

Guidelines.<sup>14</sup> Preliminary analyses of these data are expected in Spring 2003. The analyses will be made available to commenters through the MSHA and NIOSH Web sites, <http://www.msha.gov> and <http://www.cdc.gov/niosh/homepage.html>, respectively.

As of the end of fiscal year 2002, more than 19,500 active coal miners from 20 states voluntarily participated in Miners' Choice. The overall CWP prevalence rate for radiographic categories of simple CWP categories 1, 2, 3, and PMF combined was 2.8% (546/19,517) among miners examined in Miners' Choice during the 2000–2002 period. This is similar to the CWP prevalence rate of 2.25% for initial participants in the Miners' Choice Program reported in the 2000 NPRM (65 FR 42100). Among Miners' Choice participants, the CWP prevalence rate was higher among underground coal miners at 3.8% (356/9,265), than it was for surface coal miners, 1.8% (188/10,184). The CWP prevalence rate for independent contractors was 2.9% (2/68). These findings show that CWP continues to occur among coal miners working under the current program to control respirable coal mine dust, including quartz.

Coal miners with simple CWP, particularly the advanced categories, are much more likely to develop life-threatening complicated CWP (*i.e.*, progressive massive fibrosis, or PMF), than those with category 0 (ILO profusion categories of 0/0 or 0/1) (Cochrane, 1962; Hurley *et al.*, 1987; Hurley and Jacobsen, 1986; Hurley and McLaren, 1987; Jacobsen, *et al.*, 1971; McLintock, *et al.*, 1971; and Morfeld, *et al.*, 1992). In addition, epidemiological studies have shown that even among miners with category 0, those with a CWP profusion category suggesting pneumoconiosis (*i.e.*, 0/1) are at increased risk of developing PMF compared to miners with a CWP profusion category of 0/0 (Hodous and Attfield, 1990 and McLintock, *et al.*, 1971).

Several studies provide consistent information relevant to this issue. In a study of miners who participated in round six (1990–1995) of the Coal Workers' X-Ray Surveillance Program (CWXSP), Althouse *et al.* (1998) found an average prevalence rate of 2.2% for

simple CWP category 1 and higher among the 8,210 miners who reported beginning work in underground coal mines in 1973 or later. Miners who reported other prior dusty work were excluded from the analysis. Althouse *et al.* (1998) also report an overall decline in the CWP prevalence rates between 1970 and 1995. While this result is encouraging, it also demonstrates that pneumoconiosis is still occurring among miners who have worked only under the current applicable dust standard, and for less than a full working lifetime. The Althouse *et al.* (1998) study did not include estimates of exposure concentration, but the prevalence rates were shown to increase with tenure in mining (up to 22 years). In an earlier study, NIOSH compared the observed prevalences of CWP among miners who participated in rounds 3 and 4 of the CWXSP with the predicted prevalences from the epidemiological study by Attfield and Morring (1992b) (NIOSH 1995, Appendix L). That analysis included coal miners in the CWXSP who had started work between 1969 and 1986 and who had worked 10 or more years; exposure concentrations were estimated at or below the current standard. NIOSH found that the observed and predicted prevalences were similar, thus supporting the validity of the predictions from that epidemiological study. The findings from the Attfield and Morring (1992b) study are consistent with the findings from other epidemiological studies, including Attfield and Seixas (1995). Comparing the effect of miners' exposures received either before or after 1970, Attfield and Seixas (1995) found that exposure during both time periods contributed to the development of pneumoconiosis.

In addition, the epidemiological studies are relevant to predicting the risks of occupational respiratory diseases among miners working today because the cumulative exposures of miners working at the current standard of 2.0 mg/m<sup>3</sup> for a full 45-year working lifetime are well within the range of the data examined in these studies (Attfield and Seixas, 1995; Attfield and Morring 1992a,b; Attfield and Hodous, 1992; Seixas *et al.* 1992, 1993). Thus, risk estimates based on these studies do not require extrapolation beyond the range of the data. These epidemiological studies included quantitative estimates of miners' exposures to respirable coal mine dust and found statistically significant relationships between cumulative exposure and prevalence of pneumoconiosis or COPD. Despite several differences in the surveillance

and epidemiological studies (*e.g.*, exposure estimation and tenure, x-ray readers, miner participation rates, and mines), the observed prevalence rates from the surveillance studies confirm the predicted prevalences from the epidemiological studies.

The Mine Act of 1977 states:

“\* \* \* in promulgating mandatory [health] standards which must adequately assure on the basis of the best available evidence that no miner will suffer material impairment of health or functional capacity even if such miner has regular exposure to the hazards dealt with by such standards for the period of his working life.” Mine Act 101(a)(6)(A).

Findings from the CWXSP indicate an overall decline in the prevalence of CWP from 11% in the 1970s to 2.8% in the sixth round of CWXSP (1992–1996) (NIOSH, Work-Related Lung Disease Surveillance Report, Table 2–11, 1999). Even so, Miners' Choice, CWXSP, and MSHA's one-time medical surveillance programs in the 1990s consistently show prevalence of CWP to be at levels that cause concern. If patterns of overexposure to respirable coal mine dust remain unchanged for these coal miners, the prevalence of CWP would continue to increase, as their cumulative exposure to respirable coal mine dust increases over their coal mining careers.

Both MSHA and NIOSH (Re-opening notice for the Determination of Respirable Coal Mine Dust published elsewhere in today's **Federal Register**; Criteria Document, 1995) find the current program for preventing overexposures to respirable coal mine dust is not sufficient to adequately prevent overexposures to respirable coal mine dust and protect the health of the coal miners.

#### B. Hazard Identification

##### 1. Agent: Coal

Coal is a fossil fuel derived from partial degradation of vegetation. Through its combustion, energy is produced which makes coal a valuable global commodity. It has been estimated that over one-third of the world uses energy provided by coal (Manahan, 1994). Approximately 1,800 underground and surface coal mines are in operation in the United States annually producing slightly over a billion short tons of coal (Mattos, 1999).

Coal may be classified on the basis of its type, grade, and rank. The type of coal is based upon the plant material (*e.g.*, lignin, cellulose) from which it originated. The grade of coal refers to its chemical purity. Although coal is largely carbon, it may also contain other elements such as hydrogen, oxygen,

<sup>14</sup> Specifically, the information is maintained in a confidential manner, all methodologies for data processing are transparent, and all available records were included. This information is reliable and accurate, and is presented in a clear and objective manner, as required by the Department of Labor's Information Quality Guidelines and the Department of Health and Human Services' Guidelines for Ensuring the Quality of Information Disseminated to the Public.