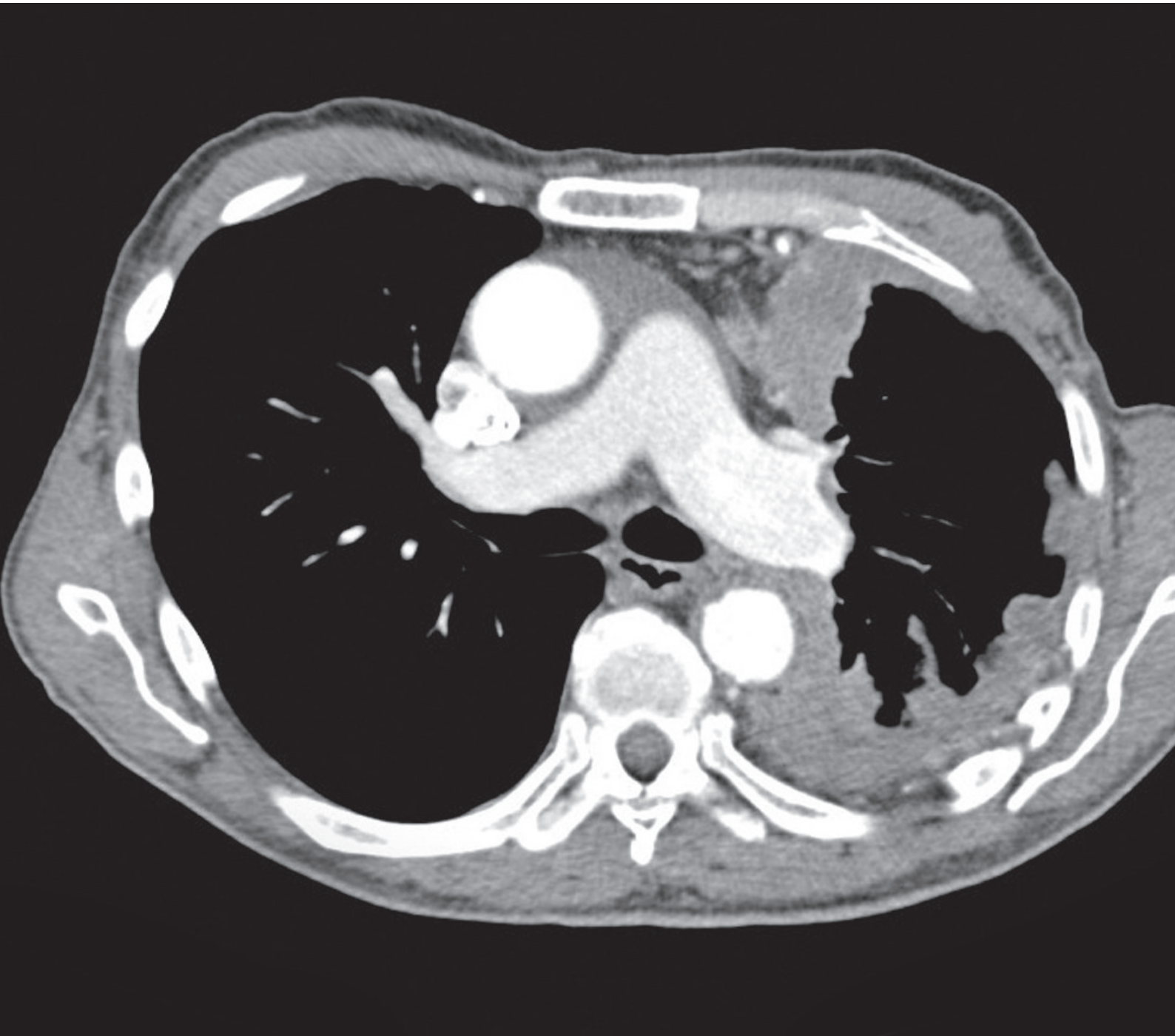
National Lung Cancer Audit Report 2014

Mesothelioma

Report for the period 2008–2012



The Healthcare Quality Improvement Partnership (HQIP)
The National Lung Cancer Audit is commissioned by the Healthcare Quality Improvement Partnership (HQIP) as part of the National Clinical Audit Programme (NCA). HQIP is led by a consortium of the Academy of Medical Royal Colleges, the Royal College of Nursing and National Voices. Its aim is to promote quality improvement, and in particular to increase the impact that clinical audit has on healthcare quality in England and Wales. HQIP holds the contract to manage and develop the NCA Programme, comprising more than 30 clinical audits that cover care provided to people with a wide range of medical, surgical and mental health conditions. The programme is funded by NHS England, the Welsh Government and, with some individual audits, also funded by the Health Department of the Scottish Government, DHSSPS Northern Ireland and the Channel Islands.

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Foreword

We are very pleased to be able to produce this report which, with data on over 8,700 patients diagnosed between 2008 and 2012 with malignant pleural mesothelioma is, we believe, the largest case series published from anywhere in the world. A wide range of data are presented covering the nature of the disease, the range and timeliness of treatments and the survival rates in different sub groups of patients. It is heartening to see that the large majority of patients are now having their diagnosis confirmed by biopsy and that 94 per cent of cases are discussed by a multi-disciplinary team. This would certainly not have been the case 10-15 years ago. The proportion of patients receiving chemotherapy has also increased steadily year on year over the period of observation – almost doubling over the period of the audit. However there are still a quarter of patients who are not having the benefit of support from a Clinical Nurse Specialist.

The report also, for the first time, begins to show the level of variation in diagnosis, treatment and survival for mesothelioma by geographical area in England and Wales and perhaps the most worrying feature of the report is the wide range of this variation across the cancer networks (as they were before the NHS re-organisation in 2013). For example the proportion of patients first admitted to secondary care as an emergency varied fourfold from 10 per cent to 40 per cent by network and the proportion of fit patients (performance status 0 and 1) who are receiving chemotherapy ranged from 20 per cent to 60 per cent. Whilst the prognosis remains generally poor, overall survival, especially for the commonest morphological type, epithelioid mesothelioma, is better than reported in many older case series and one would like to think that this is the result of a better overall standard of care.

We hope that this report is used by all those responsible for providing and commissioning services for patients with mesothelioma to examine the quality of care and outcomes in their own areas and put measures in place to drive up the standard of their services. Mesothelioma remains an uncommon cancer in many areas of the country and more needs to be done to ensure that every patient is fully assessed by an experienced and dedicated team of specialist clinicians. Not only is the standard of care likely to be better in teams dealing with mesothelioma on a regular basis, but patients will be more likely to be offered entry into clinical trials of new treatments that are so desperately needed if we are to make further inroads into treating this dreadful disease.

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Acknowledgments

The National Lung Cancer Audit (NLCA) Project Team: Mick Peake, Paul Beckett, Ian Woolhouse, Roz Stanley (who left the team during 2013), Kimberley Greenaway, Arthur Yelland and Anne Cerchione, would like to thank all the organisations that have made this report possible. These include the Healthcare Quality Improvement Partnership (HQIP), The Royal College of Physicians (The RCP), The Health and Social Care Information Centre (HSCIC), The University of Nottingham, The Cancer Information System Cymru, (CaNISC), Informing Healthcare (Wales), Welsh Cancer Intelligence and Surveillance Unit (WCISU), South-East Scotland Cancer Network (SCAN), North of Scotland Cancer Network (NoSCAN), West of Scotland Cancer Network (WoSCAN). In addition thanks to Laila Tata at the University of Nottingham for her work on the analysis of the data.

Thanks must also go to all the lung cancer teams who have contributed data to the audit as without their considerable efforts it would not have been possible to produce this report.

Introduction and Purpose

Malignant pleural mesothelioma (hereafter "mesothelioma" or "MPM") is a type of cancer that develops over a long period of time, but once clinically apparent is often rapidly progressive. The cancer originates in specialised mesothelial cells which line the thin membrane (pleura) that surrounds the lungs and the inside of the chest wall. Mesothelioma can also affect the similar peritoneal membrane within the abdominal cavity, but this is less common and is not dealt with as part of the audit. Approximately 90 per cent of cases of mesothelioma are linked to asbestos exposure, and so a number of occupations, notably shipbuilding, railway engineering, insulation, plumbing, electrical installation and asbestos product manufacturing, are associated with an increased risk of the disease.

The purpose of this document, the first Mesothelioma Report of the National Lung Cancer Audit, is to summarise the key findings of the audit for patients who were first seen in secondary care for diagnosis and treatment of their mesothelioma between 2008 and 2012 inclusive. The history, purpose and methodology of the audit have been extensively documented and further details can be obtained from the HSCIC website (www.hscic.gov.uk/lung). Although data on mesothelioma has been included in previous Annual Reports, the relatively low numbers of cases compared to lung cancer, as well as the differing diagnostic and treatment pathways suggested the need for a mesothelioma-specific report covering a period of several years.

Every Trust or Health Board in England, Wales and Scotland have participated in the audit, although because of differences in reporting schedules, standards and targets the analysis and report focuses on the England and Wales data; Scottish data are tabulated separately in Appendix 2. Details of care provided by individual organisations in this report are based on "place first seen" in secondary care. Place first seen is chosen since, in the vast majority of cases, it represents the location of the Multi-Disciplinary Team that co-ordinates the investigation and treatment of the individual patient. As a result some tertiary centres may appear to have little input into the care of mesothelioma and to submit little data to the audit, however, on the contrary, they usually provide the most complex care for the most difficult patients and submit treatment data on behalf of other Trusts. Information about the number and types of treatment provided by these Trusts is presented in the Table below.

Trust Code	Trust Name	Surgery (n)	Chemotherapy (n)	Radiotherapy (n)	Any (n)
RBV	The Christie NHS Foundation Trust	0	6	113	116
REN	The Clatterbridge Cancer Centre NHS Foundation Trust	*	87	173	210
RGM	Papworth Hospital NHS Foundation Trust	26	0	0	26
RM2	University Hospital of South Manchester NHS Foundation Trust	50	221	0	254
RPY	The Royal Marsden NHS Foundation Trust	0	52	41	81
RT3	Royal Brompton and Harefield NHS Foundation Trust	147	0	0	147

* (asterisk) in table cell = small number between 1-4

The data collected in this report is for patients first seen in the calendar years 2008-2012. At this time the Cancer Networks were still in place and responsible for helping to facilitate cancer services in the areas they served therefore the audit has decided to report by Network. Moving forward the report will be modified to reflect the new commissioning structures. The NLCA Project Team would like to take this opportunity to thank colleagues who were employed by Cancer Networks for their invaluable support of the audit, often over many years. This has undoubtedly contributed hugely to the progress that the audit has made in improving mesothelioma care.

