



State of Illinois
Illinois Department of Public Health

ILLINOIS CARBON MONOXIDE SURVEILLANCE REPORT: 2019-2023



Indoor Air Quality Program
February 2026



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Acknowledgments

This report was produced by the Illinois Department of Public Health (IDPH) Office of Health Protection, Division of Environmental Health. The authors would like to thank the doctors, hospital staff, local health department personnel, community members, first responders, and medical professionals who identify, diagnose, and treat individuals exposed to carbon monoxide in Illinois.

Thank you to the Syndromic Surveillance and Vital Records teams with IDPH for assisting with data collection, processing, and review and to the Illinois State Fire Marshall for providing additional data from the National Fire Incident Reporting System for this report.

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Scope of the Illinois Carbon Monoxide Surveillance

- Estimate the trends of carbon monoxide exposure incidents across Illinois.
- Identify common sources and locations contributing to CO exposure.
- Inform the allocation of resources for prevention, education, and response initiatives.
- Provide data to support public health education, environmental safety policy, and risk communication strategies.
- Enhance data collection and analysis processes to support future initiatives.

Introduction

This *Illinois Carbon Monoxide Surveillance Report 2019-2023* represents the state's first comprehensive effort to compile and analyze data on carbon monoxide (CO) exposure. Carbon monoxide is a toxic gas that is colorless, odorless, and tasteless, making it virtually undetectable without specialized equipment. When inhaled in high concentrations, CO can lead to serious illness or death within minutes. Even low-level, prolonged exposure can result in significant health effects.

The information presented here includes data from IDPH Syndromic Surveillance via IL ESSENCE and Vital Records Data from 2019 to 2023, along with incident records from the National Fire Incident Reporting System (NFIRS) spanning the same period. To better understand the root causes of hospital stays, triage notes associated with discharge records were analyzed. By combining these sources, the report identifies patterns in who is being affected, when and where exposures occur, and the most common sources and settings. Between 2019 and 2023, over 4,500 emergency department visits, 600 hospital admittance visits, and more than 200 deaths of Illinois residents were linked to unintentional carbon monoxide exposure.

Carbon monoxide incidents often stem from everyday sources: malfunctioning furnaces and appliances, improper use of gas-powered generators, vehicle exhaust in enclosed areas, and other gas or oil powered equipment. These exposures frequently occur in homes, but they are also reported in workplaces, public buildings, and vehicles. Because CO exposure can happen silently and without warning, the availability of timely, localized data is essential for prevention efforts.

The intent of this report is to lay the foundation for ongoing statewide CO monitoring and reporting. Its findings are designed to inform the work of local and state public health agencies, healthcare providers, emergency responders, policymakers, and other community stakeholders. By identifying key trends and risk factors, the report can help target outreach, shape educational campaigns, improve emergency response systems, and support policy and infrastructure changes aimed at reducing and responding to exposure.

Carbon monoxide exposure is preventable. Through coordinated efforts, increased public awareness, improved data collection, and strategic interventions, Illinois can reduce the burden of illness and death associated with this invisible threat. This report is a first step in that direction, toward a healthier, safer Illinois for all residents.

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Executive Summary

Carbon Monoxide (CO) Surveillance in Illinois: 2019-2023

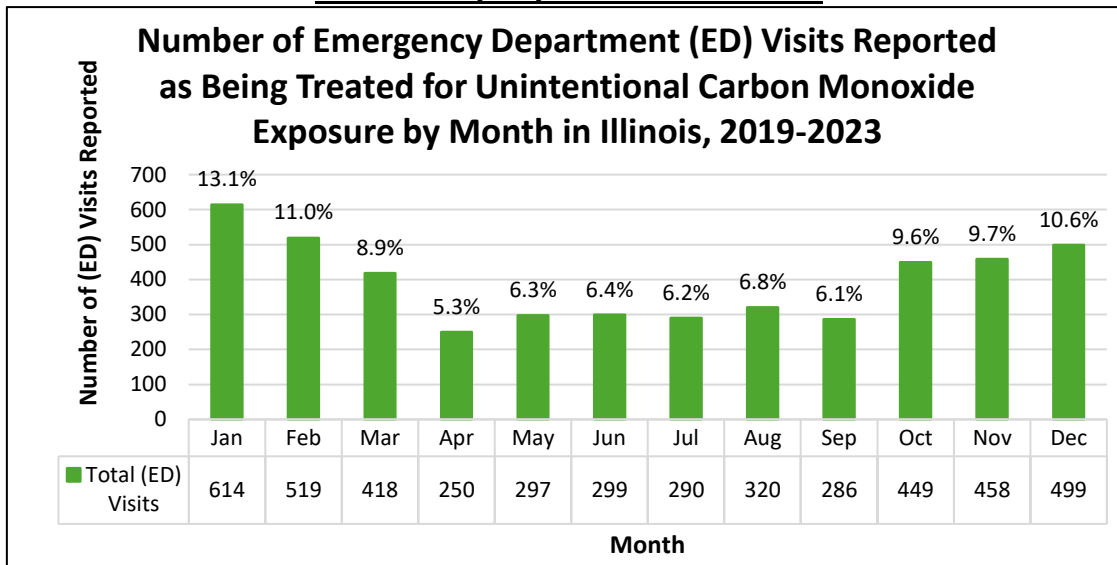
Trends in CO-Related Health Impacts (2019–2023)

- Emergency Department (ED) Visits: 4,699 total
- Hospital Admittances (HA): 630 total
- National Fire Incident Reporting System Calls Reported: 50,733
- Total Deaths Reported from Accidental CO Poisoning: 284

Who is most affected?

Age Group (Years)	CO (ED) Visits	CO (HA) Visits
<18	894 (20%)	<10
18-44	1,922 (41%)	141 (22%)
45-64	1,273 (27%)	253 (40%)
65+	583 (12%)	202 (32%)

When are people most affected?

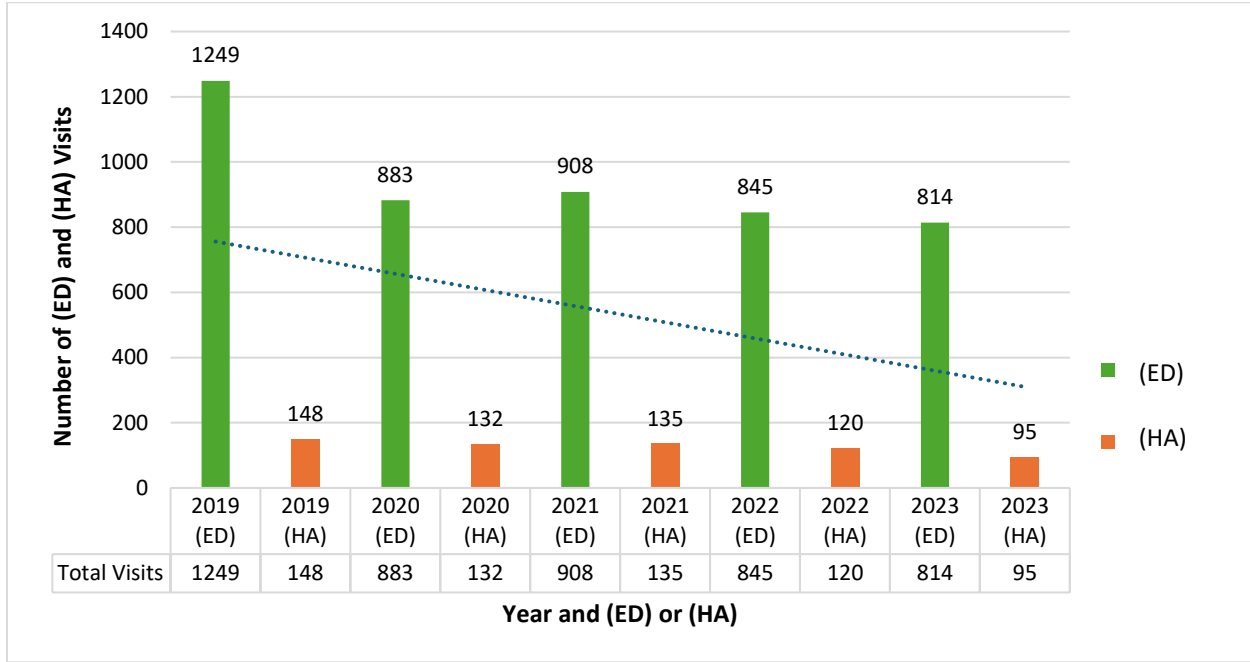


The Path Forward

- Strengthen and support public information campaigns
- Support local health departments and community partners
- Encourage CO detector awareness
- Strengthen interagency coordination
- Promote continued CO surveillance efforts

Emergency Department (ED) and Hospital Admittance (HA) Visits Reported in Illinois: 2019-2023

Table 1: Number of Emergency Department (ED) and Hospital Admittance (HA) Visits Reported as Being Treated for Unintentional Carbon Monoxide Exposure by Year in Illinois, 2019-2023



Data Source: Illinois Department of Public Health: syndromic surveillance data 2019-2023, accessed 3/17/2025 from IL ESSENCE.

Table 1 shows annual trends in Emergency Department visits and Hospital Admittances for unintentional Carbon Monoxide (CO) exposure from 2019 to 2023. Unintentional exposure refers to incidents where individuals were unknowingly exposed to CO due to factors such as faulty appliances, improper ventilation, incorrect use of gas-powered or smoke-producing equipment (e.g., gas-powered saws and BBQ grills), or accidental exposure to vehicle emissions, rather than intentional actions and sources. Most admittances are first seen in the ED data.

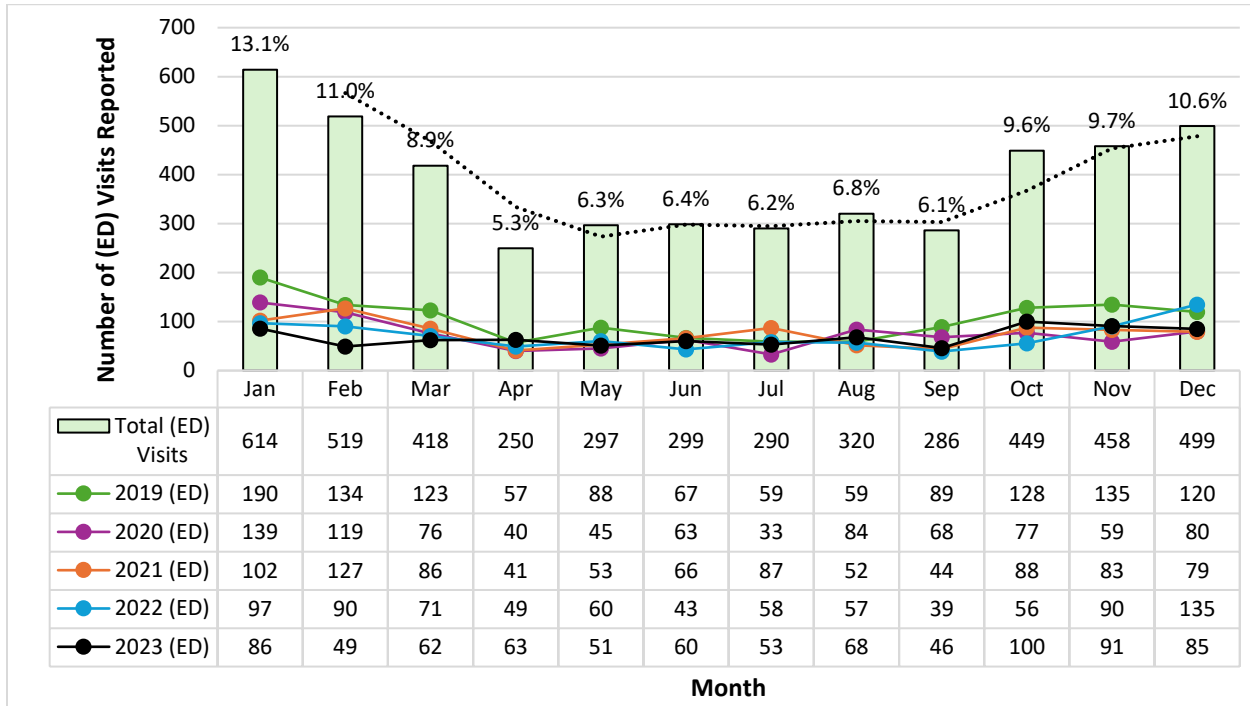
Emergency Department (ED) Visits:

- The total number of Emergency Department visits for unintentional carbon monoxide (CO) exposure over the five-year period was 4,699, with an annual average of approximately 940 visits.
- The highest number occurred in 2019 (1,249 visits; 27%) and the lowest number of visits took place in 2023 (814 visits; 17%).

Hospital Admittance (HA) Visits:

- A total of 630 hospital admittances were reported from 2019–2023, with an annual average of 126 visits.
- Hospital Admittances had the highest count of visits reported in 2019 (148 visits; 23%) and had the lowest reported number of 95 (HA) visits in 2023 (15%).

Table 2: Number of Emergency Department (ED) Visits Reported as Being Treated for Unintentional Carbon Monoxide Exposure by Month in Illinois, 2019-2023



Data Source: Illinois Department of Public Health: syndromic surveillance data 2019-2023, accessed 3/17/2025 from IL ESSENCE.

Table 2 shows annual monthly trends in Emergency Department visits for unintentional carbon monoxide (CO) exposure from 2019 to 2023.

