

Carbon monoxide: Emergency Department Visits for Carbon monoxide

Type of EPHT Indicator	Health outcome
Measures	<ol style="list-style-type: none"> 1. Age-adjusted rate of emergency department visits for CO poisoning per 100,000 population 2. Crude rate of emergency department visits for CO poisoning per 100,000 population 3. Number of emergency department visits for CO Poisoning
Derivation of measure	<p><i>Numerator:</i> Resident emergency department visits for CO poisoning that meet the 1998 CSTE case definition for public health surveillance for a "Confirmed" or "Probable" case of acute CO poisoning in administrative data sets.</p> <p>Frequencies for three unique groups:</p> <ul style="list-style-type: none"> • Unintentional, non-fire related • Unintentional, fire-related • Unknown intent <p><i>Denominator:</i> Midyear resident population</p> <p><i>Adjustment:</i> Age-adjustment by the direct method to year 2000 US Standard Population</p>
Unit	<ol style="list-style-type: none"> 1. Age-adjusted rate per 100,000 population 2. Rate per 100,000 population 3. Number
Geographic Scope	State
Geographic Scale	Residents of jurisdiction — State
Time Period	Hospital admissions between January 1 to December 31, inclusive, for each year, 2003 to Most recent year available
Time Scale	Calendar year
Rationale	<p>Carbon Monoxide (CO) poisoning is preventable; nonetheless, unintentional, non-fire-related CO poisoning is responsible for approximately 15,000 emergency department visits and nearly 500 deaths annually in the United States. During 2004—2006, an estimated average of 20,636 ED visits for nonfatal, unintentional, non-fire-related CO exposures occurred each year. Approximately 73% of these exposures occurred in homes, and 41% occurred during winter months (December—February). Prevention efforts targeting residential and seasonal CO exposures can substantially reduce CO-related morbidity. During 2000—2009, a total of 68,316 CO exposures were reported to poison centers across United States.</p> <p>Persons admitted to emergency departments and diagnosed with CO poisoning, ranging from suspected exposure to severe poisonings, may result in treatment and release, hospitalization, or death. Emergency department visits represent patients not counted in other clinical settings. Emergency department data are available in more</p>

	than 50% of states and that number is increasing.
Use of the Measure	These data can be used to assess the burden of severe CO poisoning, monitor trends over time, identify high-risk groups, and enhance prevention, education, and evaluation efforts.
Limitations of the Measure	<p>This data may not include:</p> <ul style="list-style-type: none"> • Persons who call poison control centers and are managed at the scene, and/or receive medical care but are not treated at the emergency department • persons who do not seek any medical care • persons who die immediately from CO exposure without medical care
Data sources	<p><i>Numerator.</i> Emergency department visits data <i>Denominator.</i> US Census Bureau population data</p>
Limitations of the Data Source	<p><i>State hospital discharge data:</i></p> <p>The use and quality of ICD-9-CM coding varies across jurisdictions; this is especially true of the codes used to describe how an injury occurs, indicated as E-codes. Examples of this variation include:</p> <p>The number of diagnostic fields available to specify cause of the injury;</p> <p>Whether E-codes are mandated;</p> <p>The completeness and quality of E-coding; for example, the reliability of ICD-9-CM coding to distinguish between cases of CO poisoning that are intentional or unintentional, and/or fire-or non-fire related</p> <p>The toxic effects of CO exposure are nonspecific and easily misdiagnosed when CO exposure is not suspected. These misdiagnosed cases will not be counted.</p> <p>These data usually do not include data from federal facilities such as Veteran's Administration hospitals, Indian Health Services, or institutionalized populations (e.g., prisons).</p> <p>These data usually include only cases of state residents treated within the state. Health-care access is not restricted to these political boundaries so patients arriving at emergency departments for CO poisoning in another state may not be counted in their own state. Likewise, they may not be counted in the jurisdiction in which they were treated. Currently, few states have access to, or agreements to obtain, emergency department data from other states where their state residents may be hospitalized. To the extent that patients are treated out of state, there is undercounting of the rate of state residents poisoned by CO.</p> <p>Race and ethnicity are important risk factors for CO poisoning, yet many hospitalization data sets do not contain these data. Those that do may have data quality issues.</p> <p><i>Census data:</i></p>

	<ul style="list-style-type: none"> • Only available every 10 years, thus postcensal estimates are needed when calculating rates for years following the census year. • Postcensal estimates at the ZIP code level are not available from the Census Bureau. These need to be extrapolated or purchased from a vendor.
Related Indicators	<ul style="list-style-type: none"> • Hospitalizations for Carbon monoxide poisoning • Mortality for Carbon monoxide poisoning
References	<ol style="list-style-type: none"> 1. Centers for Disease Control and Prevention. Perspectives in Disease Prevention and Health Promotion Carbon Monoxide Intoxication—A Preventable Environmental Health Hazard MMWR Morb Mortal Wkly Rep 1982;31(39):529—31. 2. Centers for Disease Control Prevention. Nonfatal, unintentional, non-fire-related carbon monoxide exposures—United States, 2004-2006. MMWR Morb Mortal Wkly Rep 2008;57(33):896—9. 3. Hampson NB. Emergency department visits for carbon monoxide poisoning in the Pacific Northwest. J Emerg Med 1998;16(5):695—8. 4. Kao LW, Nanagas KA. Carbon monoxide poisoning. Emerg Med Clin North Am 2004;22(4):985—1018. 5. Partrick M, Fiessler F, Shih R, Riggs R, Hung O. Monthly variations in the diagnosis of carbon monoxide exposures in the emergency department. Undersea Hyperb Med 2009;36(3):161—7.