



# **Department for Work and Pensions**

Department for Work and Pensions Social  
Security Administration Act 1992

## **Asbestos-related diseases**





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### **Asbestos-related diseases**

Report by the Industrial Injuries Advisory Council  
in accordance with Section 171 of the Social  
Security Administration Act 1992 reviewing the  
prescription of the asbestos-related diseases.

*Presented to Parliament by the Secretary of State for Work and Pensions  
by Command of Her Majesty  
July 2005*

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# INDUSTRIAL INJURIES ADVISORY COUNCIL

*The Rt Hon David Blunkett MP*  
*Secretary of State for Work and Pensions*

Dear Secretary of State,

## **REVIEW OF THE SCHEDULE OF PRESCRIBED DISEASES: ASBESTOS-RELATED DISEASES**

1. In August 2003, we announced that the Industrial Injuries Advisory Council would be conducting a review of the asbestos-related diseases - as part of our remit to review the scheduled list of prescribed diseases for which benefits are paid. We last reviewed the asbestos-related prescribed diseases, namely asbestosis, mesothelioma, lung cancer and pleural thickening in November 1996 (Cm. 3467). Since that time new evidence has accumulated which has informed this review.

2. We recommend that diagnosis of asbestosis be based on clinical evidence of interstitial pulmonary fibrosis and a history of substantial asbestos exposure. High counts of asbestos bodies or fibres in the lungs may be used to support the diagnosis of asbestosis. However, a lack of asbestos fibres or bodies should not be used to exclude a diagnosis of asbestosis as asbestos bodies may be absent and fibres not increased above background level in clear cut cases (i.e. these counting techniques have a significant false negative rate).

3. There is a difference between the numbers of people in receipt of IIDB for mesothelioma and the number of individuals dying from mesothelioma in the UK. We found no evidence that the terms of prescription account for the shortfall and these do not need to change. There may be several reasons for this difference: these include ineligible claims by the self-employed or from cases caused by non-occupational exposures, but one important reason may be a lack of awareness of the Scheme. We recommend that the provisions of the IIDB Scheme be highlighted to mesothelioma sufferers.

4. The prescription of lung cancer due to asbestos has had a long history. Whilst it is clear that there is an excess of risk of lung cancer in the presence of asbestosis, evidence has accumulated which demonstrates that lung cancer can occur independently from asbestosis, where substantial occupational exposure to asbestos has occurred. We recommend adding lung cancer in the absence of asbestosis, for occupations where there is evidence of substantial occupational asbestos exposure, to the terms of prescription for PD D8. We further recommend removing pleural thickening from the terms of prescription for lung cancer, as it is unreliable as an indicator of substantial asbestos exposure - the purpose it was meant to serve. Due to the poor prognosis for those with asbestos-related lung cancer, we recommend that all claimants of PD D8 be assessed at 100% disablement.

5. The increasing use of non-standard plain chest radiographs has complicated the diagnosis of diffuse pleural thickening (PD D9) which relies on measurements of the extent of pleural thickening. We recommend that diagnosis of diffuse pleural thickening be based upon involvement of the costophrenic angle on a plain chest radiograph.

6. We have considered pleural plaques due to occupational asbestos exposure but find that there is a lack of evidence to justify the prescription of this disorder.
7. Computed tomography scans may be used for the diagnosis of asbestosis and pleural thickening where available. However, we are unable to recommend requiring the use of such scans for the purposes of determining benefit.
8. Finally we have considered the issue of gross payments for terminally ill claimants, such as those with mesothelioma, compared to those with less severe prescribed diseases. We recommend that the current inequity in the payment structure of the IIDB Scheme be referred by the Department for Work and Pensions to the Council for a full review.

Yours sincerely,

Professor A J Newman Taylor

*Chairman*

Date: 20 January 2005

## Summary

9. The Industrial Injuries Advisory Council's asbestos-related diseases review has investigated prescription of asbestosis, mesothelioma, lung cancer, pleural thickening and pleural plaques. Following reviews of the literature, consultation with experts and the relevant stakeholders, the Council recommends a number of changes to the terms of prescription for the asbestos-related diseases.

10. The Council has taken into consideration representations about the use of asbestos fibres and counts in diagnosing asbestosis. The Council recommends that diagnosis of asbestosis should be based on clinical evidence of interstitial pulmonary fibrosis and a history of substantial asbestos exposure. The presence of high counts of asbestos fibres or bodies in the lungs can be used to support a diagnosis of asbestosis but the absence of such evidence should not be used to exclude the diagnosis.

11. In reviewing the terms of prescription for mesothelioma, the Council has considered the apparent difference between the number of assessments for PD D3 (i.e. those receiving IIDB for mesothelioma) and the reported number of deaths from mesothelioma. The difference does not appear to lie with claimants being refused benefit, as 86% of sufferers who claim for PD D3 are assessed and awarded benefit. The discrepancy may be explained by mesothelioma sufferers not claiming for PD D3, as they have experienced non-occupational asbestos exposures, are self-employed or are unaware of the availability of the IIDB scheme. The questions of providing IIDB for non-occupational exposures, or for the self-employed, fall outside the remit of this review, but the Council recommends that the availability of PD D3 is highlighted to potential claimants and has taken steps to facilitate this.

12. The terms of prescription for asbestos-related lung cancer currently include the requirement for the presence of asbestosis and/or pleural thickening. Evidence of excess lung cancer in the presence of asbestosis is undisputed; in some cases a greater than 5-fold increased risk has been observed. The evidence shows that the risk of lung cancer is also doubled in the absence of asbestosis where there has been substantial occupational asbestos exposure. The Council recommends prescription for lung cancer in the presence of asbestosis for occupations at risk of asbestosis, and for lung cancer in the absence of asbestosis for occupations where there has been substantial asbestos exposure. The requirement for pleural thickening in the terms of prescription for lung cancer was originally included as an indicator of substantial asbestos exposure. However, recent evidence suggests that pleural thickening is an unreliable marker of substantial asbestos exposure, and so the Council recommends it is removed from the terms of prescription for PD D8. The Council recommends that claimants assessed as eligible for PD D8 should be awarded 100% disablement due to the poor prognosis of lung cancer due to asbestos.

13. Diagnosis of pleural thickening for the purposes of prescription currently relies on the degree of thickening as measured on a standard sized, plain chest radiograph. The use of non-standard chest radiographs has complicated the diagnosis of PD D9. Experts consulted by the Council suggested that the involvement of the costophrenic angle on a plain chest radiograph was the most reliable way to diagnose asbestos-related pleural thickening. IAC recommends replacing reference to measurements for the terms of prescription for PD D9 with involvement of the costophrenic angle for the diagnosis of diffuse pleural thickening.

14. Computed tomography (CT) scans are widely used in clinical practice for diagnosing asbestosis and pleural thickening. The Council recommends that where available, use can be made of CT scans in the diagnosis of PD D1 or PD D9. The Council does not recommend CT scans are included as a requirement for diagnosis of

PD D1 or D9 as these scans are not yet universally used by clinicians, so not all claimants will have CT scans available. The Council will reconsider this issue if the use of CT scans in the diagnosis of asbestosis and pleural thickening becomes universally adopted.

15. Pleural plaques are small localised areas of fibrosis found within the pleura due to asbestos exposure. Plaques do not impair lung function. The Council does not recommend that pleural plaques should be added to the list of prescribed diseases.