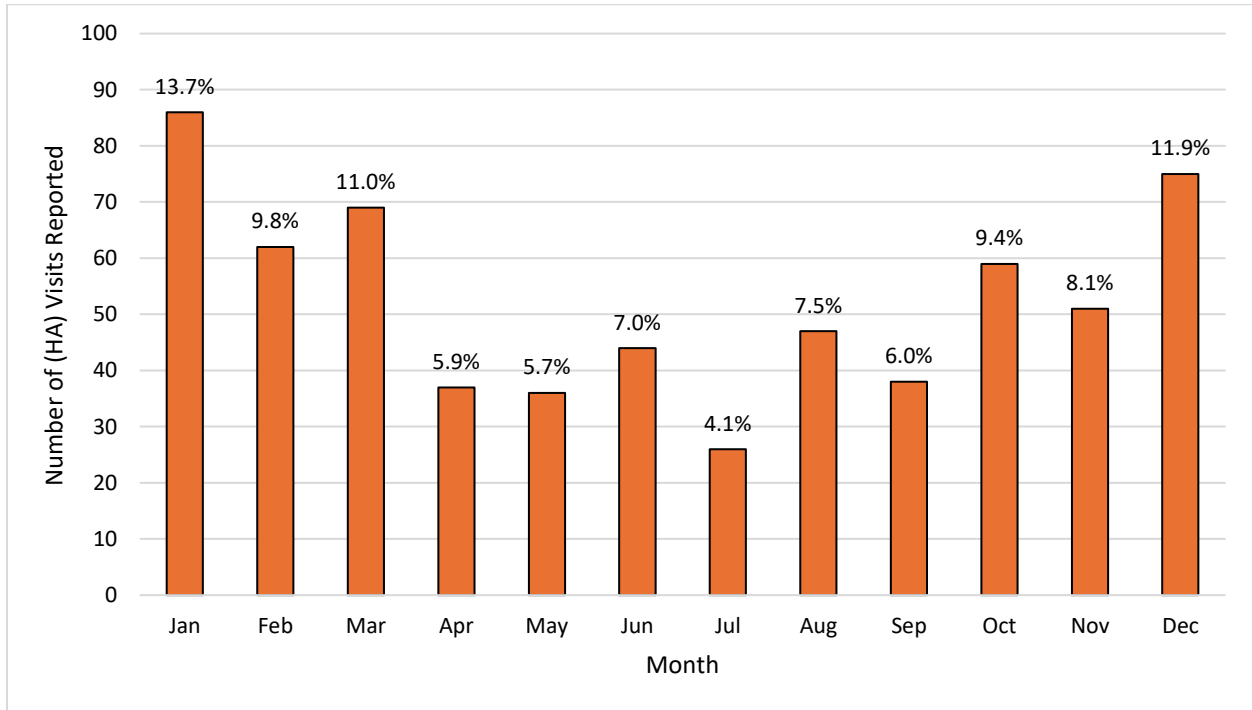
Seasonal Trends and Peak Months:

- Emergency Department (ED) visits for unintentional carbon monoxide (CO) exposure show a strong seasonal pattern, with 62.9% occurring in late fall through early spring months (October–March). January consistently had the highest ED visits (614; 13.1%), followed by February (519; 11.0%), December (499; 10.6%), November (458; 9.7%), October (449; 9.6%), and March (418; 8.9%).

Lowest Case Volumes:

- Emergency Department visits were lowest from April to September (5.3%–6.8% of total visits per month).

Table 3: Number of Hospital Admittance (HA) Visits Reported as Being Treated for Unintentional Carbon Monoxide Exposure by Month in Illinois, 2019-2023



Data Source: Illinois Department of Public Health: syndromic surveillance data 2019-2023, accessed 3/17/2025 from IL ESSENCE.

Table 3 presents the number of hospital admittances for unintentional carbon monoxide (CO) exposure by month in Illinois from 2019 to 2023, based on data from the Illinois Department of Public Health's ESSENCE database.

Seasonal Trends and Peak Months:

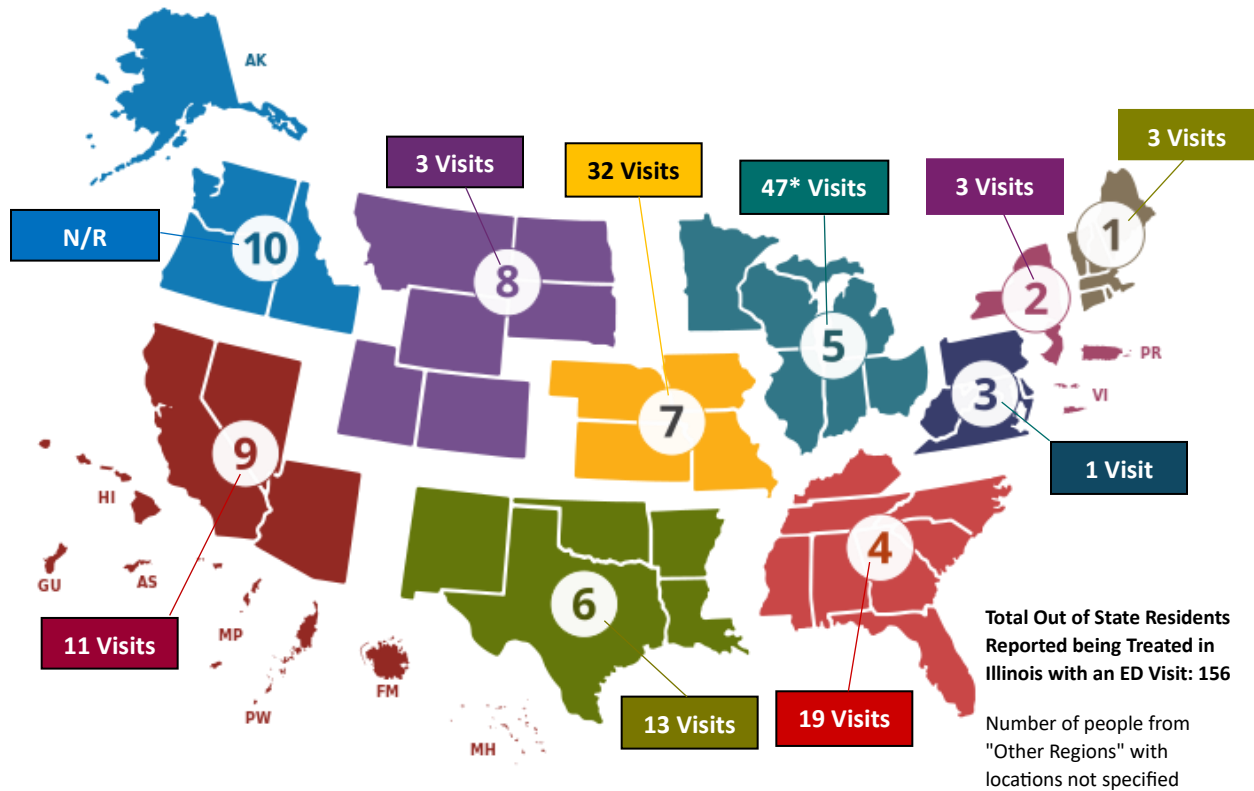
- A seasonal pattern is evident in hospital admittances for unintentional carbon monoxide (CO) exposure. Nearly two-thirds (63.8%) of reported visits occurred between October and March, mirroring seasonal patterns observed in Emergency Department visits.

Lowest Case Volumes:

- Like ED visits, hospital admittances were lowest in April through September with 4.1% to 7.5% of visits per month occurring before the seasonal increase begins.

Distribution of Emergency Department (ED) Visits Treated in Illinois by National Health and Human Services (HHS) Regions 2019-2023

Figure 1: Emergency Department (ED) Visits Reported for Unintentional Carbon Monoxide Exposure by the 10 HHS Regions of Residence and “Other Regions” having been Treated in Illinois, 2019-2023



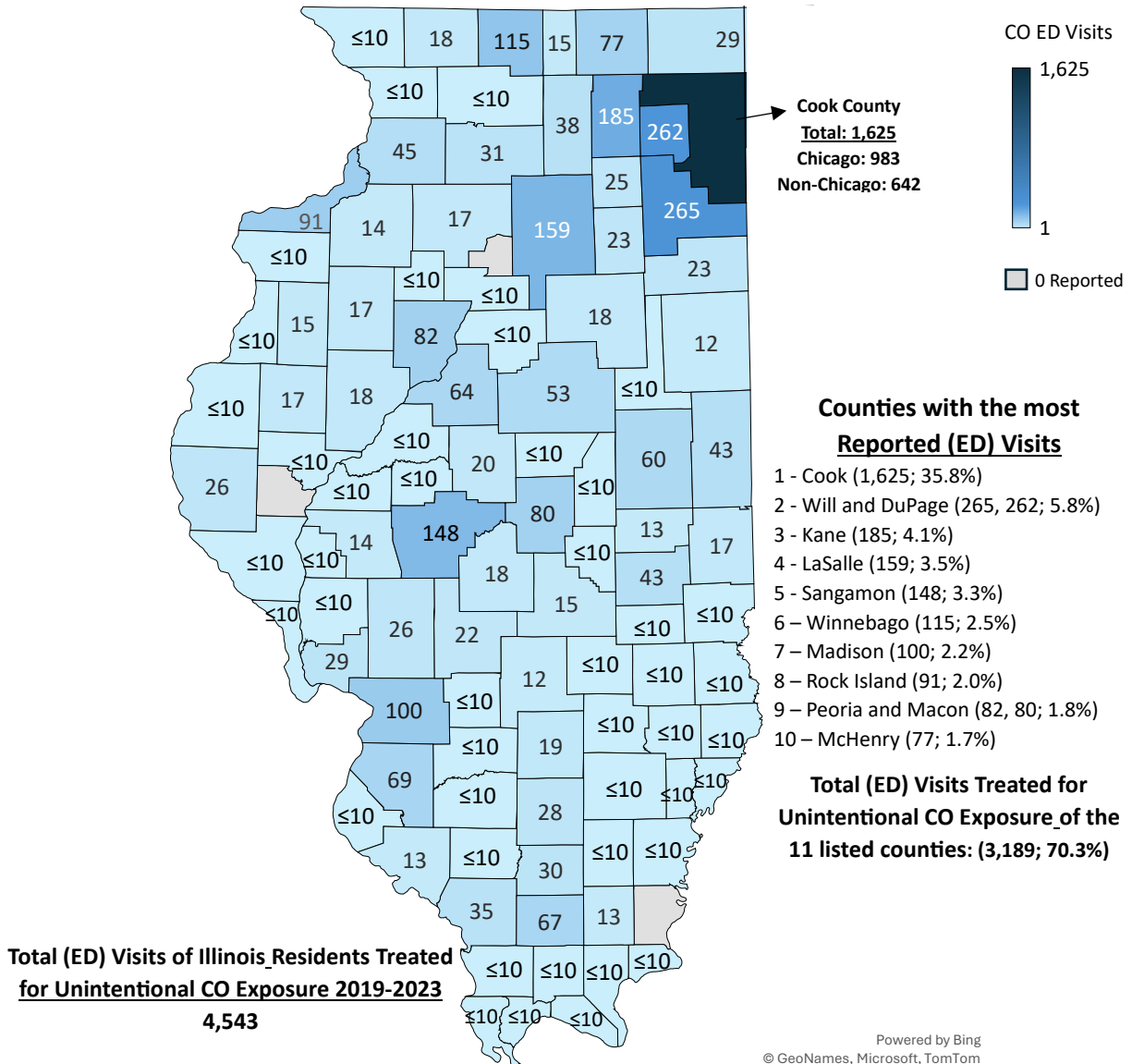
Data Source: ¹Illinois Department of Public Health: syndromic surveillance data 2019-2023, accessed 3/17/2025 from IL ESSENCE. ²U.S. Department of Health & Human Services, “HHS Regional Offices,” *HHS.gov*, accessed December 9, 2025. *Region 5’s total represents the total number of ED Visits after subtracting out those individuals who were reported to reside in Illinois.

Figure 1 highlights the importance of CO prevention efforts to raise awareness among both Illinois residents and non-residents who may be at risk while traveling through or staying in the state.

A total of 4,699 emergency department visits for unintentional carbon monoxide exposure were reported in Illinois, including 156 individuals (about 3.3%) whose residence was outside the state. Future research should aim to better understand the circumstances surrounding non-resident visits by collecting more detailed information on factors such as the purpose of travel, length of stay, and the specific environments where carbon monoxide exposure occurred. This could include identifying whether exposures happened in lodging facilities, recreational areas, businesses, vehicles, or other temporary settings. By gaining deeper insight into these contextual factors, researchers can better assess how travel and mobility patterns contribute to exposure risks. Such information will strengthen the ability to develop informed prevention strategies and enhance emergency preparedness for both residents and visitors in Illinois.

Distribution of Emergency Department (ED) Visits Treated in Illinois by County of Residence in Illinois: 2019-2023

Figure 2: Number of Emergency Department (ED) Visits Reported for Unintentional Carbon Monoxide Exposure of Illinois Residents by County of Residence in Illinois, 2019-2023



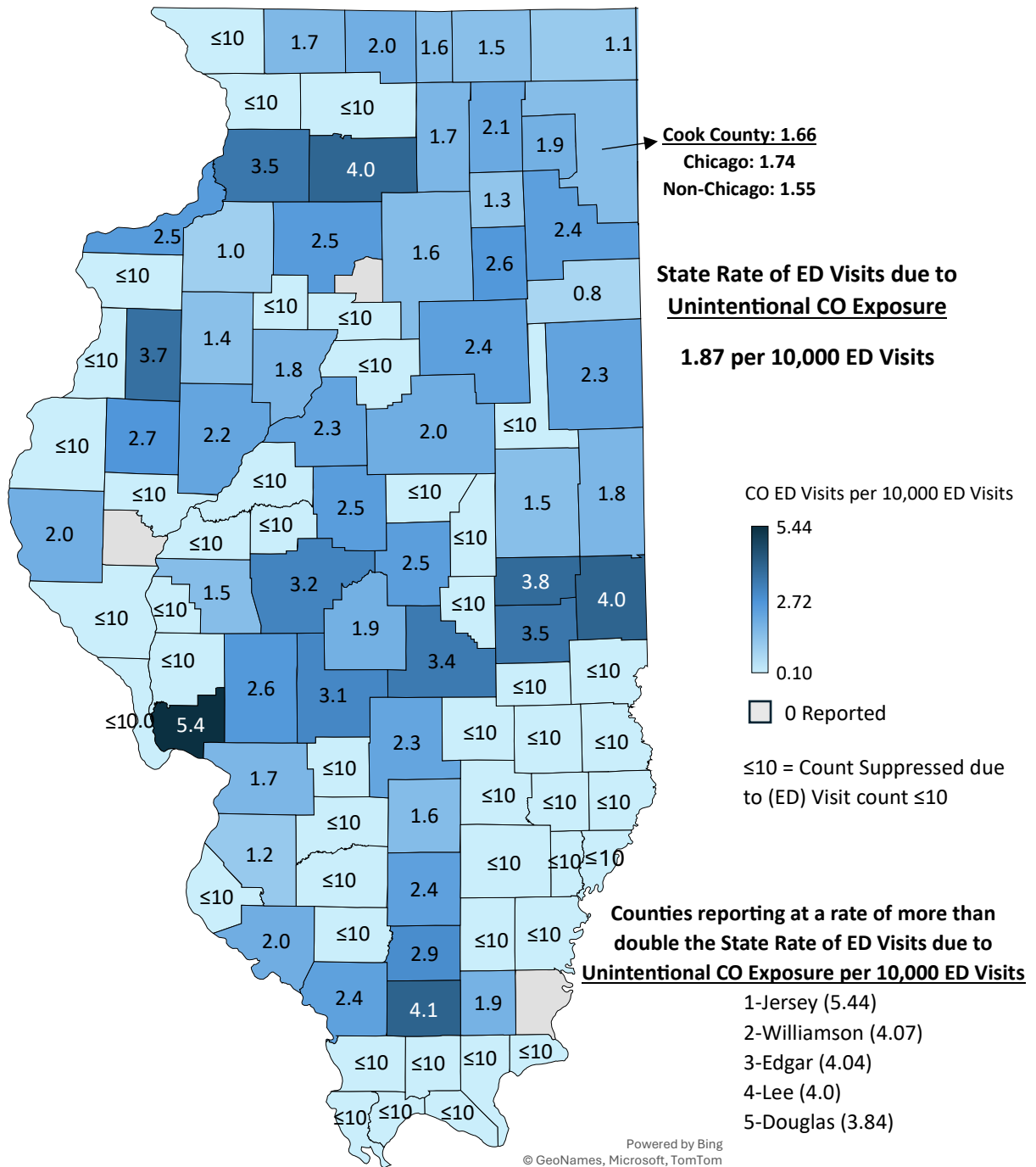
Data Source: Illinois Department of Public Health: syndromic surveillance data 2019-2023, accessed 3/17/2025 from IL ESSENCE.

