Mesothelioma in Great Britain

Mesothelioma mortality in Great Britain 1968-2015

Contents

Summary

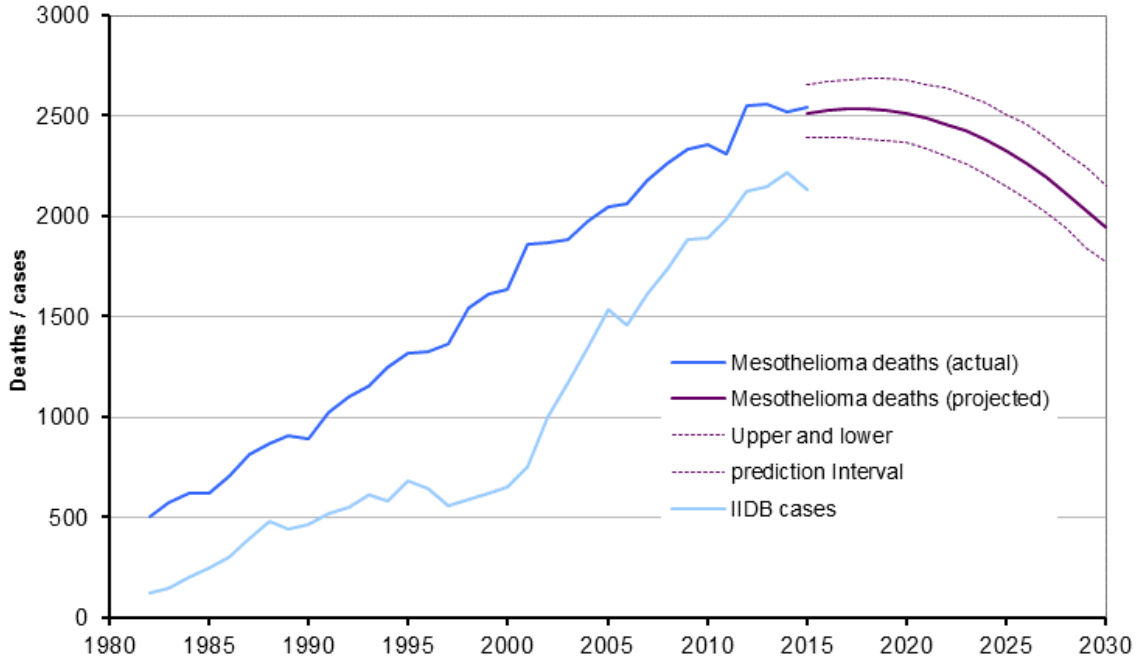
The information in this document relates to Health and Safety Statistics published by the Health and Safety Executive in 2016. The document can be found at: www.hse.gov.uk/statistics/causdis/mesothelioma/

Mesothelioma is a form of cancer that takes many years to develop following the inhalation of asbestos fibres, but is usually rapidly fatal following disease onset. 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 2,130 new cases of mesothelioma assessed for Industrial Injuries Disablement Benefit (IIDB) in 2015 compared with 2,215 in 2014.
- Men who worked in the building industry when asbestos was used extensively are now among those most at risk of mesothelioma.

Figure 1 – Mesothelioma annual deaths, IIDB cases and projected future deaths to 2030 in GB



Introduction

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). Many cases are 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.

