

Mesothelioma

Mesothelioma mortality in Great Britain 1968-2010

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Summary

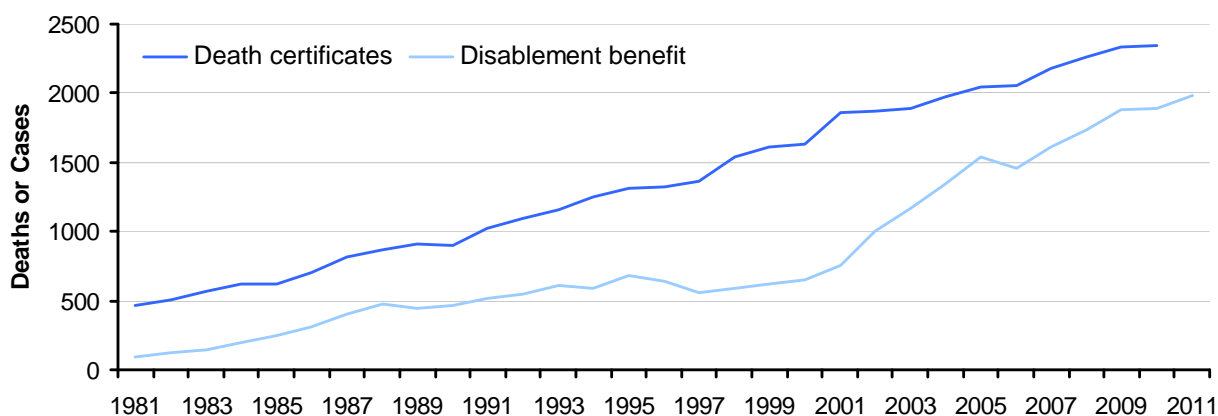
The information in this document relates to Health and Safety statistics for 2011/12. The document can be found at: www.hse.gov.uk/statistics/causdis/mesothelioma/index.htm

Deaths from mesothelioma continue to increase in Great Britain. Most deaths occurring now are a legacy of past occupational exposures to asbestos when it was widely used in the building industry.

The latest information shows:

- The number of mesothelioma deaths has increased from 153 in 1968 to 2 347 in 2010. Over 80% of deaths were among men mainly due to asbestos exposures in the workplace. (Mesothelioma register).
- There were 1 985 new cases of mesothelioma assessed for Industrial Injuries Disablement Benefit in 2011 (IIDB).
- Men who worked in the building industry when asbestos was used extensively are now among those most at risk of mesothelioma.
- The worst case predictions for males are that annual deaths will increase to a peak of about 2 100 around the year 2016.
- Female deaths are likely to peak after this but at a much lower level as most deaths among women are likely to be due to non occupational asbestos exposures.

Figure 1 – Mesothelioma deaths and disablement benefit cases 1981-2011(p)



(p) Provisional.

Introduction

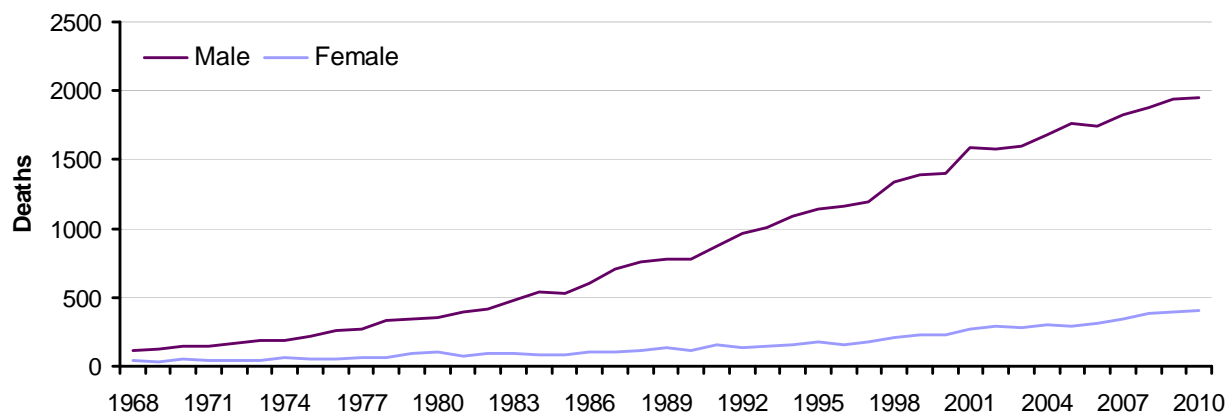
Mesothelioma is a formally rare form of cancer that principally affects the pleura (the external lining of the lung) and the peritoneum (the lining of the lower digestive tract). Many cases of mesothelioma are diagnosed at an advanced stage as symptoms are non specific and appear late in the development of the disease. It is almost always fatal with most of those affected usually dying within twelve months of diagnosis.

