

## **Toxic Substance-Related Illness**

**Agent:** Multiple, including pesticides, heavy metals (e.g., lead, cadmium, mercury, arsenic), occupational dusts or fibers (e.g., coal, silica, asbestos), gases (e.g., carbon monoxide, methane) or radioactive materials.

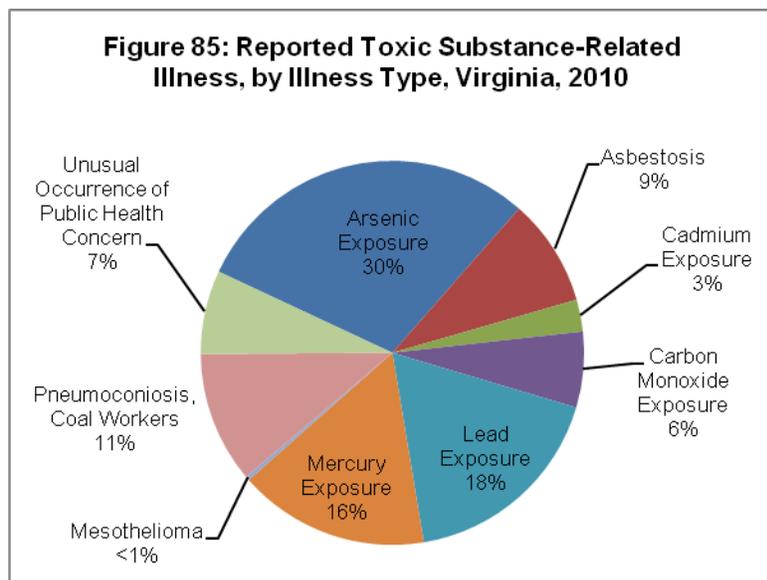
**Mode of Transmission:** Varies depending on agent; can include absorption through skin, ingestion, or inhalation.

**Signs/Symptoms:** Varies depending on agent, dose of exposure, and duration of exposure. Chronic occupational dust or fiber exposure may increase the risk of lung cancer, mesothelioma and nonmalignant lung disorders. Heavy metals, gases and pesticides may damage nervous, digestive, or reproductive systems.

**Prevention:** Eating, drinking, or smoking should not occur in contaminated work areas. Hands and face should be washed with soap and water after contacting toxic materials. After working with potential toxic substances, showering and changing clothes should occur at the worksite, if possible. Preventive measures include strict adherence to safety guidelines and requirements.

**Other Important Information:** Improving public and healthcare professional awareness and recognition of various toxic substance exposures among healthcare professionals can help reduce subsequent illness.

During 2010, 298 cases of toxic substance-related illness were reported in Virginia. This is 20% fewer than the five-year average of 374.2 cases per year. A determination of illness is based upon a physician's diagnosis or on a laboratory finding outside expected normal values. The three most frequently reported toxic substance-related illnesses were arsenic, lead, and mercury exposures (Figure 85).



Additional toxic substance-related illnesses reported during 2010 included pneumoconiosis and mesothelioma, and exposures to asbestos, cadmium and carbon monoxide. In addition, illness from exposure to rarely reported substances were captured. These unusual occurrences of public health concern included exposures to combustion products, aerosol cleaners, noxious fumes, black powder, and magnesium phosphide. Many of these unusual exposures were reported through death certificates or claims from the Virginia Workers' Compensation Commission (WCC).

The number of cases of arsenic exposure has quadrupled in the past three years from 18 cases in 2007 to 88 cases in 2010. This increase in reported arsenic exposure has been the result of reports for persons with arsenic levels above normal laboratory values received through electronic laboratory reporting. The same phenomenon is seen, to a lesser extent, with reports of mercury exposure. Most of the arsenic and mercury reports resulted from elevated blood or urine levels for total arsenic or mercury. Further speciation for the more dangerous forms of inorganic arsenic or mercury is rarely provided. Reported cases of adult lead exposure continue to decrease. In 2005, 140 cases of elevated blood lead levels in adults were reported compared with 53 cases in 2010. Greater awareness of the dangers of lead exposure, as well as enforcement of workplace lead standards have contributed to the decrease in reported exposures.

Among other frequently reported conditions, 97% of those reported with pneumoconiosis worked in the coal mining industry, and of these, 61% died from this condition. The 19 persons with reported carbon monoxide exposures worked in various industries; all but one of the exposures were reported through death certificates and resulted from either accidental or deliberate exposure to fire, vehicle exhaust, charcoal grills, generators, or heaters. Although asbestosis accounted for 9% of all toxic substance-related illness in 2010, the number of reported cases has dropped steadily over the past decade. The average age of those reported with asbestosis was 77 years, which is reflective of exposures occurring before regulatory standards and guidelines became effective. Seventy-four percent of the asbestos exposures were reported through death certificates, and of these, 45% listed asbestosis as a primary cause of death. The remaining asbestos cases were reported through the WCC.

Among all toxic exposures, the highest percentage of cases (39%) occurred in the 60 year and older age group with an incidence rate of 8.4 per 100,000, followed by the 50-59 year age group with a rate of 5.1 per 100,000. Race information was not reported for 60% of toxic substance-related cases and, therefore, no meaningful conclusions can be drawn from the distribution of cases by race. Seventy-seven percent of all cases occurred in males and the incidence was more than three times that in females (5.9 and 1.6 per 100,000, respectively). The southwest region, where coal mining and battery manufacturing industries are concentrated, had the highest incidence at 4.8 per 100,000. Other regions of the state had incidence rates ranging from 3.8 to 4.6 per 100,000.

Children with exposure to lead are not discussed in this section. For that information, see the “Lead - Elevated Blood Levels in Children” section of this report.