Asbestos-related diseases

Contents

Summary

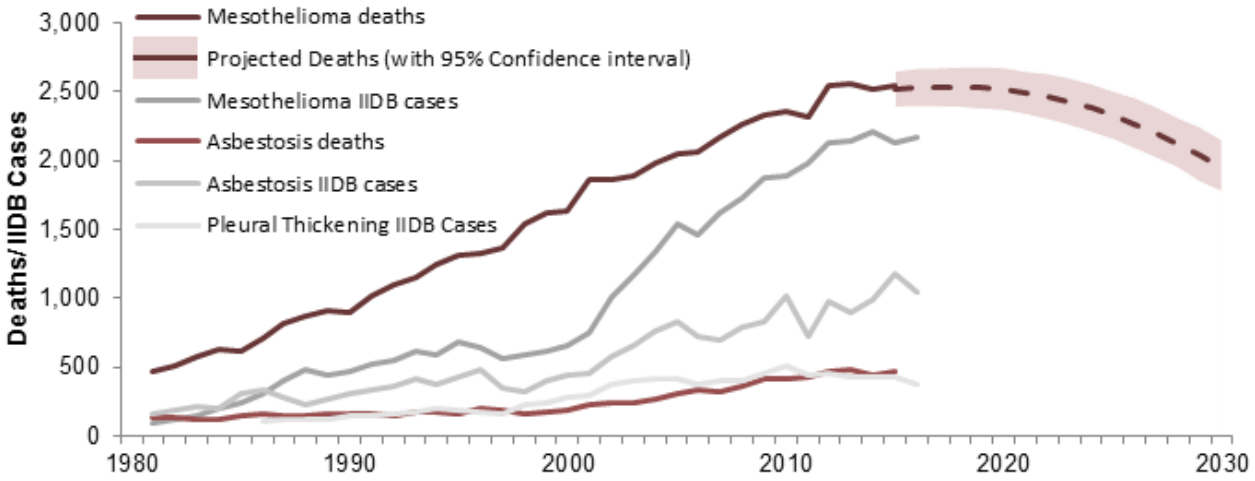
Asbestos-related disease

2,542
Mesothelioma deaths in 2015, with a similar number of lung cancer deaths linked to past exposures to asbestos

467
Asbestosis deaths in 2015 due to past exposures to asbestos

- Inhalation of asbestos fibres can cause cancers such as mesothelioma and lung cancer, and other serious lung diseases such as asbestosis and pleural thickening.

Figure 1 – Mesothelioma, asbestosis, and pleural thickening: time trends in annual deaths and Industrial Injuries Benefit Disablement (IIDB) cases*



**Latest statistics are for 2015 for deaths and 2016 for IIDB cases*

- All asbestos-related diseases typically take many years to develop so current statistics reflect the legacy of past working conditions.
- Widespread use of asbestos containing products in the past- particularly in the post-WWII building industry- led to a large increase in asbestos-related disease in Great Britain over the last few decades.
- The cancer, mesothelioma, has such a strong relationship with asbestos that annual deaths give a particularly clear view of the effect of past exposures.
- Annual deaths increased steeply over the last 50 years, largely as a result of asbestos exposure prior to 1980, and are now expected to continue at current levels for the rest of the decade before declining

More detailed information on mesothelioma

Mesothelioma deaths by geographical area

Mesothelioma deaths by last occupation of the deceased

Introduction

Inhalation of asbestos fibres can cause a number of serious diseases most of which affect the lungs or pleura (the external lining of the lung). These include a number of forms of cancer and chronic conditions such as asbestosis and pleural thickening. This document summarised the latest available statistics on these diseases.

All of these diseases have a *long latency,* meaning it takes a long time – typically decades – for symptoms to occur following exposure to asbestos. However, for cancers such as mesothelioma and lung cancer, cases are often rapidly fatal following disease onset, while conditions such as asbestosis may progress over time to seriously affect normal daily activity and lead to complications which can be fatal.