Note that all data presented in this report refers to cases submitted to the National Lung Cancer Audit unless otherwise stated.

All the results in this report as well as further detailed analyses are available online at www.hscic.gov.uk/lung

Definition of Mesothelioma

A diagnosis of mesothelioma may be inferred from several of the audit data fields, but care needs to be taken to ensure that cases of lung cancer, originally suspected to be mesothelioma but later disproved, are not mistakenly included. For this reason, the following hierarchy of diagnosis is used:

1. Mesothelioma confirmed on pathological sample taken at the time of surgery.
2. If no surgical pathological sample, mesothelioma confirmed on other pathological sample taken pre-treatment.
3. If no pathological sample taken, mesothelioma confirmed on basis of clinico-radiological picture (ICD-10 code of C45/C45.0).

Key Messages and Recommendations

Key Messages

- The audit has collected data on 8,740 patents with mesothelioma who first presented to secondary care in England and Wales between 2008 and 2012 inclusive. This represents approximately 85 per cent of the expected number of cases for the time period.
- Mesothelioma is a relatively rare cancer with a median of 10 cases per year for secondary care organisations. It is predominantly a disease of older males, in keeping with the close association with asbestos exposure.
- Recording of key audit data is excellent, with the exception of data on stage which is considered to reflect the historic lack of a clinical staging system.
- Approximately two-thirds of mesothelioma patients receive some form of anti-cancer treatment, individual patients may have more than one treatment:
    - Chemotherapy 34 per cent
    - Surgery (predominantly pleurodesis) 27 per cent
    - Radiotherapy 29 per cent

Although the low number of cases means that data must be interpreted with caution, there appears to be significant variation in the approach to diagnosis and treatment between organisations that should form the basis for service improvement.

Recommendations

1. All Hospitals, Trusts and Health Boards should participate in this national audit, should submit data on all patients with mesothelioma presenting to secondary care and should complete all relevant data fields for each individual patient.
2. Data completeness for the Performance Status field should exceed 85 per cent.
3. Clinical teams should use the International Mesothelioma Interest Group (IMIG) staging system to record clinical (and where appropriate pathological) stage for all patients, with overall recording of stage in at least 85 per cent of cases.
4. Data completeness for the co-morbidity field should exceed 85 per cent.
5. At least 95 per cent of patients submitted to the audit should be discussed at a Multi-Disciplinary Team (MDT) Meeting.
6. Histological/cytological confirmation rates below 85 per cent should be reviewed to determine whether best practice is being followed and whether patients have access to the whole range of biopsy techniques. However, this should not deter recording of cases where a clinical diagnosis of mesothelioma has been made.
7. Every effort should be made to subtype the mesothelioma, and where the proportion of cases of unspecified mesothelioma is above 30 per cent, review of diagnostic procedures and pathological processing is recommended.
8. For patients undergoing surgical treatment, every effort should be made to accurately record the OPCS code of the procedure undertaken.
9. At least 90 per cent of patients are seen by a Lung Cancer Nurse Specialist (LCNS); at least 85 per cent of patients should have a Lung Cancer Nurse Specialist present at the time of diagnosis (note that the latter data are not available for Wales).
10. Patients with adequate performance status should be offered chemotherapy and high quality patient information should be available to guide treatment decisions.
11. All patients should be offered access to relevant clinical trials.

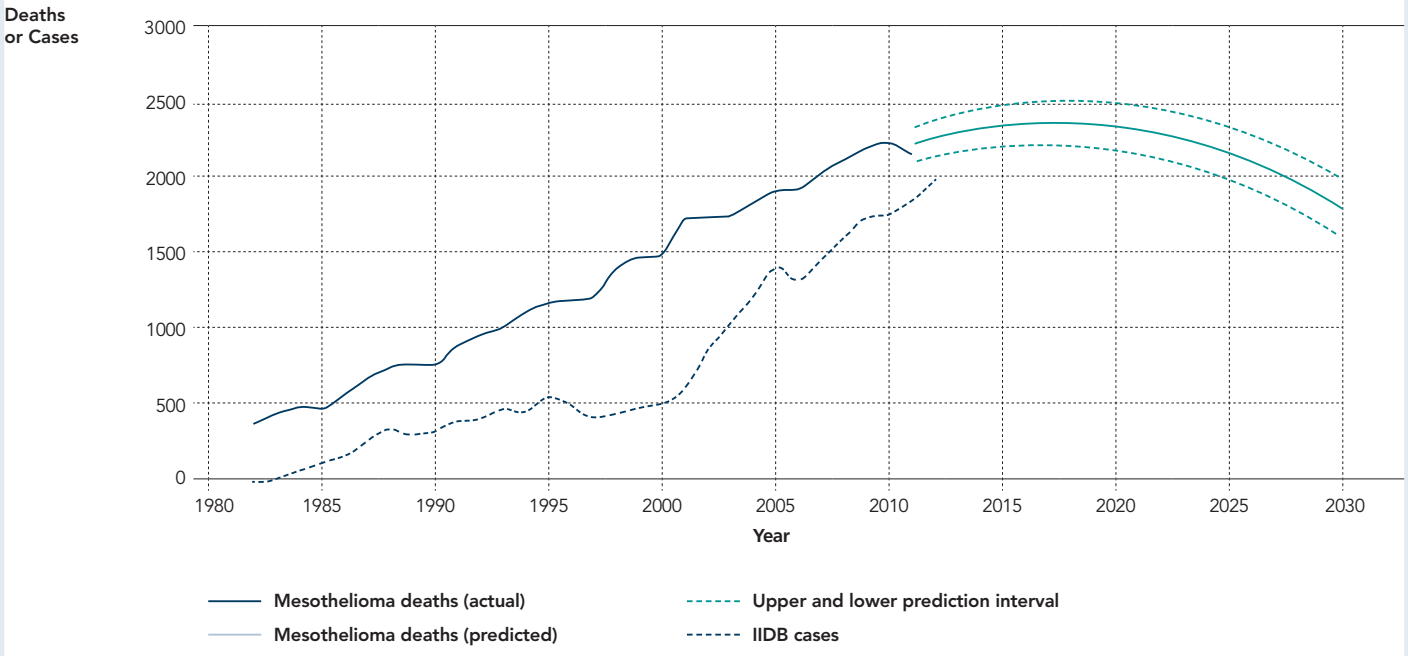
Focus on Demographics

Between 2008 and 2012 there were 8,740 cases of mesothelioma submitted to the audit. Every Trust or Health Board in England and Wales, and every Health Board in Scotland has participated in the audit.

Most cases of mesothelioma are believed to be caused by occupational asbestos exposure and so the demographics are strongly influenced by this.

Occupations at particular risk include the shipbuilding industry as well as carpenters, joiners, plumbers, boilermakers and electricians. Since there is a 20-50 year lag between exposure to asbestos and development of the disease, cases of mesothelioma continue to rise in the UK despite import bans and regulations on handling asbestos (see Figure below).

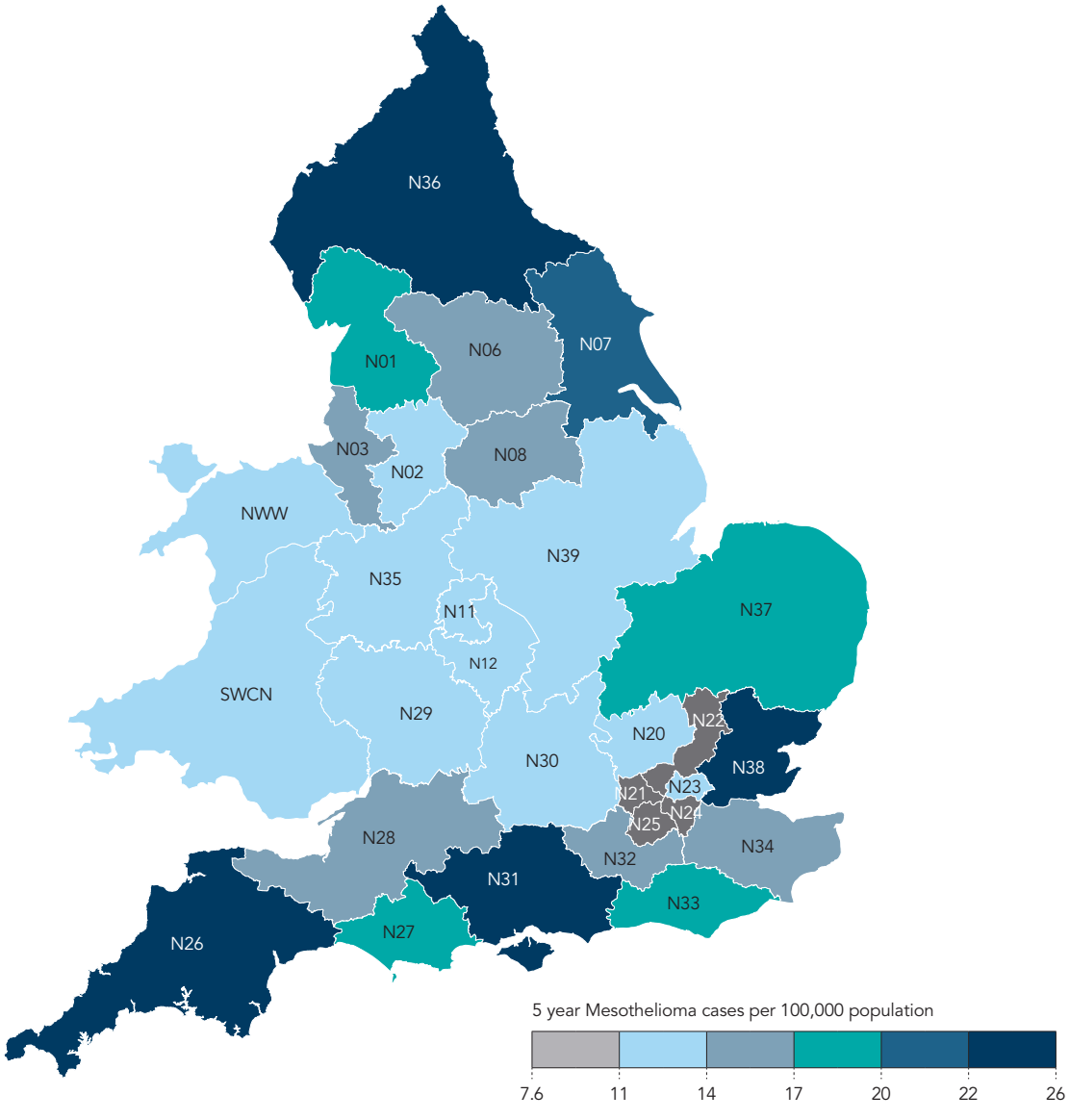
Mesothelioma in Great Britain: annual deaths, Industrial Injuries Disablement Benefit (IIDB) cases and projected future deaths to 2030. Reproduced from http://www.hse.gov.uk/statistics/causdis/mesothelioma/



