

Mesothelioma Mortality in Great Britain by Geographical Area, 1981 - 2011

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Introduction

This fact sheet provides statistics on mesothelioma deaths in Great Britain by geographical area for deaths occurring in the period 1981 to 2011. Numbers of deaths for males and females are given for areas within the current local government structure down to Unitary Authority (UA) and Local Authority level. Standardised Mortality Ratios (SMRs) are also provided with associated 95% Confidence Intervals in order to allow comparison of areas after taking into account the age distributions of the underlying populations.

The statistics are presented in tabular form in the following spreadsheet:

www.hse.gov.uk/statistics/tables/mesoarea.xlsx

- **MESOAREA01:** UAs and LAs with the highest/lowest mesothelioma mortality for males 1981-2011
- **MESOAREA02:** Number of mesothelioma deaths and SMRs for males by geographical area in Great Britain
- **MESOAREA03:** UAs and LAs with the highest/lowest mesothelioma mortality for females 1981-2011
- **MESOAREA04:** Number of mesothelioma deaths and SMRs for females by geographical area in Great Britain
- **MESOAREA05:** Mesothelioma deaths and Standardised Mortality Ratios (SMRs) for males in Great Britain by area and five year time periods 1981-2010
- **MESOAREA06:** Mesothelioma deaths and Standardised Mortality Ratios (SMRs) for females in Great Britain by area and five year time periods 1981-2010

Methods

Mesothelioma deaths occurring during the period 1981-2011 were obtained from the Health and Safety Executive's mesothelioma register. SMRs were derived using mid-year population estimates provided by the Office for National Statistics.

The method of age standardisation used in the production of SMRs is commonly referred to as the indirect method. Age-specific death rates in a standard population (in this case Great Britain) are applied to the age structure of the population for each geographical area in order to calculate expected numbers of deaths. The ratio of the observed number of deaths to the expected number of deaths in the area is calculated and multiplied by 100 to give the SMR. The SMR of the standard population is 100. An SMR greater or less than 100 indicates a respectively higher or lower than expected mortality rate in a specific area. If the lower bound of the 95% Confidence Interval for the SMR is greater than 100 this indicates that the observed number of deaths was statistically significantly higher than expected. Further details of the SMR calculation are provided in the Annex.

The analyses by geographical area are limited by the fact that death certificates record only the last address of residence. A case of mesothelioma caused by work in one geographical area will only be assigned to that area in this analysis if the individual was resident there when they died. The long latency period of mesothelioma means that individuals may move between areas before the onset of the disease and thus there is considerable potential for dilution of the observed difference in risk between areas. The extent of this dilution will be strongest for those areas where there have been substantial migrations. Areas with the highest SMRs will be those which are genuine sources of risk, but their SMRs will understate the true risk level relative to the rest of Great Britain. Conversely, SMRs of other areas will overstate the level of risk associated with these locations. The areas recording the lowest SMRs will be those areas not associated with asbestos exposure and which are unlikely to be the final area of residence for individuals with asbestos exposure.

The current local government structure that has been in place since 2009 divides each of the 11 Government Office Regions (GORs) in Great Britain into Unitary Authorities (UAs) and counties, with counties further subdivided into Local Authorities (LAs) (<http://www.ons.gov.uk/ons/guide-method/geography/ons-geography/index.html>). Deaths included in the mesothelioma register have been assigned to areas within this structure from 1981 onwards based on postcode of residence at time of death. The geographical analysis is therefore restricted to the period 1981-2011. Mortality in the different geographical areas is

represented by Standardised Mortality Ratios (SMRs) and associated 95% Confidence Intervals, with Great Britain used as the reference population. SMRs are also presented for each of six five-year time periods from 1981 to 2010 with age standardisation within each period.

