Carbon Monoxide Incidents: A Review of the Data Landscape

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by NCOAA

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Background

Research Goals:

1) Review and present the CO incident data landscape to clarify the sources of information, how the data is compiled and what the data represents.

2) Identify, summarize & analyze case studies of non-fire CO incidents specific to commercial-type occupancies

Project Tasks

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1. • Identify Currently Available Data Sources
2. • CO Incident Data Collection
3. • Final Report

Databases Analyzed

Source	Database
Centers for Disease Control and Prevention (CDC)	National Environmental Public Health Tracking
Centers for Disease Control and Prevention (CDC)	WONDER (Death Rate Datasets)
Consumer Product Safety Commission (CPSC)	National Electronic Injury Surveillance System (NEISS)
Institute of Health Metrics and Evaluation (IHME)	Global Health Data Exchange Registry
National Transportation Safety Board (NTSB)	Aviation Accident Database & Synopses
National Highway Transportation Safety Administration (NHTSA)	Fatality Analysis Reporting System
Occupational Safety and Health Administration (OSHA)	Collection of Accident Data related to CO poisonings
United States Fire Administration (USFA)	National Fire Incident Reporting System

- Database name, managing agency, web link
- Primary Purpose/Objective
- Collecting Data since____
- Type of Data Collected
- Inclusion/Exclusion Criteria
- Advantages/Limitations
- Insights to be derived from the data
- Insights that cannot be derived from the data

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CDC – National Environmental Public Health Tracking

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Purpose: Provides data about health effects due to CO poisoning

Advantages:

- US Map and simple dropdown menus to change visuals
- Updated annually.
- Results shown for 1-, 3-, and 5-year increments
- Presents average rates based on population size

Limitations:

- Hospitalization data sets do not include info on race/ethnicity
- No info on occupancy type.

CDC Wonders

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Purpose: Provides public health information related to death rates in the US

Advantages:

- User interface is menu-driven and simple to query.
- Data is updated annually.

Limitations:

- Does not delineate death by CO poisoning from "accidentally poisoning by and exposure to other gases and vapors"
- No info re. occupancy type

CPSC – Collection of Injury Statistics and Technical Reports Related to CO Incidents

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Purpose: Provides collection of published reports on CO incidents due to consumer products

Advantages:

- Digestible summaries of findings for each product.
- Include incidences and consequences of incidents
- Many reports include narratives for additional context.

Limitations:

- Delayed publishing
- Narrow scope (almost all incidents involve use tools are in residential occupancy)
- Deals only with fatalities, not injuries

CPSC – National Electronic Injury Surveillance System (NEISS)

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Purpose: Collect details of consumer product-related injuries that have occurred within the US

Advantages:

- Easy to use query system with extensive list of parameters
- Provides excel file with related cases and related narrative.

Limitations:

- Must have specific search codes; cant look up “CO incidents”
- Cannot sort by occupancy

IHME – Global Health Data Exchange Registry

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Purpose: Provides researchers access to a large amount of health-related data

Advantages:

- Can highlight age, sex, or location
- Appealing and digestible visualizations
- Can output data in Death, YLDs, or DALYs

Limitations:

- Does not specialize in particular incidents
- Some data are only available in summary visualizations
- Does not offer breakdown of data (by occupancy, ethnicity, context, etc.)

National Fire Incident Reporting System (NFIRS)

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Purpose: Public data release of incidents reported by U.S. Fire Dept.

Advantages:

- Tens of millions of incidents in U.S. reported each year.
- Provides description of each incident.

Limitations:

- Potential unknown fields
- Data lags a few years behind. Most recent datasets currently available from 2019.
- No specific exclusion criteria but minor incidents may go unreported at the secretion of responders completing the form.
- Not all FD participate (24k/27k)

National Highway Traffic Safety Administration (NHTSA) – Fatality Analysis Reporting System

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Purpose: Nationwide census that collects data related to fata injuries suffered in motor vehicle traffic crashes

Advantages:

- User interface simplified query for CO incidents

Limitations:

- Datasets apply only to motor vehicle incidents
- Little detail about the information queried (yes/no for each input)

National Transportation Safety Board (NTSB) – Aviation Accident Database & Synopses

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Purpose: Reports summarizing civil aviation accidents and incidents

Advantages:

- Detailed reports on each accident provides a great deal of specific inco

Limitations:

- Only for accidents/incidents occurring in aircraft.
- Difficult/Impossible to filter accidents related to CO exposure
- Searching for data from many incidents requires reviewing each report.

OSHA – Accident Database

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Purpose: Provides a list of summaries of OSHA investigations into fatal or injurious workplace accidents.

Advantages:

- Database of workplace accidents, most or all accidents are in commercial occupancies in the database.
- Easy to filter to show CO incidents only.

Limitations:

- Does not provide the specific occupancy the injury occurred in, though, this can be inferred.

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Task 2: Data on Commercial Occupancies

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Based upon findings from Task 1, the following databases and data sources will be utilized to collect information relevant to commercial occupancies:

- NFIRS
- OSHA
- CPSC
- Hotel/Motel Incident Data

Review NFPA 101, 5000, and IBC to determine requirements for CO detection

Findings

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- While all databases show that incidents are occurring in commercial occupancies
- The limited datasets do not allow for:
  - a national-level appreciation of CO incident occurrences or frequencies.
  - a comprehensive view of injuries and deaths resulting from CO exposure correlated by occupancy type.
- 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.
- There is no dataset which details the location of the victim relative to the CO source.
  - No way to determine, using these datasets alone, if current CO detection placement criteria, e.g., detector in space with CO source, is adequate.

NFPA RESEARCH FOUNDATION
RESEARCH FOR THE NFPA MISSION

PROJECT PROSPECTUS

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A Review of the Carbon Monoxide Alarm and Detection Thresholds

Research Goal

Examine the current literature to determine if new information exists regarding the levels of CO that are potentially dangerous for various populations. Identify knowledge gaps and provide recommendations for future research to address the gaps.

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THANK YOU
QUESTIONS?

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