

Notes from the Field

Editor's Note: Submissions to *Notes from the Field* (500–1000 words) should be sent to Hugh H. Tilson, MD, DrPH, Epidemiology Information & Surveillance Division, Burroughs Wellcome Company, 3030 Cornwallis Road, Research Triangle Park, NC 27709. This column presents information regarding newsworthy public health programs and project experience at the community level. Further information should be sought from the person(s) listed in the footnote to each article.

Tailored Safety Training for Miners in Small Pennsylvania Surface Coal Mines

Injuries to miners are a significant public health problem. The incidence, severity, and costs of mortality, disability, and morbidity due to injuries of coal miners have been persistently high compared with injuries to workers in other industries in the United States private sector.¹ In a major review of coal mine safety in the United States, the National Research Council observed that mines employing relatively few miners have much higher rates of injuries per employee-hours worked than do mines with a large work force.² The causes of these differences in injury rates by mine work force size have not been explored. However, a complex of factors may be operating.

Large mines are often part of vertically integrated enterprises with greater corporate resources and advantages of economies of scale to bear on safety management and engineering than are available to small mines. The lower likelihood of unionization among miners in small mines may be accompanied by less organized worker oversight of safety and fewer formal opportunities for joint worker/management safety initiatives. In addition, a large work force embodies large and varied stocks of skill and practical experience from which less experienced miners can learn.

Federal regulations³ require that newly hired miners receive pre-employment training in health and safety; working miners must be retrained an-

nually. The regulations specify the minimum hours of safety instruction and topics required in initial or refresher training of miners, although the descriptions of the safety topics are quite vague. In theory, the federal regulations allow the focus of safety training to vary from site to site depending upon mining conditions encountered, equipment used, work experience of miners, and injury experience. However, many training programs, especially those of small mines, are generic programs of study that fail to address the specific daily hazards that face miners in their own unique work environments. In practice, training programs often are conducted to comply with regulations, rather than to directly treat specific work place hazards and identified unsafe miner behavior. Moreover, many small mining companies are ill-equipped with qualified trainers and materials to provide effective training programs that meet the requirements of federal regulations.

In 1985, the Pennsylvania State University received a grant of \$115,548 from the Mine Safety and Health Administration of the United States Department of Labor to help small surface coal mines in Pennsylvania reduce the frequency and severity of injuries among the miners they employ. Penn State's effort involved safety training tailored to the injury hazards identified through analysis of injury records and through safety sampling and observation at mines. The process developed was field tested at 77 pits operated by 59 companies in Pennsylvania and has yielded improved safety performance, higher quality training, an enhanced atmosphere of cooperation among trainers, miners, and mine operators, and a high degree of acceptance by miners.⁴ The process developed through this grant has been incorporated into regular miner safety training conducted by Penn State. The process developed by the university follows four steps:

- After a training agreement is reached between the trainers and a mine operator, Penn State prepares a Pennsylvania Mine

Injury Report (PMIR) that describes the injury experience of the surface mine at which training will be delivered. Federal regulations stipulate that all injuries requiring medical attention must be reported by mine operators to the Health and Safety Technology Center of the US Department of Labor for aggregation and publication. The PMIR is a computer-generated summary of the injuries that have been reported to the federal government over the previous three-year period. The PMIR, programmed by Penn State, contains tabulations of the number of injuries that have occurred and their severity as well as information about injury-related agents, hosts, vehicles, and environments.

- The second step involves discussion of the PMIR with the mine operator or safety director. The primary purposes of this discussion are to acquaint the trainer with the specific conditions of the mine and to help the mine operator decide what major safety problems need extra attention. The PMIR is nothing more than the record of the injury reports that the mine operator has supplied to the federal government. However, few operators receive feedback from the federal government about injuries at their mine or about the comparison of their mine's injury experience to that at other mines unless they distinguish themselves by a poor safety record or are part of a select group of large firms. Our experience reveals that most small mine operators lack the expertise to maintain surveillance over injuries at their mines or to interpret patterns of injury occurrence, even if the data were available to them.
- In the third step in the process, The Penn State trainer observes work at the mine. After making a

general assessment of the mine layout, technologies employed, and operating conditions, the trainer records safety observations of miners in most of the occupations essential to production of coal or maintenance of mining equipment. Each of the major occupations at the pit is observed for approximately one hour. The observations include ratings of the likelihood that injuries could occur among detailed tasks miners perform, an assessment of the severity of injuries if they did occur, and a specification of the corrective action that should be taken to reduce the hazards observed. Immediate corrections are suggested for unsafe acts or environments through discussions with the mine operator, mine foreman, and miners.

- The fourth step is the delivery of training to miners that is tailored to the hazards uncovered in government data, observed by the trainer, and previously discussed with mine management and miners. By the time the training is conducted, the trainer has obtained substantial information about safety conditions and practices of the mine and

about technology employed at the mine. The training course includes mine-specific information, including photographs of hazardous situations that were observed in the miners' work environment. In addition, the trainer has developed a personal relationship with the trainees through time spent at the work-site and an emphatic knowledge of the conditions under which the trainees labor.

The safety training design methods, instruments for safety sampling and observation, and computer programs written to support this effort are available from one of the authors (Radomsky) for use in injury control programs in other mining settings and other industries.⁵⁻⁷ We believe that the procedures Penn State developed and implemented offer a unique synthesis of government injury data, work-site observation, on-site consultation, and training tailored to reduce safety hazards in a dangerous industry.

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Community and Migrant Health Centers Awarded \$38 Million

Fifty-one grants totaling \$38.1 million were awarded by the Health Resources and Services Administration in July to community and migrant health centers in 25 states and Puerto Rico. Community health centers provide primary health services to people residing in medically underserved areas; migrant health centers provide services to migrant and seasonal farmworkers and their families.

The 25 states are Alabama, Alaska, Arizona, California, Colorado, Florida, Idaho, Georgia, Illinois, Kansas, Maine, Maryland, Massachusetts, Mississippi, New Jersey, New Mexico, North Carolina, Oregon, Pennsylvania, South Carolina, Tennessee, Texas, Utah, Vermont and West Virginia.

More information is available from the Division of Primary Care Services, Bureau of Health Care Delivery and Assistance, 5600 Fishers Lane, Rm 7A-55, Rockville, MD 20857. Tel: (301) 443-2260.