



IIAC

**THE INDUSTRIAL INJURIES ADVISORY COUNCIL**

POSITION PAPER 41

**Coal mining, silicosis and lung  
cancer**

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## Position Paper 41: Coal mining, silicosis and lung cancer

### Summary

*This position paper concerns the potential eligibility of coalminers with silicosis to claim benefit for primary carcinoma of the lung under the terms of prescribed disease (PD) D11. It emphasises that exposure to silica dust and cases of silicosis can sometimes arise when coal mining involves cutting of sandstone strata. In the Council's view, PD D11(b), which refers to "tunnelling in, or quarrying sandstone or granite", could apply to work as a coalminer, depending on the occupational history of the claimant. Some challenges in implementation and the relationship between exposure definitions for PD D11 and PD D1 (pneumoconiosis) are briefly discussed.*

### Background

1. At a public meeting of the Industrial Injuries Advisory Council (IIAC) in 2017 a trade union representative posed a question about the terms of prescribed disease (PD) D11.
2. PD D11 provides for primary carcinoma of the lung where silicosis is also diagnosed. The International Agency for Cancer Research (IARC) has classified silica (quartz or silicon dioxide) as a human carcinogen. A previous Council review concluded that in persons who had received sufficient occupational exposure to silica to cause silicosis, the risk of lung cancer was at least doubled, providing the basis for this prescription.
3. PD D11 lists nine occupational activities in which silicosis may occur, namely: glass manufacture, sandstone tunnelling and quarrying, the pottery industry, metal ore mining, slate quarrying and production, clay mining, use of siliceous materials as abrasives, foundry work, granite tunnelling and quarrying, stone cutting and masonry.
4. The question raised at the meeting concerned whether the exposure conditions for PD D11(b), "tunnelling in, or quarrying sandstone or granite" could apply to work as a coalminer; and if not, whether the prescription should be amended to enable such coverage. This report provides a relevant history and considers these questions.

### Silicosis and coal workers' pneumoconiosis

5. **Silicosis** is one of a group of occupational lung diseases collectively called the 'pneumoconioses' which are caused by inhalation of dust. Silicosis was first recognised in 1796 in people exposed to stone dust from using grinding wheels.
6. A separate disease, characterised by black lungs at autopsy, was recognised in Scottish coal miners in 1831. It became apparent that the two conditions differed in prognosis, the one due to coal (**coal workers' pneumoconiosis** (CWP)) being associated with a much less aggressive course, although both diseases showed similar pathological changes.
7. Silicosis was recognised in the Workmen's Compensation (Silicosis) Act of 1918. There then followed a series of Acts specific to different industries, such as refractories, pottery, and metal grinding in which silicosis had been recognised, leading to consolidation with other pneumoconioses in The Workmen's Compensation Act (Silicosis and Asbestosis) 1930.
8. Since it had been shown in 1924 that coal miners could get silicosis by cutting or drilling sandstone strata, they had been added to the schedule in those specific circumstances from 1928 and were thus included in the 1930 Act.

9. The history of CWP followed a different path. Some authorities claimed that coal inhalation was harmless and the disease was not included in initial legislation. In the 1930s, however, the introduction of chest radiography revealed a serious problem of lung disease among coal miners exposed to coal free of silica. It happens that in the initial stages, 'simple' CWP is characterised by the development of multiple small radiological and pathological nodules in the lungs and this 'simple' form of the disease is benign; it does not cause symptoms or impair lung function and does not progress after exposure ceases. However, a person with simple CWP is at increased risk of later developing Progressive Massive Fibrosis (PMF), larger fibrotic masses that can be severely disabling and even fatal.<sup>1</sup>
10. In 1943, therefore, the Workmen's Compensation Act was extended to include any form of pneumoconiosis, including that of coalminers and certain surface coal workers. Since then coal workers have been able to claim compensation for pneumoconiosis, be it in the form of silicosis or CWP.
11. Within the Industrial Injuries Disablement Benefit (IIDB) Scheme, PD D1 (*Pneumoconiosis (includes silicosis and asbestosis)*) provides coverage defined currently in terms of 13 occupational activities, of which those relevant to coal workers are:
- 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 minerals or to the manufacture of articles containing crushed or ground silica rock);*
- (b) the handling of any of the materials 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. ....*
- (10)(a) Work underground in any mine in which one of the objects of the mining operations is the getting of any mineral;<sup>2</sup>*
- (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;...*
12. In principle, therefore, a coalminer might receive benefit for silicosis in relation to the exposures defined in PD D1(1), or (far more commonly) for CWP in relation to the exposures defined in PD D1(10). Within the Scheme the distinction matters less than the associated disablement, since this determines the scale of award payments.
13. It should be noted, however, that while PD D1 does not discriminate by name between different pneumoconioses, failure in PD D11 to mention work in coal mines as a potential cause of silicosis may give rise to uncertainty as to the entitlement of coal miners to benefit for lung cancer if they have silicosis. The complex history of the recognition of the two pneumoconioses may account for differences of wording between the prescriptions.

