

## 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.

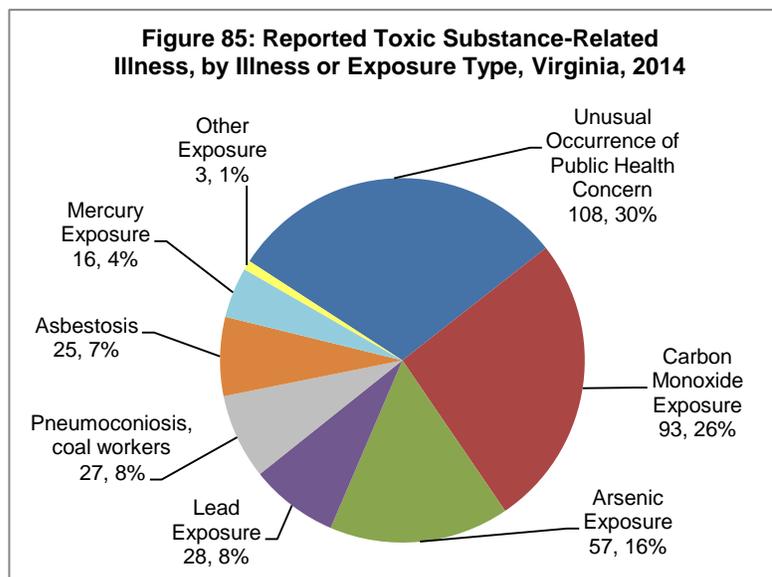
Mode of Transmission: Varies depending on agent; can include absorption through skin, ingestion, or inhalation.

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.

In 2014, 357 cases of toxic substance-related illness were reported in Virginia. This is a 16% increase from the five-year average of 306.8 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. Toxic substance exposures are identified by public health from electronic laboratory reports and death certificates, and through claims by exposed persons to the Virginia Workers' Compensation Commission (WCC). The two most frequently reported toxic substance-related conditions in 2014 were carbon monoxide and arsenic exposure. These were followed by lead exposure, coal workers' pneumoconiosis, asbestosis, and mercury exposure (Figure 85). Other toxic substance-related exposures reported during 2014 included silicosis and exposures to cadmium. 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 captured in 2013 and 2014. These included unintentional workplace exposures to aerosol cleaners, solvents, exhaust fumes, and methane, or other illness sustained during a toxic substance or chemical release. Inhalation was the most common route of exposure, followed by dermal contact and ingestion.

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 and 57 exposures in 2014 suggests that this trend is stabilizing. The same phenomenon was seen, to a lesser extent, in the reporting of mercury and cadmium exposures. The number of reported cases of these two conditions has dropped noticeably in the last two years, so that together they accounted for only 5% of toxic substance-related exposures in 2014. 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.

Reports of adult lead exposures ( $\geq 25$   $\mu\text{g}/\text{dL}$  of lead in blood for persons aged 16 years or older) continued to decrease. In 2014, 28 cases of elevated blood lead levels in adults were reported compared to 181 cases in 2006. The persons with elevated lead exposures in 2014 worked in stained glass making or repair, painting, construction, or at firing ranges. 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. Lead exposures among children aged 15 years and younger are discussed in the childhood lead section of this report.

The number of reported cases of illness from asbestos exposure has remained relatively stable over the past decade, but dropped slightly in 2014. In 2014, 25 persons were reported with asbestosis in Virginia, compared to 48 persons in 2013. The age of those affected ranged from 71-96 years, with a mean age of 83 years. This older age group reflects current illness from exposures occurring before regulatory standards and guidelines went into effect. Ten (25%) of the asbestos exposures were reported through death certificates. The remaining asbestosis cases were reported by the WCC as asbestosis-related disease due to previous exposures.

In 2014, the number of reported carbon monoxide exposures was 93 compared to 14 exposures in 2013. This dramatic increase was due, in part, to 48 workers who were exposed to carbon monoxide at a produce facility in the southwest region. The source of carbon monoxide was thought to be exhaust from forklifts located inside the facility. The other persons with reported carbon monoxide exposures worked in various industries including automobile services. Nine of the exposures were reported through death certificates and resulted from exposure to vehicle exhaust or carbon monoxide inside the home. Three were deliberate exposures.

Nearly all 8 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 (25%) occurred in the 60 year and older age group; however, the highest incidence rate occurred in the 30-39 year age group with a rate of 6.4 per 100,000. Incidence rates ranged from 6.3 to 0.1 per 100,000 among

the remaining age groups, with no cases reported for infants less than one year of age (excluding childhood lead). 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. Race information was not reported for 60% of toxic substance-related cases. As such, no statement can be made about the distribution of this condition by race. Sixty-four percent of all cases occurred in males. The incidence rate among males was almost twice the rate in females (5.6 and 3.0 per 100,000, respectively). The southwest region had the highest incidence rate at 10.5 per 100,000. Rates in other regions ranged from 2.6 to 3.7 per 100,000.