Total ED Visits (Statewide): 4,543

Figure 2 presents all emergency department (ED) visits for carbon monoxide (CO) exposure among Illinois residents, categorized by county of residence. Counties were ranked by total case count from 2019 to 2023, with the top 12 counties highlighted due to ties for ranks two and nine. Together, these counties accounted for 70.3% of all statewide ED visits related to CO exposure.

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Figure 3: County-Level Emergency Department Visit Rates for Unintentional Carbon Monoxide Exposure per 10,000 Emergency Department Visits, 2019–2023.



Data Source: Illinois Department of Public Health: syndromic surveillance data 2019-2023, accessed 3/17/2025 and ED Visit data, accessed 1/6/2026 from IL ESSENCE.

From 2019 to 2023, Illinois reported a total of 4,543 emergency department visits due to unintentional carbon monoxide (CO) exposure among residents, with a statewide rate of 1.87 Unintentional CO related (ED) visits per 10,000 ED Visits.

County-level patterns of emergency department visits due to unintentional carbon monoxide exposure reveal notable geographic differences across Illinois. Jersey County demonstrated an elevated rate at 5.44 per 10,000 ED visits. Several additional counties, including Williamson (4.07), Edgar (4.04), Lee (4.00), and Douglas (3.84), reported rates exceeding twice the state rate.

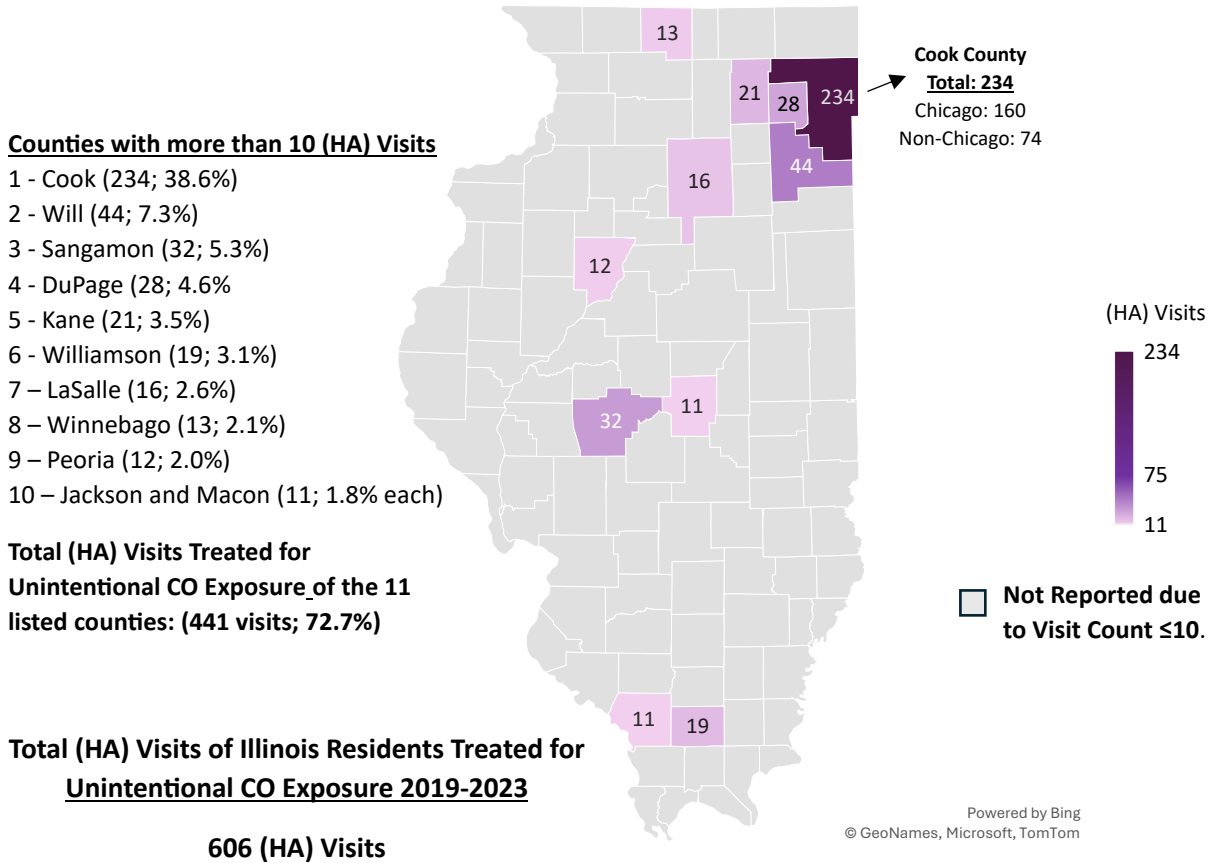
These findings highlight areas of heightened vulnerability and underscore the importance of localized surveillance. By identifying counties with disproportionately high rates of carbon monoxide related ED visits, public health agencies can better focus prevention efforts, enhance community education, and deploy targeted interventions aimed at reducing exposure and preventing avoidable illness statewide.

Data Limitations: These findings are subject to limitations inherent in hospital-based surveillance data. The analysis includes only emergency department visits reported by hospitals within Illinois and does not capture Illinois residents who may have sought medical care in neighboring states. As a result, rates for border counties may be underestimated, particularly in areas where residents commonly cross state lines to access healthcare services. Additionally, variations in hospital reporting practices and coding accuracy may affect the completeness and consistency of the data. These limitations should be considered when interpreting county-level differences in emergency department visit rates due to unintentional carbon monoxide exposure.



Distribution of Hospital Admittance (HA) Visits Treated in Illinois by County of Residence in Illinois: 2019-2023

Figure 4: Number of Hospital Admittance (HA) Visits Reported for Unintentional Carbon Monoxide Exposure of Illinois Residents by County in Illinois, 2019-2023



Data Source(s): Data Source: Illinois Department of Public Health: syndromic surveillance data 2019-2023, accessed 3/17/2025 from IL ESSENCE.

Total HA Visits (Statewide): 606

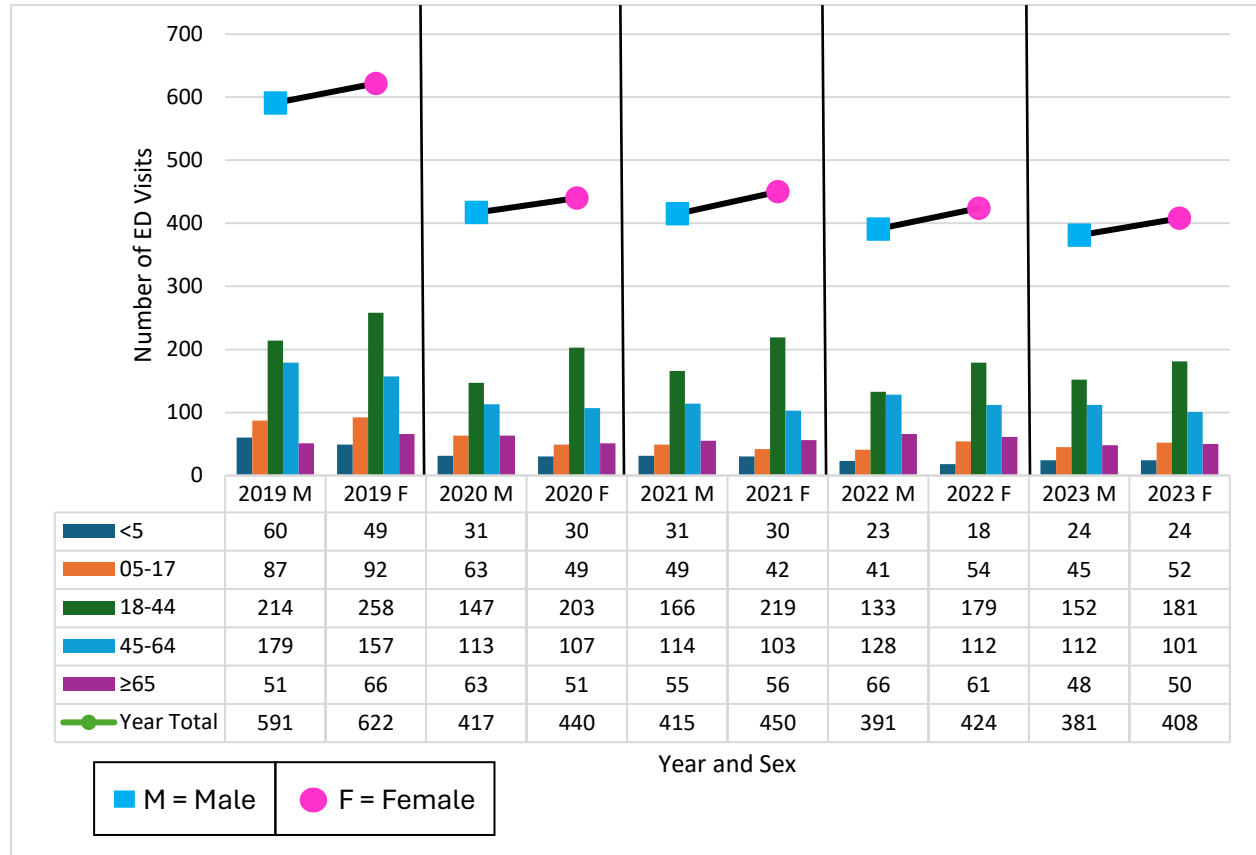
Figure 4 displays all unintentional carbon monoxide (CO) hospital admittances among Illinois residents from 2019 to 2023, organized by county of residence. Counties are ranked by total visit count, with the top 11 included due to a tie at the 10th position. These counties collectively account for 72.7% of all CO-related hospital admittances statewide, highlighting geographic concentrations of severe visits.

Observations:

Although hospital admittances occurred across much of the state, the concentration of visits in a few counties emphasizes the importance of using hospitalization data to guide public health planning. These findings can inform hospital system preparedness, help assess local capacity to manage CO-related incidents, and support more efficient allocation of resources and emergency response planning. Understanding where the burden of severe CO exposure is highest enables better support for both acute care response and long-term prevention infrastructure at the local level.

Age and Sex Specific Trends in CO Exposure (ED) Visits

Table 4: Number of Emergency Department (ED) Visits Reported for Unintentional CO Exposure by Year, Age, and Sex Treated in IL, 2019-2023



Data Source: Illinois Department of Public Health: syndromic surveillance data 2019-2023, accessed 3/17/2025 from IL ESSENCE.

Between 2019 and 2023, a total of 4,543 emergency department (ED) visits were reported having treated residents of Illinois for unintentional carbon monoxide (CO) exposure. However, rates varied across age groups and by sex, highlighting key populations at increased risk. The total presented in this graph equals 4,539 visits as four visits did not report age or sex.

Age Specific Trends

Table 5: Age Specific Trends in Carbon Monoxide Exposure ED Visits Treated in Illinois, 2019-2023

Age Group in Years	Total CO ED Visits	Rate per 10,000 ED Visits	Rate to State per 10,000 ED Visits
<5	320	2.00	1.10x
5–17	574	2.47	1.36x
18–44	1,852	2.04	1.12x
45–64	1,226	2.02	1.11x
≥65	567	0.96	0.53x
State Total	4,539	1.82	1.00x

Data Source: Illinois Department of Public Health: syndromic surveillance data 2019-2023, accessed 3/17/2025 and ED Visit data, accessed 1/6/2026 from IL ESSENCE.

During the surveillance period, 4,539 emergency department (ED) visits for unintentional carbon monoxide (CO) exposure were reported in Illinois. When standardized to overall ED utilization, the statewide rate was 1.82 CO-related ED visits per 10,000 ED visits.

Age-specific analysis showed clear differences in the proportion of CO-related ED visits across age groups. Children and adolescents experienced the highest relative rates, with individuals aged 5–17 years showing the highest rate overall (2.47 per 10,000 ED visits), which was 36% higher than the state average. Children under 5 years of age also had elevated rates (2.00 per 10,000 ED visits), exceeding the statewide rate by approximately 10%.

Adults represented a substantial share of CO-related ED visits and also experienced elevated rates. Adults aged 18–44 years and 45–64 years accounted for the largest number of visits and had rates of 2.04 and 2.02 per 10,000 ED visits, respectively. These rates were comparable to, and slightly higher than, those observed among children under 5 years of age and exceeded the state average. In contrast, adults aged 65 years and older had the lowest relative rate (0.96 per 10,000 ED visits), approximately half the statewide rate.

Overall, these findings indicate that, while children and adolescents are disproportionately affected by unintentional CO exposure, working-age adults also experience a meaningful burden, both in terms of visit volume and rates above the state average. Using ED-based surveillance to examine CO-related visits relative to total ED utilization provides important insight into age-specific risk and supports prevention strategies across the lifespan, including household CO detector use, public education, and seasonal risk communication.

Table 6: Sex Specific Trends in Carbon Monoxide Exposure ED Visits Treated in Illinois, 2019-2023

Age Group	Male Visits	Female Visits	Total Visits	% Male	% Female
<5	169	151	320	52.8%	47.2%
5–17	285	289	574	49.7%	50.3%
18–44	812	1,040	1,852	43.8%	56.2%
45–64	646	580	1,226	52.7%	47.3%
65+	283	284	567	49.9%	50.1%
State Total	2,195	2,344	4,539	48.4%	51.6%

Data Source: Illinois Department of Public Health: syndromic surveillance data 2019-2023, accessed 3/17/2025 from IL ESSENCE.

Sex Specific Trends

Between 2019 and 2023, Illinois recorded 4,539 emergency department (ED) visits for unintentional carbon monoxide exposure with documented sex and age; 4 additional visits were excluded because sex or age was not reported. Of these, 2,344 visits (51.6%) occurred among females and 2,195 visits (48.4%) among males, reflecting a nearly even distribution of CO-related ED visits by sex.