16. The Council recommends that the Department for Work and Pensions considers asking IIAC to review payments for terminally ill claimants.

17. The term asbestos refers to a group of natural fibrous silicates whose strength, heat resistance, and chemical and electrical properties have been widely exploited since the late 1800s. The most common forms of asbestos are chrysotile (white asbestos), crocidolite (blue asbestos), amosite (brown asbestos), anthophyllite and tremolite.

## **Introduction**

18. The different types of asbestos fibres have different physical properties and can be classified into amphiboles (straight fibres) and serpentine (wavy fibres). The physical properties of asbestos fibres, in particular its length and tendency to split longitudinally, are important determinants of its pathogenicity. Amphibole fibres persist longer in the lungs than chrysotile, which probably accounts for the increased toxicity of these fibres. However, few workers will be aware of which asbestos fibre they were exposed to.

19. Due to the widespread global use of asbestos, many adults have evidence of environmental exposure to asbestos in their lungs. Asbestos was widely used in the 1950s to 1970s, with peak exposures occurring in the UK in the mid to late 1960s. Restrictions on the use of asbestos followed the introduction of the 1969 Asbestos Regulations in the UK. The importation, supply and use of raw asbestos or asbestos-containing materials (with a few exceptions) was banned in the UK in 1992 for amphibole asbestos (blue and brown), and in 1999 for chrysotile (white). The use of asbestos has now been banned in most of the developed world.

20. Inhalation of asbestos can cause disease in the lungs (both the conducting airways – the bronchi – and the peripheral gas exchanging parts of the lungs - the alveoli) and in the thin surface membrane which covers the lungs - the pleura. Inhaled asbestos can cause fibrosis (or scarring) of the lungs (asbestosis) and cancer of the bronchi (lung cancer). It can also cause pleural plaques, diffuse pleural thickening and malignant mesothelioma of the pleura (and peritoneum – the lining membrane of the abdomen). In general the amount of asbestos exposure which causes pleural disease (e.g. mesothelioma) is less than that needed to cause disease of the lungs (e.g. lung cancer). The interval from initial exposure to the development of disease is almost always several years and usually longer than 10 years.

21. **Asbestosis** – Inhaled asbestos can cause inflammation which leads to fibrosis of the lungs. Asbestosis is fibrosis of the lungs; it does not refer to all types of asbestos-related diseases. Asbestosis usually only occurs after substantial exposure to asbestos. The interval from initial exposure to the development of asbestosis is usually 15-30 years.

22. **Mesothelioma** – Mesothelioma is a cancer of the pleura (the lining of the lung), the peritoneum (the lining of the abdominal cavity) and, rarely, other lining membranes. In adults, it is caused in the great majority of cases by inhaled asbestos. It can be caused by only a few months exposure to low levels of asbestos. Mesothelioma generally develops after 20 years from the time of first exposure, though occasionally it may develop after less than 15 years.

23. **Lung cancer** – Asbestos-related lung cancer is a malignant tumour of the bronchi of the lungs. It is indistinguishable from lung cancer due to other causes. Lung cancer due to asbestos usually develops after an interval from initial exposure to asbestos of 20 or more years after substantial exposure to asbestos.

24. **Benign pleural disease** – There are two main types of benign pleural disease:

- a) Pleural plaques – These are localised areas of fibrosis, which do not cause impairment of lung function or associated disability.
- b) Diffuse pleural thickening – This occurs when there are large areas of fibrosis within the pleural cavity. Diffuse pleural thickening can cause impairment and disability due to the widespread constriction of the lungs. Pleural thickening usually occurs from 10 to 15 years after initial exposure to asbestos.

#### **The Industrial Injuries Disablement Benefit Scheme**

25. The Industrial Injuries Disablement Benefit (IIDB) Scheme provides non-contributory, ‘no-fault’ benefits for disablement because of accidents or prescribed diseases which arise during the course of employed earners’ employment. The benefit is paid in addition to other incapacity and disability benefits. It is tax-free and administered by the Department for Work and Pensions. An additional lump sum payment may also be available for certain workers suffering asbestos-related diseases under the Pneumoconiosis (Workers’ Compensation) Act 1979 scheme. The DWP also administers the Workers’ Compensation (Supplementation) Act 1948 scheme which provides benefits for workers with certain asbestos-related diseases occurring prior to 1948. The Pneumoconiosis, Byssinosis and Miscellaneous Diseases Scheme is also administered by the DWP and provides benefits for certain asbestos-related diseases for exposures occurring prior to 1948. Workers may only claim under the Pneumoconiosis, Byssinosis and Miscellaneous Diseases Scheme if they have not received payments under the Workers’ Compensation (Supplementation) Scheme.

26. The IIDB Scheme covers several asbestos-related prescribed diseases (PD): PD D1 (Pneumoconiosis: asbestosis), PD D3 (Mesothelioma), PD D8 (Lung cancer due to asbestos) and PD D9 (Diffuse pleural thickening). The current terms of prescription for the asbestos-related diseases can be found at Appendix 1.

#### **The role of the Industrial Injuries Advisory Council**

27. The Industrial Injuries Advisory Council (IIAC) is an independent statutory body set up in 1946 to advise the Secretary of State for Social Security on matters relating to the Industrial Injuries Scheme. The major part of the Council’s time is spent considering whether the list of prescribed diseases for which benefit may be paid should be enlarged or amended.

#### **The legal requirements for prescription**

28. The Social Security Contributions and Benefits Act 1992 states that the Secretary of State may prescribe a disease where he is satisfied that the disease:

- a) ought to be treated, having regard to its causes and incidence and any other relevant considerations, as a risk of the occupation and not as a risk common to all persons; and

- b) is such that, in the absence of special circumstances, the attribution of particular cases to the nature of the employment can be established or presumed with reasonable certainty.

29. In other words, a disease may only be prescribed if there is a recognised risk to workers in an occupation, and the link between disease and occupation can be established or reasonably presumed in individual cases.

30. In seeking to address the question of prescription for any particular condition, the Council first looks for a workable definition of the disease. The Council then searches for a practical way to demonstrate in the individual case that the disease can be attributed to occupational exposure with reasonable confidence. For this purpose, reasonable confidence is interpreted as being based on the balance of probabilities according to the available evidence in the scientific literature. An accident at work is specifically catered for within the IIDB Scheme. However, if the condition might result from occupational exposure in the absence of an identifiable accident, the Council must consider whether it should be included in the list of diseases that are prescribed for benefit purposes. In these circumstances, it may be possible to ascribe a disease to a particular occupational exposure in two ways – from specific clinical features of the disease or from epidemiological evidence that the risk of disease is at least doubled by the relevant occupational exposure.

Clinical features 31. For some diseases attribution to occupation may be possible from specific clinical features of the individual case. For example, the proof that an individual's asthma is caused by his occupation may lie in its improvement when he is on holiday and regression when he returns to work, and in the demonstration that he is allergic to a specific substance with which he comes into contact only at work. It can be that the disease only occurs as a result of an occupational hazard (e.g. coal workers' pneumoconiosis).

