

## 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.

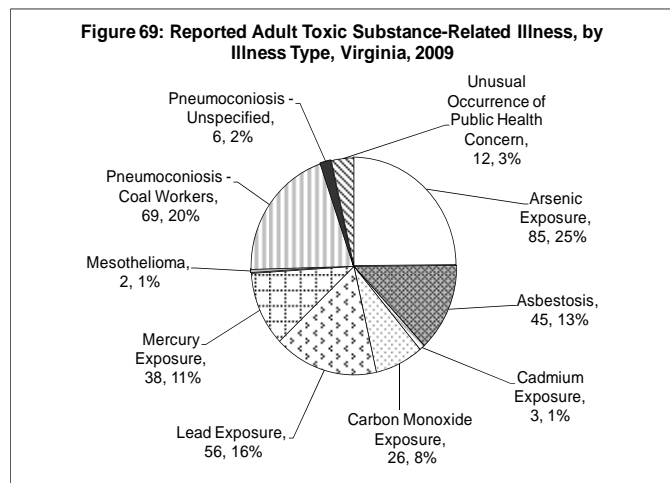
**Mode of Transmission:** Varies depending on agent; can include absorption through skin, ingestion, or inhalation.

**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 2009, 342 cases of toxic substance-related illness were reported in Virginia. This is comparable to the five-year average of 370.0 cases per year. An incidence of exposure is based on a physician's diagnosis or on a laboratory finding above expected normal values. The three most frequently reported toxic substance-related illnesses were arsenic exposure, pneumoconiosis, and lead exposure (Figure 69).



Additional toxic substance-related illnesses reported during 2009 included mesothelioma and exposures to asbestos, cadmium, carbon monoxide, and mercury. In addition, occurrence of illness from exposure to rarely reported substances were captured. These unusual occurrences of public health concern included exposures to combustion products, ethylene glycol, noxious fumes, aluminum, carbon dioxide, isopropanol, argon gas, and bleach. Many of these unusual occurrence exposures were reported through death certificates.

The number of cases of arsenic exposure has significantly increased in the past two years, from 18 cases in 2007 to 85 cases in 2009. This increase in reported arsenic exposure has been the result of additional submissions of electronic laboratory reports for persons with arsenic levels above normal laboratory values. This same reporting phenomenon is seen, to a lesser extent, with reported cases of mercury exposure. Most of the arsenic and

mercury reports resulted from elevated blood or urine levels for total arsenic or mercury. Further speciations for the more dangerous forms of inorganic arsenic or mercury were not provided. Numbers for reported cases of adult lead exposure continue to decrease. In 2005, 140 cases of elevated blood lead levels in adults were reported compared with 56 cases in 2009. 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, 88% of those reported with pneumoconiosis worked in the coal mining industry, and of these reported cases, 38% died from this condition. The 26 persons with reported carbon monoxide exposures worked in various industries; however, all but six of the exposures were reported through death certificates and resulted from accidental fires and exposure to generator exhaust or deliberate exposure to vehicle exhaust. Although asbestosis accounted for 13% of all toxic substance related-illness in 2009, the number of reported cases has dropped steadily over the past decade. The average age reported for asbestosis was 80 years, which is reflective of exposures occurring before regulatory standards and guidelines became effective. Ninety-seven percent of the asbestos exposures were reported through death certificates, and of these, 51% listed asbestosis as a primary cause of death.

Among all toxic exposures, the highest percentage of cases (39%) occurred in the 60 year and older age group with an incidence rate of 10.1 per 100,000, followed by the 50-59 year age group with a rate of 7.0 per 100,000. Race information was not reported for 51% of toxic substance-related cases. Where race information was provided, the white population had the highest incidence (2.5 per 100,000), followed by the black population (1.2 per 100,000). Eighty-one percent of all cases occurred in males and the incidence was more than four times that of females (7.3 and 1.6 per 100,000, respectively). The southwest region, where coal and battery manufacturing industries are concentrated, accounted for 32% of reported exposures and had an incidence of 8.4 per 100,000. Other regions of the state had incidence rates ranging from 2.6 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.