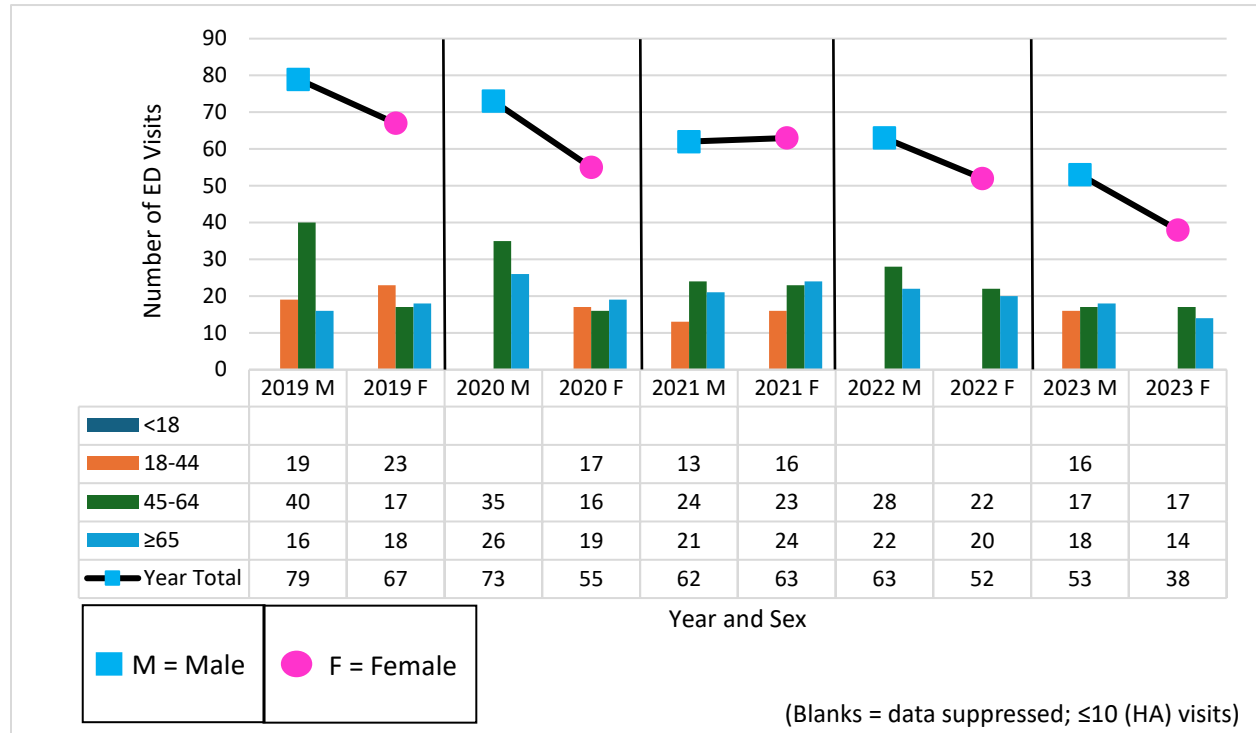
While overall sex differences were modest, more detailed analysis by age group reveals meaningful patterns:

- Among adults aged 18–44, females accounted for 56.2% of visits, the highest proportion of female visits across all age groups.
- In contrast, males accounted for most visits (646; 52.7%) in the 45–64 age group.
- Youth aged 5-17 had nearly equal distribution between males and females with females having only four more reported ED visits than males.
- Children less than 5-years-old had more male (169; 52.8%) visits reported than female (151; 47.2%).
- Among adults aged 65 and older, the visit distribution was almost equal, with 49.9% male and 50.1% female.

Although sex disparities were not extreme, these differences highlight the value of demographically detailed data for targeting public health interventions. Understanding who is most affected, and in what contexts, can help inform age- and sex-appropriate education, prevention strategies, and response planning for carbon monoxide exposure across Illinois communities.

Age and Sex Specific Trends of Carbon Monoxide Exposure (HA) Visits

Table 7: Number of Hospital Admittance (HA) Visits Reported for Unintentional CO Exposure by Year, Age, and Sex Treated in IL, 2019-2023



Data Source: Illinois Department of Public Health: syndromic surveillance data 2019-2023, accessed 3/17/2025 from IL ESSENCE.

From 2019 through 2023, Illinois recorded 606 hospital admittance (HA) visits related to unintentional carbon monoxide (CO) exposure. Analysis of these hospitalizations by age group and sex reveals differences in hospitalization patterns, indicating that the burden of severe CO exposure is not evenly distributed across the population. Certain demographic groups experienced higher numbers of hospital admittance visits, suggesting increased vulnerability or severity of exposure.

As shown in Table 7, a total of 605 HA visits are presented in the analysis; one hospitalization was excluded due to missing age or sex information. Cells with ten or fewer hospital admittances are suppressed in the table to protect patient confidentiality, consistent with data privacy standards.

Age Specific Trends

Table 8: Age Specific Trends in (HA) Carbon Monoxide Exposure Visits Treated in Illinois, 2019-2023

Age Group in Years	Total CO HA Visits	CO (HA) Visits per 10,000 HA Visits	Rate to State per 10,000 HA Visits
<18	31	0.49	0.51x
18–44	137	0.94	0.99x
45–64	239	1.54	1.61x
≥65	198	0.74	0.77x
Total	605	0.96	1.00x

Data Source: Illinois Department of Public Health: syndromic surveillance data 2019-2023, accessed 3/17/2025 and ED Visit data, accessed 1/6/2026 from IL ESSENCE.

Sex Specific Trends

Table 9: Sex Specific Trends in (HA) Carbon Monoxide Exposure Visits Treated in Illinois, 2019-2023

Age Group	Male Visits	Female Visits	Total Visits	% Male	% Female
<18	16	15	31	51.6%	48.4%
18–44	67	70	137	48.9%	51.1%
45–64	144	95	239	60.3%	39.7%
65+	103	95	198	52.0%	48.0%
Total	330	275	605	54.5%	45.5%

Data Source: Illinois Department of Public Health: syndromic surveillance data 2019-2023, accessed 3/17/2025 from IL ESSENCE.

Age and Sex Trends in Hospital Admittance Visits Due to Unintentional CO Exposure

From 2019 through 2023, Illinois recorded 605 hospital admittance (HA) visits related to unintentional carbon monoxide (CO) exposure with complete age and sex information. When standardized to overall hospital admittances, the statewide rate was 0.96 CO-related HA visits per 10,000 HA visits.

Age-specific analysis revealed differences in the relative burden of CO-related hospitalizations.

- Adults aged 45–64 years accounted for the highest number of hospital admittances, with 239 HA visits, and experienced the highest relative rate at 1.54 CO-related HA visits per 10,000 HA visits. This rate was 61% higher than the statewide average, indicating a disproportionate burden of more severe CO exposure requiring hospitalization in this age group. Among these admittances, males represented 60.3% (144 visits) and females 39.7% (95 visits), suggesting a higher hospitalization burden among men.
- Adults aged 65 years and older had the second-highest number of hospital admittances, with 198 HA visits, but a lower relative rate (0.74 per 10,000 HA visits) compared with the state overall. The sex distribution in this age group was comparable, with 103 male visits (52.0%) and 95 female visits (48.0%), indicating similar, but slightly elevated hospitalization patterns of males than females among older adults.
- Among adults aged 18–44 years, there were 137 CO-related hospital admittances, corresponding to a rate of 0.94 per 10,000 HA visits, which was comparable to the statewide rate.

Hospitalizations in this age group were evenly distributed by sex, with 67 male visits (48.9%) and 70 female visits (51.1%), reflecting a shared burden between males and females.

- Children and adolescents aged under 18 years experienced the fewest CO-related hospital admittances, with 31 HA visits, and the lowest relative rate at 0.49 per 10,000 HA visits, approximately half the statewide rate. Admittances in this group were similarly distributed between males (51.6%) and females (48.4%).

Across all age groups, due to unintentional carbon monoxide exposure, males accounted for 330 hospital admittance visits (54.5%), while females accounted for 275 hospital admittance visits (45.5%). The higher proportion of male hospitalizations observed, particularly among middle-aged and older adults, may reflect differences in exposure circumstances, severity of illness, occupational, or health seeking factors. Continued surveillance of CO-related hospital admittance visits, standardized to overall hospital utilization, is essential for identifying populations at increased risk of severe CO exposure and for informing targeted prevention and intervention strategies.

Informing Prevention: Demographic Trends in Unintentional Carbon Monoxide Exposure, ED Visits, and Hospital Admittance Visits

Surveillance of emergency department (ED) visits and hospital admittance visits (HA) for unintentional carbon monoxide (CO) exposure in Illinois from 2019 through 2023 highlights important distinctions between patterns of exposure and clinical severity. Combining ED- and HA- based data provides a deeper understanding of populations experiencing CO exposure and those at greatest risk for severe outcomes.

- Adults aged 18–44 years accounted for the largest number of CO-related ED visits, reflecting an elevated burden of exposure in this group. Despite this high volume of ED visits, hospital admittance visits were comparable to the statewide average, suggesting that many exposures did not result in severe illness requiring inpatient care. ED visits in this age group were slightly more frequent among females, whereas hospitalizations were nearly evenly distributed between sexes.
- In contrast, adults aged 45–64 years experienced the largest share of unintentional CO hospital admittance visits and had the highest rate of hospitalizations relative to all admittances statewide, exceeding the statewide rate by more than 60%. Males accounted for most hospitalizations, indicating potential differences in exposure intensity, occupational or environmental risk, healthcare seeking behaviors, or severity at presentation. Adults aged 65 years and older also contributed considerably to hospital admittance visits, with slightly more males than females, though their hospitalization rate was lower than the statewide average.
- Children and adolescents experienced elevated rates of CO-related ED visits, particularly those aged 5–17 years, yet hospital admittances were rare among individuals under 18. This pattern suggests that pediatric exposures are often identified and managed in the ED without progression to severe illness, potentially reflecting early detection, heightened caregiver vigilance, or lower-intensity exposures.

Across all age groups, males accounted for a larger share of hospital admittance visits, particularly among adults aged more than 45 years, reflecting a higher likelihood of severe outcomes in this population. In contrast, females were slightly more likely than males to seek care in the ED, highlighting that patterns of exposure and healthcare utilization may differ by sex. These findings underscore the value of integrating multiple surveillance measures to differentiate between frequent exposure and risk of severe illness.

Taken together, these results support targeted prevention strategies. ED-based surveillance identifies populations where CO exposure is most frequent, while hospital admittance visit data reveal groups at higher risk for severe outcomes. Using both sources allows public health interventions to be more effectively tailored, including education on CO risks, promotion of household CO detectors, occupational safety initiatives, and seasonal outreach to reduce exposures and prevent serious health consequences across all affected populations.

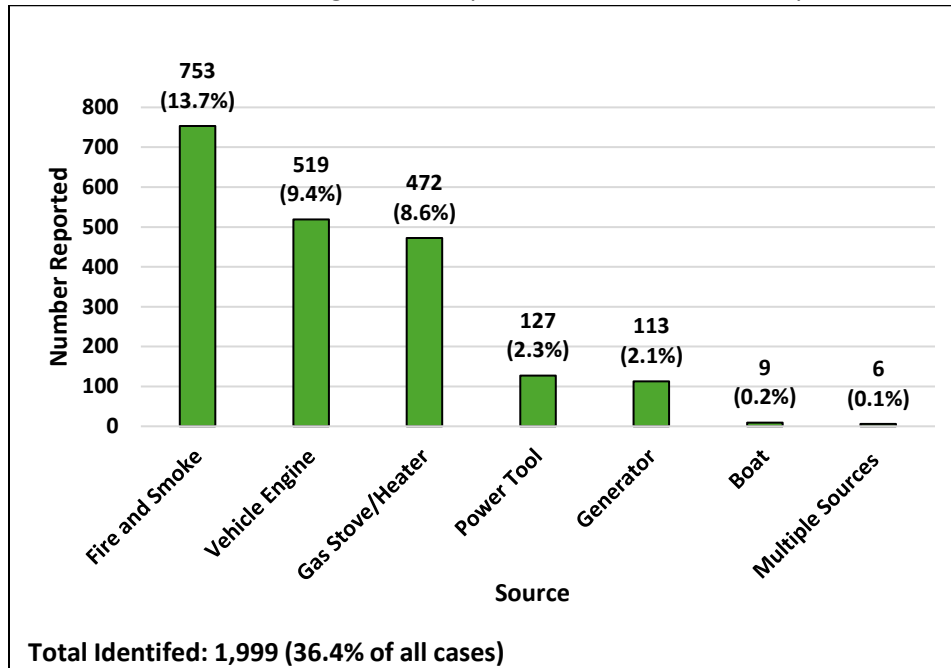


Identified Sources of Unintentional Carbon Monoxide Exposure

Between 2019 and 2023, a total of 5,493 carbon monoxide (CO) exposure visits were treated in some capacity in Illinois hospitals with a record that included a triage surveillance note. Of these, 1,999 visits (36.4%) included identification of a known source of the unintentional CO exposure.

The remaining 3,494 visits (63.6%) lacked sufficient detail to determine a definitive exposure source. Improved documentation practices are needed.

