number of HIV-positive MSM with symptomatic early neurosyphilis and the estimated population at risk (i.e., HIV-positive MSM with early syphilis) are underestimated. Thirteen possible symptomatic early neurosyphilis cases were not included because information on patients' HIV status or the sex of their sex partners was missing or because a CSF test was not documented. In addition, certain neurosyphilis and early syphilis cases likely were undiagnosed or unreported. Finally, because medical records were not standardized and had varying levels of completeness, establishing a relationship between clinical and laboratory findings is difficult. Prospectively collected data are needed to more clearly describe the complexities of symptomatic early neurosyphilis.

Health-care providers should be alert to signs and symptoms of neurosyphilis among MSM and should counsel MSM about the various symptoms of neurosyphilis and the risk for illness and permanent disability. Counseling about neurosyphilis and its consequences might promote safer sexual behaviors and decrease transmission of syphilis and other sexually transmitted infections.

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*Information on CDC's surveillance case definition for neurosyphilis is available at http://www.cdc.gov/std/syphsurvreco.pdf. Confirmed: syphilis of any stage, a reactive serologic test for syphilis, and a reactive Venereal Disease Research Laboratory (VDRL) test in CSF. Probable: syphilis of any stage, a nonreactive VDRL test in CSF, and both of the following: (1) elevated CSF protein (>40 mg/dL) or leukocyte count (>5 cells/mm^3) in the absence of other known causes of these abnormalities and (2) clinical symptoms or signs consistent with neurosyphilis in the absence of other known causes of these abnormalities.

†Additional treatment and follow-up recommendations are described in CDC's *Sexually Transmitted Disease Treatment Guidelines, 2006*.[5] Available at http://www.cdc.gov/std/treatment.

Advanced Pneumoconiosis Among Working Underground Coal Miners—Eastern Kentucky and Southwestern Virginia, 2006

MMWR. 2007;56:652-655

1 table omitted

CURRENT REGULATIONS FOR U.S. underground coal mines, mandated by federal legislation in 1969 and amended in 1977, include provisions to prevent the occurrence of pneumoconiosis.*[1] However, in 2005 and 2006, clusters of rapidly progressing and potentially disabling pneumoconiosis were reported in certain geographic areas.[2,3] In response to these reports, CDC's National Institute for Occupational Safety and Health (NIOSH) instituted field surveys conducted under the Enhanced Coal Workers' Health Surveillance Program (ECWHSP).† This report describes the results of those surveys, which were conducted in three counties in eastern Kentucky (Knott, Letcher, and Pike) and four counties in southwestern Virginia (Buchanan, Dickenson, Tazewell, and Wise). A total of 37 cases of advanced pneumoconiosis (including four cases reported previously) were identified. Measures are needed to prevent further occurrence of this disease among underground coal miners.

The ECWHSP team visited 26 sites in the seven counties. All 4,897 miners listed on the rosters of active underground coal mines were notified of the field survey program by mail and told when and where the ECWHSP mobile examination unit would be in operation. During the medical surveys, standardized questionnaires, spirometry (lung-capacity testing), and chest radiography were administered according to NIOSH-specified procedures. Radiographs were classified by NIOSH-certified B Readers according to international standards.‡[4] A total of 975 (20%) of the 4,897 miners were tested; 37 (4%) of those tested had advanced pneumoconiosis.

The national chest radiograph program recommends that all miners receive an initial radiograph upon hire, a second radiograph after 3 years, and additional radiographs at 5-year intervals for the remainder of their careers. However, medical record data indicated that all 37 miners had worked underground for at least one interval of ≥10 years without a chest radiograph. Twenty-two (59%) of the miners had worked for at least a 20-year interval without a chest radiograph, and two had worked for >30 years without a radiograph. The following descriptions of four of the 37 cases exemplify the different patterns of exposure to coal-mine dust and development of advanced pneumoconiosis observed among the miners surveyed.

Case Descriptions

Case 1

A man from Wise County, Virginia, began work as an underground coal miner in 1970, at age 22 years. He worked underground for 31 years, all but 2 years in coal-face§ jobs. In 2001, he began work in other areas underground, and his chest radiograph indi-

cated category 2/1 small opacities.[4] In 2006, at age 58 years, his ECWHSP radiograph indicated progression to 2/3. His exposure history (i.e., limited exposure to silica dust) and slow disease progression were consistent with coal workers' pneumoconiosis (CWP).

Case 2

A man from Pike County, Kentucky, began work as an underground coal miner in 1976, at age 18 years. After 23 years in coal-face jobs, in 1999, his chest radiograph indicated no evidence of pneumoconiosis. Seven years later, at age 48 years, he participated in a health survey through ECWHSP, and his radiograph revealed category 2/2 small opacities and stage B progressive massive fibrosis (PMF). This rapid disease development is atypical of the usual clinical progression of CWP, which can take 20-40 years to develop, and is more consistent with silicosis. However, the man's disease developed without apparent exposure to silica dust.

