Occupational Asthma in Great Britain 2014

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Summary

The information in this document relates to Health and Safety statistics for 2013/14. The document can be found at: www.hse.gov.uk/statistics/causdis/asthma/

During the last decade, our data sources suggest there has been an overall decrease in occupational asthma. However, new cases continue to occur, particularly in jobs where there is exposure to isocyanates in spray paint or to flour dust.

The latest information shows:

- In 2013 there were an estimated 177 new cases of occupational asthma seen by chest physicians (THOR-SWORD). This is likely to be an underestimate.
- Other data sources suggest the total number of new cases each year in the wider category of work-related asthma (asthma caused or made worse by work) could be more than 10 times higher than this (LFS, THOR-GP).
- For the period 2011-2013 and the previous two 3-year periods, 'vehicle paint technicians' and 'bakers and flour confectioners' were the occupations with the highest rates of new cases per year (THOR-SWORD).
- The most common causes of occupational asthma continue to be isocyanates, and flour/grain (THOR-SWORD).

Figure 1: Occupational asthma in Great Britain, 1999-2013
Introduction

Individuals with asthma have chronic inflammation in the bronchi (air passages). As a consequence the bronchial walls swell causing the bronchi to narrow, which can lead to breathlessness. Muscles around the air passages also become irritable so that they contract, causing sudden worsening of symptoms in response to various stimuli, including exposures encountered at work. The inflammation can also make mucus glands in the bronchi produce excessive sputum which further blocks up already narrowed air passages. If the inflammation is not controlled with treatment, as well as causing acute attacks, it can lead to permanent narrowing and scarring of the air passages.

There is no universally accepted definition of "occupational asthma". It can be defined as adult asthma caused by workplace exposures and not by factors outside the workplace. The wider definition of "work-related" asthma includes all cases where there is an association between symptoms and work, and includes "work aggravated asthma", meaning pre-existing or coincidental new onset adult asthma which is made worse by non-specific factors in the workplace.

Asthma caused by specific work factors is of two broad types: "allergic occupational asthma" and "irritant-induced occupational asthma". The former accounts for the majority of cases and typically involves a latency period between first exposure to the specific cause (the "respiratory sensitiser") in the workplace and the onset of symptoms. The latter typically occurs within a period of hours following exposure to high levels of an irritant gas, fume or vapour in the workplace.

The causal mechanisms for occupational asthma vary from one substance to another. Because the range of industries which use substances with the potential to cause asthma is quite broad, and not all employees in these industries will necessarily be exposed, it is difficult to estimate with any confidence the total number of workers at risk. Estimation of the overall scale of the disease, trends in incidence, and identification of high risk occupations and activities, relies on a variety of sources of data each with different strengths and weaknesses.

Overall scale of occupational asthma

The number of new cases occurring each year (annual incidence)

A number of data sources provide information about the incidence of work-related and occupational asthma in Great Britain – i.e. the number of newly diagnosed cases each year. Information about cases of occupational asthma referred to consultant chest physicians or occupational physicians is available from The Health and Occupation Reporting (THOR) network SWORD and OPRA schemes, and information about newly assessed cases for Industrial Injuries and Disablement Benefit (IIDB) is available from the Department for Work and Pensions (DWP). Although these sources record a substantial number of actual cases occurring each year, they both underestimate the overall incidence of occupational asthma and substantially underestimate the incidence of work-related asthma. The Labour Force Survey (LFS) provides estimates of all work-related respiratory disease, and while a substantial proportion of this is likely to be work-related asthma, actual estimates are not available. Relatively few actual cases of asthma are reported each year within the THOR-GP scheme meaning that any estimates of the scale of GP reported occupational or work-related asthma would be imprecise.

In 2013, there were 85 new cases of occupational asthma assessed for disablement benefit under the IIDB scheme compared with 90 in 2012 and an average of 141 cases per year over the last decade (see table IIDB01 www.hse.gov.uk/statistics/tables/iidb01.xls). In 2013 there were 177 estimated new cases based on reporting by chest physicians within the SWORD scheme, compared with 189 in 2012 and 159 in 2011. There was an average of 268 cases per year over the last decade. There were 65 estimated cases recorded by occupational physicians in 2010 (the final year of the OPRA scheme) (see table THORR01 www.hse.gov.uk/statistics/tables/thorr01.xls).

Reports to SWORD include only those cases of asthma that were serious enough to be seen by a chest physician. The majority, but not all, of eligible chest physicians are included in the scheme, and some of those who are included do not report any cases. A previous analysis suggested that non-participation and non-response led to an underestimation of the true incidence of specialist diagnosed occupational asthma in 2005-2007 of about 40%.

A number of factors may account for the differences between the IIDB and SWORD scheme figures. Individuals may be unaware of the IIDB scheme, and it may tend to pick up fewer cases arising from substances or in occupational settings where the link with asthma is less well established or well known. Furthermore, the self-employed are not covered by the IIDB scheme and the level of compensation available
for even those who are severely disabled may not provide sufficient incentive for all eligible individuals to apply.