Table 10: Distribution of Identified Categories of Reported Unintentional CO Exposures



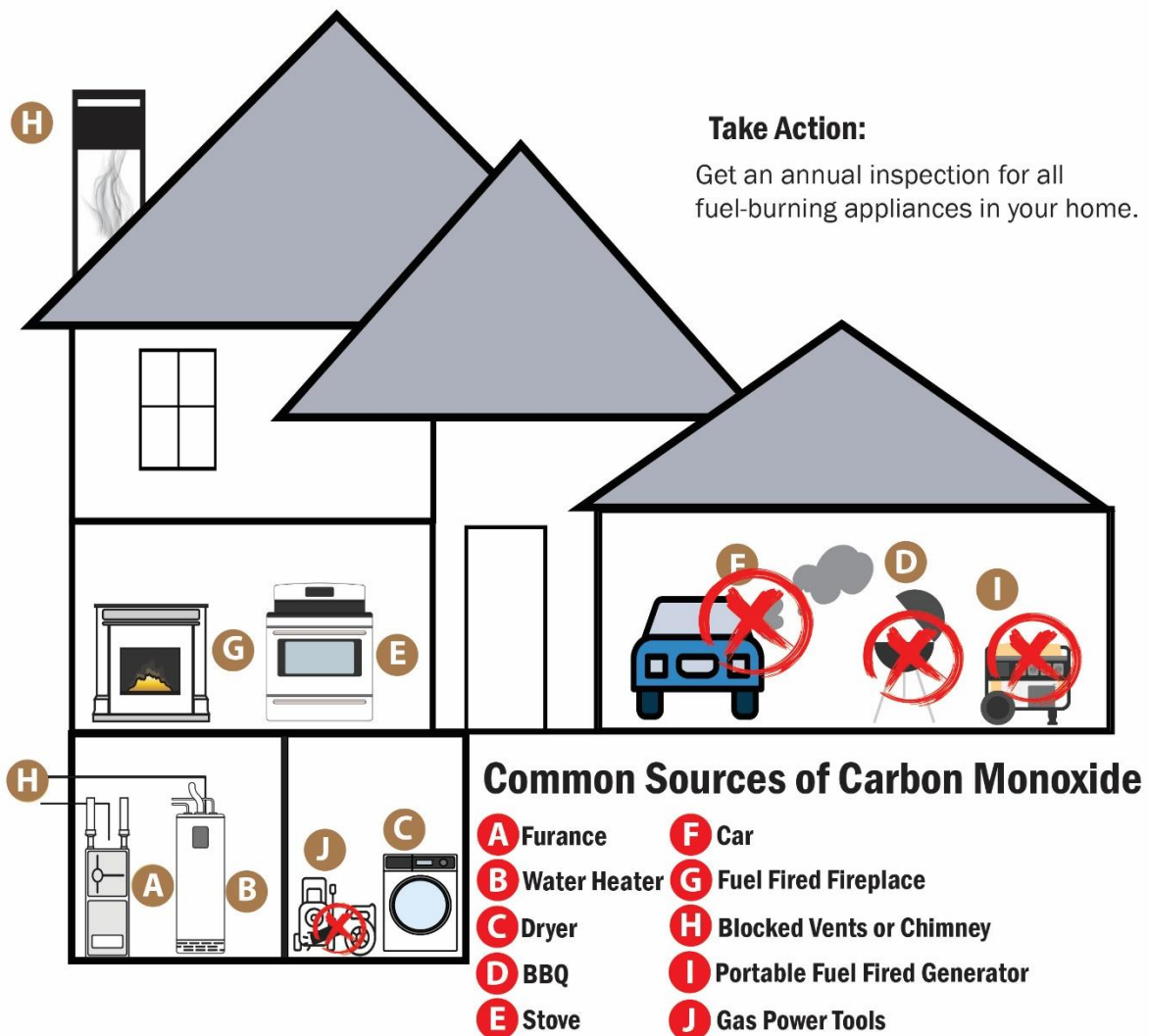
Data Source: Illinois Department of Public Health: syndromic surveillance data 2019-2023, accessed 3/17/2025 from IL ESSENCE.

Total Unintentional Exposure Visits: 5,493

- Fire and Smoke:** Accounting for 753 exposures and representing 13.7% of all reported carbon monoxide visits, this category includes incidents involving not only structure fires, but also other exposure sources such as vehicle fires producing smoke during normal operation or after being involved in an accident, improper use of wood burning fireplaces and furnaces without proper ventilation or malfunctioning equipment releasing CO into the home, and charcoal grills being used within enclosed areas for cooking, such as in a garage, or as a source of heat and placed within the home's living area.
- Vehicle Engine:** A total of 519 visits (9.4% of all visits) are attributed to vehicle exhaust exposures which encompasses cars, trucks, tractors, forklifts, and similar vehicles while in an enclosed space or during normal operations with a malfunctioning exhaust.
- Gas Stove/Heater:** Comprising 472 visits (8.6% of all visits), this category refers to exposures from malfunctioning gas ovens, gas stoves, water heaters, gas furnaces, gas grills, and related appliances.

- **Power Tools:** Associated with 127 visits (2.3% of all visits), this category includes exposures involving power washers, saws, and other gas-powered tools being used in unventilated and enclosed areas including, basements and garages.
- **Generators:** There are 113 visits (2.1% of all visits) linked to improper generator use, either within enclosed areas of the home such as basements and garages, or without proper ventilation too close to the structure, such as near an open window.
- Visits involving **multiple sources**, including boats and mixed exposures, total 15, representing less than 1% of reported visits.

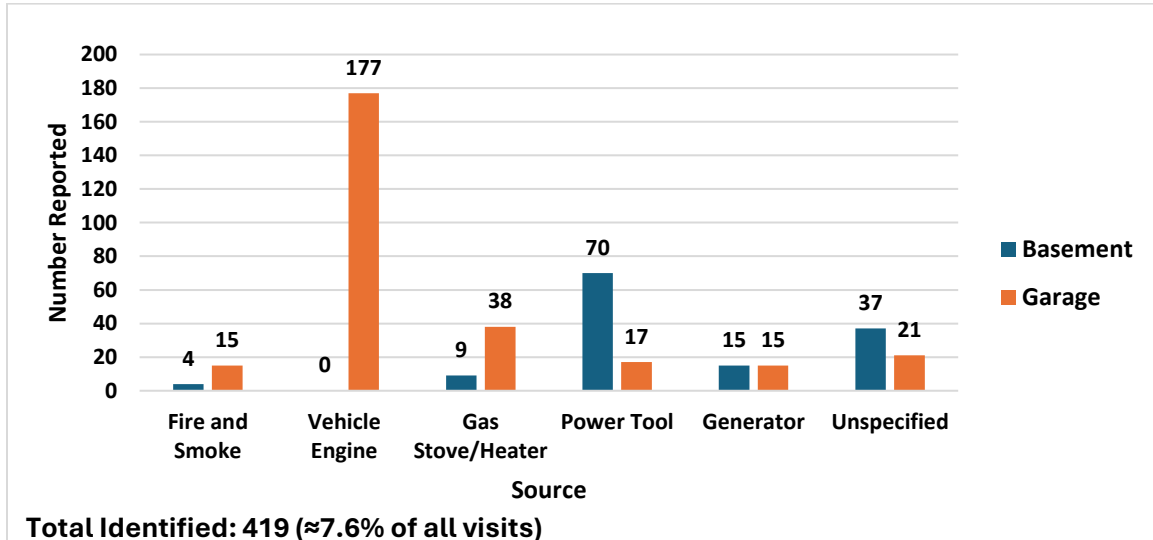
Figure 5: Common Sources and Locations of Carbon Monoxide Exposure in a Residential Home



Identified Locations (Basement or Garage) of Reported CO Exposure Sources

Table 11 presents a focused subset of 419 carbon monoxide (CO) exposure visits, about 7.6% of all Emergency Department and Hospital Admittance visits, where the known source was specifically reported and identified as being in a basement or garage during triage note review. This analysis, drawn from the 1,999 total known source visits, highlights common exposure sources such as vehicles, generators, gas appliances, and power tools, and reveals patterns in how frequently these sources are associated with basement and garage settings.

Table 11: Carbon Monoxide Exposure Visits by Source and Known Location of Incident



Data Source: Illinois Department of Public Health: syndromic surveillance data 2019-2023, accessed 3/17/2025 from IL ESSENCE.

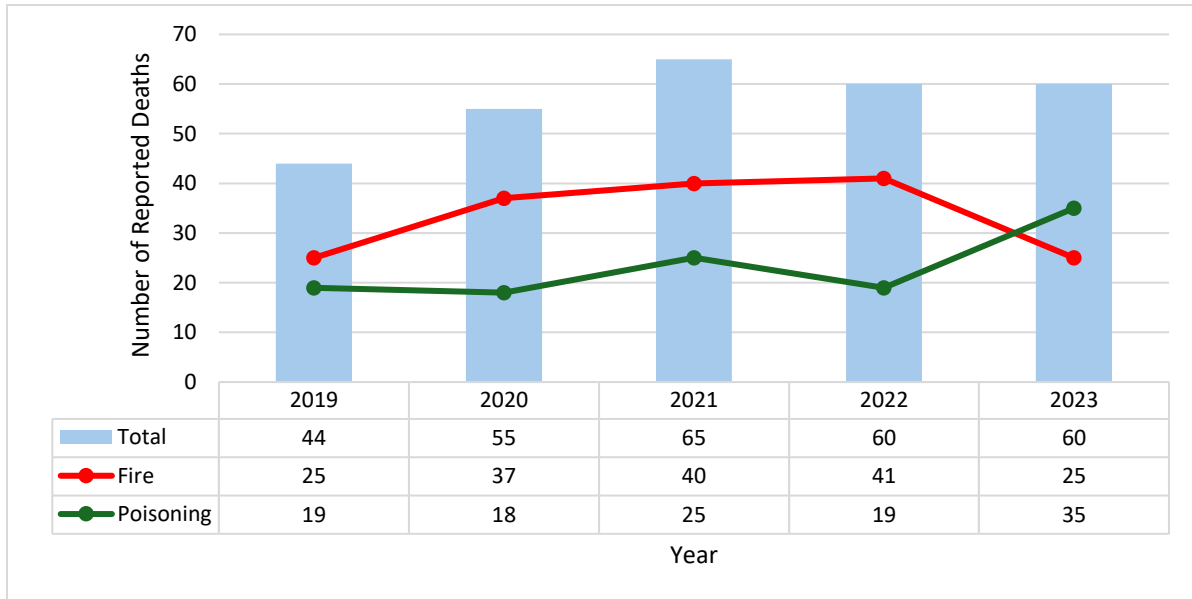
Garage related exposures (n=284, 68%) were identified more often than basement-related exposures (n=135, 32%). Vehicle engines were the most frequent source of CO exposure in garages, responsible for 177 visits (42%) of all basement and garage incidents. This finding highlights the continued risk of running vehicles in enclosed or attached spaces. In comparison, power tools, such as gas-powered equipment, were the leading source of CO exposure in basements, accounting for 70 visits (52%) of all basement incidents.

Gas stoves or heaters accounted for 47 visits (11%), most occurring in garages (38 visits, 81%), Generators were identified in 30 visits (7%), evenly split between basements (15) and garages (15), showing that unsafe operation occurs in both settings. Fires or smoke were linked to 19 visits (5%), primarily in garages (15 visits, 79%). Unspecified sources made up 58 visits (14%), more often in basements (37) than garages (21), representing exposures where the exact CO source was not clearly identified.

This data shows clear differences in exposure patterns by location. Basement incidents were more often associated with stationary or gas power equipment, whereas garage incidents primarily involved vehicle engines and gas-powered heating equipment. These findings reinforce the need for ongoing public education about the dangers of operating fuel-burning devices in enclosed or attached spaces and the importance of maintaining working CO alarms in both garages and basements.

Deaths Involving Toxic Effects of Carbon Monoxide 2019-2023

Table 12: Accidental Deaths Involving Toxic Effects of Carbon Monoxide by Injury Mechanism, Illinois Residents, 2019-2023



Data Source: Illinois Department of Public Health: Vital Records 2019-2023. Provided 11/18/2025

Between 2019 and 2023, a total of 284 unintentional deaths involving the toxic effects of carbon monoxide (CO) were recorded among Illinois residents by Accidental Fire or Poisoning. Annual deaths ranged from a low of 44 in 2019 to a high of 65 in 2021.

Accidental Fire-Related Deaths (168 deaths):

Accidental fire-related CO deaths were the most frequently reported cause, totaling 168 deaths over the five years. Annual counts fluctuated between 25 and 41.

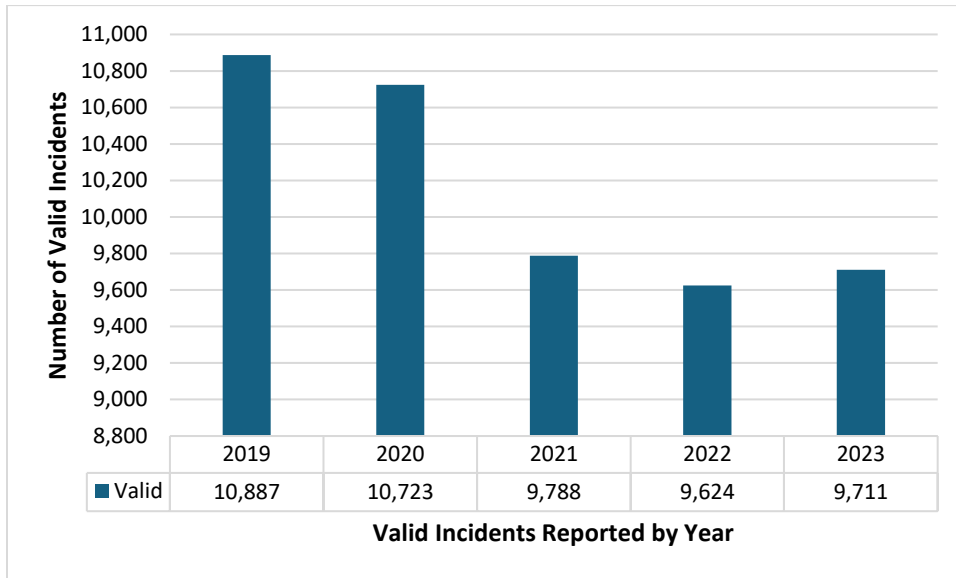
Accidental Poisoning Related Deaths (116 deaths):

There were 116 accidental CO-related deaths recorded during this five-year period. Most years reported between 18 and 25 deaths, with an increase in 2023 showing 35 deaths, the highest annual total in this timeframe. Accidental deaths may be related to improperly maintained or unvented appliances, gas powered equipment, etc.

Carbon Monoxide (CO) Exposure Incidents Reported to the National Fire Incident Reporting System (NFIRS) in Illinois: 2019–2023

Table 13 presents data on the number of *valid incidents* where carbon monoxide exposure was confirmed and reported by first responders, typically through the presence of elevated CO levels measured on-scene or through other credible indicators such as alarm activation or verified sources of CO. A total of 50,733 valid calls were reported over the 5-year period.

Table 13: Total Valid Incidents Reported by Year to the NFIRS for Carbon Monoxide Exposure in IL: 2019-2023



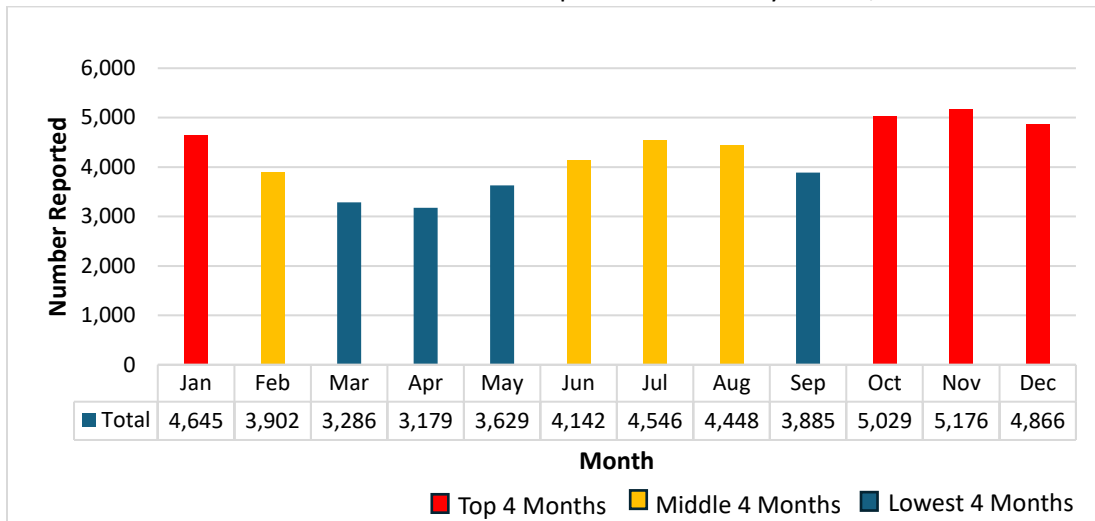
Data Source: National Fire Incident Reporting System 2019-2023

There was a 12.1% overall decline in validated carbon monoxide (CO) incidents over the five-year period, from 10,887 in 2019 to 9,711 in 2023.