Asbestos was used extensively in Great Britain in a wide range of products, but particularly in insulation and building materials following World War II. Widespread asbestos-exposures during the 1950s, 1960s and 1970s led to a large increase in asbestos-related disease in Great Britain.

For some diseases – for example, mesothelioma and asbestosis – statistics can be derived from data sources that rely on counting of individual cases or deaths. For diseases that are regularly caused by other agents as well as asbestos – for example, lung cancer – statistics can be derived based on epidemiological evidence about the Attributable Fraction (AF) of cases or deaths due to asbestos exposure.

Asbestos-related cancers

Mesothelioma

Malignant Mesothelioma is a form of cancer that principally affects the pleura (the external lining of the lung) and the peritoneum (the lining of the lower digestive tract). It takes many years to develop following the inhalation of asbestos fibres. Cases are often diagnosed at an advanced stage as symptoms are typically non-specific and appear late in the development of the disease. It is almost always fatal, and often within twelve months of symptom onset.

Mesothelioma has such a strong relationship with asbestos that annual cases give a particularly clear view of the effect of past exposures, and as the disease is usually rapidly fatal following disease onset, the number of annual deaths closely approximates to the annual number of new cases (i.e. the annual disease incidence).

Annual deaths in Britain increased steeply over the last 50 years, a consequence of mainly occupational asbestos exposures that occurred because of the widespread industrial use of asbestos during 1950-1980.

The latest information shows:

- There were 2,542 mesothelioma deaths in Great Britain in 2015, a similar number to the previous three years.
- The latest projections suggest that there will continue to be around 2,500 deaths per year for the rest of this current decade before annual numbers begin to decline.
- The continuing increase in annual mesothelioma deaths in recent years has been driven mainly by deaths among those aged 70 and above.
- In 2015 there were 2,135 male deaths and 407 female deaths, similar to the annual numbers in among males and females in the previous three years.
- There were 2,170 new cases of mesothelioma assessed for Industrial Injuries Disablement Benefit (IIDB) in 2016 of which 240 were female, compared with 2,130 in 2015 of which 220 were female.

Men who worked in the building industry when asbestos was used extensively are now among those most at risk of mesothelioma.

A more detailed description of the latest mesothelioma mortality statistics is available at:
www.hse.gov.uk/statistics/causdis/mesothelioma/mesothelioma.pdf

Asbestos-related lung cancer

Asbestos is one of the most common causes of lung cancer after tobacco smoking. Lung cancer usually has no specific clinical signs associated with particular causes and so it is very difficult to be sure about the cause of individual cases. However, the overall proportion of annual deaths that are attributable to past asbestos exposures can be estimated from epidemiological information. Lung cancer is still typically fatal within a few years of diagnosis and so, as with the mesothelioma, the number of annual deaths is similar to the annual incidence of new cases.

- Research suggests there are currently about as many lung cancer deaths attributed to past asbestos exposure each year in Great Britain as there are mesothelioma deaths. There is considerable uncertainty associated with this estimate.
- This implies there are currently around 2,500 asbestos-related lung cancer deaths each year.
- Estimation of attributable deaths is complicated by the fact that asbestos and smoking act together to increase the risk of lung cancer. This means that many cases of lung cancer will be caused by both smoking and asbestos rather than by one or other of these exposures.

Epidemiological studies of specific groups of workers that were heavily exposed to asbestos in the past have typically estimated a greater number of lung cancers attributed to asbestos than there were mesotheliomas[1]. However, other studies that are more representative of the British population as a whole provide the best basis for estimating the overall number of asbestos-related lung cancers. Such evidence suggest that there are around as many lung cancer cases attributed to past asbestos exposure each year as there are mesotheliomas, though this estimate is uncertain.[2,3] A ratio of one asbestos-related lung cancer for ever mesothelioma implies there are currently around 2,500 asbestos-related lung cancer deaths each year.

It is expected that there will be fewer asbestos-related lung cancers per mesothelioma in the future as a consequence of reductions in both asbestos exposure and smoking prevalence in past decades.

