



Unintentional Occupational Irritant and Asphyxiant Gas Exposures

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Introduction

- Occupational exposures to irritant and asphyxiant hazardous gases are common.
- Some gases are known to result in morbidity and mortality, therefore characterizing these unintentional exposures may direct efforts for workplace controls.

Research Objectives

- Describe characteristics of occupational irritant and asphyxiant gas exposures.
- Identify gases of greatest concern to direct hazard prevention and reduction efforts.

Methods

- Design: Retrospective cohort analysis
- Data source: National Poison Data System (NPDS)
- Study period: 01/01/2000 through 10/31/2014
- Population: Unintentional occupational exposures to irritant or asphyxiant gases reported to the NPDS

Results

Average number of gas calls per year: 1,357

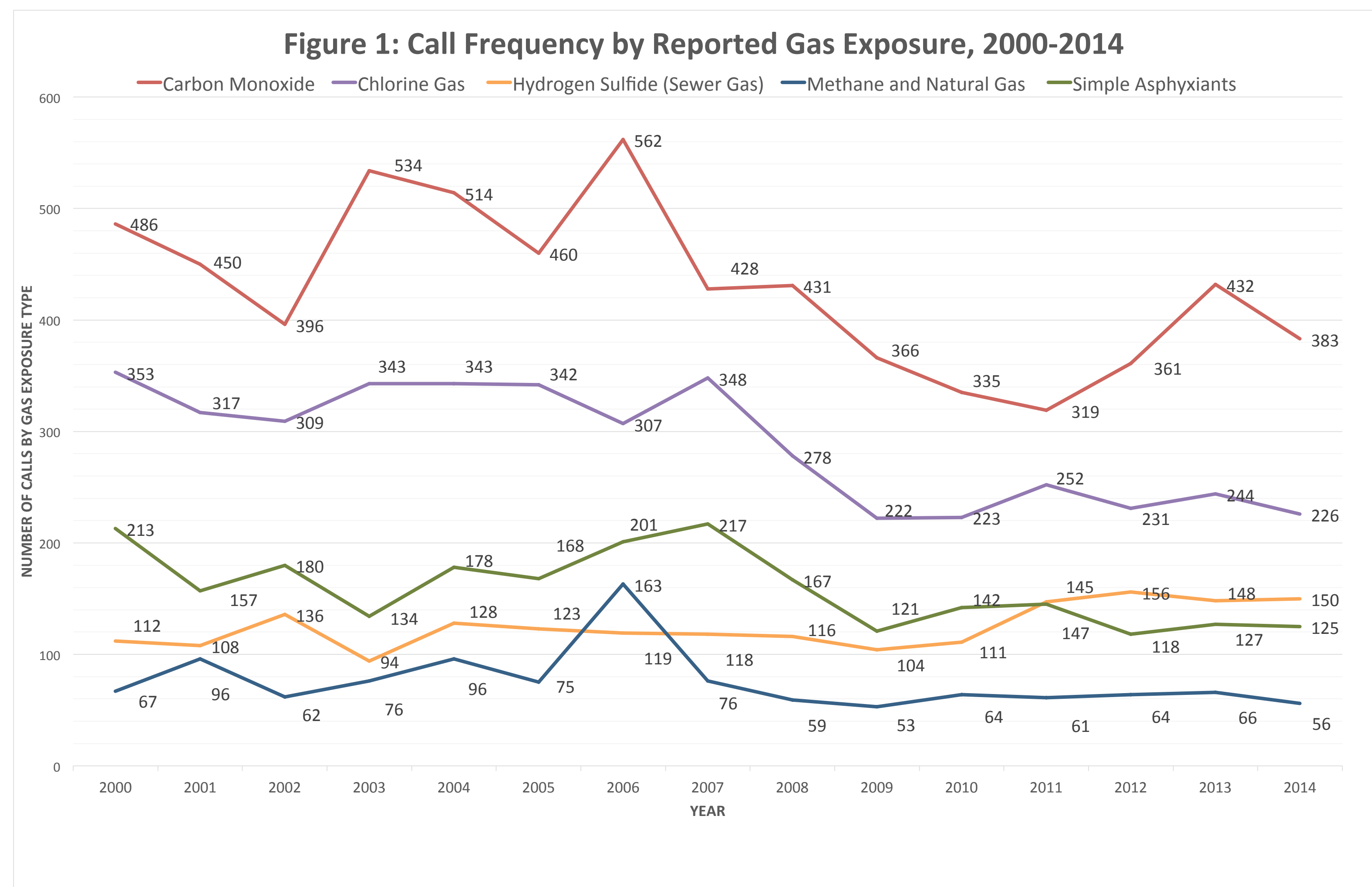
Demographics

- Males: 14,177 (69.6%) (n=20,357)
- 20-49 years of age: 16,826 (82.7%) (n=20,357)

Route of exposure (n=21,704)

- Inhalation or nasal: 17,994 (82.9%)
- Dermal: 1,640 (7.6%)
- Ocular: 1,057 (4.9%)

Results, continued



Clinical effect (n=47,002)

- Headache: 6,997 (14.9%)
- Nausea: 4,982 (10.6%)
- Dizziness: 4,641 (9.9%)
- Cough or choke: 4,457 (9.5%)

Scenario (n=2,053)

- Poor ventilation: 747 (36.4%)
- Mixing products: 489 (23.8%)

Management site (n=20,357)

- Healthcare facility: 15,133 (74.3%)
- On-site: 4,923 (24.2%)

Level of care required (n=15,133)

- Evaluate/treat & release: 11,888 (78.6%)
- Non-critical care: 1,055 (7.0%)
- Critical care: 656 (4.3%)

Treatment (n=31,735)

- Fresh air: 11,064 (34.9%)
- Oxygen: 7,365 (23.2%)

Medical Outcome (n=20,357)

- Minor effect: 12,401 (60.9%)
- Moderate effect: 6,078 (29.9%)
- Death: 61 (0.3%), 35 resulting from hydrogen sulfide (H₂S) exposure

Conclusions

- Need for additional workplace controls to prevent hazardous gas exposures
- Improper chemical mixing practices and inadequate ventilation are contributing factors to hazardous gas exposure
- Most exposures resulted in mild health effects manageable with minimal intervention, but serious health effects can occur, including death

Limitations

- No access to case notes for specific cause or follow up information
- Not all exposures confirmed with biological testing
- Passive surveillance underestimation

Discussion & Public Health Implications

- NPDS captures health exposures managed on-site & at healthcare facilities
- Informs several levels of exposure prevention efforts & clinical care