Cancer registry data suggests that approximately 2,100 cases of mesothelioma are registered in England each year and hence the audit has captured approximately 85 per cent of the expected number of cases. The Table below shows the numbers of cases submitted to the audit by year and by country:

	Number
England 2008	1,310
England 2009	1,688
England 2010	1,717
England 2011	1,735
England 2012	1,885
Wales 2008	86
Wales 2009	67
Wales 2010	91
Wales 2011	82
Wales 2012	79

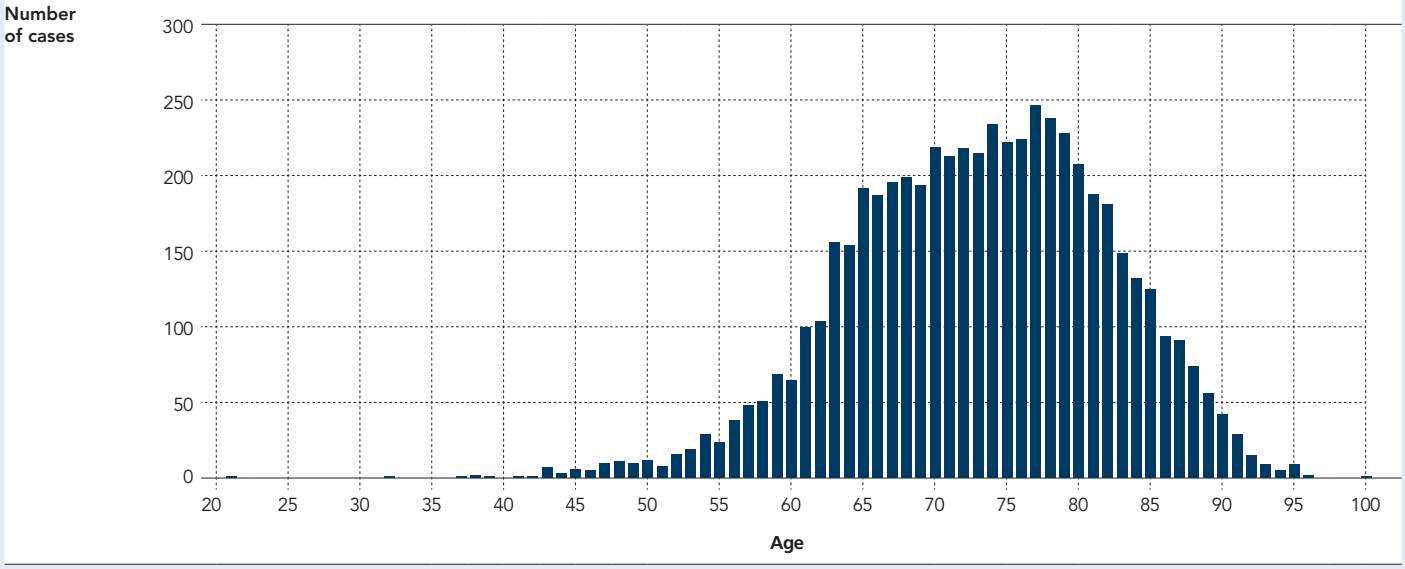
Appendix 1 shows the numbers of patients submitted by each individual trust over the whole five year period, and the graphic below demonstrates the geographical distribution of cases. It can be seen that many organisations see relatively few cases of mesothelioma (median value 10 per year). This may make it difficult to provide the skills and experience to ensure optimum management of patients.



Age

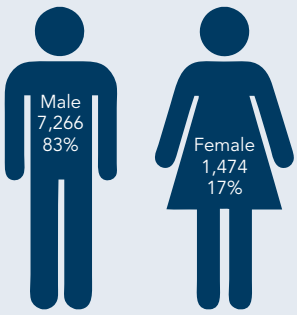
Age at the time of diagnosis is recorded in 100 per cent of cases. Mesothelioma is a disease of adults, with the age at diagnosis ranging from 21 to 100 in this dataset. The median age is 73 years (interquartile range 66-79).

Age Distribution of Mesothelioma



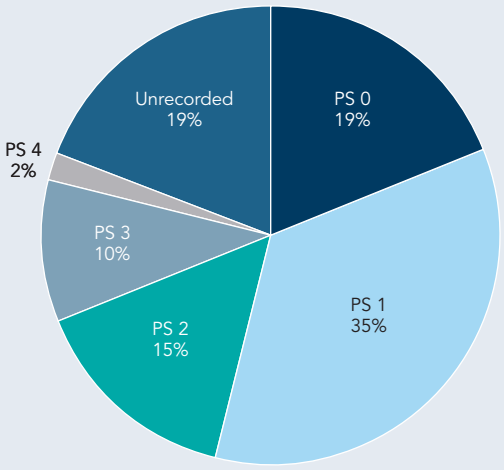
Sex

Sex is recorded in 100 per cent of cases. Mesothelioma is predominantly a disease of males as shown in the graphic opposite. For Wales there is a slight increase in the proportion of female cases (19 per cent).



Performance Status

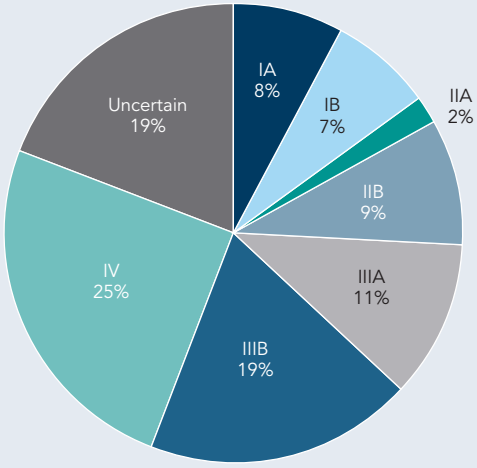
Performance status (PS) is recorded in 81 per cent of cases. PS is a standardised method of assessing a patients overall fitness. Generally speaking, patients with PS 0-1 will be fit enough to receive treatment of their disease, whereas patients with PS 3-4 will not (PS 2 patients require individualised assessment). The graph opposite indicates that just under three-quarters of patients have PS 0-2 at the time of diagnosis and so might be suitable for anti-cancer treatment.



Stage

Stage is a measure of the extent of disease. Historically, there has been no validated staging system for clinical assessment of mesothelioma stage (although lung cancer staging TNM was sometimes used), and it was only possible to define stage in patients undergoing surgery. Therefore, for the purposes of the audit, recording of stage was considered optional and for this reason stage is only recorded in 36 per cent of all cases.

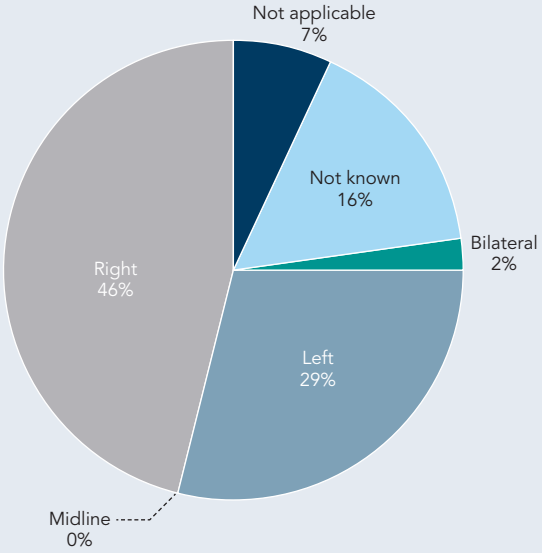
The IMIG (International Mesothelioma Interest Group) TNM system is now recommended for both clinical and pathological staging and organisations are encouraged to use this system for recording of stage wherever possible. The graphic opposite describes the stage



Laterality

The data shows that pleural mesothelioma is strikingly more commonly found to affect the right as opposed to the left side of the chest – this has been observed in previous studies of mesothelioma and it has been postulated that this reflects the larger pleural surface area in the right hemi-thorax.

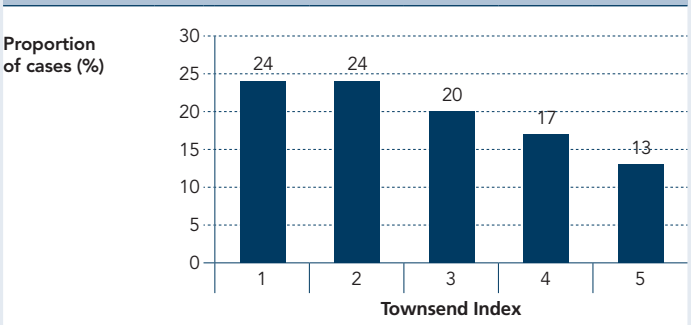
A small number of cases are found to affect the midline or to be bilateral at the time of diagnosis.



