Occupational Health and Safety

Occupational Injuries

Employment offers certain financial, social and health benefits, yet it can also be a source for illness, injury, or exposure to hazardous substances. Workplaces vary widely in terms of types of industry, manner of work and safety risks. Workers vary in age, gender, heredity, culture, health status, training and knowledge about information about health/prevention and health care options.

The U.S. Occupational Safety and Health Administration (OSHA) is the agency that monitors the health and safety of workers. OSHA was formed in 1970 by Congress "to assure so far as possible every working man and woman in the nation, safe and healthful working conditions."[1] Federal OSHA and its state partners, with employers, safety and health professionals, unions and advocates, have had a dramatic effect on workplace safety. Since 1970, workplace fatalities have decreased more than 65 percent. At the same time, occupational injury and illness rates have declined by 67 percent, even though U.S. employment has almost doubled.[2]

Under the Occupational Safety and Health Act, employers are responsible for providing a safe and healthful workplace. OSHA's mission is to ensure this standard is met by setting and enforcing workplace standards, as well as providing training, outreach, education and assistance. OSHA has jurisdiction over private sector employers, except for self-employed workers, family farm workers and government workers (except in state plan states).

OSHA works with the states to collect data on workplace injuries to improve the safety and working conditions for employees. In Pennsylvania, the Department of Labor and Industry (L&I) is responsible for the oversight and data collection of worker activity. L&I began its work in 1913 and it continues to serve as an advocate for worker safety across the state.[3]

Healthy People 2020

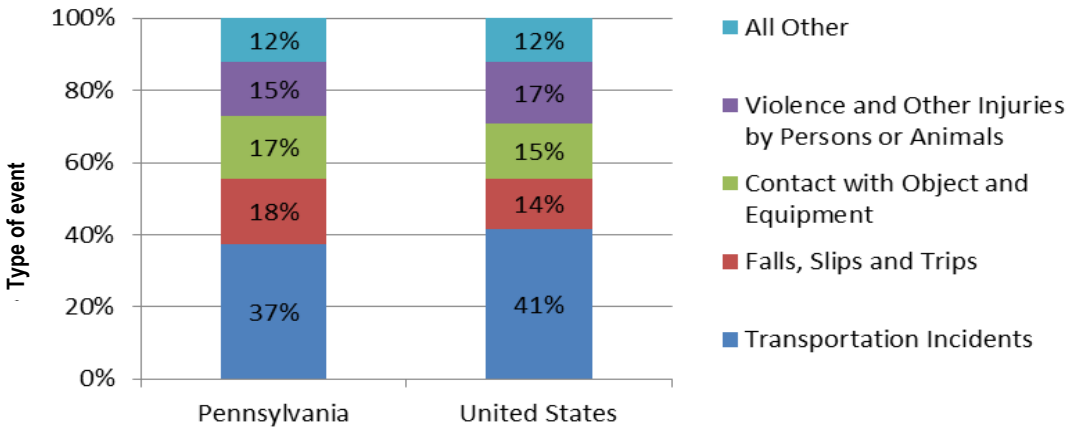
The national Healthy People 2020 initiative sets no goal for occupational injuries. However, it does set a target for occupational fatalities in all industries (OSH-1.1). That goal is 3.6 per 100,000 workers ages 16 years and older.

Pennsylvania's rate for occupational fatalities was not far off the mark in 2010, with a rate of 3.8 per 100,000. However, the goal for fatalities in the construction industry (OSH-1.3) is 9.7 per 100,000 workers 16 years and older, and Pennsylvania's rate is higher on this indicator. The state's rate for fatalities in the construction industry was 11.4 per 100,000.

Occupational Fatalities

Almost three-quarters of the 186 fatal occupational injuries in Pennsylvania in 2011 resulted from transportation incidents, falls, slips and trips, and contact with objects and equipment. Pennsylvania's distribution of fatal occupational injuries was similar to that of the U.S., as shown in Figure 4.1.[4]

Figure 4.1 Occupational Fatalities by Selected Events, Pennsylvania and United States, 2011



The Bureau of Labor Statistics has identified several key characteristics of fatal occupational injuries in Pennsylvania:[5]