Given that a substantial proportion of the annual incidence of work-related respiratory disease as estimated by the LFS is likely to be asthma, this suggest that the annual incidence of work-related asthma may be substantially higher – perhaps an order of magnitude higher – than the incidence of occupational asthma suggested by the SWORD and IIDB schemes. The annual incidence of “breathing and lung problems” that were caused or made worse by work based on data from the LFS over the last three years was 10 000 (95% confidence interval: 7 000 – 14 000) [Table SWIT6W12_3YR www.hse.gov.uk/statistics/lfs/swit6w12_3yr.xls].

An investigation of THOR-GP data from 2006-2012 indicates that about 30% of the total number of respiratory disease cases were asthma, and of these, about half were reported as aggravated by work and a further third (i.e. about 10% of the total) were reported as being caused by a particular workplace agent. These estimates are imprecise, however, if 10% of GP-diagnosed respiratory disease was occupational asthma, as this investigation tentatively suggests, and if a similar proportion of total self-reported work-related respiratory disease was also occupational asthma, then this would imply that there are about 5 times as many cases each year than estimated by SWORD.

Estimates of the proportion of cases of asthma attributed to workplace exposures from epidemiological studies suggest that the incidence of work-related asthma may be higher still. For example, a recent European population-based study estimated the incidence of work-related asthma (including irritant-induced occupational asthma) to be 25 to 30 cases per 100,000 people per year3 (equivalent to 7500 to 9000 new cases per year). Other studies have estimated that occupational factors account for approximately 9-15% of asthma cases in adults of working age6. Applying these latter proportions to the estimated incidence of adult asthma in developed countries3 would imply rates of work-related asthma in Great Britain even higher than based on the European study. However, there is considerable uncertainty in these estimates – and it is not clear whether estimates based on studies in other countries are directly applicable to the Great Britain population.

Age, sex and region
Tables THORR02 (www.hse.gov.uk/statistics/tables/thorr02.xls) and THORR03 (www.hse.gov.uk/statistics/tables/thorr03.xls) show the distribution of the cases of occupational asthma (and other respiratory diseases) reported to SWORD during 2011-2013 and OPRA during 2008-2010 by age and by country, respectively.

These THOR data suggest that occupational asthma affects workers of a wide range of ages: percentages of total SWORD cases falling into the age groups 25-34, 35-44, 45-54 and 55-64 years were 20%, 24%, 25% and 18% respectively.

Table THORR03 (www.hse.gov.uk/statistics/tables/thorr03.xls) shows that during 2011-2013, 92 per cent of reported occupational asthma cases were in England, with 3 per cent in Scotland and 5 per cent in Wales.

Trends in annual new cases (incidence)
Statistics based on reports of occupational asthma within the THOR scheme are affected by various factors including the number and type of participating specialist and occupational physicians, their reporting habits, and by seasonal effects associated with the time of year they report. This makes assessment of trends based on total annual estimated cases problematic since these factors - as well as the true incidence - can vary over time. However, statistical modelling by the University of Manchester showed a statistically significant downward trend in the incidence of occupational asthma over the period 1999-2013 after taking account of some of these effects: the estimated average annual decrease in the incidence of occupational asthma was -7.1% (95% confidence interval: -8.4% to -5.9%)6. However, there was little evidence of any change in incidence over the last 5 years. The analyses do not take account of a possible tendency for reporters to include fewer cases than they should once they have been reporting for some time (so called “reporting fatigue”). Investigations to date into reporter fatigue within SWORD have found some evidence for it among “sample reporters” (those physicians that report into the scheme for one month of the year only) but little among “core reporters” (those that report every month). If present, taking account of the effect of reporter fatigue would tend to reduce the size of a downward trend. These investigations therefore reinforce the conclusion that there has been no reduction in incidence over the last 5 years.

Annual estimated cases of occupational asthma based on the SWORD scheme and annual IIDB cases are shown in Figure 1 above along with relative rates (with each year’s figures expressed as a proportion of the 2013 figure) based on the statistical modelling of the SWORD data, and which therefore give the best guide available to date about year on year changes.
The current list of agents for which benefit is payable within the IIDB scheme has remained constant for the period shown in Figure 1 with one minor exception - the addition of latex to the list of agents in March 2005. However, this has had little impact on the overall numbers, with 10 or fewer assessed cases each year in this category (Table IIDB08 www.hse.gov.uk/statistics/tables/iidb08.xls). There is some evidence of a fall in the annual number of IIDB cases of occupational asthma since 2005 with the numbers in each of the latest three years being around 60% of the average over the last 10 years. The number of cases in the open category (which includes cases due to any other sensitising agent where claimants have been able to demonstrate that this was the likely cause) has also fallen recently: there were 15 cases in 2013 compared with 85 in 2005.