Data sources that rely on the counting of individual cases attributed to asbestos exposures, such as the Industrial Injuries Disablement Benefit (IIDB) and the Health and Occupation Reporting (THOR) schemes, tend to substantially underestimate the true scale of asbestos-related lung cancer cases.

In recent years there have been, on average, around 300 new cases of asbestos-related lung cancer each year within the IIDB scheme (see table IDB01 www.hse.gov.uk/statistics/tables/iidb01.xlsx) and less than 100 cases identified by chest physicians each year within the THOR scheme. (See table THORR01 www.hse.gov.uk/statistics/tables/thorr01.xlsx.) Typically females account for 2% of IIDB cases and less than 1% of THOR cases.

Estimates of the burden of lung cancer attributable to occupational exposures other than asbestos are available based on the Burden of Occupational Cancer research (www.hse.gov.uk/cancer/research).

Other asbestos-related cancers

In their most recent review, the International Agency for Research on Cancer (IARC) concluded that in addition to mesothelioma and lung cancer there is sufficient evidence that asbestos can cause cancer of the larynx, ovary, pharynx and stomach[4].

Two of these cancers (larynx and stomach) were already known to be caused by asbestos when the Burden of Occupational Cancer research (www.hse.gov.uk/cancer/research) was carried out and so estimates of the current annual number of new cases and deaths are available.

Based on mortality data for 2005 and cancer incidence data for 2004, the current estimated annual number of cases and deaths attributed to past asbestos exposure were:

- for cancer of the larynx: 8 cases and 3 deaths;
- for cancer of the stomach: 47 cases and 32 deaths.

Non-malignant asbestos-related disease

Asbestosis

Asbestosis is a form of pneumoconiosis caused by the inhalation of asbestos fibres which is characterised by scarring and inflammation of the lung tissue. It is a chronic and irreversible condition in which symptoms typically start to develop several decades following exposure to asbestos. These often progress to seriously affect normal daily activity and can lead to various complications which can be fatal.

It is generally recognised that heavy asbestos exposures are required in order to produce clinically significant asbestosis within the lifetime of an individual. Current trends therefore still largely reflect the results of heavy exposures in the past.

The latest statistics for deaths where asbestosis contributed as a cause of death based on the Asbestosis Register show:

- Deaths mentioning asbestosis (excluding those that also mention “mesothelioma”) have increased substantially over a number of decades: there were 467 such deaths in 2015 compared with 109 in 1978. Typically, in recent years, around 2-3% of these deaths were among women.
- These figures include some deaths where the underlying cause of death was not recorded as asbestosis but where asbestosis was nevertheless mentioned elsewhere on the death certificate. This gives an indication of the number of individuals who were suffering from asbestosis when they died.
- Deaths also mentioning mesothelioma are excluded, since here the term “asbestosis” may have been used incorrectly to indicate the role of asbestos fibres in causing the separate disease mesothelioma. There were 29 such deaths in 2015.
- There were 222 deaths in 2015 where asbestosis was recorded as the underlying cause of death (defined as the disease or injury that initiated the events leading directly to death).
- Interpretation of these figures is further complicated by the fact that cases of asbestosis may sometimes not be recorded as such because they may be mistaken for other types of lung fibrosis – or recorded as “idiopathic” cases (i.e. lung fibrosis without a known cause)[5] – or may go undiagnosed.

Asbestosis death statistics are summarised in more detail in Table ASIS01 at www.hse.gov.uk/statistics/tables/asis01.xlsx

Table IIDB06 www.hse.gov.uk/statistics/tables/iidb06.xlsx shows the number of new cases of asbestosis (and other forms of pneumoconiosis) assessed under the Industrial Injuries and Disablement Benefit (IIDB) scheme. The number of cases of asbestosis has increased from 132 in 1978 to 1050 in 2016 (see Figure 2) of which 1-2% were female.