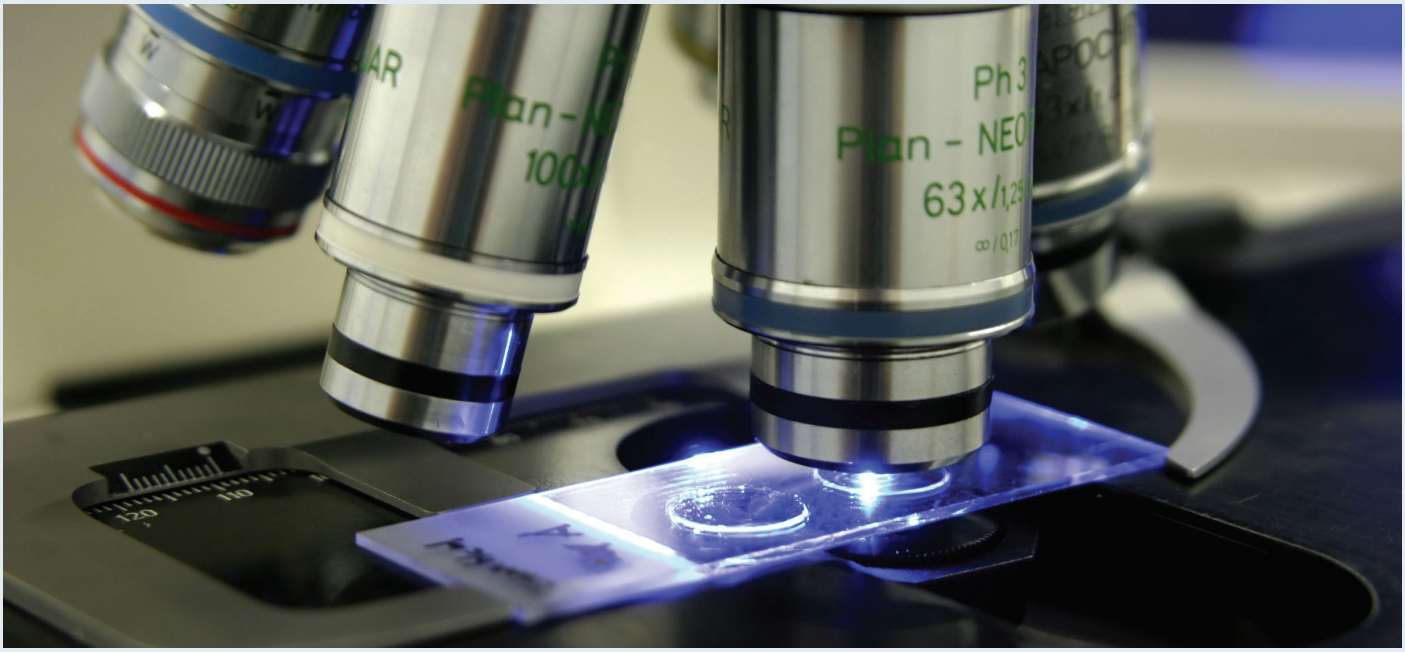
Socio-economic Status

The Townsend Index is a measure of socio-economic deprivation and is derived from a patient's postcode. It can be a useful way to measure health inequalities. Analysis of the Townsend Index of patients with mesothelioma, shows that there is a trend for more cases to be found in less deprived communities. This finding may be surprising given the types of employment areas that are associated with asbestos exposure and is an area worthy of further study.

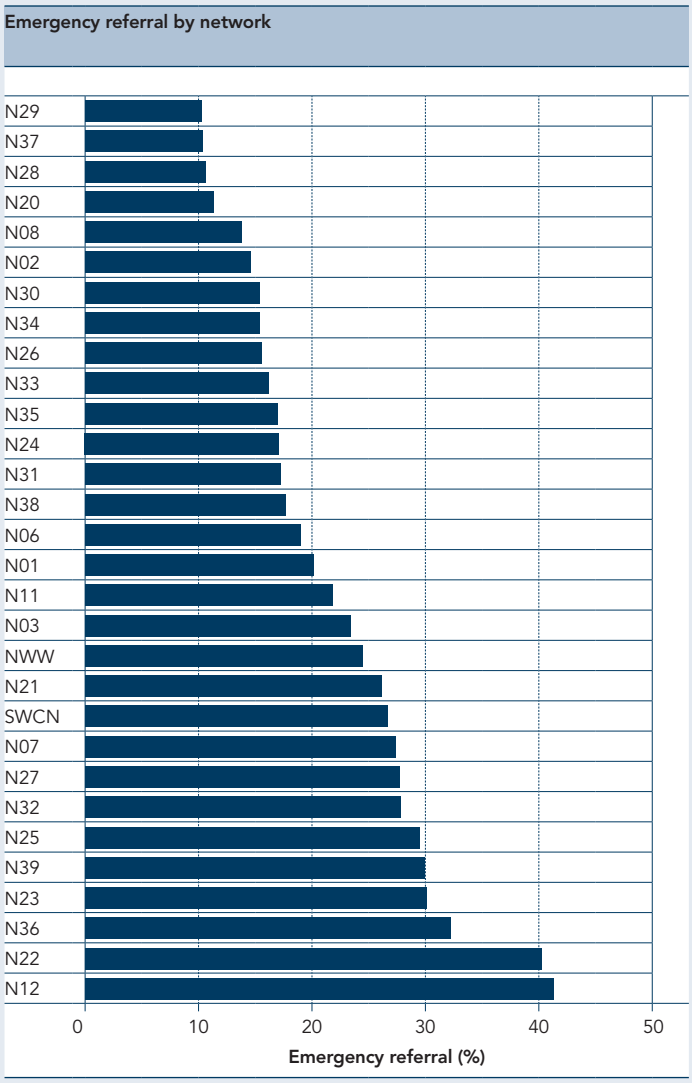
Distribution of Townsend Index in Mesothelioma cases

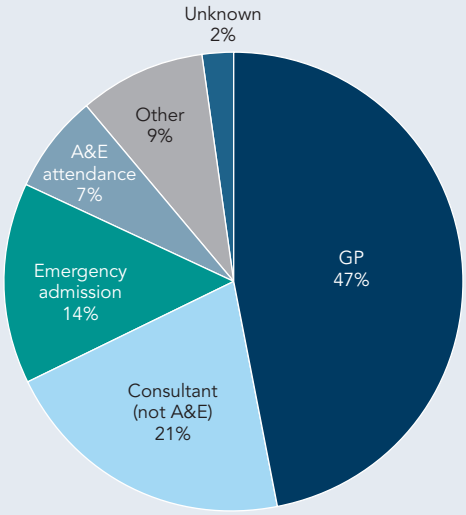


Focus on Pathway and Diagnostics



Referral Pathways





Patients with mesothelioma are usually diagnosed and treated following referral to a secondary care Respiratory Medicine service. The audit captures the route through which patients access secondary care as shown in the graph above. Almost half are referred by their General Practice, around a quarter are referred from another hopital consultant, and around 21 per cent are referred non-electively after an emergency admission or Accident and Emergency attendance.

The proportion of patients who are referred non-electively varies considerably across the networks from 10 per cent to 41 percent, as shown in the graph opposite.

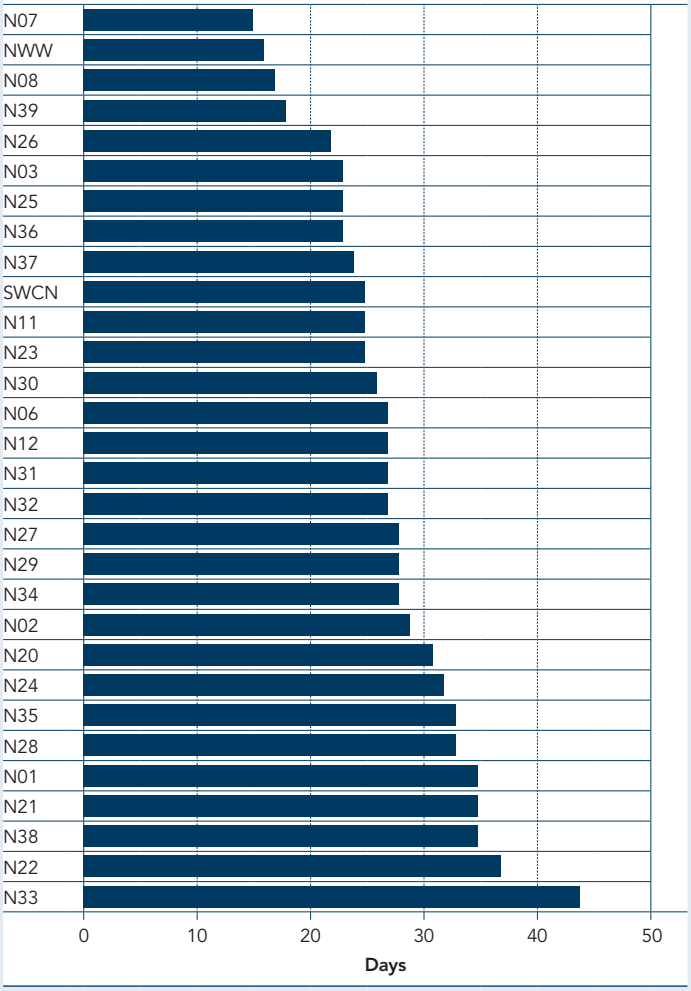
Speed of Pathway

The Department of Health monitors the speed of cancer pathways through its "Cancer Waiting Times" programme, but the NLCA also collects similar data on timeliness of the pathway for mesothelioma.

Dates of referral to secondary care and the date of diagnosis are available for 5,117 patients (59 per cent) and the median time between these time points is 28 days (interquartile range 13-47). The variation in this measurement across cancer networks is shown in the graph opposite.

Assessment of time to first anti-cancer treatment is complex since surgical treatments may precede the diagnosis date, and so the time may appear to be less than zero. However, excluding surgical treatment, the median period is 35 days (interquartile range 24-51).

Time to diagnosis by network



Miscellaneous

The diagnosis of mesothelioma is often suspected on the basis of patient symptoms and Chest-X-Ray findings. In the vast majority of cases, a CT scan will be carried out as the next investigation and this is recorded to be the case in 86 per cent of cases submitted to the audit. Whilst a clinical diagnosis of mesothelioma may be appropriately made in individuals with a history of asbestos exposure and supportive imaging tests, a histological diagnosis is strongly recommended for confirmation and to allow the sub-classification of tumours – the latter has important implications for treatment and prognosis.

