

## Toxic Substance-Related Illness

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

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

Signs/Symptoms: Varies depending on agent and route, dose 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, hepatic (liver), digestive, or reproductive systems.

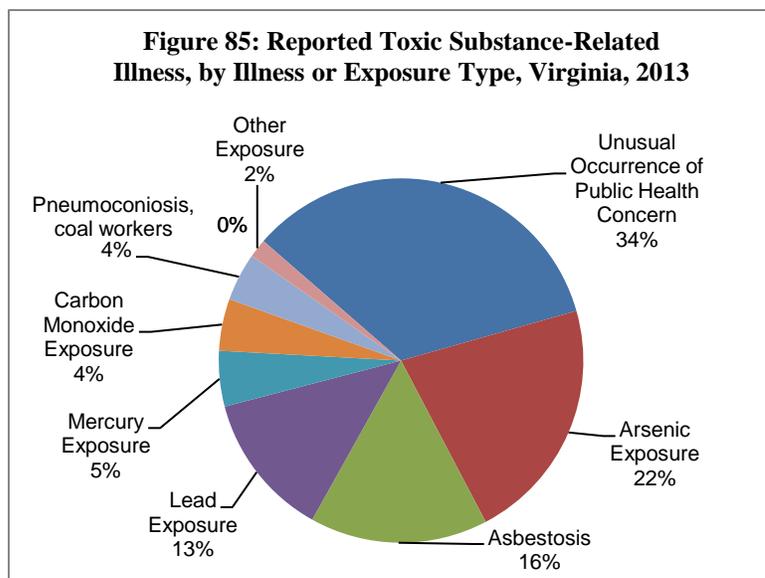
Prevention: Eating, drinking, or smoking should not occur in contaminated work areas. Hands and face should be washed with soap and water after contacting toxic materials. After working with potential toxic substances, showering and changing clothes should occur at the worksite, if possible. Preventive 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 can help reduce subsequent illness.

During 2013, 304 cases of toxic substance-related illness were reported in Virginia. This is 4% fewer than the five-year average of 317.2 cases per year. A determination of illness is based upon a physician's diagnosis or on a laboratory finding outside an occupational standard, or when no standard exists, outside expected normal values. The two most frequently reported toxic substance-related conditions

were arsenic exposure and asbestosis, followed by lead exposure, mercury exposure, carbon monoxide exposure, and coal workers' pneumoconiosis (Figure 85). Other toxic substance-related exposures reported during 2013 included exposures to cadmium and pesticides. Illness from exposure to rarely reported substances were also captured. While the occurrence of most types of toxic exposure or illness has remained very similar in recent years, more

"unusual occurrences of public health concern" were reported in 2013. These included unintentional exposures to aerosol cleaners, solvents, exhaust fumes, and methane, or other illness sustained during a toxic substance or chemical release. A large proportion of toxic substance exposures are identified by public health through claims to the Virginia Workers' Compensation Commission (WCC) and from death certificates.



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Arsenic exposure has continued to be one of the most frequently reported toxic substance exposures, due in part to the presence of arsenic in various foods, particularly seafood. There was a general increase from the 18 cases reported in 2007 to the 92 cases reported in 2012. This increase was primarily due to more comprehensive reporting of persons with arsenic levels above normal laboratory values with the implementation of electronic laboratory reporting. However, the decrease to 66 reported arsenic exposures in 2013 suggests that this trend is stabilizing. The same phenomenon was seen, to a lesser extent, in the reporting of mercury and cadmium exposures and these two conditions have also experienced a noticeable drop in reported cases in the last two years, so that together they accounted for only 6% of toxic substance-related exposures in 2013. Most laboratory reports of elevated arsenic provide results for total urine levels, without further speciation of this substance. Without the additional information from speciation, reports for total urinary arsenic levels may contain a non-toxic organic form of arsenic (arsenobetaine) and, therefore, elevated levels of this compound may overstate the health hazard of arsenic exposures.

While lead remains one of the three most commonly reported exposures, reports of adult lead exposures continue to show a general decrease. In 2013, 39 cases of elevated blood lead levels in adults were reported, compared with 181 cases in 2006. Greater awareness of the dangers of lead exposure, as well as enforcement of workplace lead safety standards, has contributed to the decrease in reported exposures.

The number of reported cases of illness from asbestos exposure has remained relatively stable over the past decade. Forty-eight persons were reported with asbestosis in 2013, accounting for 16% of all toxic substance-related illness. The age of those affected ranged from 60-93 years, with an average age of 75 years. This older age group reflects current illness from exposures occurring before regulatory standards and guidelines went into effect. Sixteen (33%) of the asbestos exposures were reported through death certificates, and of these, 44% listed asbestosis as a primary cause of death. The remaining asbestosis cases were reported by the WCC as asbestosis-related disease due to previous exposures.

The 14 persons with reported carbon monoxide exposures worked in various industries; six of the exposures were reported through death certificates and resulted from deliberate exposure to vehicle exhaust, charcoal grills, or generators. The remaining eight carbon monoxide cases resulted from accidental occupational exposures to fumes generated from vehicle exhaust, cleaning activities, and boiler repairs.

All 13 persons reported with pneumoconiosis worked in the coal mining industry, and were identified from death certificates.

Among all toxic substance exposures, the largest proportion of cases (36%) occurred in the 60 year and older age group, with an incidence rate of 7.2 per 100,000, followed by the 50-59 year age group, with a rate of 5.8 per 100,000. No cases of toxic substance exposure (excluding childhood lead) occurred in children less than ten years of age. This age distribution reflects the large proportion of cases identified by public health through WCC reports and death certificates, which are likely to represent long-term exposures. Because information on race was not reported for 76% of toxic substance-related cases, no statement can be made about the distribution of this

condition by race. Seventy-five percent of all cases occurred in males and their incidence rate was slightly less than three times the rate in females (5.6 and 1.9 per 100,000, respectively). The southwest region had the highest incidence, at 5.1 per 100,000. Incidence rates in other regions of the state ranged from 2.6 to 4.6 per 100,000.