Figure 2 – Annual deaths where death certificates mentioned asbestosis but not mesothelioma, and IIDB cases 1978-2016

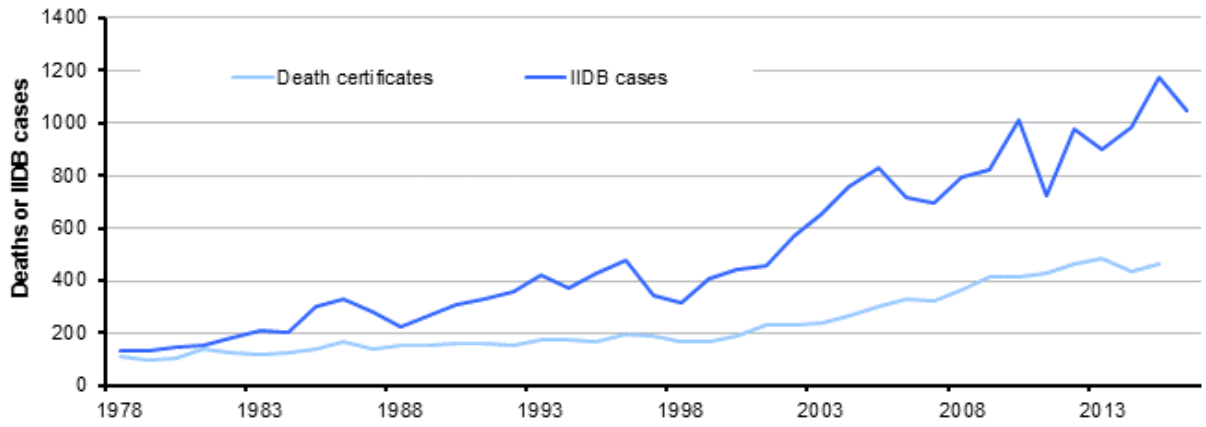


Table THORR01 (www.hse.gov.uk/statistics/tables/thorr01.xlsx) gives a breakdown of the pneumoconiosis cases seen by chest physicians in the THOR scheme. There were 123 cases of asbestosis out of the

estimated 187 pneumoconiosis cases reported to respiratory physicians in 2016. Typically less than 1% of cases were female.

The statistics based on reporting by chest physicians in the THOR scheme also support a continuing increase in annual asbestosis cases. The latest analysis of trends in THOR data[6] suggests that the incidence of all pneumoconiosis – the majority of which is known to be asbestosis within that scheme – has been increasing with an average increase of + 3.4 % (95% CIs: +1.5, +5.3) per year over the time period 1999-2016. For the more recent period 2007-2016, the equivalent estimate was +8.2% (95% CIs: +4.1, +12.5) but the last four years show a relatively flat trend (with wide confidence intervals).

Asbestosis deaths by age group and time period

Table ASIS02 www.hse.gov.uk/statistics/tables/asis02.xlsx shows the total number of death certificates mentioning the term asbestosis without mention of mesothelioma among males, and equivalent death rates, by age group for the three-year time periods during 1978-2015.

Age-specific death rates for males are also shown in Figure 3 below.