Other measures of patient pathway include:

- 94 per cent of submitted cases were discussed in a multi-disciplinary team meeting
- 4 per cent of patients are recorded as having a CT-PET scan
- 19 per cent are recorded to have had a CT-guided biopsy (organ not specified)
- 76 per cent of patients are seen by a lung cancer nurse specialist
- 52 per cent of cases have the nurse specialist present at the time of diagnosis (data available for England only)
- 20 per cent of patients have lung function recorded

Histological confirmation

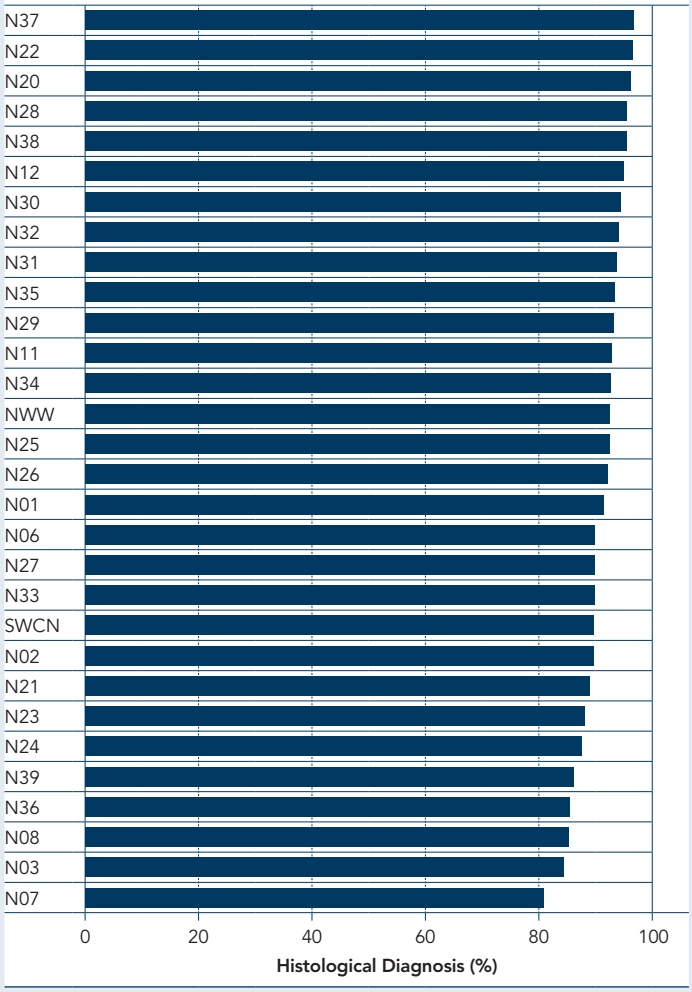
The audit does not distinguish between diagnoses made through histology (tissue samples) and cytology (fluid samples), but overall 91 per cent of cases of mesothelioma were confirmed histo-cytologically. It is recognised that the diagnosis may be difficult and it has been recommended that a second opinion from specialist pathologists be obtained where there is any doubt.

There are several histological subtypes of mesothelioma that may be distinguishable on histological samples. Around half of cases submitted to the audit are recorded as mesothelioma without sub-classification, but where sub-classification is achieved, the epithelioid subtype is most common, with sarcomatoid and biphasic subtypes less common (see Table right). Distinguishing the subtype is relevant as it can predict prognosis and may be used to determine treatment options (see section on survival).

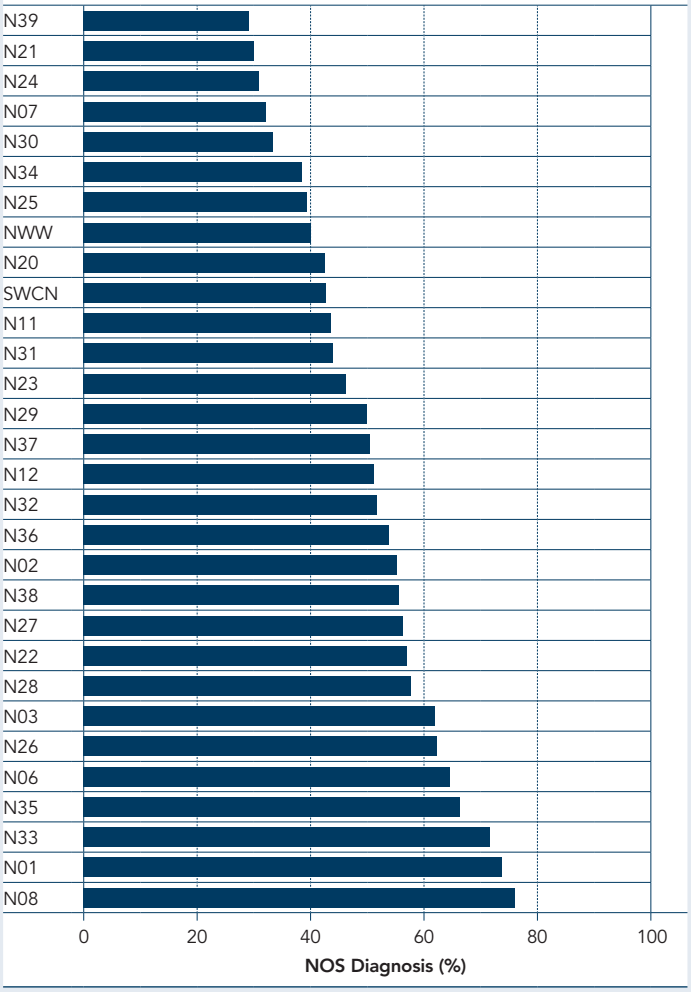
	No.	%
Mesothelioma (unspecified)	4.036	50.9
Epithelioid mesothelioma	2,334	29.4
Sarcomatoid mesothelioma	445	5.6
Biphasic mesothelioma	328	4.1
Other	289	3.6
No SNOMED code	1,308	6.2

***Proportions excluding 814 cases who had no histological confirmation

Histological confirmation rate by network



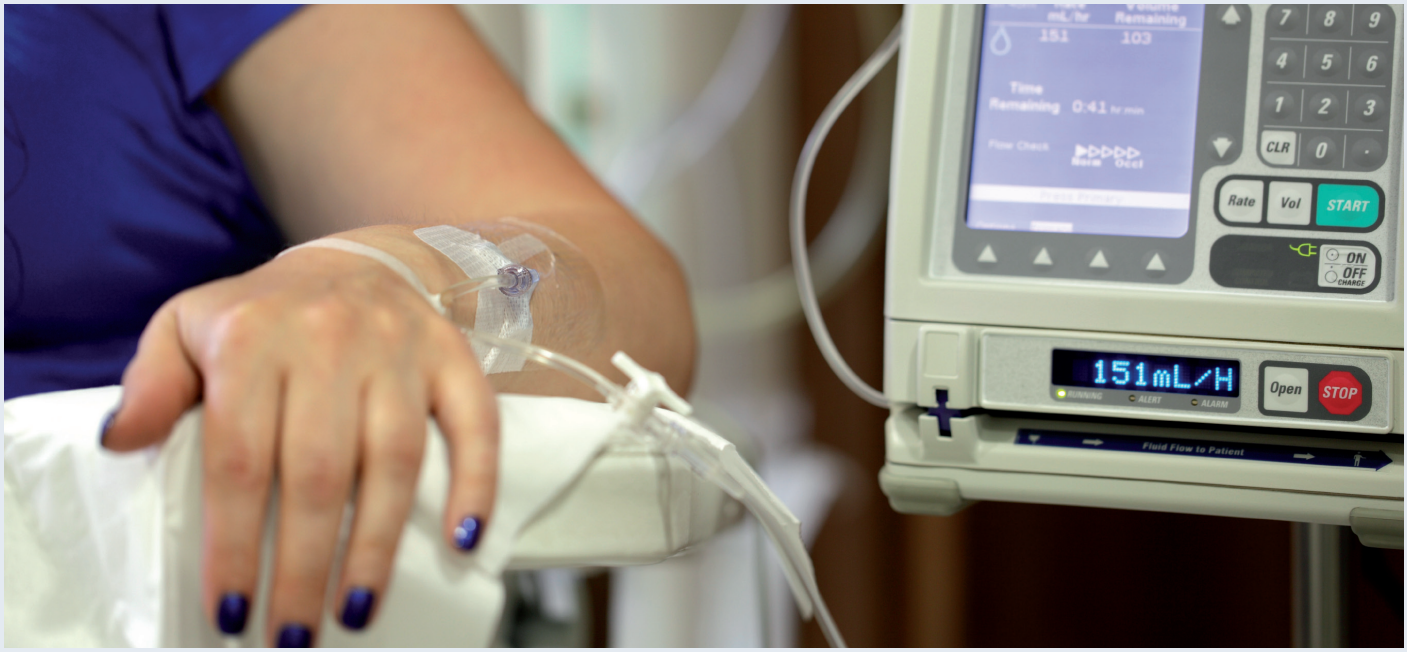
Mesothelioma NOS rate by network



The graph on the left shows the proportion of cases that have histo-cytological confirmation in each of the cancer networks. There is a large variation in the proportion confirmed from 81 per cent to 97 per cent.

The graph on the right shows the proportion of histo-cytologically confirmed cases that are not sub-classified (not otherwise specified, NOS). Again there is a large variation from 29 per cent to 76 per cent.

Focus on Treatment



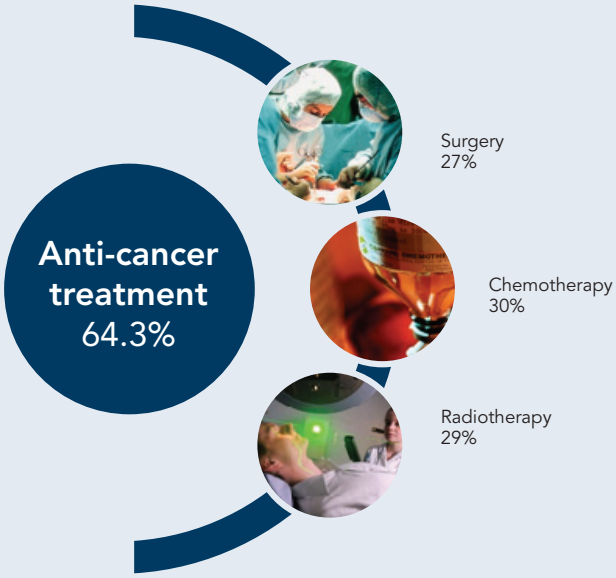
The lack of randomised controlled trial evidence means that no treatment option can be considered "standard". Treatments for mesothelioma should be considered palliative. Whilst there are occasional case reports of patients who survive for more than five years, they are very much the exception. High-quality randomised controlled trial data supports the use of palliative chemotherapy which provides approximately a two month's survival advantage. The use of port-site radiotherapy, whilst widely practiced, does not have clear evidence to support it and is currently the subject of two UK-based randomised controlled trials.

The graphic opposite indicates the proportion of patients in the audit who are recorded as receiving each of the main modalities of anti-cancer treatment (an individual patient may receive more than one form of treatment).