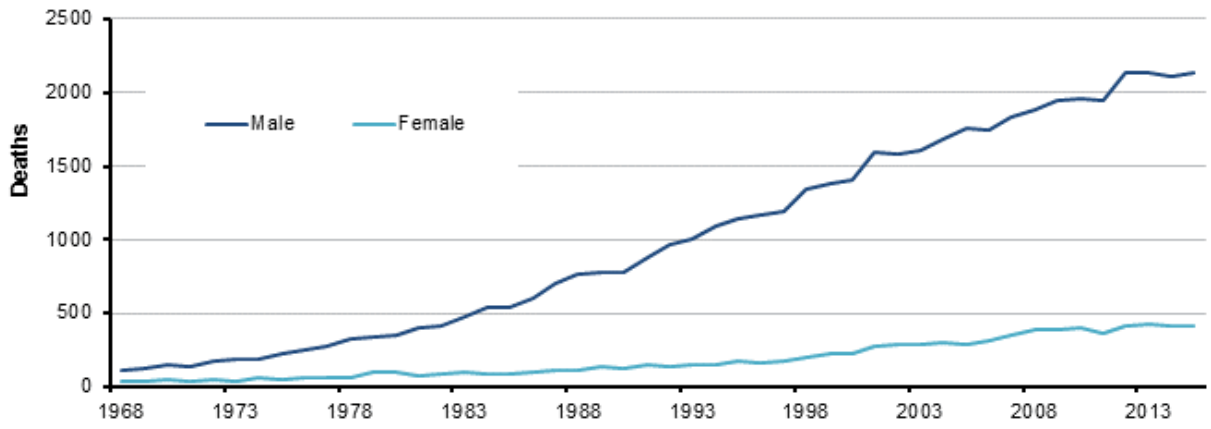
Mesothelioma has a strong association with exposure to asbestos and current evidence suggests that around 85% of all male mesotheliomas are attributable to asbestos exposures that occurred in occupational settings. The long latency period (i.e. the time between initial exposure to asbestos and the manifestation of the disease) of typically at least 30 years means that most mesothelioma deaths occurring today are a result of past exposures that occurred because of the widespread industrial use of asbestos during 1950-1980.

Overall scale of disease including trends

Figure 2 shows annual numbers of male and female deaths from mesothelioma in Great Britain from 1968 to 2015. Annual deaths increased steeply over this period among both men and women. The substantially higher numbers of deaths among men reflects that fact that past asbestos exposures tended to occur in male dominated occupations.

Numbers of annual deaths have been similar over the last four years with 2542 deaths in the latest year 2015 compared with 2549, 2560 and 2519 deaths in years 2012, 2013 and 2014 respectively – see Table MESO01 www.hse.gov.uk/statistics/tables/meso01.xlsx. There were 2,135 male deaths and 407 female deaths in 2015, again similar to the annual numbers in among males and females in the previous three years.

Figure 2 – Male and female mesothelioma deaths 1968-2015(p)



