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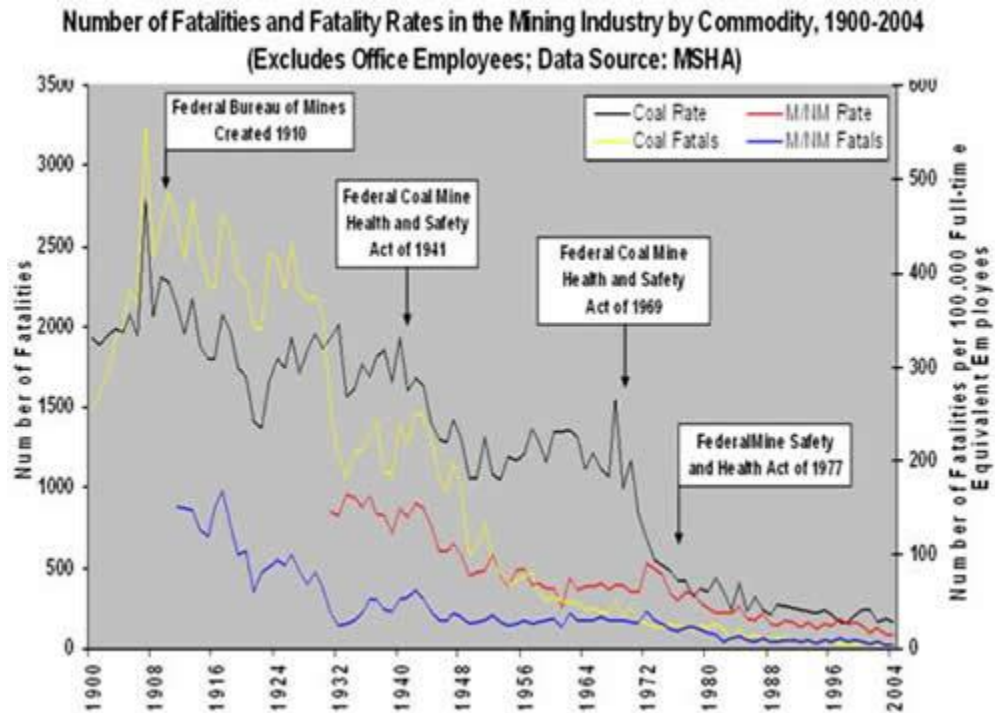


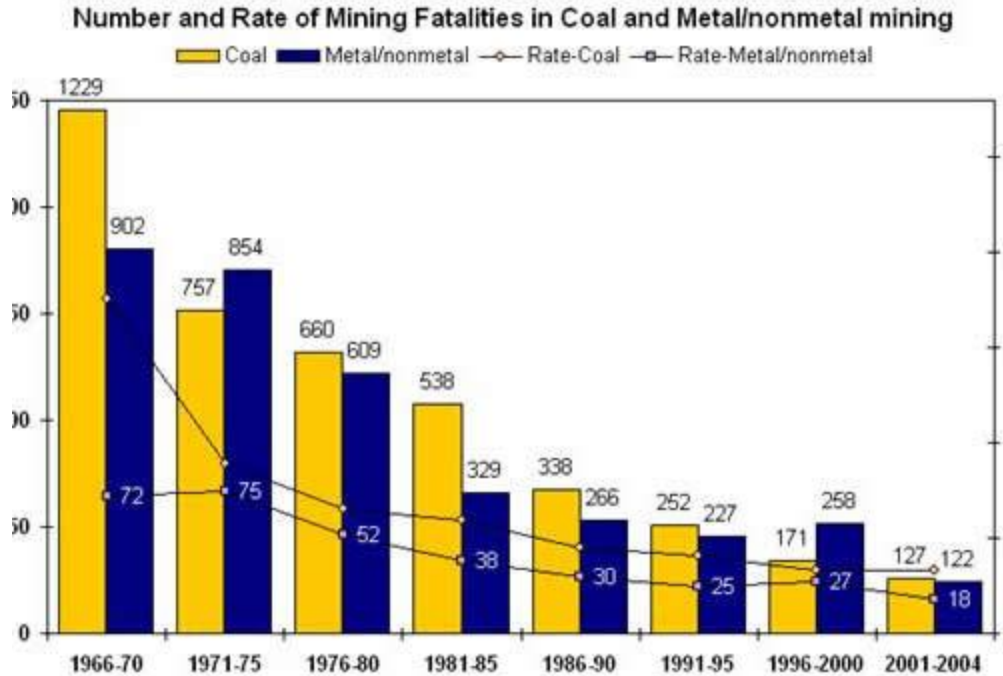
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MINING