CO Exposure Incidents by Month Reported to the NFIRS in IL: 2019-2023

Table 14: Total Illinois Carbon Monoxide Incidents Reported to NFIRS by Month, 2019-2023



Data Source: National Fire Incident Reporting System 2019-2023

Table 14 shows the 50,733 validated carbon monoxide (CO) incidents in Illinois (2019–2023) reported to the NFIRS, revealing consistent seasonal trends in emergency call volumes. A clear peak in reported incidents occurs during the fall and winter months, with the highest volumes in November, October, December, and January. These months collectively account for nearly 40% of all CO-related reports. This pattern aligns with increased reliance on heating systems, particularly gas-powered appliances, during colder weather. Improper installation, lack of maintenance, and poor ventilation are likely contributors to the increased risk of CO exposure during this period.

In addition to winter peaks, a notable secondary increase in incident volume is observed during the summer months, specifically June, July, and August. Although not as pronounced as the winter surge, this seasonal rise suggests that CO risks persist year-round and may be associated with alternative sources such as portable generators or fuel-powered tools systems in enclosed spaces.

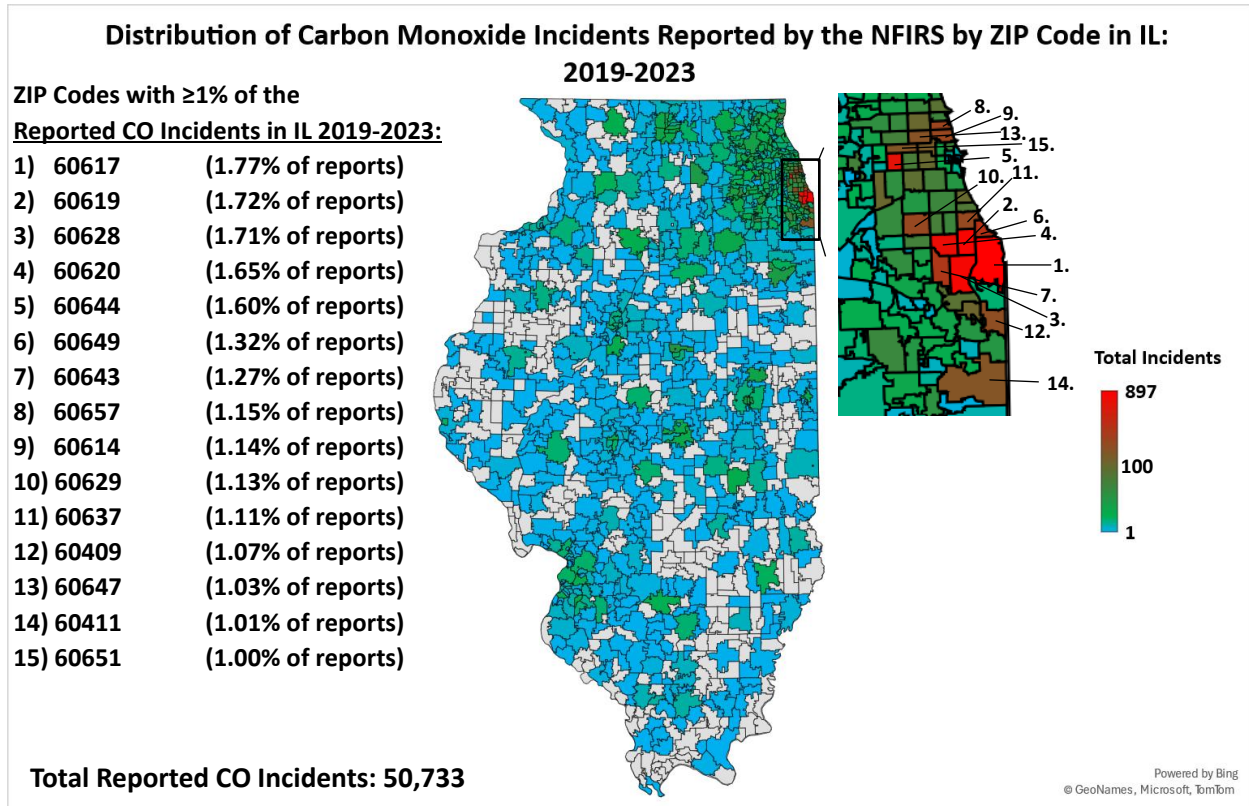
In contrast, the lowest number of incidents consistently occurs during the spring months (March through May), correlating with mild temperatures and reduced use of major CO-producing appliances.

Informing Prevention: Seasonal Trends in CO Exposure Call Volumes to Emergency Services

Findings from the data suggest opportunities to strengthen public safety efforts through seasonal and year-round prevention strategies. Public education campaigns may be particularly effective when timed for the late fall and early winter months, focusing on the importance of carbon monoxide alarm installation, heating system inspections, and the safe use of fuel-burning appliances. Given the consistent increase in incidents during summer, messaging could also address risks associated with generators, grills, and other equipment commonly used in warmer weather. Although seasonal peaks are evident, carbon monoxide exposure remains a year-round concern, and ongoing efforts to promote regular maintenance of combustion appliances and adequate ventilation are warranted.

CO Exposure Incidents by ZIP Code Reported to the NFIRS in IL: 2019-2023

Figure 6: Number of CO Incidents Reported to the NFIRS by ZIP Code in IL: 2019-2023



Data Source: National Fire Incident Reporting System 2019-2023

Between 2019 and 2023, carbon monoxide (CO) incidents were reported in 931 ZIP Codes across Illinois. A total of 50,733 incidents were recorded in the National Fire Incident Reporting System (NFIRS) during this period.

Figure 7 displays a heat map showing the distribution of incident calls by ZIP Code as reported to the NFIRS. The map highlights 15 ZIP Codes, each accounting for at least 1% of all carbon monoxide (CO) incidents statewide. Together, these ZIP Codes represent nearly 20% of all reported CO incidents in Illinois. Notably, 13 of the 15 ZIP Codes are located within the City of Chicago. This concentration reflects Chicago’s large population rather than an inherently higher risk of CO exposure. This interpretation is supported by examining the city’s emergency department (ED) visit rates: Chicago’s ED visit rate (1.77 per 10,000 ED visits) is less than the state rate (1.87 per 10,000 ED visits). Overall, these findings suggest that CO exposure risks are present across Illinois communities, urban and rural alike.

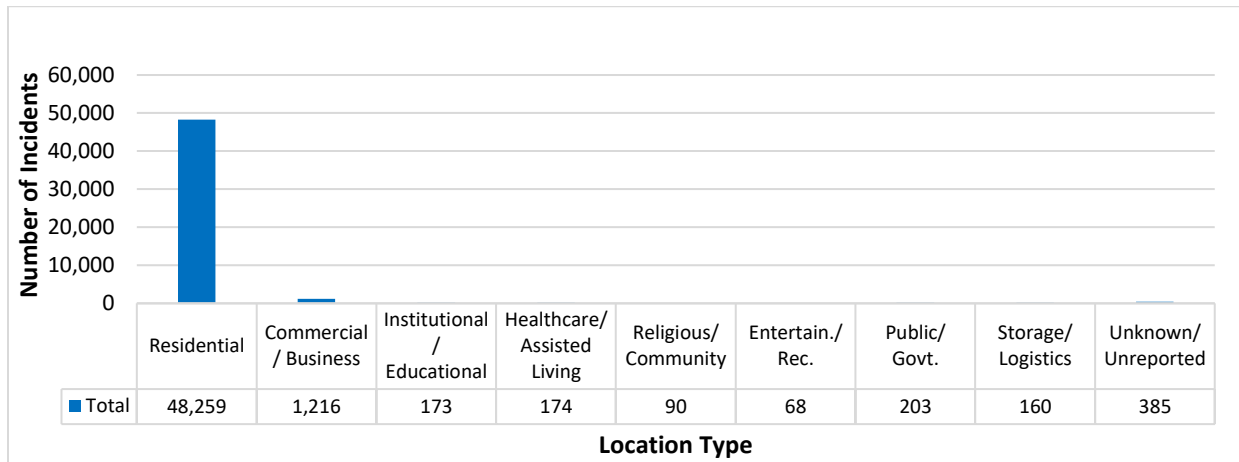
CO Incidents by Location Type Reported to the NFIRS in IL: 2019-2023

Tables 15 and 16 present the total carbon monoxide (CO) incidents reported to the NFIRS in Illinois from 2019 to 2023, categorized by location type.

- Table 15 includes all location types, including Residential.
- Table 16 shows the same data but excludes Residential locations.

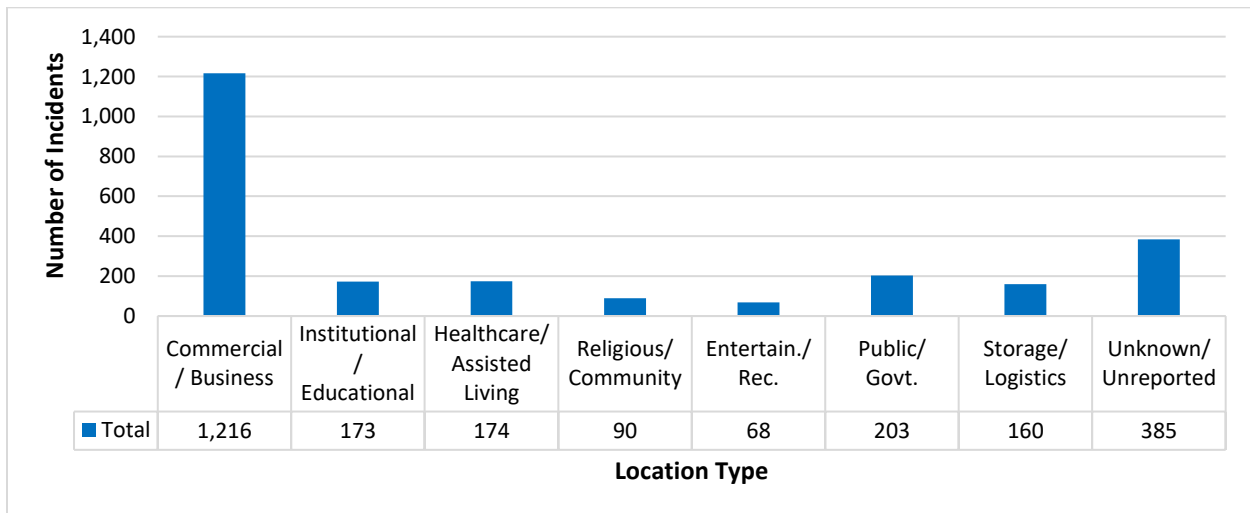
This separation was done to improve clarity. Because residential incidents account for most reports, its category visually overwhelmed the data from other location types.

Table 15: Total CO Incidents by Location Type Reported to the NFIRS for Carbon Monoxide Incidents in IL: 2019-2023.



Data Source: National Fire Incident Reporting System 2019-2023

Table 16: Total CO Incidents by Location Type, Excluding Residential, Reported to the NFIRS for Carbon Monoxide Incidents in IL: 2019-2023.



Data Source: National Fire Incident Reporting System 2019-2023

By removing Residential from Table 16, the distribution of CO incidents across non-residential settings becomes easier to interpret, while still highlighting the disproportionately high number of residential calls.

Total Valid Incidents (2019-2023): 50,733 incidents reported for carbon monoxide across various locations.

Residential areas consistently have the highest number of carbon monoxide incidents, accounting for over 95% of all incidents reported each year. Other location types, such as commercial, healthcare, and government, contributed a small fraction of the total reports.

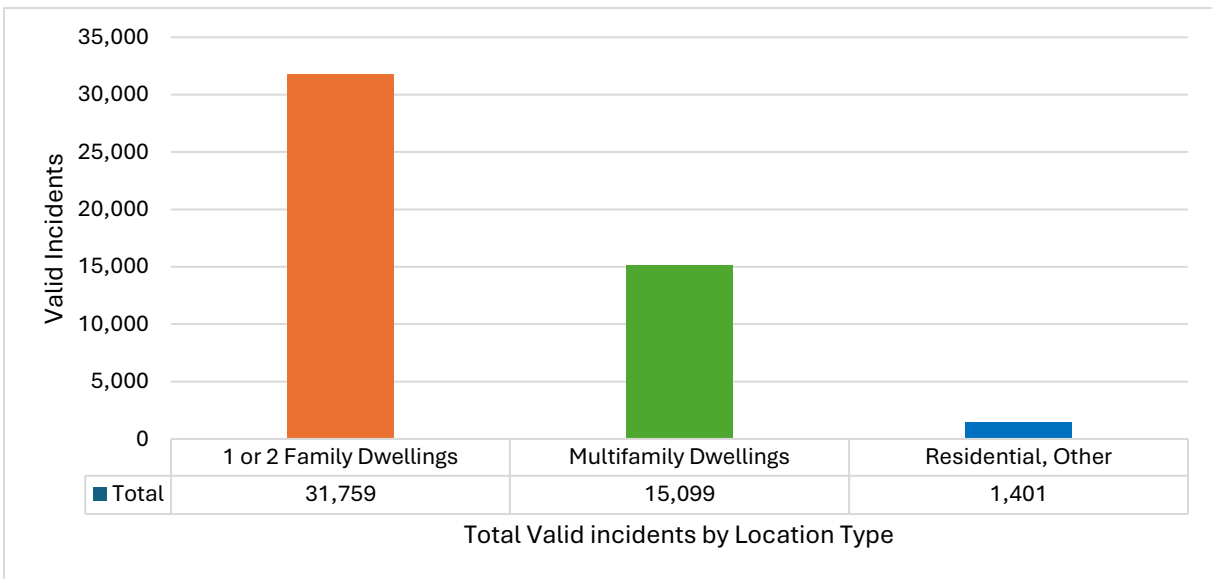
- **Residential locations** accounted for most incidents, with 48,259 reports, representing 95.1% of all reported cases. Although the number of incidents at these locations slightly decreased each year, from 10,292 in 2019 to 9,214 in 2023, they consistently remained the most affected category.
- **Commercial/Business** locations had 1,216 incidents (2.4% of total reports)
- **Institutional/Educational** locations had 173 incidents (0.3% of total reports)
- **Healthcare/Assisted Living** locations had 174 incidents (0.3% of total reports)
- **Religious/Community** locations had 90 incidents (0.2% of total reports)
- **Entertainment/Recreational** locations had 68 incidents (0.1% of total reports)
- **Public/Government** locations had 203 incidents (0.4% of total reports)
- **Storage/Logistics** locations had 160 incidents (0.3% of total reports)
- **Unknown/Unreported** locations had 385 incidents (0.8% of total reports)



CO Incidents by Residential Location Type Reported to the NFIRS in IL: 2019-2023

In Illinois from 2019-2023, the most common residential location type for carbon monoxide incidents was 1 or 2 Family Dwellings, accounting for 66% of all residential reports. Multifamily Dwellings are the second most common, contributing 31% of total residential reports. The “Residential, Other” category contributed a smaller fraction of incidents but still accounted for 3% of all incidents.