Case 3

A man from Letcher County, Kentucky, began work as an underground coal miner in 1972, at age 18 years. By 2003, at age 49 years, he had spent 6 years at the coal face and 25 years as a roofbolter,‖ and a chest radiograph indicated category ½ small opacities, suggesting simple pneumoconiosis. During 2003-2006, the man continued to work at the coal face. In 2006, he participated in ECWHSP, and his chest radiograph indicated progression to category 2/2 small opacities. Although he had spent most of his mining years as a roofbolter, a job generally associated with silica-dust exposure, his disease development pattern was more consistent with CWP than silicosis.

Case 4

A man from Buchanan County, Virginia, began work as an underground coal miner in 1971, at age 20 years. In 2001, after 30 years working in jobs at the coal face and roofbolting, he had category 0/1 small opacities. After 5 more years of similar work, at age 55 years, he participated in ECWHSP, and his disease had progressed to category ½ simple small opacities and stage B PMF. This exposure pattern and accelerated clinical course is more consistent with silicosis development than CWP.

Field Survey Findings

Silica dust is more toxic to lungs than coal-mine dust, and categorization by exposure to these two types of dust can be a useful way to differentiate lung disease and identify causative factors. The 37 miners with advanced pneumoconiosis were categorized into two groups according to their occupation exposures: those who had worked in jobs with known exposure to silica dust (roofbolters or drillers) and those who had worked in jobs not typically associated with silica-dust exposure (coal-face jobs only). Job information was summarized from self-reported work histories collected at each medical examination. Eleven miners (more likely at risk for CWP) reported working only in coal-face jobs and other mining jobs not historically associated with the high silica-dust levels that might result in silicosis. Twenty-six miners (more likely at risk for silicosis) included 25 who had worked as roofbolters and one who had not been a roofbolter but had worked for 8 years as a driller at a surface coal mine; both jobs are historically associated with exposure to higher levels of silica dust.

Miners in both groups (coal-face workers and roofbolters) had worked underground in coal mining for similar periods (means of 31.2 years and 29.1 years, respectively). PMF was identified in 64% of the coal-face workers and 42% of the roofbolters. Because silicosis usually develops more rapidly than CWP, examination of disease development patterns can aid in differentiation between CWP and silicosis. However, in this survey, the results were atypical; one of 26 roofbolters (4%) progressed to PMF rapidly (in <10 years), compared with two of 11 coal-face workers (18%). In addition, the mean number of years to detection of PMF was similar between the two groups (28.9 years for coal-face workers, compared with 29.5 years for roofbolters).¶

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CDC Editorial Note: The Federal Coal Mine Health and Safety Act of 1969 brought about a reduction in pneumoconiosis among underground coal miners. Largely as a result of the new limit on coal-mine dust and launch of the periodic chest radiograph program, prevalence of all pneumoconiosis (category 1/0 or greater) among underground miners with ≥25 years on the job dropped from approximately 30% in the early 1970s to <5% in the late 1990s.[5] However, this report and others[2,3] document the persistent occurrence of advanced pneumoconiosis among miners in certain locations. Identification of advanced cases among miners aged <50 years is particularly concerning, because they were exposed to coal-mine dust in the years after implementation of the disease prevention measures mandated by the 1969 federal legislation.

Various explanations might be considered for the continued occurrence of advanced pneumoconiosis. These include (1) inadequacies in the mandated coal-mine–dust regulations, (2) failure to comply with or adequately enforce those regulations, (3) lack of disease prevention innovations to accommodate changes in mining practices (e.g., thin-seam mining) brought about by depletion of richer coal reserves, and (4) missed opportunities by miners to be screened for early disease and take action to reduce dust exposure.

With respect to the adequacy of coal-mine–dust regulations, NIOSH concluded in 1995 that the current 2 mg/m^3 exposure limit was insufficiently protective.[6] Based on United Kingdom and U.S. exposure-response model predictions published after 1969, NIOSH recommended a 1 mg/m^3 limit in 1995. In addition, regional differences in coal-dust toxicity might also be a factor in development of pneumoconiosis, possibly affecting the findings in this re-

port. Coal rank,# which varies widely among coalfields, has been suggested as a factor in disease prevalence.[6] NIOSH is examining coal rank to determine whether it was a factor in the 37 cases of advanced pneumoconiosis described in this report.

The effectiveness of methods used to enforce compliance with legal exposure limits has been challenged previously.[7] NIOSH currently is assessing the use of real-time personal dust-monitoring instruments to help enhance exposure assessment and dust control.** Such instruments can provide immediate evidence of overexposure to coal-mine dust, facilitating rapid action to ameliorate adverse conditions.