Inputs: Occupational Safety and Health Risks Fatalities

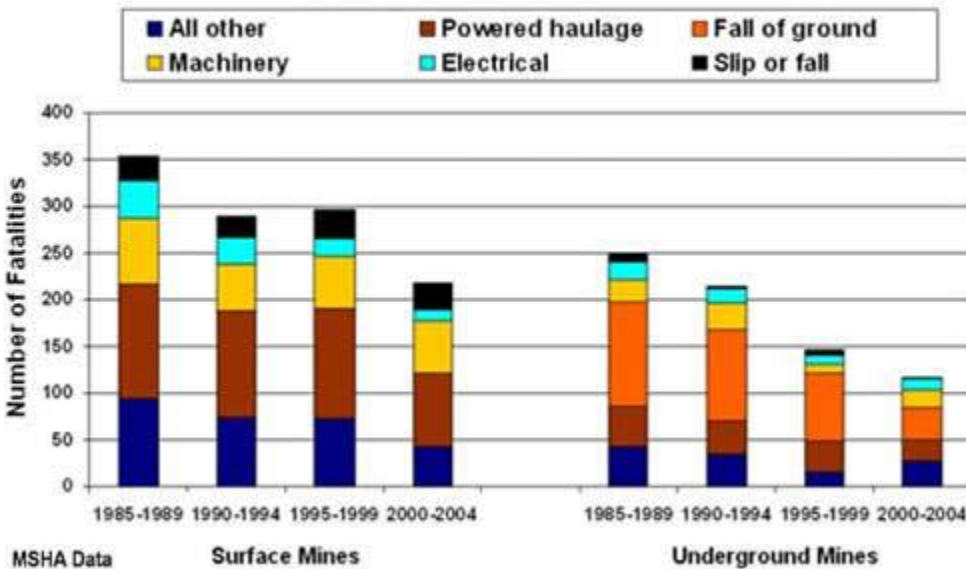
Over the last century, significant progress has been made in reducing the frequency of mining fatalities as shown in the figure below, which is the result of legislative, labor, corporate, research, and technological interventions.





The frequency of these events varies by the commodity being mined (figure above) and whether the mine is on the surface or underground (figure below). For 2001-2004, the fatality rate for miners was 33 per 100,000 Full-time-equivalents (FTE) in coal mining and 18 in metal/nonmetal mining. These contrast with a rate of 4.1 for all industry.

Mining Fatalities – All U.S. Mines Accident/Injury Classes



During the 5-year period 2000 through 2004, the five leading major causes of underground mining fatalities were as follows:

- Fall of ground, 28%
- Powered haulage, 21%

- Machinery, 17%
- Explosions, 16%
- Electrical, 10%

These 5 causes account for 92% of the fatalities.

During the same period, the five leading causes of surface mining fatalities were as follows:

- Powered haulage, 37%
- Machinery, 25%
- Slip or fall of person, 14%
- Fall of rock or highwall, 8%
- Electrical, 5%

These 5 causes account for 89% of the fatalities in surface mining and processing operations. It bears mentioning that during 1992-2002, overall employment in surface mining operations was estimated to be 217,000; that in underground operations was 46,000 (NIOSH Worker Health Chartbook [2004]), so the fatality rate was higher for underground miners.

On the basis of the leading causes of fatalities in underground and surface mining, our priorities are to address traumatic injury fatalities from powered haulage and machinery, fall of ground, explosions, slips and falls, and electrocutions.

Lost-time Injuries

During 2000-2004, the nonfatal lost-time injury rate for mining is 4.5 injuries per 100 FTE in coal mining and 2.9 in metal/nonmetal mining. This contrasts to a rate of 2.6 (2003 rate) for all industry. The higher rate in coal mining leads us to place greater emphasis on research for injury reduction in this Mining sector.

The five leading causes of nonfatal lost-time injuries in underground mining are as follows:

- Handling materials, 33%
- Machinery, 18%
- Slips and fall of person, 17%
- Powered haulage, 12%
- Fall of ground, 9%

These 5 causes account for 89% of the nonfatal lost-time injuries.

The 5 leading causes of nonfatal lost-time injuries in surface mining are as follows:

- Handling materials, 36%
- Slip or fall of person, 28%
- Hand tools, 10%
- Machinery, 10%

- Powered haulage, 9%

These account for 95% of the nonfatal lost-time injuries incurred by surface mine workers.

The frequency of nonfatal lost-time injuries provides insight into how many and what types of injuries are occurring. A second metric, severity, as defined by the median number of days lost, helps to further characterize the overall importance of the injury class. Note that this measure combines actual lost workdays, statutory days lost, and days of restricted work activity through the following formula: Total days lost is calculated as the maximum of statutory days lost, or the sum of actual days lost plus days restricted, whichever is greater. The severity of nonfatal-lost time injuries in underground mining for 2000-2004, ranked by severity, is shown below.

- Slip or fall of person, 26 days
- Powered haulage, 23 days
- Machinery, 21 days
- Handling materials, 20 days
- Fall of ground, 19 days

For surface mining during 2000-2004, the lost-time injury classes, ranked by severity, are shown below.

- Fall of ground, 20 days
- Slip or fall of person, 16 days
- Powered haulage, 13 days
- Handling materials, 12 days
- Machinery, 10 days

Illnesses

The following are the occupational illnesses and diseases newly reported to MSHA, by category (from MSHA public file for 2004):

- Repetitive trauma, 43.1%
- Hearing loss, 20.9%
- Dust diseases of the lungs, 16.9%

These top 3 account for 81% of the newly reported cases. Uniquely, dust diseases can result in death, and for 1999, the most recent year for which data is available, 1,003 people died from coal worker pneumoconiosis. During the 1990s, deaths from coal worker pneumoconiosis ranged from 1,000 to 2,000 per year. Silicosis death statistics in the mining industry are not as readily available, since many States do not report the associated industry with the silicosis-related death. For those States that do report the associated industry, the data shows that mining is responsible for approximately 25% of the deaths. Mining machine operators represent the occupation with the highest number of silicosis-related deaths, and account for about 16% of the U.S. deaths due to

silicosis. The provenance for the lung disease figure is NIOSH Division of Respiratory Disease Studies' Work-Related Lung Disease (WoRLD) Report, but the most recent one is quoted.