- The highest numbers of workplace fatalities occurred in the transportation and material moving occupations (54) and construction and extraction occupations (37). The majority of the fatalities within transportation and material moving were among heavy and tractor-trailer truck drivers (30). Among construction and extraction workers, more than one-third (13) were the result of falls to lower levels.
- The highest number of fatal workplace injuries occurred on Mondays and Tuesdays in Pennsylvania, with 36 fatalities each; nationally, fatalities occurred most frequently on Wednesdays.
- Men accounted for 167 (90 percent) of work-related fatalities in Pennsylvania. Transportation incidents made up more than one-third of these fatalities.
- In Pennsylvania, 81 percent of those who died from a workplace injury were white non-Hispanics. Nationwide, this group accounted for 71 percent of work-related deaths.
- Workers 25 to 54 years old—the prime working age group—accounted for 100 (54 percent) of the state's work-related fatalities in 2011. By comparison, workers in this age group accounted for 60 percent of on-the-job fatalities nationwide. In Pennsylvania, workers 55 to 64 years old suffered more than one-quarter (49) of the state's fatal work injuries, more than any other age group.

Non-fatal Occupational Injuries

In 2011, the Pennsylvania Department of Labor & Industry collected data as part of the Survey of Occupational Injury and Illness (SOII) program for the first time in over 15 years. L&I found that the total recordable nonfatal occupational injury and illness incidence rate in for private industry and state and local government was 4.3 cases per 100 full-time workers. This is higher than the national rate of 3.8. The Pennsylvania rate represents an estimated total of 188,600 injuries and illnesses recorded during 2011; 162,600 of these occurred in private industry.

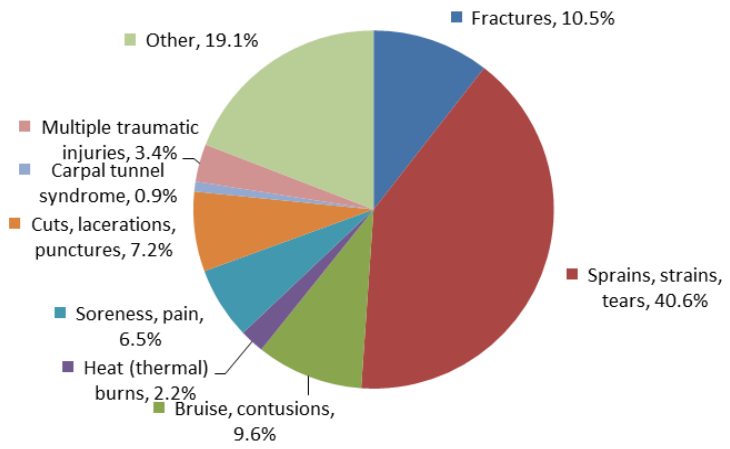
The incidence rate for non-fatal injuries in private industry was 4.1 per 100 full-time workers; the U.S. private industry rate was also lower than the state's at 3.5. Of the estimated nonfatal occupational injuries and illnesses occurring in private industry, 80,700 were cases that resulted in days away from work (DAFW), or job transfer or restriction (DJTR). The remaining 81,900 of the private industry cases consisted of injuries or illnesses cases that did not result in days lost from work, job transfer or restriction, but were otherwise considered to be OSHA recordable.

The highest incidence rates in Pennsylvania, by industry, are in education and health services (5.4), leisure and hospitality (5.3) and manufacturing (5.0). The lowest incidence rates in the state, also by industry, are financial activities (1.3), professional and business services (1.6) and other services (3.9).

At about 42,000, the highest number of recordable cases occurred in the healthcare and social assistance industry, followed by 28,200 cases in manufacturing and 20,900 in retail trade. Together, these three industries accounted for 56 percent of all cases of non-fatal occupational injury in private industry.

There were 45,740 cases that resulted in days away from work (DAFW) in 2011. Of these, sprains, strains and tears were the most common injury types, making up 18,560 (40.6 percent) of the total DAFW cases. Next came fractures, with 4,780 cases (10.5 percent of total) and bruises and contusions caused missed days in 4,410 cases (9.6 percent of the total).

Figure 4.2 Distribution of Non-fatal Injuries and Illnesses Involving Days Away From Work, Private Industry, Pennsylvania, 2011



The most commonly affected body part in DAFW cases was the back, with 8,640 cases reported in 2011. Next was the hand(s) with 5,640 cases. Multiple body parts were affected in 4,190 cases. The knee was cited in 3,830 cases.

Floors, walkways and ground surfaces was the most frequently cited cause of injury involving DAFW, followed by other persons, injured or ill worker and containers. The most common events leading to DFAW were falling on the same level (7,270 incidents), being struck by an object or equipment (6,280 incidents) and overexertion in lifting or lowering (5,890 incidents).

