

NIOSH Safety and Health Topic:

Occupational Respiratory Disease Surveillance

NIOSH/DRDS/CWHSP Celebrates the 35th Anniversary of the Federal Coal Mine Health and Safety Act

Background

"During the early hours of November 20, 1968, an explosion rocked Consolidation Coal Co.'s No. 9 mine near Farmington, W. Va. When the mine was sealed several days later, it became a tomb for 78 miners." [House Report No. 91-563, p. 2503]. The deaths of 222 miners in 1967, 311 in 1968, and this mining disaster in Farmington spurred President Nixon, in March 1969, to submit a proposal for a strong new Federal Coal Mine Health and Safety Act. President Nixon stated:

"The workers in the coal mining industry and their families have too long endured the constant threat and often sudden reality of disaster, disease, and death. Death in the mines can be as sudden as an explosion or a collapse of a roof and ribs, or it comes insidiously from pneumoconiosis or black lung disease. The time has come to replace this fatalism with hope by substituting action for words. Catastrophes in the coal mines are not inevitable. They can be prevented, and they must be prevented." [91st Congress - first session 1969, page 2506]

In December 1969, Public Law 91-173, the Federal Coal Mine Health and Safety Act of 1969, was signed into law "to protect the health and safety of persons working in the coal mining industry [The Act]". In part, it directed the Secretaries of the Department of Health, Education and Welfare and the Department of the Interior to "improve and expand, in cooperation with the States and the coal mining industry, research and development and training programs aimed at preventing coal mine accidents and occupationally caused diseases in the industry." (Section 2.g.4). Of specific interest to the National Institute for Occupational Safety and Health (NIOSH), Division of Respiratory Disease Studies (DRDS), this legislation provided the basis and mandate for an underground coal miner health surveillance program (Section 203). This Program was later defined by Regulation in 42 CFR Part 37 and is currently administered through the NIOSH Coal Workers' Health Surveillance Program (CWHSP), at the Appalachian Laboratory for Occupational Safety and Health (ALOSH), in Morgantown, WV.

Coal Worker's Health Surveillance Program

Once the *Act* was passed, NIOSH developed procedures to be used in maintaining the underground coal mine health surveillance program. Currently referred to as the Coal Workers' Health Surveillance Program (CWHSP), there are three individual components to the Program. These components are: 1) the Coal Workers' X-ray Surveillance Program (CWXS); 2) the B Reader Certification Program; 3) the National Coal Workers' Autopsy Study (NCWAS). Over the years, procedures used in this Program have been migrated from hand processing to automated processing.

When an x-ray facility wants to have their x-ray machine NIOSH-approved, the facility submits a series of films taken on that machine. These films are checked for quality and if found to be acceptable, the x-ray machine is approved for use in the CWXS. Currently there are 154 facilities with 226 x-ray machines that are NIOSH approved.

NIOSH also developed the B Reader Certification Program in response to the *Act*. Physicians must demonstrate proficiency in the classification of chest x-rays for coal workers' pneumoconiosis (CWP) using the International Labour Office (ILO) Classification System. Upon certification, a B Reader must recertify every four years. Currently there are 494 certified B Readers. Besides the certified B Readers, there are 2915 A Readers. A Readers are physicians who have attended the American College of Radiology Symposium on the Radiology of the Pneumoconiosis, but have not taken the B Reader examination.

All underground coal mine operators are responsible for creating a "mine x-ray plan" that offers chest x-rays to all their employees at no cost to the employee. The mine x-ray plan covers a five-year period with a six-month open window wherein miners can obtain their x-ray at one of the selected NIOSH-approved facilities. Once created, the mine x-ray plan and a roster containing the name and address of the mine's employees are submitted to NIOSH for approval. When NIOSH approves the mine x-ray plan, a letter is sent to everyone on the roster list. This process is repeated every five years. Currently there are 764 mines with NIOSH approved mine x-ray plans.

When the NIOSH-approved x-ray facility takes an x-ray and has it read by an A or B Reader, they send the x-ray and paper work to NIOSH for further processing. NIOSH then arranges for a second reading of the x-ray by a B Reader. If there is no consensus regarding the findings on the x-ray, a third B reading is obtained. If there is still no consensus, the x-ray is read by a panel of three B Readers working together to reach consensus. Once consensus is reached, a letter is sent to the miner regarding the results of the x-ray. If the x-ray reveals any evidence of coal workers' pneumoconiosis (CWP) or black lung, the miner is also sent information concerning his/her Part 90 transfer rights to a less dusty job (Table 1).