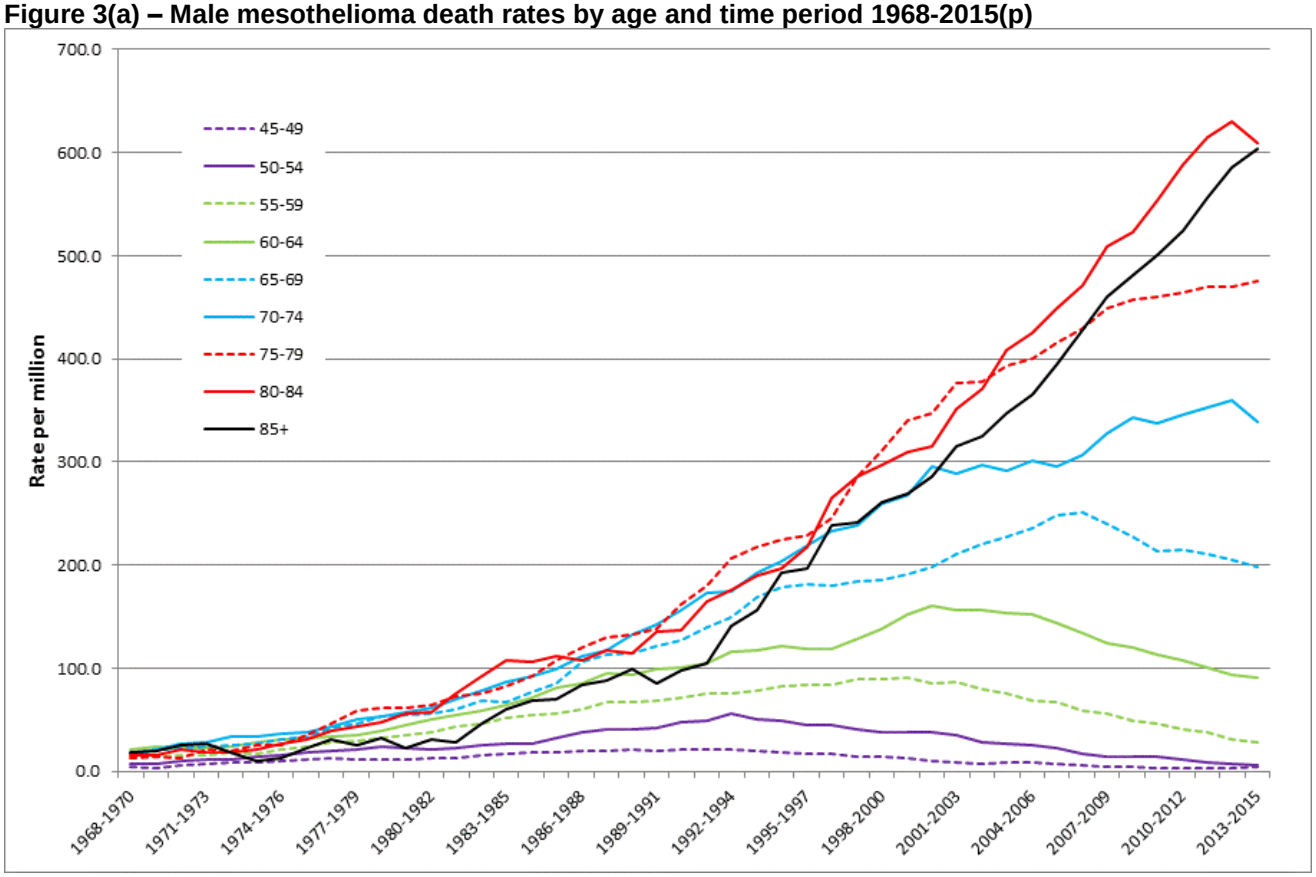
(p) Figures for 2015 are provisional.

Table MESO02 www.hse.gov.uk/statistics/tables/meso02.xlsx shows the number of mesothelioma deaths in each year in 5-year age groups for males and Table MESO03 www.hse.gov.uk/statistics/tables/meso03.xlsx shows the equivalent information for females.

Table MESO04 www.hse.gov.uk/statistics/tables/meso04.xlsx shows the number of mesothelioma deaths and death rates by age, sex and three-year time period from 1968-2015.

Death rates for males by age group are shown in Figure 3(a). The pattern of these rates is a reflection of both disease latency and the timing of past asbestos exposure. Overall, rates are much higher in older age because the disease takes many years to develop following exposure. The continuing increase in male rates at age 70 years and above also reflects the fact that this generation of men had the greatest potential for asbestos exposures in younger working life during the period of peak asbestos use in the 1950s, 1960s and 1970s. In contrast, rates below age 65 have now been falling for some time. The most recent deaths in this age group are among the generation who started working life during the 1970s or later when asbestos exposures were being much more tightly controlled.

