

10 DEADLIEST HAZARDS FOR MINERS

Throughout much of the 20th century, hundreds of miners died every single year. Given some of the hazards present in mines throughout the United States—including powerful machinery, darkened tunnels, and combustible materials—it's not hard to see the danger these workers face every time they start their shift.

Mining has become a safer occupation in recent years, but challenges remain. Here's a look at mining fatality statistics, with tips and resources for keeping miners safe on the job.



349,898

MINERS WORKING IN & AROUND 13,299 MINES IN 2015

COAL

102,804
MINERS WORKING IN & AROUND
1,460 MINES

49,417
CITATIONS & ORDERS ISSUED
TO MINES

\$37.1
MILLION

METAL & NONMETAL

247,094
MINERS WORKING IN & AROUND
11,839 MINES

58,548
CITATIONS & ORDERS ISSUED
TO MINES

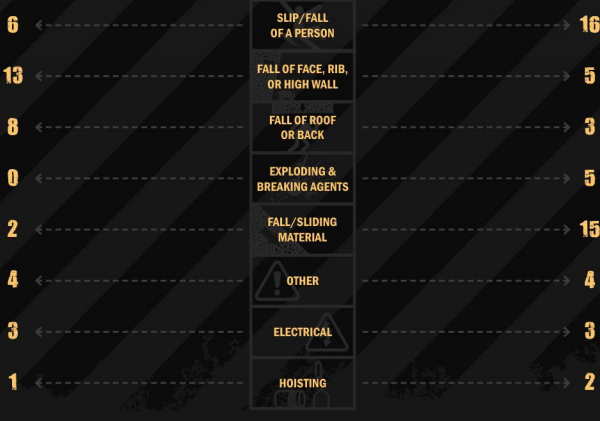
\$27.9
MILLION

107,965
TOTAL CITATIONS & ORDERS
ISSUED BY MSHA

\$65
MILLION

10 DEADLIEST HAZARDS FOR MINERS

These were the deadliest hazards for miners in coal and metal/nonmetal surface mines between 2011 and 2015, with the number of corresponding fatalities.



BREAKDOWN OF METAL/NONMETAL MINE FATALITIES

Here are the total metal/nonmetal mine fatalities between 2011 and 2015, broken down by nature of the incident.



of the **100** METAL/NONMETAL MINE FATALITIES between 2011 AND 2015

77% Took place in SURFACE MINES

23% Took place in UNDERGROUND MINES



BREAKDOWN OF COAL MINE FATALITIES

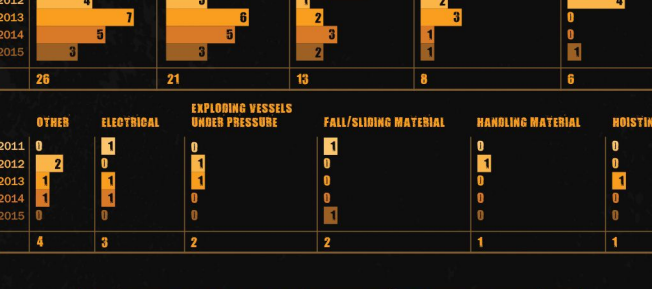
Here are the total coal mine fatalities between 2011 and 2015, broken down by nature of the incident.



of the **87** COAL MINE FATALITIES between 2011 AND 2015

38% Took place in SURFACE MINES

62% Took place in UNDERGROUND MINES



BREAKING DOWN THE VARIOUS HAZARDS

POWERED HAULAGE

Includes collisions with mobile equipment, such as hauling trucks and bulldozers, and accidents involving belt conveyors (such as not following lockout/tagout (LO/TO) procedures, a lack of machine guarding, or inadequate communication with workers performing the task).

MACHINERY

Includes machinery in motion and energized equipment (that should have been subject to lockout/tagout procedures).

FALLING/SLIDING MATERIAL

Means that a material falls or slides to a lower level (due to openings that aren't covered or secured, improper or missing barricades, suspended loads, and other errors).