Male workers in Pennsylvania had a higher incidence rate than women, at 133.6 incidents per 10,000 full-time workers, as opposed to 91.7 incidents for female workers. Mondays seem to have the most injuries, except for workers in leisure and hospitality. Their most common days for injury are Friday and Saturday. From 8 a.m. until noon is the most common time of the day for injury, again with the exception of those in leisure and hospitality (who are more prone to injury between 4 p.m. and 8 p.m.) Most accidents happen within the first two to four hours of an employee's work shift—unless that worker is in manufacturing, the higher risk time is between the sixth and eighth hours of the workday.

Endnotes

[1] U.S. Department of Labor, Occupational and Safety and Health Administration. (2013). *You have the right to a safe workplace*. Retrieved from http://www.osha.gov/workers.html#3

[2] U.S. Department of Labor, OSHA (2013). *Commonly used statistics*. Retrieved from http://www.osha.gov/oshstats/commonstats.html

[3] Pennsylvania Department of Labor and Industry. (2013). Retrieved from http://www.dli.state.pa.us/portal/server.pt/community/l_i_home/5278

[4] U.S. Department of Labor, Bureau of Labor Statistics (2011). *Census of fatal occupational injuries*. Retrieved from http://www.bls.gov/ro3/cfoipa.htm

Farm-Related Fatalities

Farming activities involve working with machinery and animals in a challenging environment that may be complicated by uneven ground, changing weather or other unpredictable conditions. These factors, as well as the proximity of the family residence to the work site, increase the risk of accidents to persons of all age groups.

The U.S. Department of Labor's Bureau of Labor Statistics reports the preliminary total of fatal work-related injuries nationwide in 2011 to be 4,609. Of these, 138 occurred in agricultural occupations, ranking the industry seventh for work-related fatalities.[1]

While this represents a 14 percent decline in U.S. agricultural fatalities from the 161 fatalities that occurred in 2010, the decline wasn't so great for Pennsylvania. Rather, the number decreased by only 1 death, less than 1 percent difference.

Pennsylvania Fatal Farm-Related Incidents

According to the Pennsylvania Farm Injury Summary, during 2011 there were 25 fatal incidents recorded in agricultural settings in the state; of these, 11 resulted from incidents directly related to agricultural production. The remaining 14 were the result of other, non-production-related activities of rural living. The table below shows the numbers of fatalities for 2010 and 2011 by activity.[2]

Seven of the fatalities in 2011 were to persons younger than 20, while nine were to individuals over the age of 65. Most of the fatal incidents occurred in months of heavy field activity: March (3), May (4), July (5) and October (3). Tuesday (8) and Wednesday (5) had more fatal incidents than other days of the week.[2]

Table 4.1 Fatal Farm-Related Incidents by Activity, Pennsylvania, 2010 and 2011[2]

	2011	2010
Tractor rollovers or run over	12	13
Equipment entrapment/entanglement	1	0
Manure gas	2	0
Animals	2	1
Non-tractor vehicle	4	4
Falls	2	3
Accidental hanging	1	0
Lightning	1	0
Plants/trees/vegetation not processed	0	4
Heat exhaustion	0	1
Total	**25**	**26**

Endnotes

[1] U.S. Department of Labor, Bureau of Labor Statistics. (2013). "Chart 3." *National Census of Fatal Occupational Injuries in 2011*. Retrieved from http://www.bls.gov/news.release/pdf/cfoi.pdf

[2] Penn State Extension. (2012). 2011 *PA Fatal Farm Injury Summary*. Retrieved from http://extension.psu.edu/agsafety/injury-data

Pesticide Exposure

Pennsylvania has two poison centers to serve its residents. The Pittsburgh Poison Center is located in the western part of the state and Children's Hospital of Philadelphia serves the east. These poison centers provide 24-hour information and assistance to Pennsylvania residents, even for non-emergency questions pertaining to potentially toxic substances around the home or workplace.

The data below were obtained from the National Poison Data System of the American Association of Poison Control Centers.[1] It serves as an indicator of occupational pesticide exposures and should not be interpreted as representing the total realm of exposures within Pennsylvania.

In 2011, callers to Pennsylvania's poison centers reported 3,321 pesticide exposures; this figure was 772 more than the 2,549 reported in 2010. Although there are 37,748 licensed occupational users of pesticides in Pennsylvania, only 33 (less than one percent) of all exposures were occupational in nature.

The following table provides information about pesticide exposures by overall chemical family, with detail about exposure by specific products within the chemical family.