Doubling of risk 32. Other diseases are not uniquely occupational, and, when caused by occupation, are indistinguishable from the same disease occurring in someone who has not been exposed to a hazard at work. In these circumstances attribution to occupation on the balance of probabilities depends on epidemiological evidence that work in the prescribed job, or with the prescribed occupational exposure, increases the risk of developing the disease by a factor of two or more. The requirement for, at least, a doubling of risk is not arbitrary. It follows from the fact that if a hazardous exposure doubles risk, for every 50 cases that would normally occur in an unexposed population, an additional 50 would be expected if the population were exposed to the hazard. Thus, out of every 100 cases that occurred in an exposed population, 50 would do so only as a consequence of their exposure while the other 50 would have been expected to develop the disease, even in the absence of the exposure. Therefore, for any individual case occurring in the exposed population, there would be a 50% chance that the disease resulted from exposure to the hazard, and a 50% chance that it would have occurred even without the exposure. Below the threshold of a doubling of risk only a minority of cases in an exposed population would be caused by the hazard, and individual cases therefore could not be attributed to exposure on the balance of probabilities. The epidemiological evidence required should ideally be drawn from several independent studies, and be sufficiently robust that further research at a later date would be unlikely to overturn it.

33. The various asbestos-related diseases considered in this report need to be regarded in different ways. Lung cancer caused by inhaled asbestos has no clinical features to distinguish it from lung cancer in the general population and evidence of a doubling of risk in exposed populations is required to allow prescription. Mesothelioma is a rare disease in the general population almost always caused by asbestos, so that

attribution to occupation is far more straightforward and does not require elaborate epidemiological evidence. These considerations have influenced our approach to the problem of prescription in each case.

**Method of investigation**

34. The Council announced its review of asbestos-related diseases with a press release in September 2003, which invited individuals or organisations with evidence on the topic to send it to the Council. Consultations were made with experts in the field of occupational and respiratory medicine and with charitable organisations involved in occupational diseases (Appendix 2). Public Meetings were held in March 2003 and 2004 which further informed the Council as to concerns about the prescribed asbestos-related diseases. Finally, a literature search was undertaken by the Council's research librarian to ensure recommendations were based on current research.

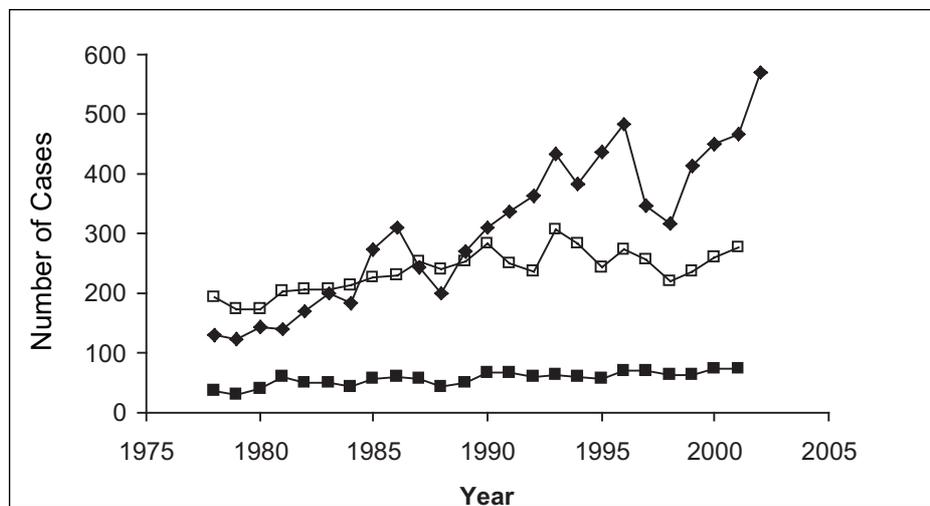
## PD D1. Pneumoconiosis (asbestosis)

### National data and claims activity

35. Information on the number of deaths from asbestosis is provided by statistics from the Health and Safety Executive's asbestosis register - compiled from death certificates where asbestosis is given as the underlying cause of death or where asbestosis is mentioned anywhere on the death certificate (see squares, graph below).

36. There were 570 new assessments under the IIDB scheme for disablement due to pneumoconiosis (asbestosis) in 2002 (see diamonds, graph below). Claims data are not available for pneumoconiosis due to asbestos, thus a direct comparison of claims<sup>1</sup> and assessments is not possible. Of those new assessments for pneumoconiosis (asbestosis) in 2002, 77% were assessed at 14-100% disablement and 23% were assessed at 1-13% disablement.

37. The number of new assessments for asbestosis (PD D1) exceeds the number of deaths from asbestosis. This is unsurprising as the majority of asbestosis patients do not die from this cause.



- asbestosis as the underlying cause on death certificate;
- asbestosis mentioned on death certificate;
- ◆ PD D1 (asbestosis) assessments

### Evidence received

Diagnosis of asbestosis:  
measurement of asbestos  
burden in lung tissue

38. The Council received representations that there was a reliance by some pathologists on the use of fibre counts or counts of asbestos bodies for the diagnosis of asbestosis at post-mortem. If too few fibre counts or asbestos bodies are found in the lungs, an alternative diagnosis, such as cryptogenic fibrosing alveolitis, may be made despite an occupational history of substantial asbestos exposure. In contrast, the diagnosis of asbestosis in living claimants relies on clinical features and the occupational history.

<sup>1</sup> 'Claims' in reference to the IIDB Scheme refers to those individuals who make a claim for IIDB benefit. 'Assessments' refers to the claimants who are medically assessed for benefit after they have been diagnosed with the prescribed disease.

39. High counts of asbestos bodies or fibres in the lungs are not essential for a diagnosis of asbestosis. Evidence from the scientific literature suggests that asbestos counts of bodies or fibres in the lungs are not a reliable index of disease and miss a significant proportion of the cases (i.e. have a false negative rate). The Council recognises that a high asbestos fibre or body count, where found, can be supportive of a diagnosis of asbestosis, but, due to the false negative rate, the absence of asbestos fibres or bodies in the lungs should not be used to exclude a diagnosis.

40. The Council recommends that the diagnosis of asbestosis should be based on clinical evidence of interstitial lung fibrosis and a history of substantial occupational exposure to asbestos.

Occupational exposure

41. After reviewing the literature, the Council recommends that the current terms of prescription for asbestosis are still appropriate and should remain unchanged.

**Recommendations**

42. The Council recommends that:

- a) Diagnosis of asbestosis should be based on clinical evidence of interstitial lung fibrosis and a history of substantial occupational exposure to asbestos.
- b) The absence or low numbers of asbestos bodies or asbestos fibres in the lungs should not be used to exclude a diagnosis of asbestosis in claimants with a history of substantial occupational asbestos exposure.
- c) The list of occupational exposures in the terms of prescription should remain unchanged.