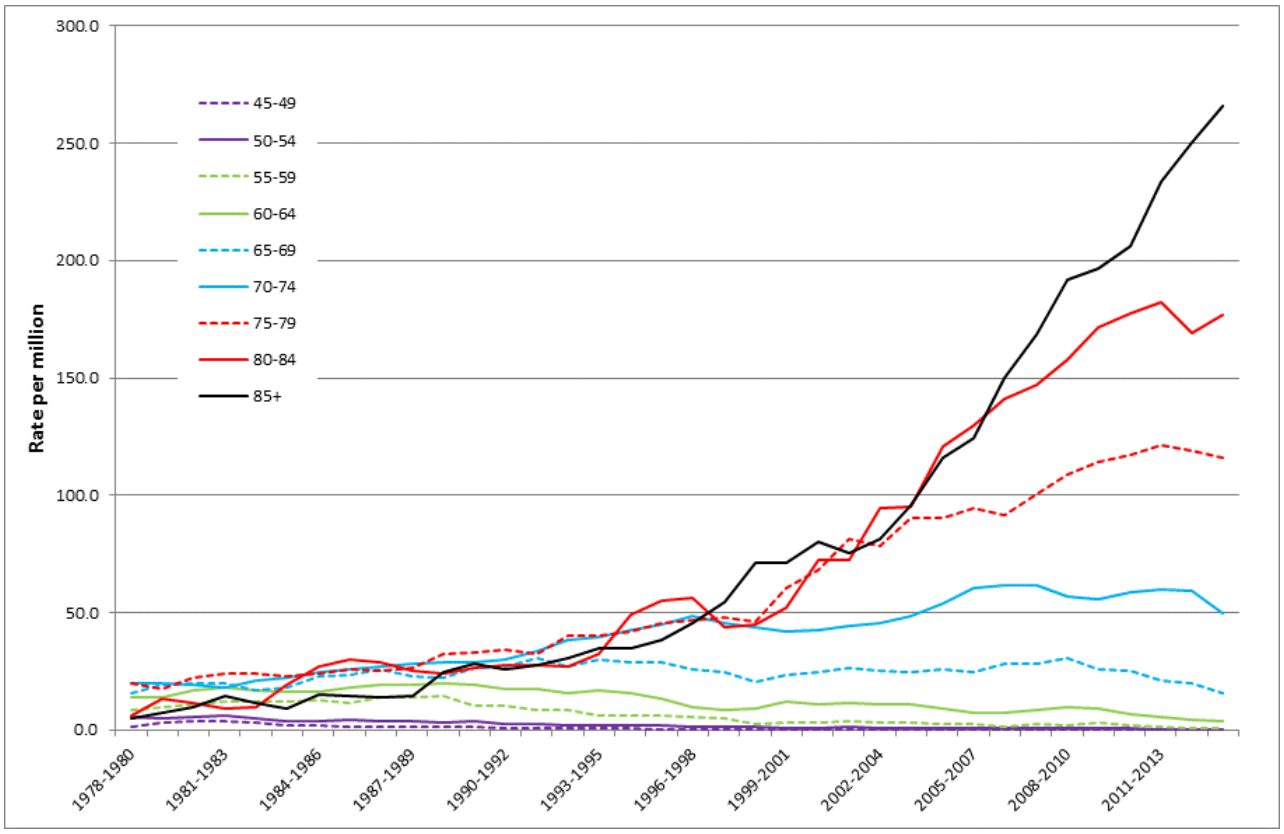
There are large differences in the magnitude of the rates between the different age groups:

- Death rates at ages below 65 years have been falling since the 1980s;
- This contrasts with strongly increasing rates for deaths at ages 75 years and above.

This is consistent with those that were born more recently tending to have lower asbestos exposures than those born earlier and who were of working age during the period when asbestos was most widely used.

Due to the small number of female deaths, age-specific death rates for women have not been shown, but they show an increase in rates in the 85+ age band over the last 10 years.

Figure 3 – Average annual male death rates based on death certificates mentioning asbestosis but not mentioning mesothelioma by age and time period, 1980-2015(p)



Asbestosis deaths by region

Age-standardised death rates for males by 3-year time period and region (again restricted to deaths mentioning asbestosis but not mesothelioma) are available in Table ASIS03 www.hse.gov.uk/statistics/tables/asis03.xlsx .

Age-standardisation allows comparison of rates taking account of changes in the age-structure of the underlying population over time and between regions. The period 2013-2015 was taken as the base for standardisation over time and Great Britain for standardisation over region. A small number of deaths with overseas addresses were excluded.

For Great Britain as a whole, male asbestosis death rates increased from 7.1 per million in 1993-95 to 14.6 in 2013-15. Male regional rates have similarly increased over time, although to a lesser extent in Wales and London. The highest rates are in the North-West (21.8 per million) and in the North East, where they have declined from a peak of 43.6 in 2010-12 to 30.1 in 2013-15.

The female asbestosis death rates for GB have fluctuated over time with the current rate of 0.3 per million being around the average for the period. The highest rates are in the North East with a rate of 1.0 per million in 2013-15.