Occupational Respiratory Disease Surveillance



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Table 1

Part 90 Transfer Rates for the Coal Workers' X-Ray Surveillance Program

Time Period[1]	Number of Miners notified of eligibility of transfer[2],[3]	Number of Miners who exercised their transfer rights[4]	Transfer Rate
1980-1984	1606	327	20
1985-1989	506	84	17
1990-1994	397	73	18

1995-1999	200	43	21
2000- Sept 2003	560	81	14

1. Prior to 1980, the transfer data was not electronically tracked.
2. If a miner received more than one letter, they were only included in the time period when the first letter was mailed.
3. Data provided by the NIOSH Underground Coal Mine System
4. Data provided by MSHA Part 90 Mining Tracking System

Throughout the Program, NIOSH encourages underground coal miners to participate in the CWXSP by outlining the following personal benefits of participation:

- It's an easy way to check on your health
- It will determine if your lungs show evidence of CWP
- It may detect other chest problems
- If CWP is evident, you have the option to work in a low dust area of the mine
- If CWP is evident, you can have regular monitoring of your dust exposure levels by MSHA
- The x-ray free of charge to you
- A confidential report of x-ray results is sent to your

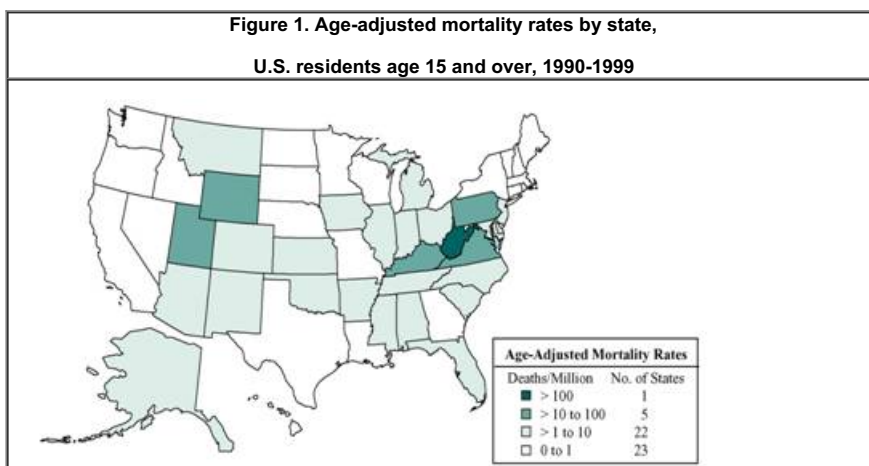
MSHA developed the Miner's Choice program to increase participation. The program ran from October 1999 through September 2002. During that time period, an additional 10,400 x-rays were submitted to the X-Ray Surveillance Program. The increase in participation for 2000-2004 and eligibility to transfer for 2000-2003 is a reflection of the Miner Choice Program.

Table 2 Participation and Disease Rates for the Coal Workers' X-Ray Surveillance Program					
Time Period	Number of X-Rays Processed by NIOSH[1]	Average Number of Underground Coal Miners for the Period[2]	Participation Rate	Number of X-Rays showing evidence of CWP[1]	CWP Disease Rate
1970-1974	122,425	152,066	81	13,259	11
1975-1979	116,014	150,474	77	3,156	3
1980-1984	49,289	131,112	38	1,080	2
1985-1989	17,830	91,122	20	546	3
1990-1994	15,523	69,424	22	458	3
1995-1999	14,629	50,319	29	283	2
2000-2004	15,236	31,826	48	604	4

1. Data provided by the NIOSH Underground Coal Mine System
2. Average calculated using the MSHA Address & Employment Data Sets