Table 17: Total Incidents by Residential Location Type reported to the NFIRS for Carbon Monoxide Incidents in IL: 2019-2023.



Data Source: National Fire Incident Reporting System 2019-2023

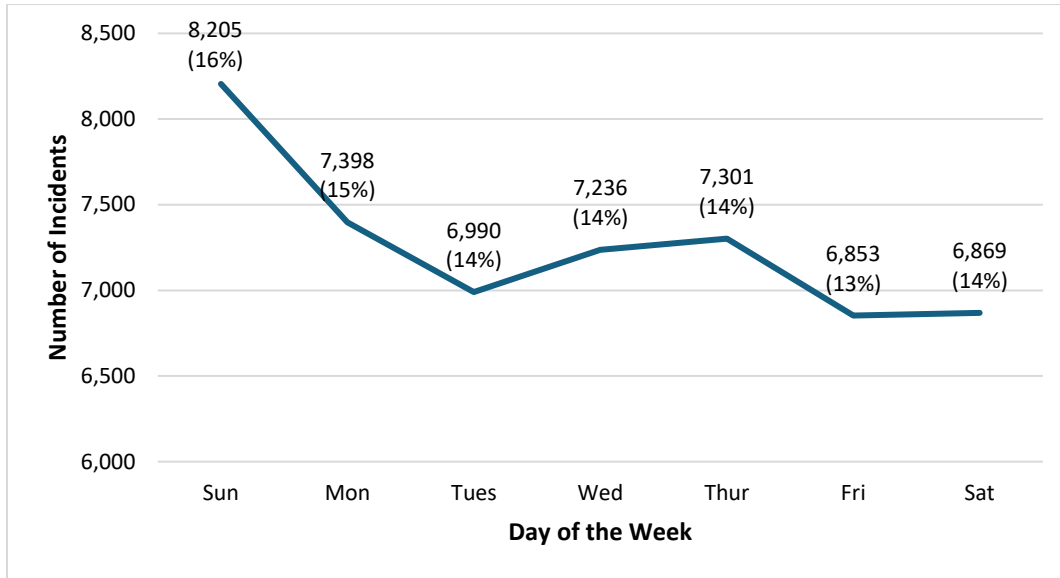
Table 17 shows the total valid carbon monoxide incidents reported to the NFIRS by residential location type in Illinois from 2019 to 2023.

Total Valid Incidents (2019-2023): 48,259 incidents reported for carbon monoxide in residential locations.

- **1 or 2 Family Dwellings** had the highest number of incidents:
 - 31,759 incidents (66% of all residential reports).
- **Multifamily Dwellings** had 15,099 incidents (31% of all residential reports):
 - Incidents varied slightly, with the highest number in 2020 (3,269) and the lowest in 2021 (2,890).
- **Residential, Other** (including barracks, dormitories, boarding homes, residential hotels, campsites with utilities, sorority and fraternity houses) had 1,401 incidents (3% of all residential reports):
 - The number of incidents remained relatively low, ranging from 227 in 2021 to 313 in 2019.

Call Distribution of CO Incident Trends by the Day of the Week in Illinois, 2019-2023

Table 18 Call Distribution of CO Incident Trends by the Day of the Week in Illinois, 2019-2023



Data Source: National Fire Incident Reporting System 2019-2023

Between 2019 and 2023, Illinois recorded a total of 50,852 carbon monoxide (CO) incident calls. When analyzed by day of the week, the data shows that calls are relatively evenly spread, reflecting the persistent risk of CO exposure regardless of the day.

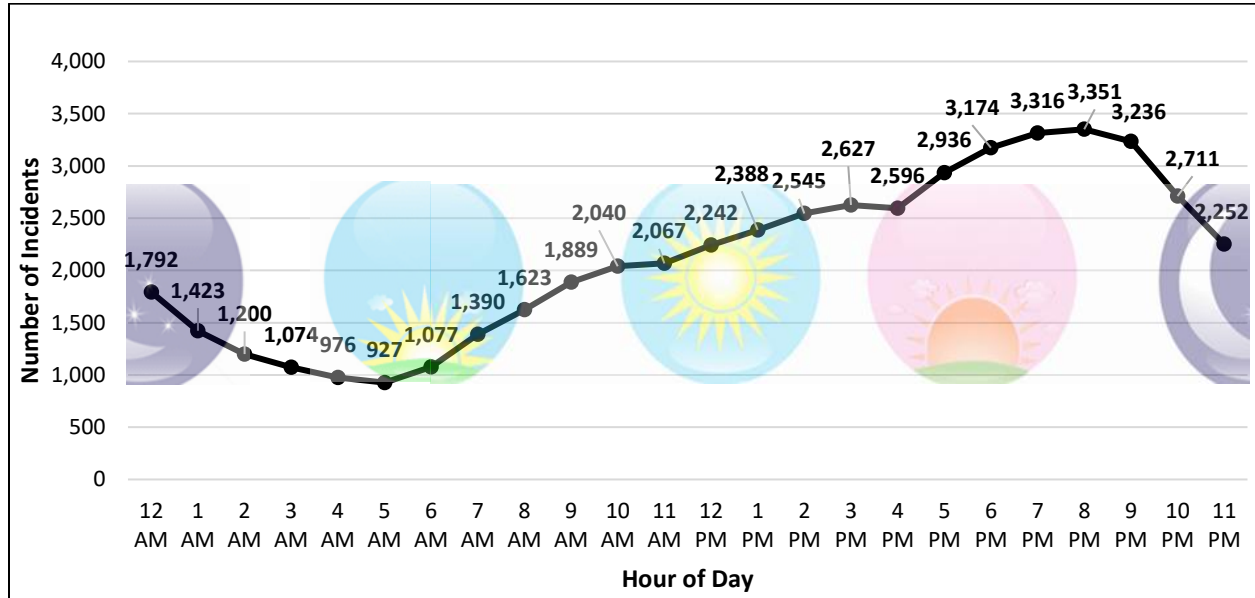
- Sunday accounted for the highest number of calls, with 8,205 incidents (16%). This elevated number may be related to increased time spent at home on this day, leading to greater use of heating, cooking, and other fuel-burning appliances, which are common sources of CO.
- From Monday through Thursday, call volumes were consistent, ranging from approximately 6,990 to 7,398 calls (14–15%). This steadiness suggests that CO risks remain significant during typical workdays, due to a combination of residential and commercial exposures.
- Friday and Saturday reported the lowest daily totals, with 6,853 (13%) calls on Friday and 6,869 (14%) on Saturday. Despite being the lowest, these numbers still represent a substantial portion of incidents, indicating that the risk of CO exposure does not diminish substantially at the end of the week.

Overall, while carbon monoxide incidents are reported every day, Sunday notably stands out as the day with the highest call volume. This pattern emphasizes that CO exposure is a consistent threat throughout the week, with slight fluctuations likely tied to changes in daily routines and appliance use. Awareness and preventive actions should therefore be maintained continuously, as no day is risk-free when it comes to carbon monoxide hazards.

Call Distribution of CO Incident Trends by Time of Day in Illinois, 2019-2023

From 2019 to 2023, Illinois reported over 50,000 carbon monoxide (CO) incident calls. When examined by time of day, distinct patterns emerge that reflect human activity and appliance use. Table 18 shows the distribution of those calls across a 24-hour period.

Table 19: Call Distribution of CO Incident Trends by Hour of Day in Illinois, 2019-2023



Data Source: National Fire Incident Reporting System 2019-2023

Calls were then grouped into four-time categories to allow for further understanding of CO incident trends: Overnight (12AM–05:59 a.m.), Morning (6 a.m.–11:59 a.m.), Afternoon (12 p.m.–5:59 p.m.), and Evening (6 p.m.–11:59 p.m.).

Table 20: Incidents of CO Call Volume Trends by Time Category Over a 24-Hour Period

Time Category	Hour of Day	Total	% of Calls
Overnight	12AM-5:59AM	7,392	15%
Morning	6AM-11:59AM	10,086	20%
Afternoon	12PM-5:59PM	15,334	30%
Evening	6PM-11:59PM	18,040	35%

Data Source: National Fire Incident Reporting System 2019-2023

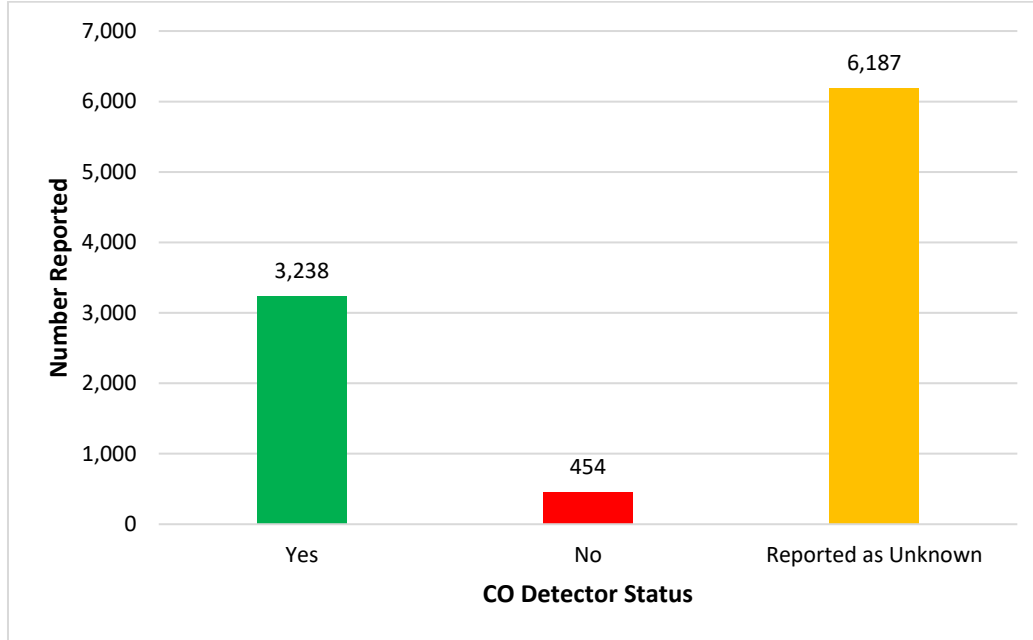
- **The Evening (6-11:59 p.m.)** had the highest call volume, accounting for 35% of all incidents (18,040 calls). This is likely due to increased use of heating systems, stoves, and other appliances after people return home. Within this window, 8 p.m. recorded the highest single-hour total (3,351 calls), followed closely by 7 p.m. (3,316) and 9 p.m. (3,236).
- **The Afternoon (12-5:59 p.m.)** accounted for 30% of total calls (15,334), reflecting continued activity during daytime hours and persistent use of household systems. Hourly totals during this period remain consistently high, with a gradual increase toward early evening.
- **The Morning (6-11:59 a.m.)** made up 20% of the total (10,086 calls). Calls increased steadily from 6 a.m. (1,077) to 11:59 a.m. (2,067), corresponding with the start of daily routines and increased use of appliances such as furnaces and water heaters.
- **The Overnight (12-5:59 a.m.)** had the lowest share of calls, 15% (7,392 incidents), but still showed risk. CO events during sleep are particularly dangerous, as individuals may be unaware of exposure without functioning detectors. Hourly totals gradually decline from 12 a.m. (1,792) to a low at 5 a.m. (927).

Overall, CO incidents are most frequent during times of household activity, such as the evening. These findings emphasize the need for working CO alarms, especially in bedrooms and high-use areas, and routine maintenance of gas-powered home systems. While evenings represent the highest-risk period, the presence of incidents across all hours reinforces that CO safety is a 24-hour concern.



CO Incidents Alerted by a CO Detector Reported to the NFIRS in IL: 2019-2023

Table 21: Total Count of CO Incidents that were Alerted by a CO Detector Reported to the NFIRS in IL: 2019-2023



Data Source: National Fire Incident Reporting System 2019-2023

Table 21 displays the total number of carbon monoxide (CO) incident reports in Illinois, categorized by whether the CO detector alerted the occupant of the incident or not, or if the alarm status was unknown.

The **Unreported** category, which includes 40,854 valid incidents, accounting for 81% of all reports, represents cases where the status of the CO detector alert was not provided. Due to the exceptionally high volume of incidents in this category, it was removed from the bar graph to prevent distortion of the remaining data.

- **Total Incidents:**
 - Total: 50,733 valid incidents reported across the five years (2019-2023)
- **Alerted by CO Detector (Yes):**
 - Total: 3,238 valid incidents (6% of total reports)
 - Indicates incidents where the CO detector successfully alerted the presence of carbon monoxide.
- **Alerted by CO Detector (No):**
 - Total: 454 valid incidents (1% of total reports)
 - Indicates incidents where the CO detector did not alert the presence of carbon monoxide.
- **Alerted by CO Detector (Unknown):**
 - Total: 6,187 valid incidents (12% of total reports)
 - Indicates incidents where the status of the CO detector alert is reported as unknown.

A large proportion of the data lacks information on CO detector alert status, highlighting the need for more consistent and complete reporting practices. Without reliable documentation concerning CO alerts, it becomes difficult to assess the effectiveness of CO detectors in preventing harm or to inform public safety strategies related to carbon monoxide education and exposure prevention. Despite these gaps, CO detectors remain a critical safety tool.

