reported by dermatologists or by occupational physicians. However the downward trend in the latter is more marked. This may be because occupational

physicians tend to work in larger industries with progressive reduction in exposure to agents causing skin disease, whereas dermatologists would see cases from small and medium enterprises (SMEs) such as hairdressers who do not have access to occupational physicians and in whose workplaces there has perhaps not been the hoped for reduction in exposure. Moreover occupational physicians as a group probably have more 'service capacity' per 'patient' and shorter waiting / access times. Therefore as a group 'OPRA' data might be more responsive to change than the data from 'EPIDERM' reporters who might be working closer to 'saturation'. The figures show that contact dermatitis trends are the predominant drivers for the changes commented above in 'all' skin disease. However there is evidence of an overall significant negative trend for reported incidence of neoplasia.

SWORD (Respiratory)

The results here, for asthma especially, show analogies with 'EPIDERM' results for contact dermatitis. This is not surprising since there is much in common between the agents, jobs, industries and mechanisms of induction of these inflammatory conditions of the lung and skin respectively. Considerations regarding access to doctors apply just as they do for 'EPIDERM'. However numbers of reported asthma cases are smaller than those of contact dermatitis and statistical power is correspondingly less, and confidence intervals wider.

A small fall in reported incidence of mesothelioma is also noted. In respect of non-malignant pleural disease it has to be borne in mind that easier access to computed tomography and other imaging techniques means that it is now easier for physicians to identify (and hence report) these pathological changes following the use of such sensitive diagnostic methods. Overall trends in pneumoconiosis reported incidence are not significant although they are significant if limited to the 'sample'. One has to be careful to avoid overinterpreting these data although plausible explanations could be found for this.

MOSS (Musculoskeletal)

The main significant finding here is the fall in reported incidence (by MOSS consultant rheumatologists) of spine/back disorders. However this can probably be explained entirely by well documented changes in management of these conditions and in corresponding referral patterns. Most are rehabilitated by GPs with hospital referrals to rheumatologists being limited to rare cases where serious pathology is suspected.

SOSMI (Mental)

The largest changes in reported incidence are identified here in relation to anxiety, depression and work related stress as reported by occupational physicians. The apparent inconsistency with the data from SOSMI psychiatrists is not surprising. Occupational physicians tend to see milder illness and a wide range of it. Most such cases do not warrant onward referral to a psychiatrist and if they did 'service capacity constraints' might mean that serious non-occupational illness would get precedence in assessment. It will be interesting to continue to follow the data year on year to determine whether or to what extent a 'plateau' in reported incidence is manifesting.

5. CONCLUSION

The THOR surveillance schemes provide an almost unique source of data on the burden of occupational disease / work related ill health in the UK which is reported by specialist physicians. The different data sources (NHS specialist consultants versus specialist occupational physicians) provide complementary and sometimes different perspectives on the same issue. Differences between the data which might at first appear to suggest inconsistency, can be explained plausibly by superimposed factors (such as differential access to physicians) and therefore serve to underline the value of such triangulation of data sources. Data from GP sources not yet presented in this analytical format is likely to further strengthen the validity and value of this output. The sophisticated analysis of temporal trends that we have undertaken makes these data an invaluable source of information, especially when viewed in parallel with other sources such as those dealing with self reported illness.

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