Mesothelioma has a strong association with exposure to asbestos and current estimates suggest that around 85% of all male mesotheliomas are attributable to occupational exposures. Most deaths occurring now are a consequence of the long latency period (i.e. the time between initial exposure to asbestos and the manifestation of the disease) which is typically between 30 and 40 years.

Overall scale of disease including trends

The annual number of mesothelioma deaths in Great Britain has increased fairly constantly from 153 in 1968 to 2 347 in 2010. See Table MESO01 www.hse.gov.uk/statistics/tables/meso01.xls. There were 1 946 male deaths and 401 female deaths in 2010. Figure 2 shows the number of male and female deaths from mesothelioma from 1968 to 2010. The higher proportion of mesothelioma deaths among men are largely due to high levels of asbestos exposure in male dominated occupations many years ago.

Figure 2 – Male and female mesothelioma deaths 1968-2010(p)

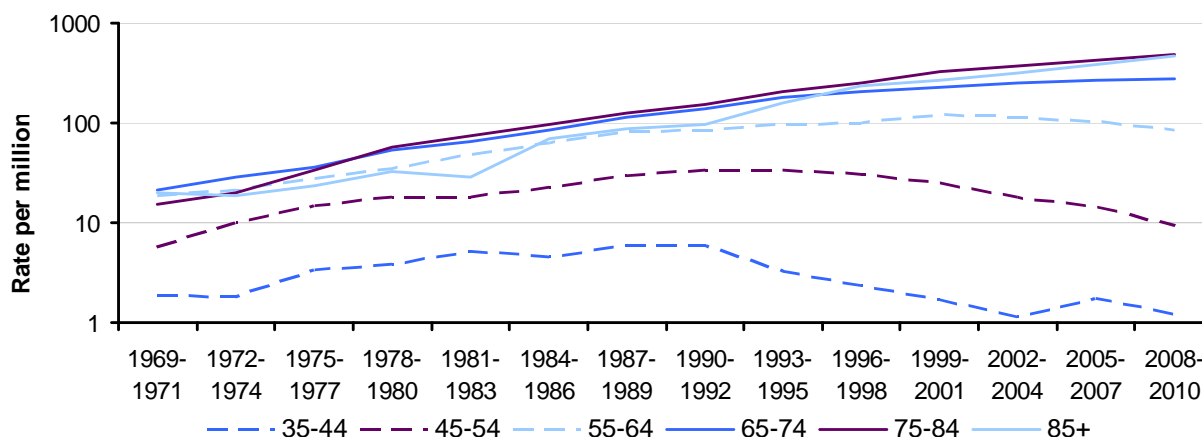


(p) Provisional.

Table MESO02 www.hse.gov.uk/statistics/tables/meso02.xls 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.xls shows the number of mesothelioma deaths in each year in 5-year age groups for females. Although the number of female mesothelioma deaths has always been much smaller than the corresponding number of male deaths, the number of annual deaths among women has increased more rapidly than the increase among men over the last ten years.

Table MESO04 www.hse.gov.uk/statistics/tables/meso04.xls shows numbers of mesothelioma deaths and death rates by age and sex for the fourteen three-year time periods from 1969-2010. Death rates for males are shown in Figure 3(a). There are large differences in the magnitude of the rates between the different age groups for males. The three oldest age groups (65-74, 75-84 and 85+) have the highest rates and these continue to follow an upward trend over time. In the 55-64 age group the increase in the rate over time has generally not been as steep as for older age groups, and rates have continued to fall after reaching a peak in 1999-2001. After an increasing trend in the earlier time periods, rates in the 35-44 and 45-54 year age groups now show a downward trend with rates falling from the early 1990s.

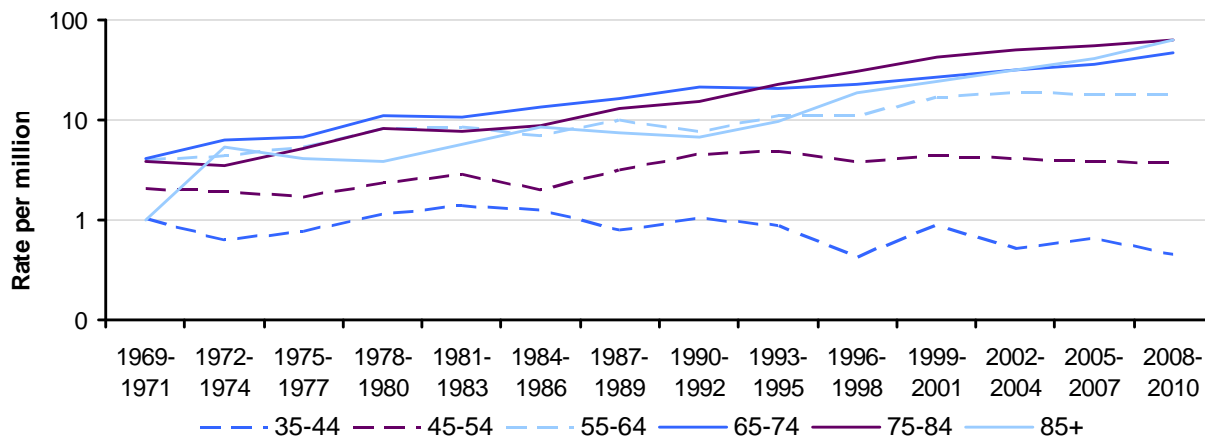
Figure 3(a) – Male mesothelioma death rates by age and time period 1969-2010(p)



