BOX. Recommendations for preventing transmission of *Salmonella* from reptiles and amphibians to humans

- Pet store owners, health-care practitioners, and veterinarians should provide information to owners and potential purchasers of reptiles and amphibians about the risk for acquiring salmonellosis from their pets.
- Persons should always wash their hands with soap and water after handling reptiles and amphibians or their cages.
- Persons at increased risk for infection with serious complications from salmonellosis (e.g., children aged <5 years and immunocompromised persons) should avoid contact with reptiles and amphibians.
- Reptiles and amphibians should be kept out of households with children aged <5 years or immunocompromised persons. Families expecting a new child should give away their pet reptiles and amphibians away before the infant arrives.
- Reptiles and amphibians should not be kept in child-care centers.
- Reptiles and amphibians should not be allowed to roam freely throughout the house.
- Reptiles and amphibians should be kept out of kitchens and other food-preparation areas to prevent contamination. Kitchen sinks should not be used to bathe pets or to wash their dishes, cages, or aquariums. If bathtubs are used for these purposes, they should be thoroughly cleaned afterward.

SOURCE: Mermin J, Hutwagner L, Vugia D, et al. Reptiles, amphibians, and human *Salmonella* infection: a population-based, case-control study. Clin Infect Dis 2004;38(Suppl 3):S253–61.

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

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

* 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.

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 indicated 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 1/2 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 1/2 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) (Table). 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

[§] 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.

TABLE. Advanced pneumoconiosis among working underground coal miners, by type of occupational exposure and medical and work history — eastern Kentucky and southwestern Virginia, 2006

Medical history/Work history	Occupational exposure: Worked coal-face jobs only* (n = 11)		Occupational exposure: Worked as a roofbolter or driller† (n = 26)		Total (N = 37)	
Progressive massive fibrosis (PMF) (% of miners)	7	(64)	11	(42)	**18**	**(49)**
Mean no. of yrs worked underground (range)	31.2	(25–43)	29.1	(16–42)	**29.7**	**(16–43)**
Mean no. of yrs to detection of pneumoconiosis§ (range)	28.9	(18–43)	27.1	(17–38)	**27.6**	**(17–43)**
Mean no. of yrs to detection of PMF (range)	28.9	(25–33)	29.5	(17–42)	**29.2**	**(17–42)**
Rapid disease development¶ (% of miners)	2	(18)	1	(4)	**3**	**(8)**

* The coal face is the area of the mine where the coal is cut from the seam.
† Twenty-five miners had worked as roofbolters, and one had worked as a driller at a surface coal mine. 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.
§ Defined as the first chest radiograph classified as category 1/0 or greater, or diagnosis of PMF. International Labour Office. Guidelines for the use of the ILO International Classification of Radiographs of Pneumoconioses. 2000 ed. Geneva, Switzerland: International Labour Office; 2002 (Occupational Safety and Health Series, no. 22, rev. 2000).
¶ Defined as chest radiograph progression from category 0 to PMF in <10 years.

(means of 31.2 years and 29.1 years, respectively) (Table). 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%) (Table). 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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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 report. 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

†† 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.

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

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Deportation of Tuberculosis Patients Complicated by a Medication Shortage — Honduras, May–August 2006

The Division of Immigration Health Services (DIHS), within the Bureau of Primary Health Care of the Health Resources and Services Administration, provides health-care and public health services to undocumented persons who are detained by Immigration and Customs Enforcement (ICE) of the U.S. Department of Homeland Security. Detainees in ICE custody are screened for active tuberculosis (TB) disease and, if medically indicated, TB treatment is initiated or continued. Approximately 84% of detainees identified with TB while in ICE custody are deported to their countries of origin before their treatment has been completed (*1,2*). These patients are only allowed to travel after they have been determined to be noninfectious in accordance with CDC guidelines (*3*). Patients with active TB who are deported before treatment completion are at high risk for interrupting or not completing treatment (which typically lasts at least 6 months), developing drug-resistant TB, and transmitting TB disease to others; in addition, these patients often illegally reenter the United States after deportation (*1*).

To facilitate treatment completion in this population, DIHS routinely collaborates with ICE, local and state health departments and health authorities in the United States, local public health authorities in foreign countries, U.S.-Mexico border health offices, binational health programs, foreign national TB programs, the Migrant Clinicians Network (MCN), and the CureTB* program to arrange for TB treatment to continue in the patient's home country after deportation. During May–August 2006, Honduras experienced a shortage of TB medication. This report describes the joint U.S.-Honduras public health actions taken to facilitate treatment completion for 30 detainees who had active TB disease and were awaiting deportation to Honduras during this shortage, highlighting a

* CureTB and MCN are U.S.-based programs that provide international services for detainees who are receiving TB treatment while awaiting deportation.