Table 4.2 Occupational Exposure by Pesticide Classification, 2011

	Case count	Percent of all exposures
Insecticides	21	63.63%
Herbicides	10	30.30%
Moth repellants	1	3.03%
Rodenticides	1	3.03%
Fungicides	0	0.00%
Fumigants	0	0.00%

Exposure to pyrethroids (9) was the most common type of insecticide exposure, while glyphosate (6) accounted for most of the herbicide incidents. These are the most widely used products of their types. From the data collected, the outcome of these exposures cannot be definitively determined.

Treatment ranged from no follow-up with a physician to treatment at a health care facility. No fatalities were reported.

Endnotes

[1] Richards, K., Harvey, J., and Davis, L. (2012). *2011 Pesticide exposures in Pennsylvania*. Retrieved from http://extension.psu.edu/pesticide-education/applicators/fact-sheets/other-fact-sheets/2011-pesticide-exposures-in-pennsylvania/view

Lead Exposure

Although childhood lead toxicity has been the subject of high-profile awareness campaigns, it is a serious health issue for adults as well. According to the Mayo Clinic, adults with high blood lead levels (BLLs) may experience symptoms such as high blood pressure, memory loss, headaches and abdominal pains.[1]

Environmental lead levels have steadily declined since the 1970s and 1980s due to the removal of lead from gasoline, paint, food cans and other products. For persons 16 years of age or older, elevated blood lead levels result primarily from workplace exposure to the substance, such as in construction work (e.g., paint removal from pre-1978 structures, demolition, maintenance of outdoor metal structures such as bridges) and manufacturing (e.g., battery, auto repair, recycling).

According to U.S. Census estimates, 6 million Pennsylvania residents aged 16 years and older were employed in 2009.[2] Approximately one-third, or 2 million, worked in industrial sectors (e.g., construction, manufacturing, wholesale trades, waste management services) that potentially could expose them to lead.

In addition to occupational exposures, certain hobbies and activities can pose the risk of lead exposure, including participation in rifle teams and using indoor shooting ranges, subject to air quality concerns.

Since 1992, the Pennsylvania Department of Health's Division of Environmental Health Epidemiology (DEHE) has participated in the Centers for Disease Control and Prevention's state-based Adult Blood Lead Epidemiology and Surveillance (ABLES) program, commonly referred to as "the adult blood lead registry." The ABLES program tracks all laboratory-reported blood lead levels (BLLs) in residents 16 years of age or older.

The Occupational Health Program (OHP) within DEHE oversees the ABLES program. This division uses an online disease surveillance and reporting system called the Pennsylvania National Electronic Disease Surveillance System (PA-NEDSS). A crucial element of the ABLES program is the capacity to initiate or improve adult blood lead level surveillance, enabling health care providers and public health researchers to accurately measure trends in adult BLLs and effectively intervene to prevent lead over-exposure. The purpose of the ABLES program is to reduce to zero the rate of adults who have BLLs of 25 µg/dL or greater; so far, it has enabled researchers to discern that the vast majority of reported adult lead exposures have been occupation-related. Certified laboratories report high blood lead levels to the Pennsylvania Department of Health which in turns provides data annually to the National Institute of Occupational Safety and Health.

Of the 41 states that participated in the ABLES program from 2002 to 2008, Pennsylvania had the highest number of blood lead tests performed. Of all participating states, Pennsylvania had the highest prevalence rate of adults with elevated BLLs (≥25 µg/dL).

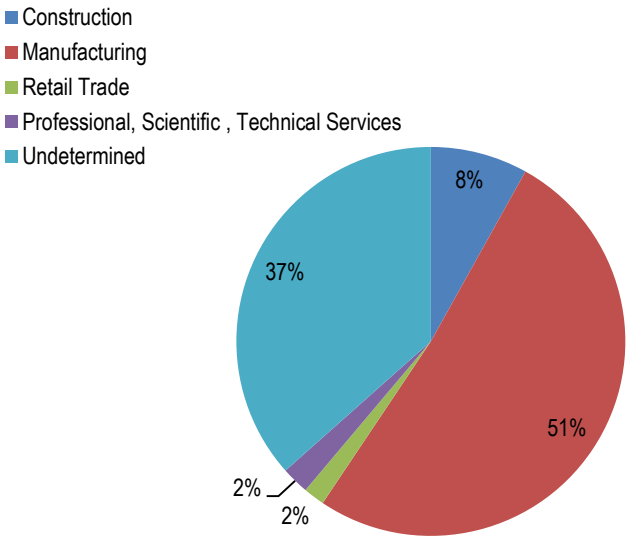
In Pennsylvania, men were more likely to be employed in occupations that exposed them to lead; therefore, they were tested more frequently for lead than women.

