Mesothelioma in Great Britain

Mesothelioma mortality in Great Britain 1968-2017

Contents

Summary

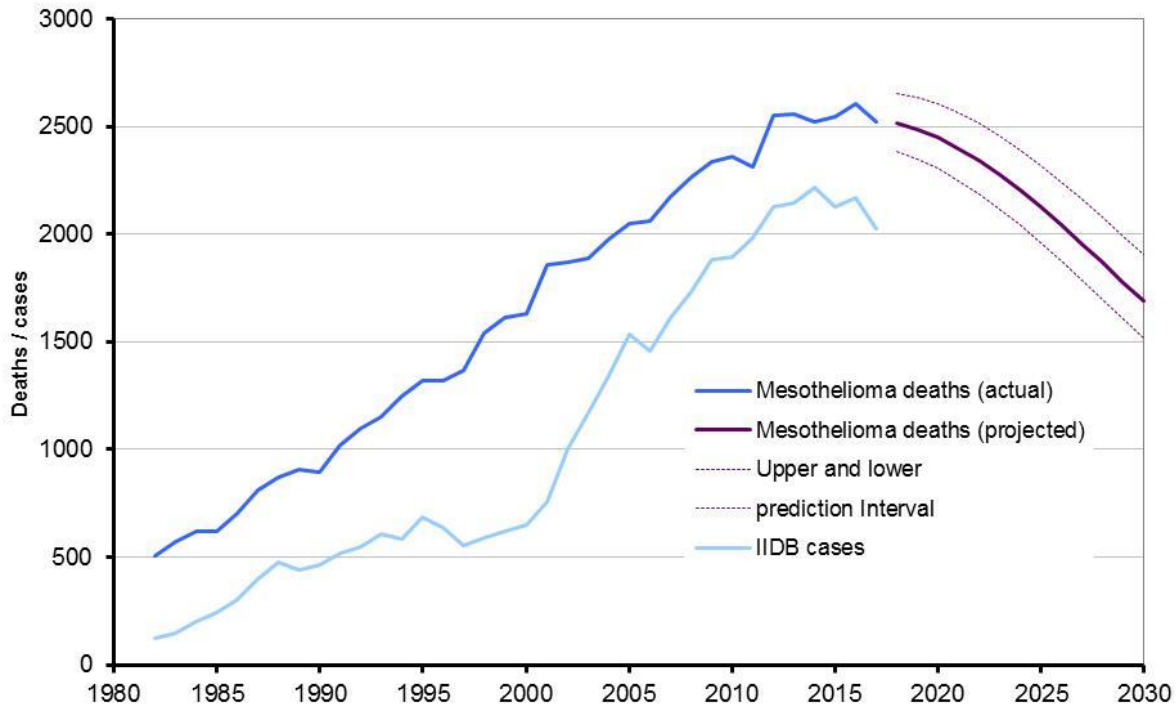
The information in this document relates to Health and Safety Statistics published by the Health and Safety Executive in 2019. The document can be found at: www.hse.gov.uk/statistics/causdis/mesothelioma/

Mesothelioma is a form of cancer that takes many years to develop following the inhalation of asbestos fibres, but is usually rapidly fatal following symptom 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 2,523 mesothelioma deaths in Great Britain in 2017, a broadly similar number to the previous five 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.
- More than half of annual deaths now occur in those aged over 75 years. Annual deaths in this age group continue to increase while deaths below age 70 are now decreasing.
- There were 2,084 male deaths in 2017, a slight reduction compared with recent years, and 439 female deaths, a slight increase.
- There were 2,025 new cases of mesothelioma assessed for Industrial Injuries Disablement Benefit (IIDB) in 2017 of which 235 were female. This compares with 2,170 new cases in 2016, of which 240 were female.
- 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.