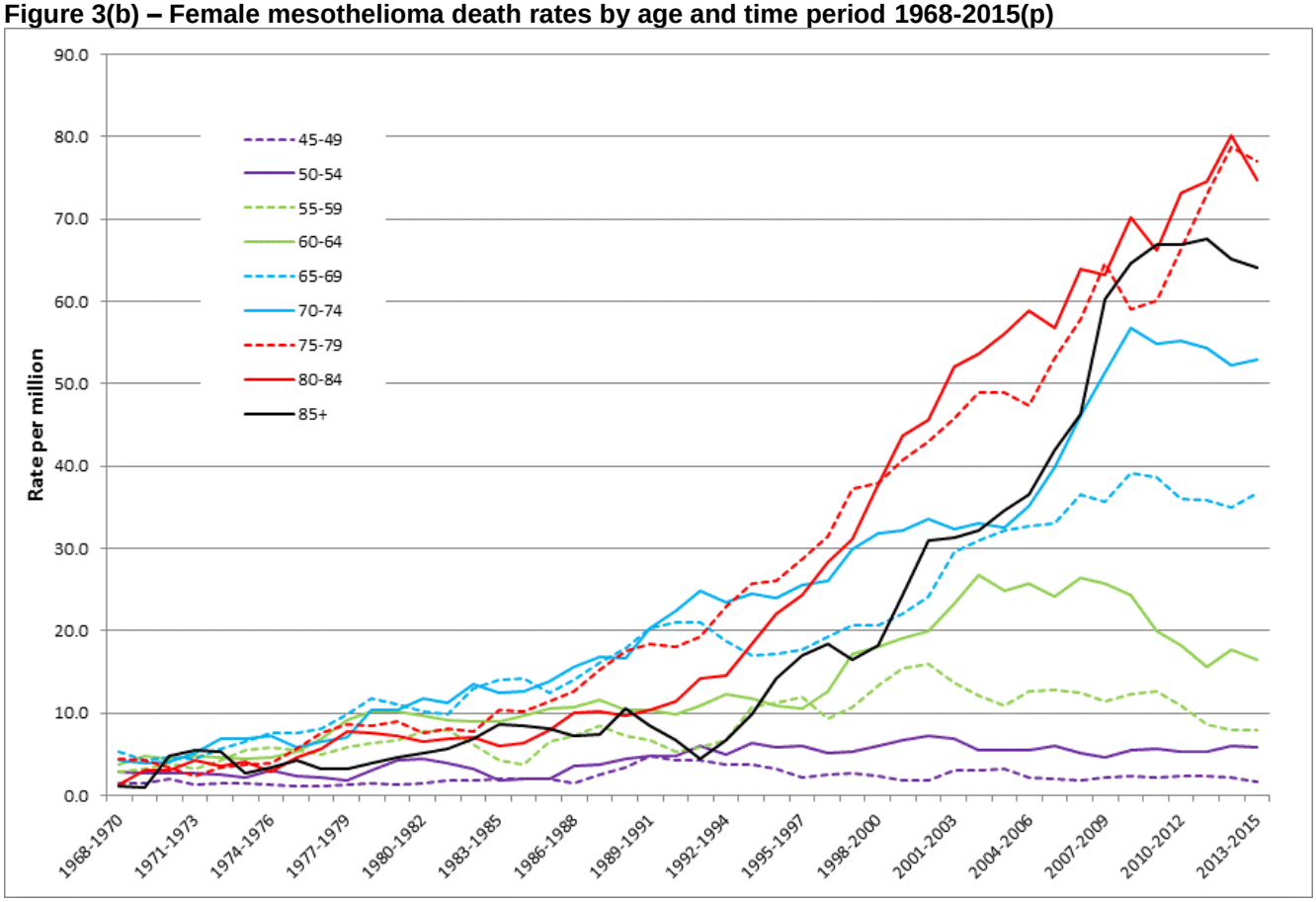
Figure 3(a) – Male mesothelioma death rates by age and time period 1968-2015(p)



(p) Figures for 2015 are provisional.

Death rates for females are shown in Figure 3(b). Although the age-specific rates for females are generally an order of magnitude lower than for males, similar patterns are evident, though with greater year-on-year fluctuations due to the smaller numbers of deaths. However, there is some suggestion that the rates in the 45-54 and 55-64 year age groups have not reduced as strongly in women as in men. This may be partly due to certain sources of exposure that mainly effected men (for example, ship building) being eliminated earliest, whilst sources of exposure that also affected some women as well as men continued (for example, exposures that resulted from asbestos use in the building industry).

Figure 3(b) – Female mesothelioma death rates by age and time period 1968-2015(p)



(p) Figures for 2015 are provisional.