Table 4.3 Blood Lead Testing by Sex for Workers Age 16 and Older, Pennsylvania, 2010 to 2012[3]

	Count	Percent
Male	51,910	84%
Female	9,842	16%

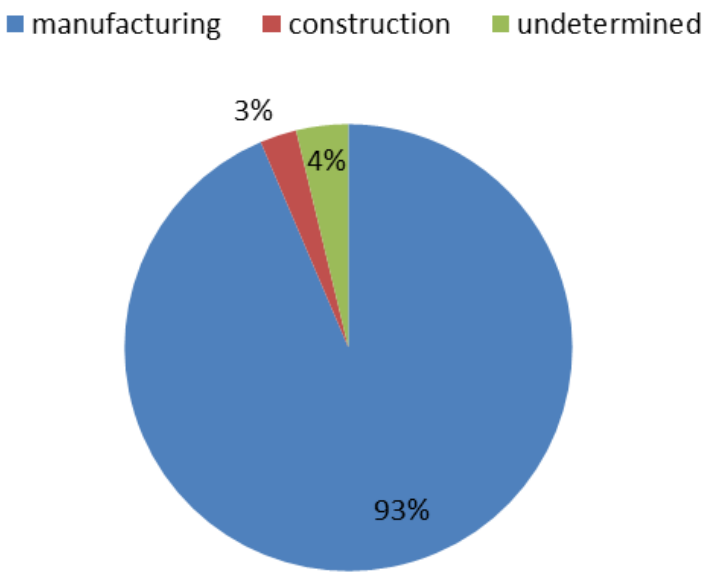
The following image (Figure 4.3) shows the industrial sectors of Pennsylvania in which occupational exposure to lead is more likely to occur. Manufacturing accounts for half of these blood tests.

Figure 4.3 Blood Lead Testing by Industrial Sector for Workers Age 16 and Older, Pennsylvania, 2010 to 2012[3]



Among workers who undergo blood lead level testing, the highest levels occurred in the manufacturing sector. The next image (Figure 4.4) shows details.

Figure 4.4 Industry Sectors with Blood Lead Levels ≥25 µg/dL, Pennsylvania, 2010-2012[3]



In Pennsylvania, from 2010 to 2012, nearly 90 percent of elevated blood lead levels among workers occurred in the battery manufacturing subsector.

Table 4.4 Workers with BLLs ≥25 µg/dL for Industry Subsectors with ≥25 Reported Cases, Pennsylvania, 2010 to 2012 Combined[3]

	Number (N=16,171)	Percent of all cases
Battery manufacturing	14,332	88.63%
Nonferrous metal (except copper and aluminum) rolling, drawing and extruding (manufacturing)	212	1.31%
Painting and wall covering contractors (construction)	143	0.88%
Secondary smelting, refining and alloying of copper (manufacturing)	102	0.63%
Copper foundries (except die-casting) (manufacturing)	101	0.62%
Primary smelting and refining of nonferrous metal (except copper and aluminum) (manufacturing)	81	0.50%
All other miscellaneous chemical product and preparation (manufacturing)	40	0.25%
Non-clay refractory manufacturing	38	0.23%
Plumbing, heating and air-conditioning contractors (construction)	37	0.23%
Industrial building construction	35	0.22%
Undetermined	582	3.60%

Between 2010 and 2012, more men were diagnosed with elevated BLLs than women.

Table 4.5 BLLs ≥25 µg/dL by Sex for Workers Age 16 and Older, Pennsylvania, 2010 to 2012 Combined[4]

	Count	Percent
Male	15,577	96%
Female	585	4%

Endnotes

[1] Mayo Clinic staff. (2011). *Lead poisoning symptoms*. Retrieved from http://www.mayoclinic.com/health/lead-poisoning/FL00068/DSECTION=symptoms

[2] U.S. Census Bureau. (2011*) American Community Survey 3-year estimate, table B18101* [Data File]. "American Factfinder." Retrieved from http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_09_5YR_DP5YR3&prodType=table

[3] Pennsylvania Department of Health. (2013). *Pennsylvania National Electronic Disease Surveillance System.* (PA-NEDSS), [Data file].

[4] Pennsylvania Department of Health. (2013). *Pennsylvania National Electronic Disease Surveillance System.* (PA-NEDSS), [Data file].