FALL OF ROOF, FACE, RIB, BACK & HIGH WALL

Occurs when a mine's support structure or roof collapses.

ELECTRICAL

Includes fires, explosions, LO/TO violations on electrical equipment, or power line clearance.

EXPLODING VESSELS UNDER PRESSURE

Occurs when a pressurized container explodes, due to equipment failure.

HANDLING MATERIALS

Accidents where heavy materials strike a worker, usually during construction or installation tasks. This usually results from using improper rigging when installing something, not having spotters, or a combination of the two.

SLIP/FALL OF A PERSON

Occurs when a worker slips and falls, whether due to a lack of PPE, unguarded holes, weather conditions, or other factors.

EXPLODING & BREAKING AGENTS

Includes fatalities where employees weren't protected from the blast area, flyrock, or any gasses present on the jobsite.

OTHER

Incidents (such as drowning) that don't fall into the other categories.

HOISTING

Fatalities involve hoists and scoops that transport miners and supplies in and out of a mine.

IGNITION/EXPLOSION OF GAS/DUST

Occurs when explosive gas or dust is ignited.



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TOP 10 MSHA VIOLATIONS IN 2015

What were the most common violations found by MSHA inspectors in 2015?



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HOW CAN YOU KEEP EMPLOYEES SAFE?

There are numerous steps you can take to keep miners safe and out of harms' way. Here are a few:

BEFORE YOU BEGIN THE JOB

- Conduct a risk assessment
- Inspect the jobsite to account for hazards
- Communicate hazards to coworkers and supervisors

DURING THE COURSE OF A JOB

- Use guardrails and other devices to prevent slips, trips, and falls
- Use lockout/tagout procedures whenever working around energized equipment
- Examine machines before beginning and completing tasks

ON AN ONGOING BASIS

- Replace equipment guarding after maintenance
- Provide and wear PPE whenever specific tasks call for it
- Provide thorough training
- Implement a near-miss reporting program
- Establish policies and procedures that promote a culture of safety
- Regularly inspect and maintain equipment
- Regularly inspect the integrity of roofs, ribs, face, and highwalls



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THE ELEMENTS OF A THOROUGH RISK ASSESSMENT

MSHA has developed an acronym—**SLAM RISKS**—to help workers conduct a risk assessment and control any hazards present on the jobsite. The acronym breaks down as follows:

- Stop and Consider the Work Involved**
 - Do you have the training, knowledge, and skills to safely perform this task?
 - Do you need assistance or permission from supervisors to perform the duty?
- Look and Identify the Hazards**
 - Keep an eye out for hazards before beginning work—and continue doing so until the task is done.
 - What are the necessary steps for performing this task, and have you identified potential hazards for each successive step?
- Analyze What Needs to be Done**
 - Check that you have the necessary tools and PPE before beginning.
 - Understand the procedures and risks associated with the task.
 - Let all impacted coworkers know you're tackling a particular job.
 - Talk with a supervisor if you can't eliminate all hazards.
- Manage Safety by Developing and Implementing Controls**
 - Take all necessary steps to ensure the job is completed safely.
 - Control all hazards by following proper procedures, eliminating hazards where possible, using PPE, continually reassessing safety, and asking for help (if necessary).
- Remember to Look for Changes**
 - Keep an eye out for sudden or unusual changes to normal conditions.
 - Assess any risks associated with a new task, procedure, or condition.
- Identify All Potential Risks**
 - Reflect on your familiarity with all aspects of the particular job.
 - Ask for help if you're unfamiliar with certain tasks or risks.
- Share What You Find, and Include Others Impacted by the Job and the Risks**
 - Communicate with employees who might be working closely or whose work depends on your completion of the task.
- Know What Others on Your Jobsite are Doing**
 - Talk with employees whose work might impact your job to assess risks or hazards.
 - Take note when others' routines, jobs, or tasks change—and think about how it might impact you.
- Safety is Everyone's Job**
 - Employers should work to develop and promote a culture of safety throughout their mines.



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