(p) 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 age groups have not reduced as strongly in women as in men and this may be consistent with a smaller proportion of female cases being caused by distinct occupational sources of exposure which ceased many years ago.

Figure 3(b) – Female mesothelioma death rates by age and time period 1969-2010(p)



(p) Provisional.

Region

Table MESO05 www.hse.gov.uk/statistics/tables/meso05.xls shows age standardised mesothelioma death rates per million by 3-year time period, government office region and sex. The period 2008-2010 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 65.1 and 12.9 deaths per million respectively in 2008-2010 compared with 24.0 and 3.3 in 1984-1986. Overall for males, upward trends were evident in the rates over the period for most regions, although rates have fallen slightly in the most recent 3-year period in the North West, London, South East and South West. There is some evidence that rates for the different regions are converging over time in that regions with the lowest rates in earlier periods tend to increase most, and those with higher rates increase to a lesser extent. 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 mesothelioma statistics by region are available in three separate fact sheets.

www.hse.gov.uk/statistics/causdis/mesothelioma/factsheets.htm

Occupation

Mesothelioma death statistics for males and females and relative mortality for different occupational groups 2002-2005 are available in the fact sheet Mesothelioma deaths – the latest picture for Great Britain: Geographical Analysis 1981-2005 and Occupational Analysis 2002-2005 – see page 9. The analysis shows that a number of occupations associated with the construction industry – such as carpenters, plumbers and electricians – are recorded much more frequently than expected on death certificates of men now dying from mesothelioma. This highlights the effect of past occupational asbestos exposures due to the use of asbestos containing materials in the construction industry.

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. 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 a lower proportion is caused directly by occupational exposures. Occupations are recorded on death certificates as a matter of course, and so inevitably there are various occupations that are recorded in appreciable numbers on female mesothelioma death certificates. However, 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 – 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 recent 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. 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 both older women (and men) due to exposures that are not readily identifiable. Such exposures 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 projections of future mesothelioma mortality in Great Britain show that the expected worst case scenario is for male mesothelioma deaths to increase to a peak of about 2 100 deaths in the year 2016. A number of other statistical models have now also been fitted to the male data, some of which predict that the peak will occur sooner and at a lower level.

Projections of future female mesothelioma mortality have now been produced based on an adapted version of the statistical model published in 2005. These projections are more uncertain than those for males due to the smaller number of deaths each year. However, one reasonably firm conclusion is that the peak for females will occur after that for males, albeit at a lower overall level.

The statistical models used provide a reasonable basis for making relatively short-term projections 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 are particularly dependent on assumptions about certain model parameters for which there is no strong empirical basis. 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 deaths to date are still dominated by the effects of heavy past occupational exposures; it is not clear whether the models will be valid for different patterns of exposure in more recent times.

Further details about the most recent projections are available at:

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

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

Fact sheets on mesothelioma

The following area and occupational based statistics show how mesothelioma rates in county districts in Great Britain compared with the average for Great Britain:

- Mesothelioma deaths – the latest picture for Great Britain: Geographical analysis 1981 – 2005 and Occupational analysis 2002 – 2005 www.hse.gov.uk/statistics/pdf/mesojune08.pdf
- Mesothelioma mortality in Great Britain: an analysis by geographical area, 1981-2000 www.hse.gov.uk/statistics/pdf/area8100.pdf
- Mesothelioma area statistics: county districts in Great Britain 1976-1991 www.hse.gov.uk/statistics/pdf/cd7691.pdf
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The following occupational statistics show how the mesothelioma rates for different occupations compared with the occupational average for Great Britain:

- Mesothelioma occupation statistics for males and females aged 16-74 in Great Britain, 1980-2000 www.hse.gov.uk/statistics/pdf/occ8000.pdf and the accompanying press release. www.hse.gov.uk/statistics/press/2003/ie03077.htm

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.
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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.
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9. Greenberg M, Lloyd Davies TA (1974). Mesothelioma register 1967-68. *British Journal of Industrial Medicine* 31(2): 91-104.

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