Non-malignant pleural disease

Non-malignant pleural disease is a non-cancerous condition affecting the outer lining of the lung (the pleura). It includes two forms of disease: diffuse pleural thickening and the less serious pleural plaques. A substantial number of cases continue to occur each year in Great Britain, mainly due to workplace asbestos exposures many years ago.

- There were 370 new cases of pleural thickening assessed for Industrial Injuries Disablement Benefit in 2016. (See table IDB01 www.hse.gov.uk/statistics/tables/iidb01.xlsx .)
- The annual number has been fairly constant over the last 10 years, with an average of around 430 new cases per year of which around 10% are female.
- An estimated 482 new cases of non-malignant pleural disease mainly caused by asbestos were reported by chest physicians in 2016 of which typically around 2-3% are female. A substantial proportion of these were cases of pleural plaques. (See table THORR01 www.hse.gov.uk/statistics/tables/thorr01.xlsx.)
- Pleural plaques are usually symptomless and are often identified in the THOR scheme when individuals have chest x-rays for other conditions.
- For these reasons, there are likely to be substantially more individuals in the population with pleural plaques than those identified by chest physicians.

References

1. McCormack V, Peto J, Byrnes G et al (2012). Estimating the asbestos-related lung cancer burden from mesothelioma mortality. *Br J Cancer.* 106(3):575-84.

2. Darnton A, McElvenny D, Hodgson J (2005). Estimating the number of asbestos related lung cancer deaths in Great Britain from 1980-2000. *Annals of Occupational Hygiene* 50(1): 29-38.

3. Gilham C, Rake C, Burdett G et al (2015). Pleural mesothelioma and lung cancer risks in relation to occupational history and asbestos lung burden. *Occup Environ Med.* 73(5):290-9.

4. International Agency for Research on Cancer (IARC). IARC Monographs on the Evaluation of Carcinogenic Risks to Humans Volume 100C. Arsenic, Metals, Fibres, and Dusts. Lyon, France 2012. http://publications.iarc.fr/Book-And-Report-Series/Iarc-Monographs-On-The-Evaluation-Of-Carcinogenic-Risks-To-Humans/Arsenic-Metals-Fibres-And-Dusts-2012

5. Barber CM, Wiggans RE, Young C, Fishwick D. (2016) UK asbestos imports and mortality due to idiopathic pulmonary fibrosis. *Occup Med* (Lond). 2016 Mar;66(2):106-11.

6. Carder M, McNamee R, Gittins M, Hussey L, Agius R. (2017) Time trends in the incidence of work-related ill health in the UK, 1996-2016: estimation from THOR surveillance data. www.hse.gov.uk/statistics/pdf/thortrends17.pdf

National Statistics

National Statistics status means that official statistics meet the highest standards of trustworthiness, quality and public value.

All official statistics should comply with the Code of Practice for Official Statistics. They are awarded National Statistics status following an assessment by the Authority's regulatory arm. The Authority considers whether the statistics meet the highest standards of Code compliance, including the value they add to public decisions and debate.

It is Health and Safety Executive's responsibility to maintain compliance with the standards expected by National Statistics. If we become concerned about whether these statistics are still meeting the appropriate standards, we will discuss any concerns with the Authority promptly. National Statistics status can be removed at any point when the highest standards are not maintained, and reinstated when standards are restored.

An account of how the figures are used for statistical purposes can be found at www.hse.gov.uk/statistics/sources.htm .

For information regarding the quality guidelines used for statistics within HSE see www.hse.gov.uk/statistics/about/quality-guidelines.htm

A revisions policy and log can be seen at www.hse.gov.uk/statistics/about/revisions/

Additional data tables can be found at www.hse.gov.uk/statistics/tables/.

Last updated: November 2017

Next update: October 2018

General enquiries: Statistician Andrew.Darnton@hse.gov.uk

Journalists/media enquiries only: www.hse.gov.uk/contact/contact.htm

First published 11/17.

Published by the Health and Safety Executive V1 11/17