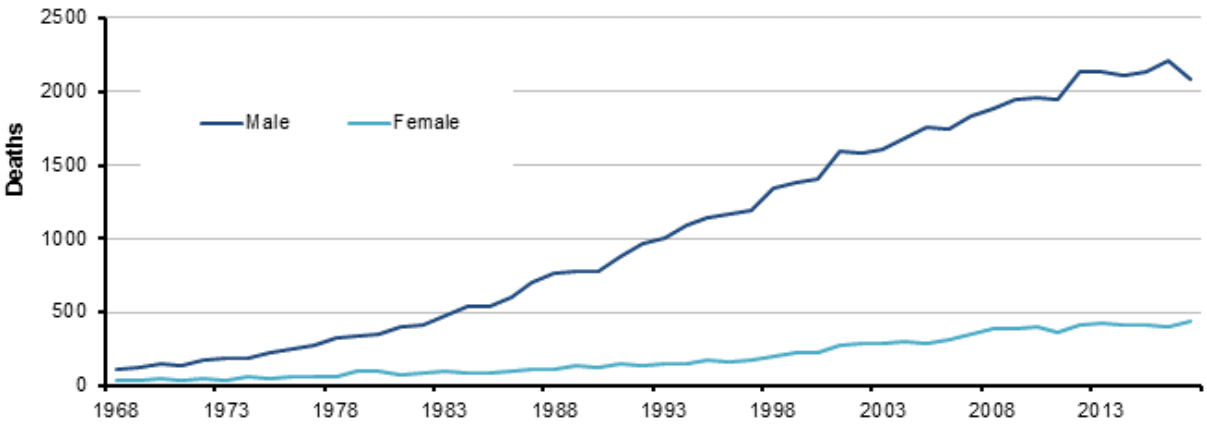
Mesothelioma has a strong association with exposure to asbestos and current evidence suggests that around 85% of all male mesotheliomas are attributable to asbestos exposures that occurred in occupational settings. Most of the remainder of male deaths and a majority of female deaths are likely to have been caused by asbestos exposures but which were not due to the direct handling asbestos materials. 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 2017. The substantially higher numbers of deaths among men reflects the fact that past asbestos exposures tended to occur in male dominated occupations.

Following sustained increases in annual deaths among both men and women since the late 1960s, numbers have now been broadly similar over the last six years with 2523 deaths in the latest year (2017). This compares with an average of 2560 per year over the period 2012 to 2016. The 2,084 male and 439 female deaths in 2017 compare with averages of 2150 and 410 deaths per year for males and females respectively during 2012 to 2016 – see Table MESO01 www.hse.gov.uk/statistics/tables/meso01.xlsx.

Figure 2 – Male and female mesothelioma deaths 1968-2017(p)



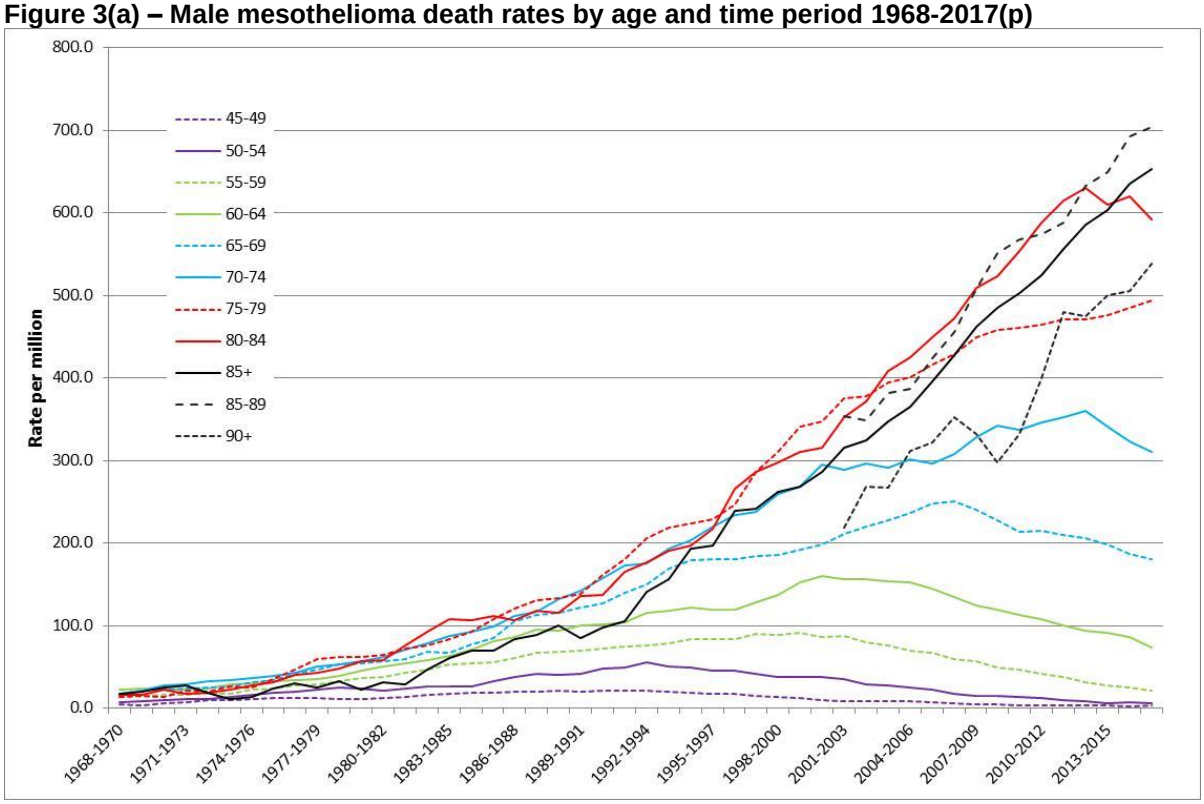
(p) Figures for 2017 are provisional.