Region

Table MESO05 www.hse.gov.uk/statistics/tables/meso05.xlsx shows age standardised mesothelioma death rates per million by 3-year time period, government office region and sex. The period 2013-2015 was taken as the base for standardisation over time and Great Britain for standardisation over region. Thus the standardisation allows for changes in the age-structure of the underlying population over time and between regions.

In Great Britain mesothelioma death rates for both males and females follow an upward trend over time - reaching 68.8 and 13.0 deaths per million respectively in 2013-2015 compared with 25.0 and 3.4 in 1984-1986. Overall for males, upward trends were evident in the rates over the period for all regions, although rates have fallen slightly in more recent years in the North East, London, South East, South West and Scotland. There is some evidence that rates have increased more strongly within those regions with lower rates in earlier periods than within those regions with higher rates. Although the numbers of cases are much smaller for females – and so the pattern in the rates over time is more erratic – an upward trend is fairly clear in all regions.

More detailed analyses of mesothelioma deaths in Great Britain by geographical area can be found under the heading *Fact sheets on mesothelioma* below.

Occupation

Mesothelioma death statistics for males and females and relative mortality for different occupational groups in 2002-2010 are available in the fact sheet *Mesothelioma Occupation Statistics – male and female deaths aged 16-74 in Great Britain* (see below).

This analysis shows that a substantial number of occupations are recorded much more frequently than expected on death certificates of men now dying from mesothelioma. These include occupations such as metal plate workers which were often associated with the shipbuilding industry, but also a substantial number associated with the construction industry including carpenters, plumbers and electricians.

A recent epidemiological study of mesothelioma in Great Britain [1] confirms the high burden of disease among former building workers. However, it also shows that occupational analyses of national mesothelioma deaths – which are based on only the last occupation of the deceased as recorded on death certificates – will tend to underestimate the proportion of male mesothelioma deaths that are attributable to asbestos exposures in the construction industry. The epidemiological study suggests that about 46% of currently occurring mesotheliomas among men born in the 1940s would be attributed to such exposures, with 17% attributed to carpentry work alone. A key factor in causing the higher risks now seen in these former workers appears to be the extensive use of insulation board containing brown asbestos (amosite) within buildings for fire protection purposes.

Occupational analyses of female mesothelioma deaths are more difficult to interpret because of the lower proportion caused directly by occupational exposures. Occupations are recorded on death certificates as a matter of course (for deaths below age 75), and so inevitably there are various occupations that are recorded in appreciable numbers on female mesothelioma death certificates. However, most of these occupations are recorded with the frequency expected if in fact there was no difference in risk between occupational groups. This suggests that where exposure to asbestos did occur at work that was not due to direct handing of asbestos containing materials – for example, due to unwitting exposure caused by others working with asbestos in the vicinity – it was no more likely in any particular occupational group.

The epidemiological study supports this view. It suggests that only a minority (around a third) of mesotheliomas in women are a result of either occupational or domestic exposures (such as the well documented risk associated with living with an asbestos-exposed worker). This, together with the fact that deaths among women have also increased over the last 4 decades, implies that there has been an increase in the average background mesothelioma risk among older women due to exposures that are not readily identifiable. This increased background risk will also apply to men of the same generation. The exposures that led to this increased background risk could have taken place in a wide variety of settings during the 1950s, 1960s and 1970s when asbestos was being widely used within the building industry.

Further details about mesothelioma and occupation are available at:

www.hse.gov.uk/research/rrhtm/rr696.htm

Estimation of the future burden of mesothelioma deaths

The latest available projections of total annual mesothelioma deaths are based on annual deaths up to and including the year 2013. These projections suggest there will continue to be around 2,500 deaths per year for the rest of this current decade before annual numbers begin to decline – see table MESO06 www.hse.gov.uk/statistics/tables/meso06.xlsx. These projections are very similar to previous projections based on deaths occurring up to and including year 2010. The fact that the actual number of deaths in 2012, 2013 and 2014 is already similar to that expected in the predicted peak year of 2018 is not surprising given that counts of actual deaths will tend to fluctuate year-on-year due to random variation, whereas the projections describe the expected future mortality as a smooth curve.