## PD D3. Diffuse mesothelioma

### National data and claims activity

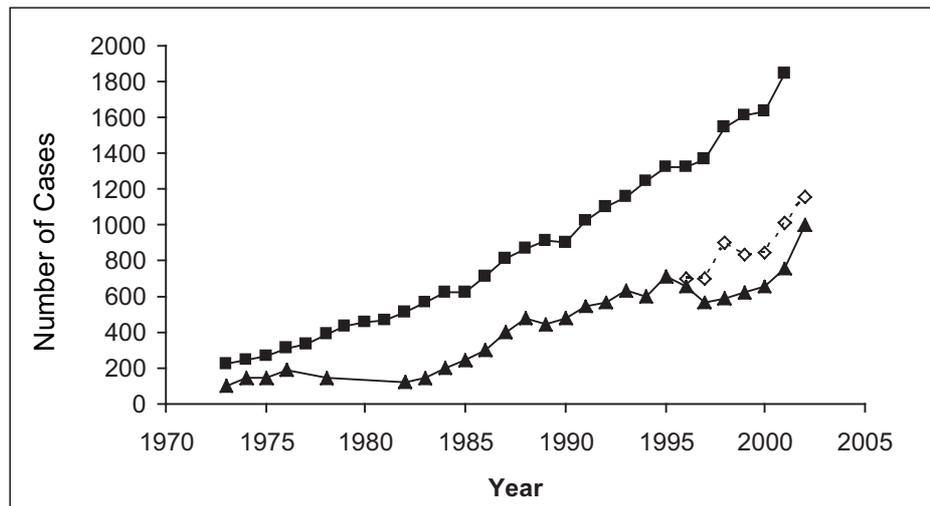
43. A broad overview of the extent of this disease in the UK comes from several sources. SWORD (Surveillance of Work-related and Occupational Respiratory Disease) is a voluntary national scheme under which chest physicians and occupational physicians report cases of disease to a central registry. It has been estimated, based on reports from chest physicians to the scheme during 1998 - 2002 that some 4170 estimated cases of mesothelioma arose due to asbestos. This compares with 4750 claims and 3618 new assessments for PD D3 mesothelioma over the same period.

44. The HSE compiles death certificate data (represented by squares in the graph overleaf) on mesothelioma in the UK. The data suggest that there are almost twice as many deaths from mesothelioma as there are claims from PD D3.

45. The number of cases of mesothelioma has been gradually increasing over the years. It was originally predicted that the peak of the epidemic, would occur between 2020 and 2025, giving an estimated 2500 - 3500 deaths per year. The HSE has recently revised these projections. A peak is now expected to occur between 2011 and 2015 when it is estimated there will be between 2000 -2500 deaths per year. The HSE estimates that there will be a total of 77,000 male deaths from mesothelioma from the start of the epidemic through to the year 2050, with 55,000 of those deaths occurring from 2002 onwards. Thus, the number of claimants for PD D3 is likely to increase in future years as the epidemic progresses.

46. In keeping with this time trend, the number of new claims and assessments of PD D3 has progressively increased since the 1960s, with 1160 claims and 1002 assessments in 2002 as compared with 900 claims and 590 assessments in 1998 (see graph overleaf where diamonds represent claims and triangles represent new assessments).

47. The proportion of claims resulting in new assessments has increased from 66% in 1998 to 86% in 2003. The increased number of claims which resulted in new assessments between 1998 and 2003 may reflect the recommendations IIAC made in 1996 (Cm. 3467). The recommendations were implemented by the Department and served to broaden the eligible occupational exposures for mesothelioma. Currently, a small minority of claims (14% in 2003) do not result in new assessments as these claimants do not fulfil the terms of prescription (e.g. claimants are self-employed or have non-occupational asbestos exposure.)



- mesothelioma deaths;
- ▲ PD D3 assessments;
- ◇ PD D3 claims

#### Evidence received

48. The Council was concerned about the apparent discrepancy between the number of deaths in the UK from mesothelioma and the number of people awarded IIDB for PD D3 – in 2001 there were 1579 male and 269 female deaths, compared to 710 male and 40 female new assessments.

49. The last IIAC review of asbestos-related diseases in 1996 (Cm. 3467) recommended that benefit for mesothelioma be awarded for claimants in any occupation involving asbestos exposure at a level above that commonly found in the environment at large. Analysis of IIDB statistics in 2003 shows that approximately 87% of male claimants and 73% of female claimants were assessed for benefit. The difference in the numbers of assessments according to gender reflects the fact that many more men have worked in exposed industries than women; women may have more non-occupational domestic exposures (e.g. from washing their husbands' contaminated overalls). Thus, it appears that the difference between the number of mesothelioma deaths and the number of successful claims is primarily due to reasons other than claimants being refused benefit.

50. There are several possible explanations for the difference between the number of deaths and the number of IIDB claims: i) low uptake of benefit due to lack of awareness of the IIDB Scheme; ii) some claimants are too ill to make a claim; iii) some mesothelioma sufferers are self-employed or environmentally exposed and aware of the restrictions of the Scheme, and do not make a claim. Whilst the Council is wholly sympathetic to the plight of the self-employed and non-occupationally exposed, the statutory provisions of the IIDB Scheme specify that benefit can only compensate employed earners.

51. One barrier that may appear to exist in the minds of potential claimants is the need for a medical assessment at a time of great personal distress. Since 2002 claimants for mesothelioma are not required to undergo a Departmental medical assessment if they have been diagnosed with mesothelioma. Claims for mesothelioma are fast-tracked and do not require the usual 90 day waiting period and are also awarded 100% assessments. The Department does request corroborative evidence for occupational exposure for PD D3, as is usual for all IIDB claims. However, mesothelioma claimants who are unable to provide corroborative evidence can still be awarded IIDB where occupational exposure is more probable than not. The Department recognises the need to keep enquiries to a minimum where claimants are terminally ill. It is reviewing its administrative forms to ensure that this is the case.

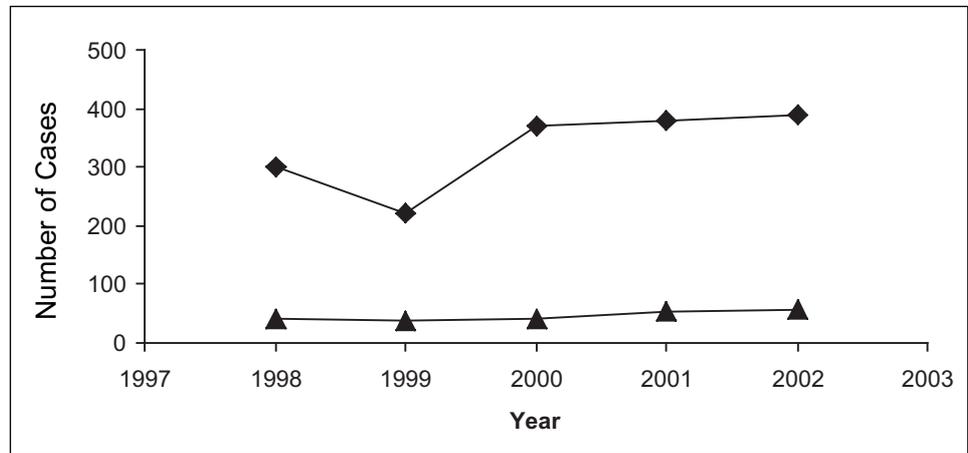
Occupational coverage 52. The current terms of prescription for PD D3 provide broad coverage for any occupational exposures to asbestos. The Council recommends that the terms of prescription for PD D3 should remain unchanged.