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 1968-2017.

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.

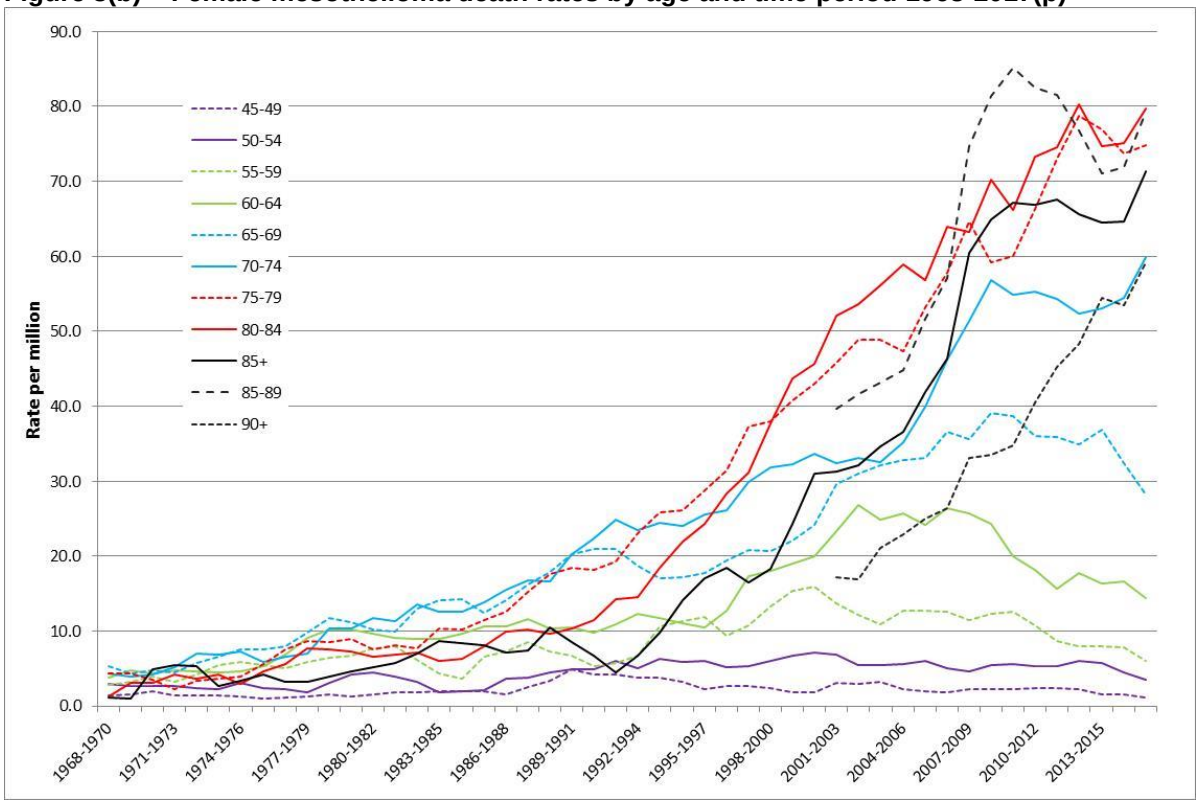
Figure 3(a) – Male mesothelioma death rates by age and time period 1968-2017(p)



(p) Figures for 2017 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.

Figure 3(b) – Female mesothelioma death rates by age and time period 1968-2017(p)



(p) Figures for 2017 are provisional.