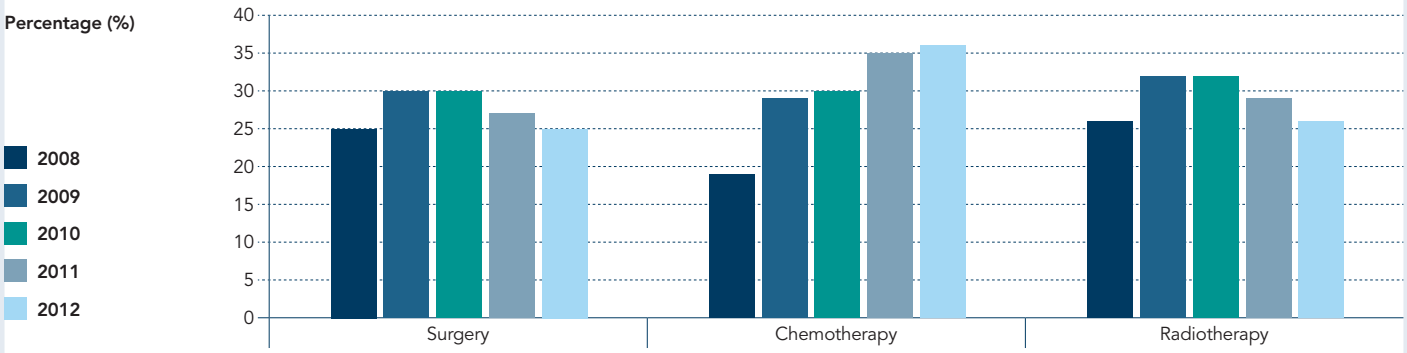
Overall, 64 per cent of patients received an anti-cancer treatment.

The definition of "surgery" is discussed below.

Year by year, the proportion of patients receiving anti-cancer treatment did not vary, but as shown in the graphic on the next page, the proportions receiving radiotherapy and surgery fell, and the proportion receiving chemotherapy rose.



Variation in treatment over time

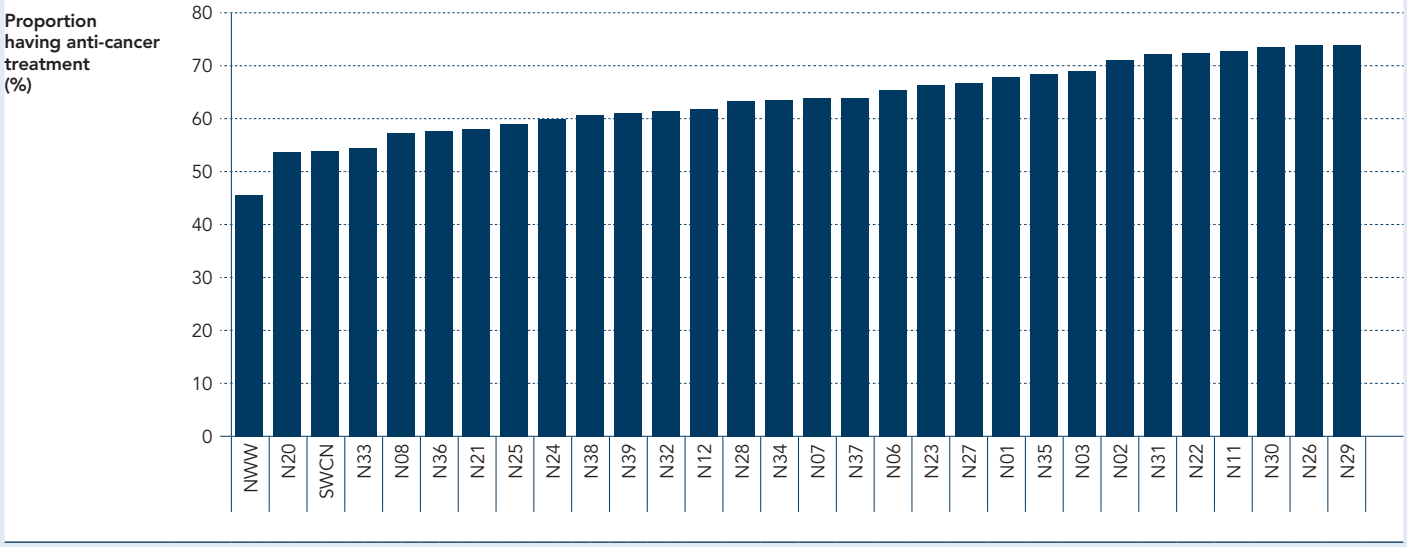


Anti-cancer treatments may be given individually or in combination as shown in the Table opposite. It should be noted that recording of multiple modalities of treatment may not be as accurate as recording of single lines of treatment. Where multiple modalities are given, they may be contemporaneous or temporally distinct.

There is a significant variation in the use of anti-cancer treatment by network (graph below) that ranges from 46 per cent to 74 per cent of patients. There is an even more striking variation by trust, although low numbers in some organisations mean that the data has to be interpreted with caution and is not detailed here.

	Number	%
No treatment	3,120	35.7
Chemotherapy alone	1,497	17.1
Surgery alone	1,273	14.6
Radiotherapy alone	1,186	13.6
Radio and chemotherapy	546	6.2
Surgery and radiotherapy	505	5.8
Surgery and chemotherapy	326	3.7
Surgery and radiotherapy and chemotherapy	287	3.3

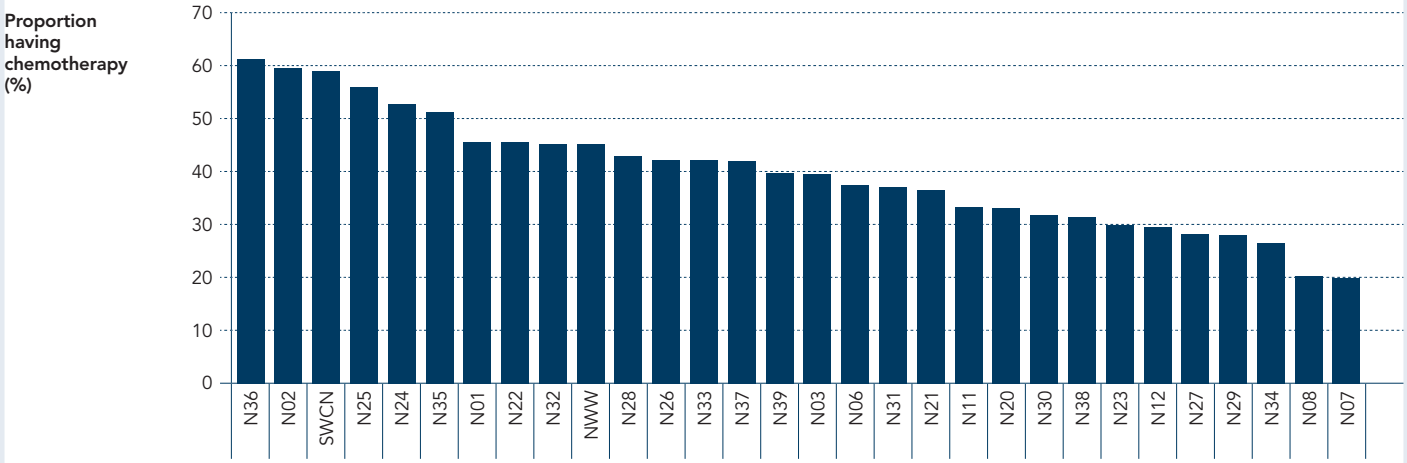
Use of anti-cancer treatment by network



Chemotherapy in Mesothelioma

As noted previously, chemotherapy may be given alone, or as part of a multi-modality therapy, but the former is more common. Usage of chemotherapy is recommended in good performance status patients – it is recorded as given in 41 per cent of patients with PS 0-1, and its usage varies across the networks (graph below) and individual trusts.

Use of chemotherapy In PS 0-1 patients



Radiotherapy in Mesothelioma

Although radiotherapy of the whole hemi-thorax may sometimes be used as part of aggressive multi-modality therapy, it is most often delivered to the site of chest wall instrumentation (surgical scars, chest drain tracts) in an attempt to prevent growth of the tumour into the chest wall. Since the use of this form of treatment is currently the subject of two UK randomised controlled trials we do not report on it further.

Procedure	Number	%
Missing	6,255	75.1
Pleurodesis	1,575	18.9
Other open operation on lung	206	2.5
Debulking pleurectomy	192	2.3
Open operation on lung	34	0.4
Wedge resection of lesion of lung (segment)	22	0.3
Pneumonectomy	13	0.2
Lung resection with resection of chest wall	12	0.1
Lobectomy	11	0.1
Extrapleural pneumonectomy	9	0.1
Multiple wedges resected	2	0.0
Segmental resection	1	0.0

Surgery in Mesothelioma

The role of surgery in mesothelioma has been a source of controversy for many years. Two main forms of surgery have been advocated: extra-pleural pneumonectomy (EPP) and lung-sparing resection known as pleurectomy/decortication (P/D). Both are typically performed as part of "multi-modality" therapy where surgery is carried out alongside chemotherapy and/or radiotherapy. Following the publication of a pilot study which linked EPP with poorer outcomes, P/D has become the surgical procedure of choice in the UK. The benefits of this procedure are still a matter of debate. In view of this debate we do not report further on the variation in use of surgery across organisations.

The recorded OPCS code for patients undergoing surgery is shown in the Table opposite (this data excludes patients from Wales where >98 per cent of OPCS codes were missing). It can be seen that most cases of surgery are palliative procedures for managing pleural effusions. Based on the recorded codes, it seems likely that around five per cent of mesothelioma cases are diagnosed following operations for suspected lung cancer.

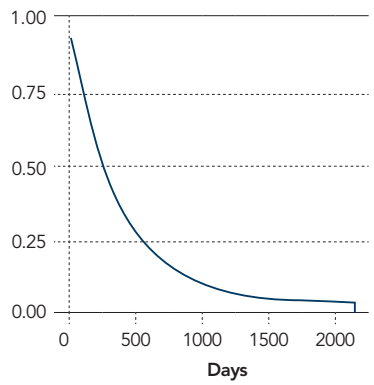
Focus on Survival

Survival of patients has been calculated from the date first seen in secondary care to the date of death, or to the census date of 11 July 2013. Where a "date first seen" is not available, a surrogate date based on other key pathway dates was used.

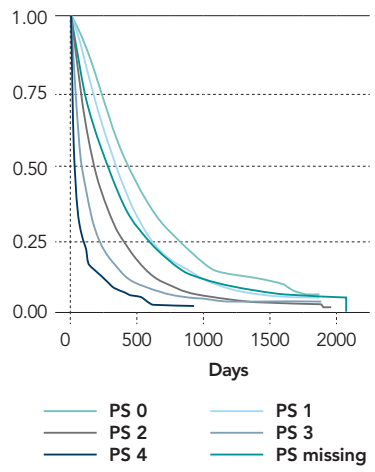
The Table opposite and graphs below show the median, one year and three year survival data for the patients, both overall and by performance status and mesothelioma subtype. Better survival is strongly related to recorded performance status and histological subtype, with the epithelioid subtype carrying the best prognosis and the sarcomatoid subtype the worst. Survival by stage is not reported due to the poor data completeness for this variable.