Causal agents for occupational asthma

Figure 2 shows the most commonly cited agents for cases of occupational asthma in the SWORD and IIDB schemes during the two most recent three year periods. Both SWORD and the IIDB scheme figures continue to show isocyanates and flour/grain as the agents responsible for the highest proportion of new cases of occupational asthma, followed by wood dusts. Tables THORR06 (www.hse.gov.uk/statistics/tables/thorr06.xls) and IIDB08 (www.hse.gov.uk/statistics/tables/iidb08.xls) show a full breakdown of the THOR and IIDB cases by agent, with IIDB09 (www.hse.gov.uk/statistics/tables/iidb09.xls) giving numbers for 14% and 50% disablement.

Figure 2: Most common agents for occupational asthma, 2008-2010 and 2011-2013

There is evidence of a decline in occupational asthma as reported in SWORD due to both glutaraldehyde and latex, which have more reported cases in the healthcare sector than elsewhere. These declines are likely to be associated with the elimination of gluteraldehyde-based disinfectant use and recent interventions to reduce exposure to latex.

The most recent estimate (based on data from the LFS in 2010/11, 2011/12 and 2013/14) is that 127 000 people who had ever been in work currently have breathing or lung problems caused or made worse by work (95% Confidence Interval: 111 000 – 143 000). The role of isocyanates and flour/grain in occupational asthma is further supported by more detailed questioning about the causes of work related illness included in the 2009/10/ 2010/11, and 2011/12 LFS. Based on data from these surveys, of those with breathing and lung problems, approximately 13% thought that “Airborne materials from spray painting or manufacturing foam product” had contributed to their ill health with a further 7% citing “Dusts from flour or grain/cereal, animal feed or bedding (straw)”. A further 10% thought that “Airborne materials while welding, soldering or cutting/grinding metals” had contributed to their ill health.
Occupation and industry

Industrial and occupational analyses of SWORD/OPRA cases give an insight into the types of workplaces and activities that are currently causing occupational asthma in the British workforce. THORR04 (www.hse.gov.uk/statistics/tables/thorr04.xls) and THORR05 (www.hse.gov.uk/statistics/tables/thorr05.xls) show the average number of SWORD cases reported per year during the period 2011-2013, by occupation and industry respectively, together with estimated rates per 100 000 workers. These latter rates are calculated by using a denominator based on the number of workers identified in the Labour Force Survey in the relevant occupational or industrial sector. Thus the denominator is representative of the whole sector whereas the number of cases reported is limited by underreporting (see above). As a consequence the rates identified should be seen as minimal estimates. Numbers and rates for each major occupational group and industrial section are shown, and where the number of actual cases over a three year period is greater than or equal to 10, case numbers and rates are shown for the unit group for occupations, and divisions for industry.

Caution must be applied when interpreting the rates at the occupational unit group and industry division level of detail, as there may be occupations and industries that are relatively small; therefore the actual rates of disease incidence may be high, but they are not included in SWORD/OPRA tables because the number of cases is below the inclusion threshold.

SWORD data in table THORR04 shows that the overall occupational asthma incidence was 1 case per 100 000 per year during 2011-2013. Two major groups of the Standard Occupation Classification have rates greater than this figure: 'Process, Plant and Machine Operatives' (3 cases per 100 000 per year) and 'Skilled Trade Occupations' (2 cases per 100 000 per year). For comparisons of more detailed occupation unit groups pooling of data over a larger number of years is necessary. Based on data for 2004-2013, 'vehicle paint technicians' (75 cases per 100 000 per year), and 'bakers and flour confectioners' (57 cases per 100 000 per year) had the highest rates of occupational asthma as seen by chest physicians. These occupations have consistently had among the highest rates of occupational asthma, although there is now some evidence that rates among 'bakers and flour confectioners' may have declined over the last 10 years. Rates among 'metal making and treating process operatives' (a group which had particularly high rates towards the beginning of that period) may have also declined in recent years. However, caution is required in drawing conclusions about trends for individual occupations over time. The earlier comments relating to trends in the overall rate of asthma apply, and in addition, particular outbreaks of occupational asthma in certain industries – for example, in relation to metal working fluids – will also have a large impact on figures at this level.

SWORD data in table THORR05 shows that during 2011-2013 the overall occupational asthma incidence was 1 case per 100 000 per year. One industry section has a rate greater than this figure: 'Manufacturing' (3 cases per 100 000 per year). The industry divisions with the highest rates of occupational asthma as seen by chest physicians were 'Manufacture of motor vehicles, trailers and semi-trailers' (9 cases per 100 000 workers per year) and the 'Manufacture of food products' (6 cases per 100 000 workers per year). The division 'Manufacture of basic metals' also has high rates (10 cases per 100 000 workers per year) based on the longer period 2008-2013. Again, particular outbreaks of occupational asthma will also have a large impact on figures at this level.
References


National Statistics

The LFS figures in this report are National Statistics.

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