**Recommendations** 53. The Council has reviewed the IIDB statistics for mesothelioma and has concluded that the terms of prescription are currently sufficient. The Scheme has broad occupational coverage and amongst those making claims for IIDB a high proportion are receiving benefit. However, the uptake of IIDB is less than the Council would expect. IAC is keen that the availability of the Scheme should be highlighted to promote greater awareness of IIDB amongst potential claimants over a period where the incidence of the disease is expected to rise. The Council is liaising with the British Lung Foundation to raise awareness of the provisions of the Scheme among lung cancer nurses in hospitals. The Department for Work and Pensions has assessed the awareness of the Scheme through consultations with claimants' groups. The Department's Corporate Medical Group website will also highlight the Scheme to doctors.

## PD D8 Primary carcinoma of the lung

### Claims activity

54. The number of claims and new assessments for PD D8 has remained broadly similar over the period 1998-2002, with an average of 330 claims per year and 50 assessments per year (see graph below where diamonds represent claims and triangles represent new assessments). For the period 1998 – 2002, 97% of assessments were at 14-100% disablement, 1% were at 1-13% disablement and 2% were at less than 1% disablement.



- ▲ PD D8 assessments;
- ◆ PD D8 claims

### Evidence received

Low numbers of claimants receiving benefit

55. The Council has received representations that the terms of prescription for PD D8 are overly strict, limiting the numbers of claimants eligible for IIDB. This criticism is based on the relatively low number of assessments for PD D8 as compared to PD D3. In heavily exposed populations the excess of lung cancers is estimated to be similar to that of mesotheliomas. However, simple extrapolation from selected heavily exposed populations to all claimants is not straightforward for several reasons, including differences in the degree and type of exposure which cause each disease, and the changing patterns of exposure in the workplace. A further artefact may arise when lung cancer develops in cases of asbestosis; the disease is registered in IIDB statistics as asbestosis, therefore masking the real number of IIDB assessments for lung cancer. The Council has considered the representations made in framing its recommendations but also recognises that the IIDB statistics probably under-estimate the actual number of people in receipt of PD D8. A research study by Berry in 1991 suggested that 20% of certified cases of asbestosis die of asbestosis, but 40% die of lung cancer. Claimants for asbestosis (PD D1) who at a later stage are also diagnosed with lung cancer may be registered on IIDB statistics as dying with asbestosis. Nonetheless this is an important issue to review.

Attribution to asbestos

56. Historically, the prescription of lung cancer has been difficult. In contrast to mesothelioma, lung cancer commonly has a non-occupational cause in the population, and the clinical features of the occupationally-related disease do not have any distinguishing characteristics. These difficulties necessitated the Council seeking evidence of an epidemiological doubling of risk in order to prescribe asbestos-related lung cancer. There was a clear evidence of a 4-5 fold excess risk of lung cancer in the presence of asbestosis. The Council also took pleural thickening as an indicator of sufficient exposure to asbestos to lead to a doubling of risk of lung cancer. Thus, the current terms of prescription for lung cancer (PD D8) require the presence of asbestosis or diffuse pleural thickening.

57. Evidence from the experts consulted and current research has confirmed the excess risk of lung cancer due to asbestos in the presence of asbestosis. The Council remains satisfied that where asbestosis is present when lung cancer is diagnosed, the lung cancer can be attributed with reasonable certainty to previous asbestos exposure.

58. Recent evidence presented to the Council indicates that the exposure necessary for diffuse pleural thickening is less than previously thought. Furthermore, exposure does not always correlate well with the severity of pleural disease. Diffuse pleural thickening can cause impairment and needs to remain a prescribed disease, but it is an unreliable indicator of substantial asbestos exposure.

59. The link between the risk of asbestosis and lung cancer is clear (see paragraph 54). However, despite the publication of more than 40 research studies, the mechanisms leading to the development of lung cancer due to asbestos remain unclear and there remains debate as to whether lung cancer is a consequence of fibrosis (asbestosis) or is independent of it. Evidence presented to the Council suggested that there was a doubling of risk of lung cancer following substantial exposure to asbestos which occurred without clinical evidence of asbestosis. However, the research evidence indicates that low level exposures to asbestos do not result in a doubling of risk for lung cancer.

Occupational exposure for the prescription of lung cancer in the absence of asbestosis

60. In 1997 the Helsinki workshop proposed that attribution to asbestos should be assumed in cases of lung cancer with 25 fibre years exposure. The Council has received representations that the IIDB Scheme should be based on similar exposure criteria. There are three main problems with the use of 25 fibre years as an exposure criterion for PD D8. First, the Council received evidence that the risk of lung cancer varied between different industries at similar levels of cumulative exposure to asbestos; this was in part, but not wholly explained by, exposure to different asbestos fibre types. Using 25 fibre years is unlikely to be valid for all occupations. The Council recognises there are variations in risk from different types of asbestos, but most workers are exposed to mixtures of fibres and for the purposes of the Scheme the common properties must be considered. Second, calculation of risk based on this formula is not a very satisfactory method for deciding occupational attribution for the purposes of the Scheme. This can be illustrated using another risk formula produced by Doll and Peto in 1988 from which it can be calculated that a doubling of risk of lung cancer would be reached on average only after 100 fibre years asbestos exposure. The level of exposure required to double risk of lung cancer can be calculated as 25 fibre years or 100 fibre years depending on the risk formulae used, demonstrating the difficulty of using this method for deciding attribution. Finally, there would be inherent difficulties in the individual assessment of fibre years for a scheme that is not based on an individual proof system.

61. A major risk factor for lung cancer in the general population is smoking. However, the risk for lung cancer in those heavily exposed to asbestos is more than doubled in smokers and non-smokers; smoking history is therefore not relevant to the prescription of lung cancer. The Council has not taken into account smoking habits in determining occupational risk.

62. The Council has reviewed the literature and found evidence of a greater than doubled risk for lung cancer in the following group of workers who have experienced substantial occupational asbestos exposure: workers in asbestos textile manufacture; asbestos sprayers; asbestos insulation workers, including those applying and removing asbestos-containing materials in shipbuilding and gas mask manufacturers.

63. The Council has given careful consideration to the qualifying conditions for the exposure sufficient to double the risk of lung cancer. The risk of lung cancer depends upon the level of cumulative (intensity x duration) asbestos exposure. It is also

dependent on the type of asbestos, amphibole (crocidolite – blue, and amosite – brown) being more carcinogenic than chrysotile – white asbestos. Military gas masks manufactured during the Second World War contained pure crocidolite (blue) asbestos. The risk of lung cancer in those employed in the manufacture of military gas masks is doubled in those who worked for less than one year. In contrast, in textile workers who were employed in a UK factory in Rochdale, Lancashire where the asbestos used in textile manufacture was 95% chrysotile (white) asbestos and 5% crocidolite (blue) asbestos, the risk of lung cancer was only doubled in those who worked 10 or more years. The majority of asbestos used in textile manufacture and insulation material was a mixture of chrysotile and amphibole asbestos - crocidolite or amosite - or both, in a proportion generally greater than 5% and up to 50%. There is also evidence that the risk of lung cancer in asbestos workers fell after the introduction of the 1969 Asbestos regulations, probably as a consequence of a reduction in the use of and associated exposure to asbestos, particularly amphiboles. The Council therefore recommends that lung cancer in those who were employed 5 or more years before 1975, and 10 or more years after 1975 should be prescribed in the listed occupations: asbestos textile workers, asbestos sprayers, asbestos insulation workers, including those applying and removing asbestos containing materials in ship building.