	Median survival (interquartile range)	1 year survival %	3 year survival %
All patients	8.5 months (4-15)	40	8
Performance Status			
PS 0	12.1 months (7-20)	57	13
PS 1	9.8 months (5-16)	46	8
PS 2	5.8 months (3-11)	26	4
PS 3	2.8 months (1-7)	13	4
PS 4	1 month (0-3)	6	0
Histological Subtype			
Epithelioid	11.1 months (6-18)	52	10
Unspecified	7.9 months (3-15)	38	8
Biphasic	7.3 months (4-12)	29	3
Sarcomatoid	3.9 months (2-8)	13	1

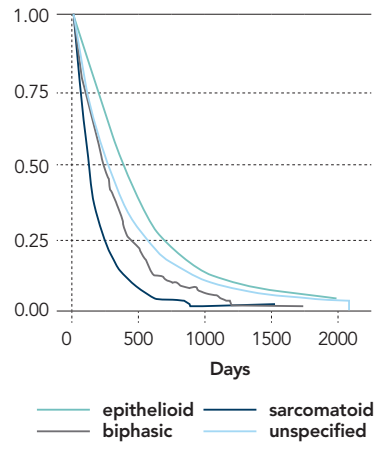
Kapian-Meier survival estimate for mesothelioma patients 2008-2012



Kapian-Meier survival estimate by performance status

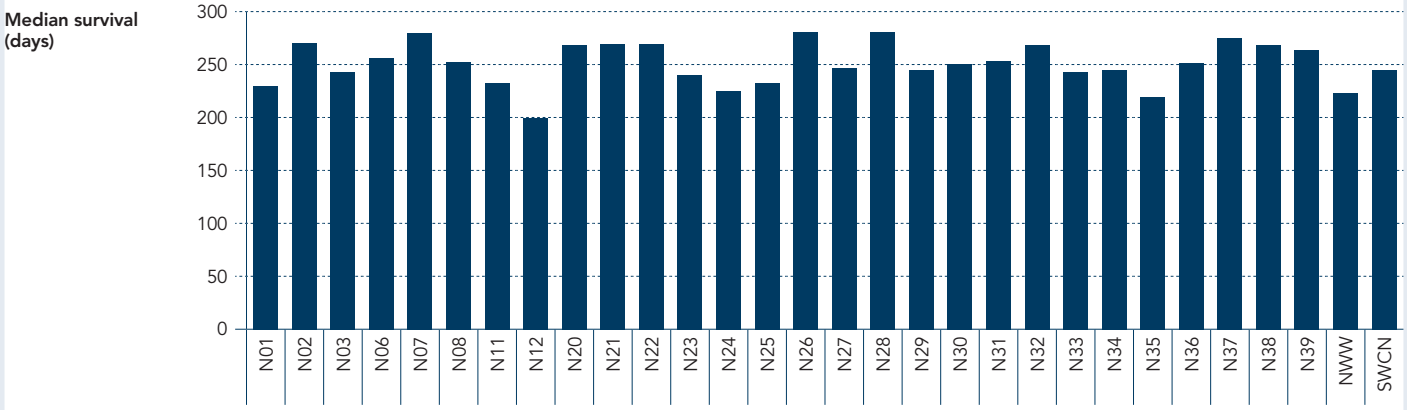


Kapian-Meier survival by histological subtype

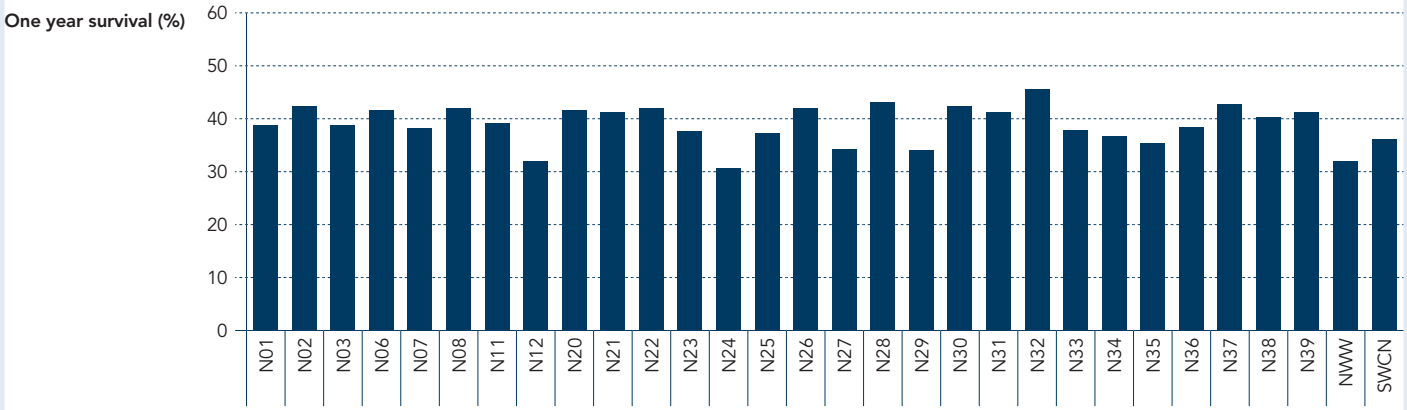


The survival of patients can be seen to vary by network as shown in the graph below. However, caution should be taken in interpretation of these figures due to the small numbers of cases in some networks as well as the lack of adjustment for key clinical features such as age, stage, fitness and co-morbidity.

Median survival by network



One year survival by network



Since survival in mesothelioma is intimately related to fitness/performance status, although some treatment modalities appear to offer better survival, this may be more a reflection of patient selection than a real benefit of the treatment itself. For this reason we do not show survival by treatment modality in this report.

Temporal analysis of the one year survival indicates a steady improvement in outcome as shown in the Table opposite.

Year	One year survival (%)
2008	38.4
2009	39.9
2010	38.5
2011	40.1
2012	43.0

Appendix 1

Numbers of cases of Mesothelioma submitted by Individual Trusts 2008–2012

Numbers of cases of Mesothelioma submitted by Individual Trusts 2008–2012		
Network	**Place First Seen: Trust**	**Number of cases**
N01	Blackpool Teaching Hospitals NHS Foundation Trust	69
N01	East Lancashire Hospitals NHS Trust	51
N01	Lancashire Teaching Hospitals NHS Foundation Trust	74
N01	University Hospitals Of Morecambe Bay NHS Foundation Trust	90
N02	Bolton NHS Foundation Trust	53
N02	Central Manchester University Hospitals NHS Foundation Trust	29
N02	East Cheshire NHS Trust	35
N02	Mid Cheshire Hospitals NHS Foundation Trust	30
N02	Pennine Acute Hospitals NHS Trust	79
N02	Salford Royal NHS Foundation Trust	29
N02	Stockport NHS Foundation Trust	40
N02	Tameside Hospital NHS Foundation Trust	33
N02	The Christie NHS Foundation Trust	*
N02	University Hospital Of South Manchester NHS Foundation Trust	68
N02	Wrightington, Wigan and Leigh NHS Foundation Trust	46
N03	Aintree University Hospital NHS Foundation Trust	57
N03	Countess Of Chester Hospital NHS Foundation Trust	41
N03	Liverpool Lung Cancer Unit	56
N03	Southport and Ormskirk Hospital NHS Trust	35
N03	St Helens and Knowsley Hospitals NHS Trust	30
N03	Warrington and Halton Hospitals NHS Foundation Trust	43
N03	Wirral University Teaching Hospital NHS Foundation Trust	88
N06	Airedale NHS Foundation Trust	29
N06	Bradford Teaching Hospitals NHS Foundation Trust	33
N06	Calderdale and Huddersfield NHS Foundation Trust	67
N06	Harrogate and District NHS Foundation Trust	14
N06	Leeds Teaching Hospitals NHS Trust	126
N06	Mid Yorkshire Hospitals NHS Trust	83
N06	York Teaching Hospital NHS Foundation Trust	63
N07	Hull and East Yorkshire Hospitals NHS Trust	114
N07	Northern Lincolnshire and Goole Hospitals NHS Foundation Trust	81
N07	Scarborough and North East Yorkshire Health Care NHS Trust	24
N08	Barnsley Hospital NHS Foundation Trust	21
N08	Chesterfield Royal Hospital NHS Foundation Trust	34
N08	Doncaster and Bassetlaw Hospitals NHS Foundation Trust	88
N08	Sheffield Teaching Hospitals NHS Foundation Trust	127
N08	The Rotherham NHS Foundation Trust	28
N11	Heart Of England NHS Foundation Trust	122
N11	Sandwell and West Birmingham Hospitals NHS Trust	35
N11	University Hospitals Birmingham NHS Foundation Trust	53
N11	Walsall Healthcare NHS Trust	29
N12	George Eliot Hospital NHS Trust	37
N12	South Warwickshire NHS Foundation Trust	25
N12	University Hospitals Coventry and Warwickshire NHS Trust	36
N12	Worcestershire Acute Hospitals NHS Trust	23
N20	East and North Hertfordshire NHS Trust	79
N20	Luton and Dunstable Hospital NHS Foundation Trust	56
N20	West Hertfordshire Hospitals NHS Trust	51
N21	Chelsea and Westminster Hospital NHS Foundation Trust	13
N21	Ealing Hospital NHS Trust	15
N21	Imperial College Healthcare NHS Trust	40
N21	North West London Hospitals NHS Trust	13
N21	Royal Brompton and Harefield NHS Foundation Trust	6