Depletion of richer coal reserves is resulting in increased mining of thin seams of coal, posing difficulties for dust control, including cutting through rock at the roof and floor of the seam, which can elevate silica-dust levels. In thin-seam mining, both coal-face and roofbolter work might be associated with high exposure to silica dust. Thin-seam mines are common in the seven counties surveyed in this report, which might explain the lack of any major differences in findings between the coal-face and roofbolter groups.

Finally, although underground coal miners are eligible for periodic chest radiographs at no cost, their participation is sporadic. Irregular participation leads to missed opportunities to diagnose early disease in miners and to counsel them to take action to reduce their dust exposures. Interviews with miners have indicated that reasons for nonparticipation are manifold, including concerns that a positive finding might be disclosed to their employers and lead to job loss or affect future receipt of compensation for disability (NIOSH, unpublished data, 2006). Moreover, of those miners eligible, only a minority exercise their legal right for transfer to a job with reduced exposure to coal-mine dust.[8]

Because pneumoconiosis is entirely preventable through stringent and effective coal-mine–dust control, the cases reported point to gaps in one or more aspects of regulations or procedures used to control dust. The Mine Safety and Health Administration has begun a national education and training campaign to increase awareness and enhance prevention of pneumoconiosis.[9] In addition, NIOSH is examining mining environments to evaluate current exposures and improve guidance on dust control, and field investigations are continuing to gather data on disease clusters in other locations. The results of these investigations are being used to inform ongoing activities aimed at preventing pneumoconiosis among coal miners.

Acknowledgments

The findings in this report are based, in part, on data collected, processed, and compiled by staff members of the NIOSH Coal Workers' Health Surveillance Program.

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*Pneumoconiosis refers to either coal workers' pneumoconiosis (CWP) or silicosis, two similar, chronic fibrotic diseases of the lungs that can result from inhalation of coal-mine dust or silica dust, respectively. Silica dust is more toxic than coal-mine dust, and silicosis historically has developed at a more rapid rate than CWP. Both diseases can advance to progressive massive fibrosis (PMF), resulting in impairment, severe disability, and premature death.

†ECWHSP is the outreach component of a national program operated by NIOSH that offers periodic chest radiographs to underground coal miners.

‡Radiographs are classified for pneumoconiosis according to the profusion of small opacities (associated with simple pneumoconiosis) and the size of large opacities (associated with PMF) when compared with standard radiographs developed by the International Labour Office. The profusion of small opacities is classified into four major categories (0, 1, 2, or 3), with subdivisions reflecting variation within the major category; category 1/0 or higher is considered radiographic evidence of pneumoconiosis. Large opacities are classified into three categories (A, B, or C). The 37 miners in this report all had either large opacities (PMF) or simple pneumoconiosis that was classified as category 2/1 or greater (advanced pneumoconiosis), or both.

§The coal face is the area of the mine where the coal is cut from the seam.

‖Roofbolters drill holes into the roof of mine passageways, often through siliceous rock, and insert bolts to prevent rock falls. Surface coal-mine drillers often drill into siliceous rock.

¶Sporadic participation in programs offering periodic chest radiographs limits the ability to ascertain rapid disease development.

#A measure of the age, hardness, and other properties of coal.

**Information available at http://www.cdc.gov/niosh/nas/mining/intermediateoutcome1.htm.

Notice to Readers: Update on Supply of Vaccines Containing Varicella-Zoster Virus

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IN FEBRUARY 2007, CDC RECEIVED NOTICE from Merck & Co., Inc., that because of lower than expected amounts of varicella-zoster virus (VZV) in its recently manufactured bulk vaccine, Merck was prioritizing production of varicella (Varivax®) and zoster vaccines (Zostavax®) over production of MMR-V vaccine (ProQuad®).[1]

In May 2007, CDC received further notice from Merck that current projections of orders indicate ProQuad will be unavailable beginning in July 2007, although timing will depend on market demand. This might cause extended back orders for the next few months. After depletion of the existing supply, ProQuad is not expected to be available for the remainder of 2007. Merck is requesting that customers begin transitioning from ProQuad to M-M-R II® and Varivax at their earliest convenience.

Merck expects to continue to meet demands for Varivax and M-M-R II to fully implement the recommended immunization schedule. This will allow for continued use of varicella vaccine for all age groups, including the routine 2-dose schedule for children aged 12-15 months and 4-6 years, catch-up vaccination with the second dose for children or adolescents who received only 1 dose, and vaccination with 2 doses for other children, adolescents, and adults without evidence of immunity.[2-4] For zoster vaccine, the supply of Zostavax is expected to be adequate for routine vaccination of adults aged ≥60 years.[5]

Questions regarding the supply of these Merck products should be addressed to Merck's National Service Center at 800-637-2590. Updates on vaccine shortages and delays are available from CDC at http://www.cdc.gov/nip/news/ shortages/default.htm.

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