The projections for the total number of annual deaths are in fact derived from separate analyses of deaths among men and women. While the overall numbers are dominated by the expected pattern in men, these separate predictions suggest that the peak among females will occur later than in males – i.e. well beyond 2020 – at a level of about a quarter of the male peak. However, the female projections are more uncertain due to the smaller number of deaths than in males.

The statistical model used for these projections provides a reasonable basis for making relatively short-term predictions of mesothelioma mortality in Britain, including the extent and timing of the peak number of deaths. However, longer-term predictions comprise two additional sources of uncertainty which are not captured within the published uncertainty intervals for the annual number of deaths. Firstly, the long term projections beyond 2030 are particularly dependent on assumptions about certain model parameters for which there is no strong empirical basis – and in particular, the extent of population asbestos exposure beyond the 1980s. The second source of uncertainty relates to the specific mathematical form of the models we have used. Whilst they provide a good fit to observations of mortality to date, they are influenced by the fact that these deaths are still dominated by the effects of heavy past occupational exposures; it is less clear whether the models will be valid for different patterns of exposure in more recent times.

The statistical model used in the latest predictions is described in detail at:

www.hse.gov.uk/research/rrhtm/rr728.htm

This model was updated for males and females separately using mesothelioma mortality data for 1968-2013 in order to produce the latest projections for 2014 and beyond. An earlier project to investigate alternative models was published in 2011 and is available at:

www.hse.gov.uk/research/rrhtm/rr876.htm

Fact sheets on mesothelioma

- Mesothelioma Mortality in Great Britain by Geographical area, 1981 – 2015
  www.hse.gov.uk/statistics/causdis/mesothelioma/mesoarea1981to2015.pdf
- Mesothelioma Occupation Statistics – male and female deaths aged 16-74 in Great Britain 2002-2010
  www.hse.gov.uk/statistics/causdis/mesothelioma/mortality-by-occupation-2002-2010.pdf
- Mesothelioma occupation statistics for males and females aged 16-74 in Great Britain, 1980-2000
  www.hse.gov.uk/statistics/pdf/occ8000.pdf

Relevant scientific publications on mesothelioma

1. Rake C, Gilham C, Hatch J, Darnton A, Hodgson J, Peto J. (2009). Occupational, domestic and environmental mesothelioma risks in the British population: a case control study. British Journal of Cancer; 100(7):1175-83.
2. Hodgson JT, McElvenny DM, Darnton AJ, Price MJ, Peto J. (2005). The expected burden of mesothelioma mortality in Great Britain from 2002 to 2050. British Journal of Cancer; 92(3): 587-593.
3. McElvenny DM, Darnton AJ, Price MJ, Hodgson JT. (2005). Mesothelioma mortality in Great Britain from 1968 to 2001. Occupational Medicine; 55(2): 79-87.
4. Hodgson JT, Darnton A (2000). The quantitative risks of mesothelioma and lung cancer in relation to asbestos exposure. Annals of Occupational Hygiene 44(8): 565-601.
5. Hutchings S, Jones J, Hodgson J (1995). Asbestos-related diseases. In: Drever F (ed). Occupational Health: Decennial Supplement. London: Her Majesty's Stationery Office: 127-152.
6. Hodgson JT, Peto J, Jones JR, Matthews FE (1997). Mesothelioma mortality in Great Britain: patterns by birth cohort and occupation. Annals of Occupational Hygiene 41(suppl1): 129-133.
7. Peto J, Hodgson JT, Matthews FE, Jones JR (1995). Continuing increase in mesothelioma mortality in Britain. Lancet 345(8949): 535-9.
8. Jones RD, Smith DM, Thomas PG (1988). Mesothelioma in Great Britain in 1968-1983. Scandinavian Journal of Work Environment & Health 14(3): 145-52.
9. Greenberg M, Lloyd Davies TA (1974). Mesothelioma register 1967-68. British Journal of Industrial Medicine 31(2): 91-104.

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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/

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