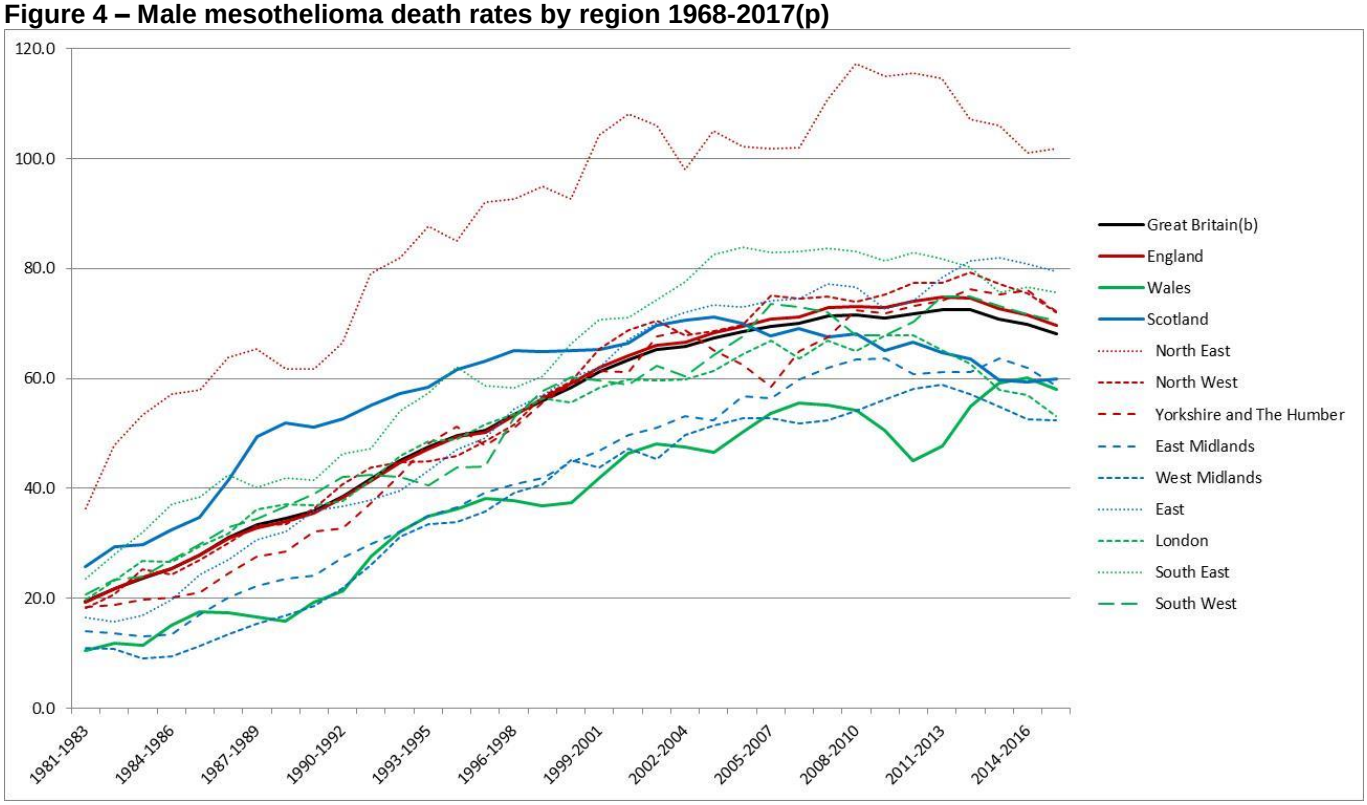
Region

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.

In Great Britain mesothelioma death rates for both males and females follow an upward trend over time with a levelling-off over recent years. Male and female rates reached 68.1 and 12.9 deaths per million respectively in 2015-2017 compared with 25.5 and 3.4 per million in 1984-1986.

Overall for males, upward trends were evident in the rates over the long-term for all regions, although rates have fallen slightly in more recent years in the North East, West Midlands, London, South East, South West and Scotland. Male rates in Wales are now similar to those in Scotland, with higher rates in England as a whole.

Figure 4 – Male mesothelioma death rates by region 1968-2017(p)



(p) Figures for 2017 are provisional.

Rates are standardised according the age-structure of the Great Britain population in 2015-2017 in order to allow comparison over time and by region.

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, see Table MESO05 www.hse.gov.uk/statistics/tables/meso05.xlsx.

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 comparisons of mortality rates for different occupational groups in 2011-2015 and 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. That 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 where exposure to asbestos did occur at work, it was no more likely in any particular occupational group. These may have been largely unwitting exposures – for example, due to disturbance by others working nearby – rather than due to the direct handling of asbestos containing materials.

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 mesothelioma 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 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.

Actual numbers of deaths are expected to fluctuate above and below the predicted peak in years close to the peak. This is due to year-on-year random variation in the annual counts, whereas the statistical projection model describes the expected future mortality as a smooth curve.

The projections for the total number of annual deaths are 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 (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.

Details of previous projections are described in detail at:

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

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, 1981–2017 www.hse.gov.uk/statistics/causdis/mesothelioma/mesoarea.pdf results are also available as interactive maps available at: https://arcg.is/PLzSj.
- Mesothelioma Occupation Statistics – male and female deaths aged 16-74 in Great Britain 2011-2015 and 2002-2010 www.hse.gov.uk/statistics/causdis/mesothelioma/mesothelioma-mortality-by-occupation-2002-2015.pdf
- Excel tables – male and female – 2011-2015 and 2002-2010 www.hse.gov.uk/statistics/tables/mesooccupation.xlsx.
- 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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