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<sup>1</sup> Silicosis may also be classified as 'simple' or as a 'PMF', but the simple form can be associated with impairment and can progress after exposure ceases.

<sup>2</sup> Coal is a mixture of carbon with silicates such as kaolin, mica and traces of quartz.

## Discussion and recommendations

14. In the Council's understanding, the public meeting question was prompted by a case in which a coalminer with lung cancer and silicosis was initially refused benefit for PD D1, a position reversed upon appeal when it was successfully argued that coal mining was a form of "tunnelling" that could be through hard rock.
15. Whatever the particulars of that case, the Council would expect that a coalminer with silicosis and primary carcinoma of the lung should be eligible to apply for benefit, since it has long been recognised that exposure to silica dust and cases of silicosis can arise in coal mining involving cutting of sandstone strata, usually by tunnelling or drilling (Fisher, 1935; Seaton *et al*, 1981).
16. Several factors may complicate or bear on assessment of such a claim. First, coalminers are not ordinarily at increased risk of lung cancer, there being no exposure-response relationship with exposure to coal dust; only where there is substantial exposure to silica does a risk arise. Second, most pneumoconiosis in coalminers is CWP, silicosis being the exception rather than the rule. Third, it is not always possible confidently to differentiate silicosis from CWP by appearances on the radiograph: the history of exposure to silica is critical to diagnosis and attribution, and may be difficult to elicit and verify. However, in relation to PD D1 (1) and PD D11, the claimant will always have to show evidence of exposure to silica from description of the work, be they a potter, stonemason, or a coal miner. A judgement will always have to be made as to whether the dust exposure was plausible and whether the dust contained silica in sufficient proportion. The position of coal miners is not special in this regard.
17. For the purposes of guidance, the activities in coal mines involving significant silica exposure are described variously as tunnelling, hard heading and brushing, roof bolting, drilling (other than into coal), but explicitly involve cutting hard rock, usually sandstone. Face work in seams where the cutter was known to be taking sandstone with the coal – e.g. machine cutting of a sandstone roof or floor, may also give rise to relevant exposure levels.
18. The Council recommends that a *prima facie* case exists for recognising PD D11 in a coalminer with primary lung cancer if (i) a diagnosis of silicosis can be sustained, and if (ii) it can be shown that their work has involved "tunnelling in, or quarrying sandstone or granite" (PD D11(b)), including the work described in the previous paragraph. Equivalently, a coalminer who meets the terms of PD D1 (1) can be considered also to satisfy the exposure requirements of PD D11(b).
19. The Council requests that this guidance be promulgated to medical assessors (e.g. by amendment to *The Industrial Injuries Benefit Handbook for Healthcare Professionals*), and to decision-makers, to ensure they are aware of the issue. It is not considered necessary at present to recommend a change to the wording of PD D11 in Schedule 1 of the Social Security (Industrial Injuries) (Prescribed Diseases) Regulations 1985, but the Council remains open to revisiting the question should its guidance require the underpinning authority of legislation.

## References

- Fisher SW. Silicosis in British coal mines. *Trans Inst Mining Engineers Lond* 1935;88:377 and 409.
- Seaton A, Dick JA, Dodgson J, Jacobsen M. Quartz and pneumoconiosis in coal miners. *Lancet* 1981; ii:1272-75.

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