64. Eligibility for the IIDB scheme requires workers to be employed earners after 5th July 1948. The manufacture of gas masks containing asbestos ceased soon after the end of the Second World War in 1945, thus gas mask workers would not be eligible for the IIDB Scheme. Gas mask workers with asbestos-related lung cancer would be eligible for the Pneumoconiosis, Byssinosis and Miscellaneous Diseases Scheme for exposures occurring before 1948.

65. In summary, lung cancer can be attributed to occupation where workers have been exposed to substantial asbestos exposure. Workers with substantial asbestos exposure are those where asbestosis is present, or workers in the following categories: asbestos textile workers, asbestos sprayers, asbestos insulation workers including those applying and removing asbestos-containing materials in shipbuilding. The Council recommends that workers in the jobs listed require at least 5 years asbestos exposure before 1975 or at least 10 years asbestos exposure after 1975 to fulfil the terms of prescription. Recent evidence indicates that diffuse pleural thickening is an unreliable marker of asbestos exposure and the Council recommends removing the requirement for the presence of diffuse pleural thickening from the terms of prescription for PD D8.

66. These new recommendations will be beneficial to those lung cancer claimants who have been exposed to substantial asbestos exposure but are unable to satisfy the current requirements for pleural thickening and/or asbestosis.

Operational considerations  
for asbestos-related lung  
cancer

67. The Council is anxious that asbestos-related lung cancer claimants should be sent for medical assessment as soon as their claims are received instead of waiting for confirmation that the employment conditions have been satisfied. The Council was reassured to hear that the Department ‘fast-tracks’ as a standard procedure all claims related to asbestos-related prescribed diseases. The Council suggests that initial assessments should take into account the poor prognosis for asbestos-related lung cancer. The Council recommends that, considering the similar prognosis, it would be appropriate to assess eligible claimants for PD D8 at 100% disablement as is routinely done with cases of mesothelioma.

**Recommendations** 68. The Council recommends that:

- a) Lung cancer should remain prescribed in cases of asbestosis.
- b) The list of occupational categories for workers with lung cancer and asbestosis should remain unchanged.
- c) Workers with lung cancer without asbestosis, but who have a history of substantial<sup>2</sup> asbestos exposure should be added to the terms of prescription for PD D8. The Council recommends that the list of occupational exposures for workers with lung cancer without asbestosis should be: workers in asbestos textile manufacture; asbestos sprayers; asbestos insulation workers, including those applying and removing asbestos-containing materials in shipbuilding. For exposures occurring before 1975 workers should have been in the occupations listed for at least 5 years. For exposures occurring after 1975 workers should have been in the occupations listed for at least 10 years.
- d) Claimants eligible for PD D8 should be assessed at 100% disablement.
- e) Reference to pleural thickening should be removed from the terms of prescription for PD D8.

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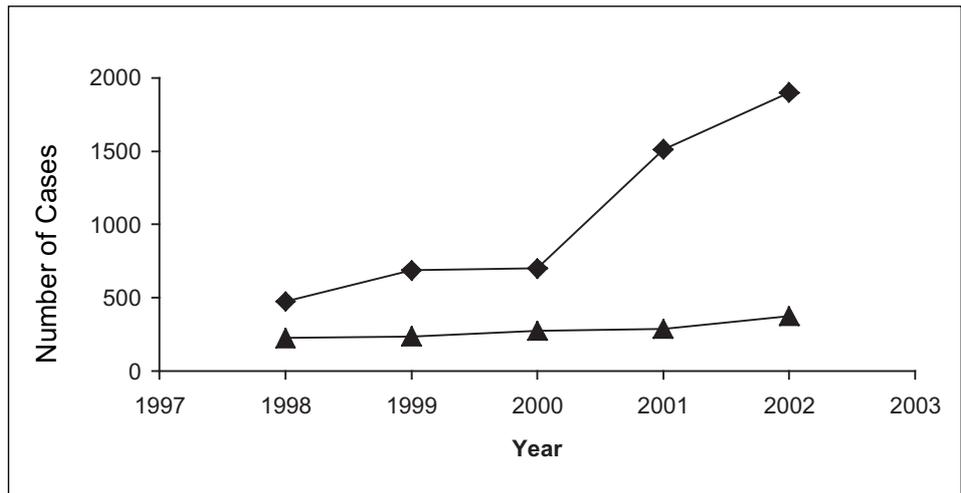
2 The Council has given a clear description of what it means by the word “substantial” in relation to lung cancer in the absence of asbestosis (PD D8b). Substantial in the context of PD D8b means asbestos exposures for at least 5 years before 1975 and 10 years after 1975 in the following occupations: workers in asbestos textile manufacture; asbestos sprayers, asbestos insulation workers, including those applying and removing asbestos-containing materials in ship-building.

This precise definition does not apply to the use of the term “substantial” exposure in PD D1 (pneumoconiosis). The definition of substantial in PD D1 (pneumoconiosis) is as set out in sub-paragraph 9 of the list of prescribed occupations for PD D1 as it relates to asbestos exposure.

## PD D9 Pleural thickening

### Claims activity

69. The number of new claims for PD D9 have increased three-fold between 1998 and 2002, with approximately 2000 claims in 2002 (see graph below, diamonds). The number of new assessments for PD D9 have also increased with 380 in 2002 compared to 230 in 1998 (triangles in graph below). For the period 1998 – 2002, 88% of assessments were at 14-100% disablement, 11% were at 1-13% disablement and 1% were at less than 1% disablement. (In 1996, the Council recommended changes to widen the prescription of PD D9 to include both bilateral and unilateral pleural thickening).



- ▲ PD D9 assessments;
- ◆ PD D9 claims

### Evidence received Diagnostic criteria

70. The current terms of prescription specify measurements of pleural thickening based on standard radiographs for satisfaction of the diagnostic criteria. However, non-standard sized radiographs are often now used with limited means of calibration, making use of a specific measurement for diagnosis problematic. The experts suggested that involvement of the costophrenic angles could be used as a diagnostic indicator for diffuse pleural thickening due to asbestos. Indeed, in the experts' opinion involvement of the costophrenic angle was one of the most important clinical factors in diagnosis of diffuse pleural thickening caused by asbestos and the chest radiograph the best indicator of the presence of diffuse pleural thickening.

### Occupational coverage

71. The occupational coverage for pleural thickening should remain unchanged.

### Recommendations

72. The Council recommends that:

- a) The prescription for PD D9 should be amended to remove the requirement for measurements of pleural thickening and introduce the requirement for involvement of costophrenic angle on plain chest radiographs.
- b) The occupational coverage for PD D9 should remain unchanged.