A number of new Unitary Authorities were created in 2009. These comprise the following local authorities that existed as part of the previous local government structure that applied from 1998. Changes in 2009 were as follows:

1. County Durham UA comprises the former districts of Chester-le-Street, Derwentside, Durham, Easington, Sedgefield, Teesdale and Wear Valley.
2. Northumberland UA comprises the former districts of Alnwick, Berwick-upon-Tweed, Blyth Valley, Castle Morpeth, Tynedale and Wansbeck.
3. Cheshire East UA comprises the former districts of Congleton, Crewe and Nantwich and Macclesfield.
4. Cheshire West and Chester UA comprises the former districts of Chester, Ellesmere Port & Neston and Vale Royal.
5. Shropshire UA comprises the former districts of Bridgnorth, North Shropshire, Oswestry, Shrewsbury and Atcham and South Shropshire.
6. Bedford UA comprises the former district of Bedford.
7. Central Bedfordshire UA comprises the former districts of Mid Bedfordshire and South Bedfordshire.
8. Cornwall UA comprises the former districts of Caradon, Carrick, Kerrier, North Cornwall, Penwith and Restormel.
9. Wiltshire UA comprises the former districts of Kennet, North Wiltshire, Salisbury and West Wiltshire.

Results and discussion

As in previous geographical analyses of mesothelioma deaths, the results presented here show that areas with the highest excess of mesothelioma in males tend to be those containing industrial sites known to have been associated with high asbestos exposures in the past, such as shipyards. However, occupational analyses suggest that asbestos exposures in the construction industry also account for a substantial proportion of mesothelioma deaths. Such exposures are less likely to have been associated with specific geographical areas; rather, they are likely to have taken place over a wide range of areas. The analysis by five-year period shows that areas associated with shipbuilding activity tend to have much higher SMRs for early time periods than for later periods. Mesothelioma rates in these areas thus tend to be rising more slowly than the overall rate for Great Britain or even falling. This may to some extent reflect the effect of risks being diluted due to the migration of those exposed in an industry which has declined substantially into lower risk areas. It may also suggest that annual mesothelioma deaths arising from such exposures may peak earlier than those arising from other sources of exposure.

For men, the geographical areas with the highest mesothelioma death rates were Barrow-in-Furness (SMR 493, 95% CI 433 to 560, 241 deaths), West Dunbartonshire (SMR 459, 95% CI; 404 to 518, 258 deaths), and North Tyneside (SMR 309, 95% CI 280 to 341, 411 deaths). For women, the geographical areas with the highest mesothelioma death rates were Barking & Dagenham (SMR 425, 95% CI 333 to 533, 74 deaths), Sunderland (SMR 394, 95% CI 328 to 470, 123 deaths) and Newham (SMR 325, 95% CI 246 to 421, 57 deaths).

Annex

Table A illustrates the calculation of an SMR for men in area A. The total population of Great Britain is used as the standard population, (column 1). The mesothelioma death rate per 1,000 in the population for each age group (column 3) is the total number of male mesothelioma deaths (column 2) divided by the total number of men in Great Britain (column 1) to give age-specific death rates in the standard population. These rates are applied to the total population in area A, given in column 4, to give the expected numbers of deaths in this area, in column 6. The total observed number of deaths, shown in column 5, (1,196) divided by the expected number of deaths (2,024), multiplied by 100 gives an SMR of 59.

Table A: Example of an SMR calculation

Age group	All men			Men in area A		
	Population, (thousands)	Mesothelioma deaths	Death rate Per 1,000	Population, (thousands)	Mesothelioma deaths	Expected deaths
	(1)	(2)	(3) = (2) / (1)	(4)	(5)	(6)=(3)*(4)
0-4	28 554	0	0.000	6 926	0	0.0
5-9	29 683	0	0.000	8 514	0	0.0
10-14	32 324	0	0.000	9 286	0	0.0
15-19	35 061	1	0.000	8 729	0	0.2
20-24	34 931	1	0.000	7 833	0	0.2
25-29	32 949	5	0.000	7 907	2	1.2
30-34	31 188	16	0.001	7 770	7	3.9
35-39	29 220	76	0.003	6 443	17	16.7
40-44	27 454	199	0.007	6 222	32	45.1
45-49	24 983	402	0.016	6 243	76	100.4
50-54	24 398	705	0.029	6 391	136	184.7
55-59	24 001	1 145	0.048	6 269	179	299.1
60-64	22 155	1 436	0.065	5 367	183	347.9
65-69	19 554	1 499	0.077	4 997	222	383.1
70-74	15 232	1 315	0.086	3 729	177	321.9
75-79	10 232	930	0.091	2 176	112	197.8
80-84	5 176	472	0.091	1 007	40	91.8
85+	2 503	145	0.058	525	13	30.4
All ages	429 600	8 347		106 334	1 196	2024.5

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