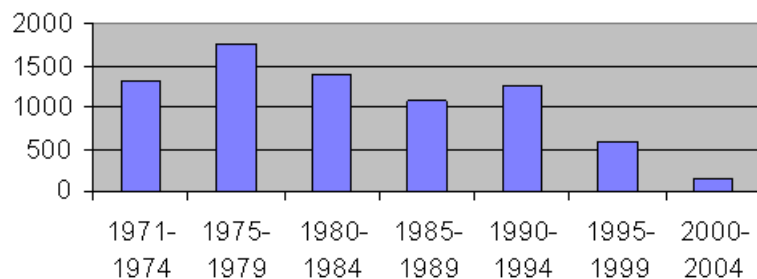
Table 2 shows participation rates in the CWXSP and that CWP prevalence declined markedly, highlighting an intended outcome of dust control in underground coal mines. NIOSH further found an indication that "a continuing decline in CWP prevalence for underground miners with tenure of > 20 years, but no clear trend for those with tenure of ≤ 20 years... CWP continues to occur among working coal miners, even among those first employed after the current federal exposure limit became effective. These results raise concern about possible excessive exposures experienced by miners in several states, at smaller mines, and by surface and contract miners." [CDC publication, Morbidity and Mortality Weekly Report, April 18, 2003, pages 336-340]

The prevalence of CWP is estimated to be 3.2%. There are over 1,000 deaths per year directly attributed to CWP. Figure 1 [[Work-Related Lung Disease Surveillance Report 2002, page 27](#)], shows that West Virginia has the highest mortality rate due to CWP, followed by Pennsylvania, Kentucky, Virginia, Utah and Wyoming.



The National Coal Worker's Autopsy Study (NCWAS) was developed as a service program for survivors of underground coal miners and to assist the scientific community in learning more about CWP. When the survivors agree to participate in the Study, an autopsy is performed by a participating pathologist to determine if CWP or other lung diseases were present at death. Results and lung samples are sent to NIOSH and can be used for research. As shown in Figure 2, participation in the NCWAS has declined due to a variety of reasons. NIOSH plans to conduct an in-depth analysis of the NCWAS in order to determine the future of the Study. For more information regarding this Study, refer to the web site: <http://www.cdc.gov/niosh/1995-120pd.html>.

Figure 2. Count of Autopsies



Future of the CWHSP

While the diligent work provided through the CWHSP has undoubtedly had a positive impact on the underground coal mining community, there is still much to do. Every week the staff who run the CWHSP review chest x-rays that document new cases of CWP. This 35th anniversary of the Act has provided a stimulus for NIOSH to reflect on progress that has been made and to assess what must be done better. In order for the Act to fulfill its intended purpose, the CWHSP must also be successful. Key to the success of the CWHSP is continuous quality assurance.

In this respect the Program has obtained under contract, a comprehensive report which provided an overall analysis of the Program along with long-term and short-term goals and recommendations. They hold meetings with the Partnering Organizations such as the UMWA, MSHA, the Black Lung Clinics Program, the National Black Lung Association, and others in an effort to provide updates on the Program and to receive feedback and recommendations. They revised the notification letters that are sent to the miners advising them of the final determination on their x-ray. These letters were revised based on focus groups held with miners. The new letters, along with a newly developed resource guide, are more understandable and provide the miner with useful information. A new exhibit showcasing the CWHSP has been created and is displayed at various conferences and coal shows. A promotional poster and a new web site has been created in an effort to get the word out about the CWP and the CWHSP. The poster has been distributed to all NIOSH-approved x-ray facilities and to all active mine sites.

New procedures have been developed in an effort to improve the quality of x-rays received from the NIOSH-approved x-ray facilities. Each year, facility-specific film quality assessments are sent to each facility. Presently, about 7% of the nation's mines are not in compliance with having an approved x-ray plan posted at the mine site. NIOSH is working closely with MSHA to bring these mines into compliance. The B Reader examinations and the syllabus have been modified in order to be compatible with the 2000 revision of the International Labour Office System from Geneva, Switzerland.

All of these activities, as well as others not mentioned here, will aid the NIOSH CWHSP in achieving their goal of increasing awareness of CWP and in turn increasing participation in the Program which will aid in early detection of disease. CWP/Black Lung is NOT a disease of the past - it still occurs everyday!

On this 35th anniversary of the Federal Coal Mine Health and Safety Act, the NIOSH CWHSP invites all applicable partners to join them in focusing on the basic premise of the Act.

"The first priority and concern of all in the coal, or other mining industry, must be the health and safety of its most precious resource - the miner."



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