## Other issues relating to the asbestos-related diseases

- Symptomatic pleural plaques** 73. The Council recognises that symptomatic pleural plaques can occur. However, there is a lack of evidence that they cause impairment of lung function sufficient to cause disability. In civil litigation pleural plaques may attract compensation, although this is generally for the psychological distress and for associated risk of other asbestos-related diseases. IAC will continue to monitor research relating to symptomatic pleural plaques and keep this issue under review.
- Use of computerised tomography scans** 74. Computerised tomography (CT) scans provide useful information and can be effectively used in early diagnosis of asbestosis and pleural thickening. In recent years, CT scans have become more widely used in diagnosis of pleural thickening and asbestosis. However, it remains standard clinical practice for patients to be assessed initially by plain chest radiograph. At present only a proportion of patients are subsequently assessed by CT. All claimants will have had a chest radiograph but not all will have had a CT scan. When available, CT scans can be used for diagnosis in claimants. The Council will reconsider these recommendations if in the future CT scans become universal in these investigations.
- Payments for the terminally ill** 75. The Council is keen that the issue of payments for terminally ill claimants, including those with asbestos-related diseases, such as mesothelioma and those with non-asbestos-related diseases, such as bladder cancer<sup>3</sup>, be addressed. Such claimants are assessed at 100% disablement, but due to the poor life expectancy for this group, receive only a fraction of the total amount payable to those with less severe prescribed diseases. The Council recommends that this inequity in the structure of payments for the terminally ill compared to other prescribed diseases should be considered by the Department for Work and Pensions for review by IAC.
- Prevention** 76. Asbestos diseases can be prevented by ensuring that workers who come into contact with asbestos containing materials are not exposed to the asbestos fibres which may be released when these materials are handled. The importation, supply and use of asbestos has now been banned but asbestos was extensively used as a building material from the 1950s through to the late 1970s. Those currently at risk from exposure to asbestos fibres include those who remove asbestos containing materials and building and maintenance workers who may unknowingly be exposed during the course of their work. To deal with the risks of exposure, there is a requirement in the Control of Asbestos at Work Regulations 2003 to carry out a risk assessment and to prevent exposure to asbestos fibres so far as is reasonably practicable. Since May 2004, there has been a new duty on those who have maintenance and repair responsibilities for non-domestic premises to assess those premises for the presence of asbestos and the condition of that asbestos, and to take a series of actions depending on the assessment.
- Recommendations** 77. The Council recommends that the diagnosis of asbestosis is based on the presence of interstitial lung fibrosis together with a history of substantial exposure to asbestos. A high asbestos fibre or body count in the lungs can be supportive of a diagnosis of asbestosis but, because of high false negative rate, the absence of such fibres or bodies should not be used to exclude a diagnosis. The occupational history should be the primary consideration in all such cases. Occupational coverage for PD D1 should remain unchanged.
78. The occupational categories for PD D3 cover any occupational exposure to asbestos and the Council is satisfied that this provides adequate exposure coverage. The Council urge that all mesothelioma sufferers are made aware of the provisions of the IIDB Scheme for PD D3.

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3 It should be noted that not all cases of bladder cancer are terminal, and thus are not assessed at 100% disablement.

79. Asbestosis and pleural thickening were originally included in the terms of prescription for asbestos-related lung cancer (PD D8) as markers of exposure to asbestos. Epidemiological evidence has confirmed the greatly increased risk of lung cancer in those with asbestosis. The Council remains content that where asbestosis is present when lung cancer is diagnosed, the lung cancer can be attributed with reasonable confidence to previous asbestos exposure.

80. However, more recent evidence indicates that pleural thickening is an unreliable index of substantial exposure to asbestos and should not therefore be used as a marker for an increased risk of lung cancer. The Council recommends the removal of reference to pleural thickening from the terms of prescription for PD D8.

81. Evidence suggests asbestosis is not necessarily present in patients with lung cancer who have had substantial exposure to asbestos. The Council recommends adding occupational categories to the scheduled list where there is a doubling of risk for lung cancer due to substantial asbestos exposure in the absence of asbestosis. The Council has carefully reviewed the occupational coverage for lung cancer and suggest that it be amended to cover: asbestos textile workers; asbestos sprayers; asbestos insulation workers, including those applying and removing asbestos-containing materials in shipbuilding. For exposures occurring before 1975, workers should have been in the occupations listed for at least 5 years. For exposures occurring after 1975, workers should have been in the occupations listed for at least 10 years (see Appendix 3: Recommended Terms of Prescription).

82. IIAC recommends that eligible cases of asbestos-related lung cancer should be assessed at 100% disablement due to the poor prognosis for this group of claimants.

83. The terms of prescription for PD D9 be amended to remove reference to specific measurements of the degree of pleural thickening. Instead the terms of prescription should specify that diagnosis of diffuse pleural thickening by chest radiograph should include the involvement of the costophrenic angle. The occupational categories for PD D9 should remain unchanged.

84. There is a lack of evidence that pleural plaques cause impairment of lung function sufficient to cause disability. IIAC does not recommend adding pleural plaques to the list of prescribed diseases, but will continue to monitor new research.

85. Where available, CT scans can be used in diagnosis of asbestos-related diseases for IIDB, but are not required under the scheme.

86. The Council recommends that the structure of payments for the terminally ill, such as those with mesothelioma should be considered by the Department for Work and Pensions and should be the subject of a future review by IIAC.

## APPENDIX 1: Current terms of prescription

Disease number	Name of disease or injury	Type of job
D1	Pneumoconiosis	<ol style="list-style-type: none"> <li>1) (a) The mining, quarrying or working of silica rock or the working of dried quartzose sand or any dry deposit or dry residue of silica or any dry admixture containing such materials (including any occupation in which any of the aforesaid operations are carried out incidentally to the mining or quarrying of other materials or to the manufacture of articles containing crushed or ground silica rock); (b) the handling of any of the material specified in the foregoing subparagraph in or incidental to any of the operations mentioned therein, or substantial exposure to the dust arising from such operations.</li> <li>2) The breaking, crushing or grinding of flint or the working or handling of broken, crushed or ground flint or materials containing such flint, or substantial exposure to the dust arising from any such operations.</li> <li>3) Sand blasting by means of compressed air with the use of quartzose sand or crushed silica rock or flint, or substantial exposure to the dust arising from sand and blasting.</li> <li>4) Work in a foundry or the performance of, or substantial exposure to the dust arising from, any of the following operations: <ol style="list-style-type: none"> <li>a) the freeing of steel castings from adherent siliceous substance;</li> <li>b) the freeing of metal castings from adherent siliceous substance: <ol style="list-style-type: none"> <li>i) by blasting with an abrasive propelled by compressed air, by steam or by a wheel, or</li> <li>ii) by the use of power-driven tools.</li> </ol> </li> </ol> </li> <li>5) The manufacture of china or earthenware (including sanitary earthenware, electrical earthenware and earthenware tiles), and any occupation involving substantial exposure to the dust arising therefrom.</li> <li>6) The grinding of mineral graphite, or substantial exposure to the dust arising from such grinding.</li> <li>7) The dressing of granite or any igneous rock by masons or the crushing of such materials, or substantial exposure to the dust arising from such operations.</li> <li>8) The use, or preparation for use, of a grindstone or substantial exposure to the dust arising therefrom.</li> <li>9) a) The working or handling of asbestos or any admixture of asbestos;</li> </ol>