Numbers of cases of Mesothelioma submitted by Individual Trusts 2008–2012		
Network	**Place First Seen: Trust**	**Number of cases**
N21	The Hillingdon Hospitals NHS Foundation Trust	51
N21	West Middlesex University Hospital NHS Trust	15
N22	Barnet and Chase Farm Hospitals NHS Trust	58
N22	North Middlesex University Hospital NHS Trust	12
N22	Royal Free London NHS Foundation Trust	19
N22	The Princess Alexandra Hospital NHS Trust	44
N22	The Whittington Hospital NHS Trust	24
N22	University College London Hospitals NHS Foundation Trust	17
N23	Barking, Havering and Redbridge University Hospitals NHS Trust	99
N23	Barts Health NHS Trust (Newham)	28
N23	Barts Health NHS Trust (St Barts)	25
N23	Barts Health NHS Trust (Whipps Cross)	41
N23	Homerton University Hospital NHS Foundation Trust	16
N24	Guy's and St Thomas' NHS Foundation Trust	20
N24	King's College Hospital NHS Foundation Trust	16
N24	Lewisham Healthcare NHS Trust	16
N24	South London Healthcare NHS Trust	118
N25	Croydon Health Services NHS Trust	24
N25	Epsom and St Helier University Hospitals NHS Trust	66
N25	Kingston Hospital NHS Trust	29
N25	St George's Healthcare NHS Trust	49
N25	The Royal Marsden NHS Foundation Trust	*
N25	Wandsworth PCT	*
N26	Northern Devon Healthcare NHS Trust	30
N26	Plymouth Hospitals NHS Trust	108
N26	Royal Cornwall Hospitals NHS Trust	119
N26	Royal Devon and Exeter NHS Foundation Trust	78
N26	South Devon Healthcare NHS Foundation Trust	49
N27	Dorset County Hospital NHS Foundation Trust	41
N27	Poole Hospital NHS Foundation Trust	51
N27	The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust	56
N28	North Bristol NHS Trust	91
N28	Royal United Hospital Bath NHS Trust	59
N28	Taunton and Somerset NHS Foundation Trust	59
N28	University Hospitals Bristol NHS Foundation Trust	42
N28	Weston Area Health NHS Trust	15
N28	Yeovil District Hospital NHS Foundation Trust	26
N29	Gloucestershire Hospitals NHS Foundation Trust	91
N29	Worcestershire Acute Hospitals NHS Trust	24
N29	Wye Valley NHS Trust	31
N30	Buckinghamshire Healthcare NHS Trust	71
N30	Great Western Hospitals NHS Foundation Trust	52
N30	Heatherwood and Wexham Park Hospitals NHS Foundation Trust	25
N30	Milton Keynes Hospital NHS Foundation Trust	33
N30	Oxford University Hospitals NHS Trust	97
N30	Royal Berkshire NHS Foundation Trust	60
N31	Hampshire Hospitals NHS Foundation Trust (RN1)	41
N31	Hampshire Hospitals NHS Foundation Trust (RN5)	24
N31	Isle Of Wight NHS Trust	47
N31	Portsmouth Hospitals NHS Trust	153
N31	Salisbury NHS Foundation Trust	35
N31	University Hospital Southampton NHS Foundation Trust	116
N31	Western Sussex Hospitals NHS Trust (RYR16)	49
N32	Ashford and St Peter's Hospitals NHS Foundation Trust	51
N32	Frimley Park Hospital NHS Foundation Trust	54
N32	Royal Surrey County Hospital NHS Foundation Trust	29
N32	Surrey and Sussex Healthcare NHS Trust	71
N33	Brighton and Sussex University Hospitals NHS Trust	62
N33	East Sussex Healthcare NHS Trust	92

Numbers of cases of Mesothelioma submitted by Individual Trusts 2008–2012		
Network	**Place First Seen: Trust**	**Number of cases**
N33	The Chaseley Trust	*
N33	Western Sussex Hospitals NHS Trust	61
N34	Dartford and Gravesham NHS Trust	47
N34	East Kent Hospitals University NHS Foundation Trust	102
N34	Maidstone and Tunbridge Wells NHS Trust	63
N34	Medway NHS Foundation Trust	60
N35	Mid Staffordshire NHS Foundation Trust	49
N35	Shrewsbury and Telford Hospital NHS Trust	36
N35	The Dudley Group NHS Foundation Trust	30
N35	The Royal Wolverhampton NHS Trust	48
N35	University Hospital Of North Staffordshire NHS Trust	58
N35	Worcestershire Acute Hospitals NHS Trust	8
N36	City Hospitals Sunderland NHS Foundation Trust	86
N36	County Durham and Darlington NHS Foundation Trust	80
N36	Gateshead Health NHS Foundation Trust	63
N36	North Cumbria University Hospitals NHS Trust	66
N36	North Tees and Hartlepool NHS Foundation Trust	99
N36	Northumbria Healthcare NHS Foundation Trust	118
N36	South Tees Hospitals NHS Foundation Trust	100
N36	South Tyneside NHS Foundation Trust	80
N36	The Newcastle Upon Tyne Hospitals NHS Foundation Trust	88
N37	Bedford Hospital NHS Trust	23
N37	Cambridge University Hospitals NHS Foundation Trust	63
N37	Hinchingbrooke Health Care NHS Trust	17
N37	Ipswich Hospital NHS Trust	68
N37	James Paget University Hospitals NHS Foundation Trust	48
N37	Norfolk and Norwich University Hospitals NHS Foundation Trust	143
N37	Papworth Hospital NHS Foundation Trust	*
N37	Peterborough and Stamford Hospitals NHS Foundation Trust	44
N37	The Queen Elizabeth Hospital, King's Lynn, NHS Foundation Trust	42
N37	West Suffolk NHS Foundation Trust	50
N38	Basildon and Thurrock University Hospitals NHS Foundation Trust	71
N38	Colchester Hospital University NHS Foundation Trust	98
N38	Mid Essex Hospital Services NHS Trust	78
N38	Southend University Hospital NHS Foundation Trust	86
N39	Burton Hospitals NHS Foundation Trust	46
N39	Derby Hospitals NHS Foundation Trust	95
N39	Kettering General Hospital NHS Foundation Trust	52
N39	Northampton General Hospital NHS Trust	47
N39	Nottingham University Hospitals NHS Trust	86
N39	Sherwood Forest Hospitals NHS Foundation Trust	49
N39	United Lincolnshire Hospitals NHS Trust	86
N39	University Hospitals Of Leicester NHS Trust	127
NWW	Wrexham Maelor Hospital	37
NWW	Ysbyty Glan Clwyd	39
NWW	Ysbyty Gwynedd	18
SWCN	Bronglais General Hospital	11
SWCN	Morriston Hospital	19
SWCN	Neath Port Talbot Hospital	10
SWCN	Nevill Hall Hospital	19
SWCN	Prince Charles Hospital Site	24
SWCN	Prince Philip Hospital	17
SWCN	Princess Of Wales Hospital	26
SWCN	Royal Gwent Hospital	60
SWCN	Singleton Hospital	20
SWCN	The Royal Glamorgan Hospital	14
SWCN	University Hospital Llandough	67
SWCN	West Wales General Hospital	10
SWCN	Withybush General Hospital	14

Trusts with fewer than 5 mesothelioma cases have been marked with a *

Appendix 2

Numbers of cases of Mesothelioma submitted by Individual Health Boards 2010–2012

Table 1
Numbers of cases of Mesothelioma submitted by Individual Health Boards 2010–2012

SCAN	n2010	n2011	n2010	Total
Borders	*	*	*	**6**
Dumbries & Galloway	*	*	*	**9**
Fife	8	24	13	**45**
Lothian	21	17	12	**50**
Total	**35**	**47**	**28**	**110**

NOSCAN	n2010	n2011	n2010	Total
Grampian	15	9	18	**42**
Argyll & Clyde (H)	0	0	0	**0**
Highland	8	*	*	*
Orkney	0	0	0	**0**
Shetland	0	0	0	**0**
Tayside	11	11	13	**35**
Western Isles	0	*	*	*
Total	**34**	**33**	**41**	**108**

WOSCAN	n2010	n2011	n2010	Total
Ayrshire & Arran	17	7	15	**39**
Clyde	16	15	26	**57**
Forth Valley	6	6	5	**17**
Lanarkshire	16	14	15	**45**
North Glasgow	39	28	29	**96**
South Glasgow	14	8	15	**37**
Total	**108**	**78**	**105**	**219**

SCOTLAND	177	158	174	509

Health Boards with fewer than 5 mesothelioma cases have been marked with a *

Appendix 3

International Mesothelioma Interest Group Staging System for Diffuse Malignant Pleural Mesothelioma

Table 1 Primary Tumour (T)	
TX	Primary tumour cannot be assessed.
T0	No evidence of primary tumour.
T1	Tumour limited to the ipsilateral parietal pleura with or without mediastinal pleura and with or without diaphragmatic pleural involvement.
T1a	No involvement of the visceral pleura.
T1b	Tumour also involving the visceral pleura.
T2	Tumour involving each of the ipsilateral pleural surfaces (parietal, mediastinal, diaphragmatic, and visceral pleura) with at least one of the following: involvement of diaphragmatic muscle; extension of tumour from visceral pleura into the underlying pulmonary parenchyma.
T3	Locally advanced but potentially resectable tumour. Tumour involving all of the ipsilateral pleural surfaces (parietal, mediastinal, diaphragmatic, and visceral pleura) with at least one of the following: involvement of the endothoracic fascia; extension into the mediastinal fat; solitary, completely resectable focus of tumour extending into the soft tissues of the chest wall; nontransmural involvement of the pericardium.
T4	Locally advanced technically unresectable tumour. Tumour involving all of the ipsilateral pleural surfaces (parietal, mediastinal, diaphragmatic, and visceral pleura) with at least one of the following: diffuse extension or multifocal masses of tumour in the chest wall, with or without associated rib destruction; direct transdiaphragmatic extension of tumour to the peritoneum; direct extension of tumour to the contralateral pleura; direct extension of tumour to mediastinal organs; direct extension of tumour into the spine; tumour extending through to the internal surface of the pericardium with or without a pericardial effusion or tumour involving the myocardium.

Table 2 Regional Lymph Nodes (N)	
NX	Regional lymph nodes cannot be assessed.
N0	No regional lymph node metastases.
N1	Metastases in the ipsilateral bronchopulmonary or hilar lymph nodes.
N2	Metastases in the subcarinal or the ipsilateral mediastinal lymph nodes including the ipsilateral internal mammary and peridiaphragmatic nodes.
N3	Metastases in the contralateral mediastinal, contralateral internal mammary, ipsilateral or contralateral supraclavicular lymph nodes.

Table 3 Distant Metastasis (M)	
M0	No distant metastasis.
M1	Distant metastasis present.

Table 4
Anatomic Stage/Prognostic Groups

Stage	T	N	M
I	T1	N0	M0
IA	T1a	N0	M0
IB	T1b	N0	M0
II	T2	N0	M0
III	T1, T2	N1	M0
	T1, T2	N2	M0
	T3	N0, N1, N2	M0
IV	T4	Any N	M0
	Any T	N3	M0
	Any T	Any N	M1

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