When the "Unreported" category is excluded, the remaining data falls into three groups: "Alerted by CO Detector (Yes)," "Alerted by CO Detector (No)," and "Alerted by CO Detector (Unknown)," which together represent 19% of total incidents. Of this subset, 6% of cases involved a successful alert, demonstrating the effectiveness of CO detectors in identifying hazardous carbon monoxide levels. In contrast, 1% of cases show no alert was given, suggesting possible detector malfunction or conditions that failed to trigger the alarm, such as a CO detector not being present in the area of exposure. The remaining 12% are marked as "Unknown," indicating that the alert status was either not recorded or unclear, likely a result of inconsistent or incomplete reporting.

Focusing on this 19% (9,879 call) subset highlights the critical role of CO detectors in incident response. The confirmed alert rate within this group represents about 33% of known responses and provides clear evidence that detectors can identify hazardous CO presence when functioning and placed properly. Although about 5% of incidents within this subset show no alert, and a significant 63% remain uncertain, the data underscores the need for reliable detector installation, placement, and maintenance. It also emphasizes the importance of complete and accurate reporting to better assess detector performance and improve carbon monoxide safety measures overall.



Conclusion and Call to Action

This inaugural Illinois Carbon Monoxide Surveillance Report (2019–2023) offers the most comprehensive view to date of how carbon monoxide (CO) exposure affects communities across the state. The findings are striking: over 50,000 first responder calls, more than 4,500 emergency department visits, upwards of 600 hospitalizations, and 284 unintentional deaths were reported during this five-year period, many of which were entirely preventable.

The data shows that carbon monoxide exposure is not a rare or isolated threat. It is happening every day, affecting residents of all ages, in homes across every part of Illinois. Most incidents, over 95%, occur in residential settings, and serious health outcomes are most common among adults aged 45 and older. Seasonal patterns are also clear: incident spikes in colder months align with increased heating system use, while secondary increases in summer point to risks from generators and fuel-powered tools. In total, nearly 40% of all incidents occur between October and January.

In a subset of cases where CO detector status was known, detectors successfully alerted occupants seven times more often than they did not; clear evidence that these devices save lives. Yet in almost 93% of those incidents, it wasn't known whether a detector was present or working or the data was not reported at all. That lack of information reflects a broader challenge: gaps in reporting, limited public awareness, and missed opportunities for prevention.

This report is more than a set of statistics; it is a call to action.

We have the data to guide targeted, evidence-based interventions, and with that data comes responsibility. Carbon monoxide exposure is preventable. Illinois has an opportunity, and a public health obligation, to act on what this report reveals.

The Path Forward

Based on the findings, the Illinois Department of Public Health (IDPH) will use this report to:

- **Strengthen and support public information campaigns**, especially during high-risk seasons, to educate residents about CO risks, detector installation, and proper appliance use.
- **Support local health departments and community partners** with data to tailor outreach and prevention in the most affected communities.
- **Encourage CO detector awareness**, usage, and maintenance, particularly in homes, rental properties, and other residences.
- **Strengthen interagency coordination**, including first responders, to identify high-risk settings before exposures occur.
- **Promote continued CO surveillance efforts** across Illinois and highlight their importance.

CO exposure can be silent, but its consequences are not. By acting now, armed with better data, clearer insights, and stronger resolve, we can prevent illness, save lives, and build a safer Illinois for everyone.

ILLINOIS CARBON MONOXIDE SURVEILLANCE REPORT: 2019-2023

Appendix

Appendix 1: Emergency Department Visits and Hospital Admittance visits of Illinois Residents for Unintentional Carbon Monoxide Exposure by County of Residence: 2019-2023

State	County	CO ED Visits	% of CO (ED) Visits	CO ED Visits per 10,000 ED Visits	CO (HA) Visits	% of CO (HA) Visits
Illinois	Adams	26	0.57%	1.98	≤10	≤10
Illinois	Alexander	≤10	≤10	≤10	0	0.00%
Illinois	Bond	≤10	≤10	≤10	≤10	≤10
Illinois	Boone	15	0.33%	1.56	≤10	≤10
Illinois	Brown	NR	NR	NR	0	0.00%
Illinois	Bureau	17	0.37%	2.53	≤10	≤10
Illinois	Calhoun	≤10	≤10	≤10	0	0.00%
Illinois	Carroll	≤10	≤10	≤10	0	0.00%
Illinois	Cass	≤10	≤10	≤10	≤10	≤10
Illinois	Champaign	60	1.32%	1.48	≤10	≤10
Illinois	Chicago	983	21.64%	1.74	160	26.40%
Illinois	Christian	18	0.40%	1.94	0	0.00%
Illinois	Clark	≤10	≤10	≤10	0	0.00%
Illinois	Clay	≤10	≤10	≤10	0	0.00%
Illinois	Clinton	≤10	≤10	≤10	0	0.00%
Illinois	Coles	43	0.95%	3.55	≤10	≤10
Illinois	Cook (non-Chicago)	642	14.13%	1.55	74	38.61%
Illinois	Crawford	≤10	≤10	≤10	≤10	≤10
Illinois	Cumberland	≤10	≤10	≤10	≤10	≤10
Illinois	DeKalb	38	0.80%	1.74	≤10	≤10
Illinois	DeWitt	≤10	≤10	≤10	≤10	≤10
Illinois	Douglas	13	0.29%	3.84	0	0.00%
Illinois	DuPage	262	5.77%	1.94	28	4.62%
Illinois	Edgar	17	0.37%	4.04	≤10	≤10
Illinois	Edwards	≤10	≤10	≤10	0	0.00%
Illinois	Effingham	≤10	≤10	≤10	≤10	≤10
Illinois	Fayette	12	0.26%	2.25	0	0.00%
Illinois	Ford	≤10	≤10	≤10	≤10	≤10
Illinois	Franklin	30	0.66%	2.93	≤10	≤10
Illinois	Fulton	18	0.40%	2.25	0	0.00%
Illinois	Gallatin	NR	NR	NR	0	0.00%
Illinois	Greene	≤10	≤10	≤10	≤10	≤10
Illinois	Grundy	23	0.51%	2.64	≤10	≤10
Illinois	Hamilton	≤10	≤10	≤10	0	0.00%
Illinois	Hancock	≤10	≤10	≤10	0	0.00%
Illinois	Hardin	≤10	≤10	≤10	0	0.00%
Illinois	Henderson	≤10	≤10	≤10	0	0.00%

ILLINOIS CARBON MONOXIDE SURVEILLANCE REPORT: 2019-2023

State	County	CO ED Visits	% of CO (ED) Visits	CO ED Visits per 10,000 ED Visits	CO (HA) Visits	% of CO (HA) Visits
Illinois	Henry	14	0.31%	1.00	≤10	≤10
Illinois	Iroquois	12	0.26%	2.30	≤10	≤10
Illinois	Jackson	35	0.77%	2.38	11	1.82%
Illinois	Jasper	≤10	≤10	≤10	≤10	≤10
Illinois	Jefferson	28	0.62%	2.38	≤10	≤10
Illinois	Jersey	29	0.64%	5.44	0	0.00%
Illinois	Jo Daviess	≤10	≤10	≤10	0	0.00%
Illinois	Johnson	≤10	≤10	≤10	≤10	≤10
Illinois	Kane	185	4.07%	2.12	21	3.47%
Illinois	Kankakee	23	0.51%	0.81	≤10	≤10
Illinois	Kendall	25	0.55%	1.31	≤10	≤10
Illinois	Knox	17	0.37%	1.45	≤10	≤10
Illinois	Lake	29	0.64%	1.15	16	2.64%
Illinois	La Salle	159	3.50%	1.57	≤10	≤10
Illinois	Lawrence	≤10	≤10	≤10	0	0.00%
Illinois	Lee	31	0.68%	4.00	≤10	≤10
Illinois	Livingston	18	0.40%	2.40	≤10	≤10
Illinois	Logan	20	0.44%	2.49	0	0.00%
Illinois	Macon	80	1.76%	2.45	11	1.82%
Illinois	Macoupin	26	0.57%	2.60	≤10	≤10
Illinois	Madison	100	2.20%	1.74	≤10	≤10
Illinois	Marion	19	0.42%	1.58	0	0.00%
Illinois	Marshall	≤10	≤10	≤10	≤10	≤10
Illinois	Mason	≤10	≤10	≤10	0	0.00%
Illinois	Massac	≤10	≤10	≤10	≤10	≤10
Illinois	McDonough	17	0.37%	2.68	≤10	≤10
Illinois	McHenry	77	1.69%	1.48	≤10	≤10
Illinois	McLean	53	1.17%	2.01	≤10	≤10
Illinois	Menard	≤10	≤10	≤10	0	0.00%
Illinois	Mercer	≤10	≤10	≤10	0	0.00%
Illinois	Monroe	≤10	≤10	≤10	0	0.00%
Illinois	Montgomery	22	0.48%	3.09	≤10	≤10
Illinois	Morgan	14	0.31%	1.53	≤10	≤10
Illinois	Moultrie	≤10	≤10	≤10	≤10	≤10
Illinois	Ogle	≤10	≤10	≤10	≤10	≤10
Illinois	Peoria	82	1.80%	1.80	12	1.98%
Illinois	Perry	≤10	≤10	≤10	≤10	≤10
Illinois	Piatt	≤10	≤10	≤10	0	0.00%
Illinois	Pike	≤10	≤10	≤10	0	0.00%
Illinois	Pope	≤10	≤10	≤10	≤10	≤10

ILLINOIS CARBON MONOXIDE SURVEILLANCE REPORT: 2019-2023

State	County	CO ED Visits	% of CO (ED) Visits	CO ED Visits per 10,000 ED Visits	CO (HA) Visits	% of CO (HA) Visits
Illinois	Pulaski	≤10	≤10	≤10	0	0.00%
Illinois	Putnam	NR	NR	NR	0	0.00%
Illinois	Randolph	13	0.29%	2.00	0	0.00%
Illinois	Richland	≤10	≤10	≤10	0	0.00%
Illinois	Rock Island	91	2.00%	2.55	≤10	≤10
Illinois	Saline	13	0.29%	1.88	≤10	≤10
Illinois	Sangamon	148	3.26%	3.18	32	5.28%
Illinois	Schuyler	≤10	≤10	≤10	0	0.00%
Illinois	Scott	≤10	≤10	≤10	0	0.00%
Illinois	Shelby	15	0.33%	3.44	≤10	≤10
Illinois	St. Clair	69	1.52%	1.18	≤10	≤10
Illinois	Stark	≤10	≤10	≤10	≤10	≤10
Illinois	Stephenson	18	0.40%	1.69	0	0.00%
Illinois	Tazewell	64	1.41%	2.27	≤10	≤10
Illinois	Union	≤10	≤10	≤10	≤10	≤10
Illinois	Vermilion	43	0.95%	1.75	≤10	≤10
Illinois	Wabash	≤10	≤10	≤10	0	0.00%
Illinois	Warren	15	0.33%	3.71	0	0.00%
Illinois	Washington	≤10	≤10	≤10	≤10	≤10
Illinois	Wayne	≤10	≤10	≤10	≤10	≤10
Illinois	White	≤10	≤10	≤10	0	0.00%
Illinois	Whiteside	45	0.99%	3.52	≤10	≤10
Illinois	Will	265	5.83%	2.43	44	7.26%
Illinois	Williamson	67	1.47%	4.07	19	3.14%
Illinois	Winnebago	115	2.53%	1.97	13	2.15%
Illinois	Woodford	≤10	≤10	≤10	≤10	≤10
Illinois	Total	4,543	100%	1.87	606	100%

Data Source: Data Source: Illinois Department of Public Health: syndromic surveillance data 2019-2023, accessed 3/17/2025 and ED Visit data, accessed 1/6/2026 from IL ESSENCE.

- Appendix 1 summarizes Emergency Department (ED) and Hospital Admittance visits (HA) of Illinois residents for unintentional carbon monoxide exposure by Illinois county of residence, based on ESSENCE Syndromic Data from 2019 to 2023. A total of 4,543 ED and 606 HA cases were reported statewide.
- The statewide rate of Unintentional Carbon Monoxide Exposure Emergency Department (ED) Visits was 1.87 CO ED visits per 10,000 ED Visits.
- ≤10: The number of reported (ED) or (HA) visits were less than or equal to 10 and therefore the data was suppressed and represented as such. Counties that reported zero visits were reported as “0”. Counties that did not have any data reported were represented as N/R.

Syndromic Surveillance notes

CO definition: ^m[ao]nox^,or,^carbonm^,or,^carbon m^,or,^Carbon oxid^,or,^carbonoxid^,or,^co inh^,or,^coinh^,or,(^c[o0]pois^,or,^c[o0]tox^,or,^c[o0]exp^,or,^c[o0] pois^,or,^c[o0] tox^,or,^c[o0] exp^,),ANDNOT,(^Mycotox^,or,^Vanco tox^,or,^vancotox^,or,^alco tox^,or,^alcotox^,or,^tobacco [ep][xo][pi]^,),or,(^[/]T58.[019][14]^,or,^[/]T58.[28]X[14]^,or,^[/]T58[019][14]^,or,^[/]T58[28]X[14]^,),ANDNOT,(^[/]T58.[01289][X14][X14][DS]^,or,^[/]T58[01289][X14][X14][DS]^,),or,^[/]986[/]^,or,^[/]E868.[2389][;/]^,or,^[/]E982.[01][;/]^,or,^[/]E868[2389][;/]^,or,^[/]E982[01][;/]^,or,^[/]95875007^,or,^[/]17383000^,or,^[/]95872005^,or,^[/]420057003^

- Visit counts are not population data, person-level or reportable case counts:
- Syndromes are not vetted by lab-confirmation or active clinician assessment
- Health encounters in other settings are excluded, (EMS, urgent care, ambulatory or home-care)
- Duplicate counts result from data quality processing, transfers, and repeat visits
- Syndromes fail to capture visits if text or diagnosis doesn't match syndrome definition syntax.
- Visits may not be "due to" the syndrome definition
- Visits that seek care out of state are not represented in the data
- EHR (Electronic Health Record) capabilities vary in the amount of information provided to categorize a visit as a syndrome
- Spatial comparisons are limited due to the variation of data submitted by each hospital EHR.
- Rates or percents with small numerators may be limited due to statistical instability.
- Trends over several years may change artificially due to changes in EHRs data quality over time



Let Us Know How You Use the Illinois Carbon Monoxide Surveillance Report

1. Why did you read this report?
2. How do you plan to use the information provided in this report?
3. What information in this report is most valuable to you?
4. What additional information would you like to read about in future reports?
5. How can the content of this report be improved?

Provide feedback by visiting the following URL: <https://forms.office.com/g/NAiMLi1CY4>
or by scanning or clicking the QR Code to take a brief survey:



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Or visit our webpage at: <https://dph.illinois.gov/topics-services/environmental-health-protection/toxicology.html>