		<p>b) the manufacture or repair of asbestos textiles or other articles containing or composed of asbestos;</p> <p>c) the cleaning of any machinery or plant used in any foregoing operations and of any chambers, fixtures and appliances for the collection of asbestos dust;</p> <p>d) substantial exposure to the dust arising from any of the foregoing operations.</p> <p>10) a) Work underground in any mine in which one of the objects of the mining operations is the getting of any mineral;</p> <p>b) The working or handling above ground at any coal or tin mine of any minerals extracted therefrom, or any operation incidental thereto;</p> <p>c) The trimming of coal in any ship, barge, or lighter, or in any dock or harbour or at any wharf or quay;</p> <p>d) The sawing, splitting or dressing of slate, or any operation incidental thereto.</p> <p>11) The manufacture of carbon electrodes by an industrial undertaking for use in the electrolytic extraction of aluminium from aluminium oxide, and any occupation involving substantial exposure to the dust arising therefrom.</p> <p>12) Boiler scaling or substantial exposure to the dust arising therefrom.</p> <p>13) Exposure to dust if the person employed in it has never at any time worked in any of the other occupations listed.</p>
D3	Diffuse mesothelioma (primary neoplasm of the mesothelium of the pleura or of the pericardium or of the peritoneum).	Exposure to asbestos, asbestos dust or any admixture of asbestos at a level above that commonly found in the environment at large.
D8	<p>Primary carcinoma of the lung where there is accompanying evidence of one or both of the following:</p> <p>a) Asbestosis</p> <p>b) Unilateral or bilateral diffuse pleural thickening extending to a thickness of 5mm or more at any point within the area affected as measured by a plain chest radiograph (not being a computerised tomography scan or other form of imaging) which:</p> <p>i) in the case of unilateral diffuse pleural thickening, covers 50% or more of the area of the chest wall of the lung affected; or</p>	<p>a) The working or handling of asbestos or any admixture of asbestos; or</p> <p>b) The manufacture or repair of asbestos textiles or other articles containing or composed of asbestos; or</p> <p>c) The cleaning of any machinery or plant used in any of the foregoing operations and of any chambers, fixtures and appliances for the collection of asbestos dust; or</p> <p>d) Substantial exposure to the dust arising from any of the foregoing operations.</p>

	<p>ii) in the case of bilateral diffuse pleural thickening, covers 25% or more of the combined area of the chest wall of both lungs.</p>	
D9	<p>Unilateral or bilateral diffuse pleural thickening extending to a thickness or 5mm or more at any point within the area affected as measured by a plain chest radiograph (not being a computerised tomography scan or other form of imaging) which:</p> <p>i) in the case of unilateral diffuse pleural thickening, covers 50% or more of the area of the chest wall of the lung affected; or</p> <p>ii) in the case of bilateral diffuse pleural thickening, covers 25% or more of the combined area of the chest wall of both lungs.</p>	As D8 above.

## **APPENDIX 2: Consultations received**

Professor David Hansell	Royal Brompton Hospital, London
Professor J Corbett McDonald	Royal Brompton Hospital, London
Dr Clive McGavin	Derriford Hospital, Plymouth
Dr Robin Rudd	St Bartholomew's Hospital, London
Dr Nancy Tait	Occupational and Environmental Diseases Association, Enfield, Middlesex
Professor Douglas Hendersen	Flinders University, Australia

### APPENDIX 3: Recommended terms of prescription

Disease number	Name of disease or injury	Type of job
D1	Pneumoconiosis	<p>1) (a) The mining, quarrying or working of silica rock or the working of dried quartzose sand or any dry deposit or dry residue of silica or any dry admixture containing such materials (including any occupation in which any of the aforesaid operations are carried out incidentally to the mining or quarrying of other materials or to the manufacture of articles containing crushed or ground silica rock);</p> <p>(b) the handling of any of the material specified in the foregoing subparagraph in or incidental to any of the operations mentioned therein, or substantial exposure to the dust arising from such operations.</p> <p>2) The breaking, crushing or grinding of flint or the working or handling of broken, crushed or ground flint or materials containing such flint, or substantial exposure to the dust arising from any such operations.</p> <p>3) Sand blasting by means of compressed air with the use of quartzose sand or crushed silica rock or flint, or substantial exposure to the dust arising from sand and blasting.</p> <p>4) Work in a foundry or the performance of, or substantial exposure to the dust arising from, any of the following operations:</p> <p>a) the freeing of steel castings from adherent siliceous substance;</p> <p>b) the freeing of metal castings from adherent siliceous substance:</p> <p style="padding-left: 20px;">i) by blasting with an abrasive propelled by compressed air, by steam or by a wheel, or</p> <p style="padding-left: 20px;">ii) by the use of power-driven tools.</p> <p>5) The manufacture of china or earthenware (including sanitary earthenware, electrical earthenware and earthenware tiles), and any occupation involving substantial exposure to the dust arising therefrom.</p> <p>6) The grinding of mineral graphite, or substantial exposure to the dust arising from such grinding.</p>

		<p>7) The dressing of granite or any igneous rock by masons or the crushing of such materials, or substantial exposure to the dust arising from such operations.</p> <p>8) The use, or preparation for use, of a grindstone or substantial exposure to the dust arising therefrom.</p> <p>9) a) The working or handling of asbestos or any admixture of asbestos;  b) the manufacture or repair of asbestos textiles or other articles containing or composed of asbestos;  c) the cleaning of any machinery or plant used in any foregoing operations and of any chambers, fixtures and appliances for the collection of asbestos dust;  d) substantial exposure to the dust arising from any of the foregoing operations.</p> <p>10) a) Work underground in any mine in which one of the objects of the mining operations is the getting of any mineral;  b) The working or handling above ground at any coal or tin mine of any minerals extracted therefrom, or any operation incidental thereto;  c) The trimming of coal in any ship, barge, or lighter, or in any dock or harbour or at any wharf or quay;  d) The sawing, splitting or dressing of slate, or any operation incidental thereto.</p> <p>11) The manufacture of carbon electrodes by an industrial undertaking for use in the electrolytic extraction of aluminium from aluminium oxide, and any occupation involving substantial exposure to the dust arising therefrom.</p> <p>12) Boiler scaling or substantial exposure to the dust arising therefrom.</p> <p>13) Exposure to dust if the person employed in it has never at any time worked in any of the other occupations listed.</p>
D3	Diffuse mesothelioma (primary neoplasm of the mesothelium of the pleura or of the pericardium or of the peritoneum)	Exposure to asbestos, asbestos dust or any admixture of asbestos at a level above that commonly found in the environment at large.
D8a	Primary carcinoma of the lung in the presence of asbestosis	<p>i) The working or handling of asbestos or any admixture of asbestos;  or  ii) The manufacture or repair of asbestos textiles or other articles containing or composed of asbestos; or</p>

		<p>iii) the cleaning of any machinery or plant used in any foregoing operations and of any chambers, fixtures and appliances for the collection of asbestos dust;</p> <p>iv) or substantial exposure to the dust arising from any of the foregoing operations.</p>
D8b	Primary carcinoma of the lung in the absence of asbestosis	<p>Exposure to asbestos for at least 5 years before 1975 and 10 years after 1975 in the following occupations:</p> <p>i) workers in asbestos textile manufacture;</p> <p>ii) asbestos sprayers;</p> <p>iii) asbestos insulation work, including those applying and removing asbestos-containing materials in shipbuilding.</p>
D9	Unilateral or bilateral diffuse pleural thickening with obliteration of the costophrenic angle(s)	<p>a) The working or handling of asbestos or any admixture of asbestos; or</p> <p>b) The manufacture or repair of asbestos textiles or other articles containing or composed of asbestos; or</p> <p>c) The cleaning of any machinery or plant used in any of the foregoing operations and of any chambers, fixtures and appliances for the collection of asbestos dust; or</p> <p>d) Substantial exposure to the dust arising from any of the foregoing operations.</p>







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