



## Carbon Monoxide Incidents: A Review of the Data Landscape

There are multiple sources which provide Carbon Monoxide (CO) incident data including but not limited to: Consumer Product Safety Commission (CPSC), Center for Disease Control and Prevention (CDC), U.S. Fire Administration (USFA), and standard development organizations such as the National Fire Protection Association (NFPA) and the International Codes Council (ICC). Each organization contains its own methodology for collecting information and providing statistics; however, it is not clear what specific information is being collected, disseminated, and represented for each incident type.

New requirements for the installation of CO detection into several types of occupancies (both new and existing occupancies) are being addressed in the 2024 editions of NFPA 101 Life Safety Code® and NFPA 5000, Building Construction and Safety Code®. There is a lack of understanding regarding the data available for non-fire CO incidents, specifically for commercial-type occupancies.

The goal of this project is to review and present the carbon monoxide incident data landscape to clarify the sources of information, how the data is compiled and what the data represents. Additionally, this project identifies, summarizes, and analyzes case studies of non-fire carbon monoxide incidents specific to commercial-type occupancies to provide a greater understanding to the NFPA technical committees responsible for NFPA 101 Life Safety Code® and NFPA 5000, Building Construction and Safety Code®

### Summary Observations

The purpose of this project is to review and present the carbon monoxide (CO) incident data landscape to clarify the sources of information, how the data is compiled and what the data represents. Additionally, this project identifies, summarizes, and analyzed case studies of non-fire carbon monoxide incidents specific to commercial-type occupancies to provide a greater understanding to the NFPA technical committees responsible for developing NFPA 101, Life Safety Code® and NFPA 5000, Building Construction and Safety Code®.

Eight databases and additional data sources hosting information on CO incidents were reviewed to identify insights and limitations of the data. Databases that contained information on occupancy types experiencing CO incidents were evaluated to identify trends and contributing factors, etc. Overall, it was found that databases hosting CO incident information did not provide a sufficient level of detail to fully understand the CO exposure problem in the U.S.

Of the databases that capture information on occupancy type, NFIRS is the only database that includes incidents occurring in a full range of occupancies. CPSC, because it is consumer product centric, is biased towards residential incidents, and OSHA, because it is workplace-related, is biased towards commercial occupancies. As such, neither of these two databases offer a balanced view of the issue at hand.

While all databases show that incidents are occurring in commercial occupancies, and many of these occupancies are not currently required to have CO detection, these limited datasets do not allow for a national-level appreciation of CO incident occurrences or frequencies. Moreover, the limited datasets do not provide a comprehensive view of injuries and deaths resulting from CO exposure correlated by occupancy type. Therefore, the frequency of injuries occurring in all types of commercial occupancies is unknown; this is a critical piece of information needed to determine if current requirements for CO detection are adequate. Moreover, there is no dataset which details the location of the victim relative to the CO source. As such, there is no way to determine, using these datasets alone, if current CO detection placement criteria, e.g., detector in space with CO source, is adequate.

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