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# Health Professionals and Public Awareness of Carbon Monoxide Poisoning in Vermont

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# Health Professionals and Public Awareness of Carbon Monoxide Poisoning in Vermont



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## Background

- Carbon Monoxide (CO) is a colorless, odorless gas. It is the leading cause of poison related deaths in the United States and is responsible for 450 fatalities each year.<sup>1</sup>
- CO poses a significant public health risk in VT, especially during the winter months.<sup>2</sup>
- Injury and death from CO poisoning is preventable through the use of CO detectors, increased awareness, and proper maintenance of heating systems<sup>3,4</sup>
- Objectives
  - Evaluate knowledge of CO poisoning and understanding of CO poisoning sources in the general public and among health care professionals.
  - Assess discrepancies between public and health care professional knowledge

## Methods

- A review of the available literature was conducted.
- Survey format based on the validated Chicago Lead Study<sup>5</sup>
- 21 true/false/unsure survey assessed sources of exposure, clinical symptoms of poisoning, and medical treatment. 15 additional questions assessed participant demographics, including healthcare provider status.
- General public, VT EMS District 3, Medicine Residents, and practicing physicians were surveyed.
- Surveys were distributed at Burlington Farmer's Market, UVM-MC, District 3 EMS squads, and online.
- Survey results analyzed using IBM SPSS Statistics Software.

### References:

- Centers for Disease Control and Prevention. "Carbon Monoxide Poisoning Prevention: A Toolkit." *Working Together to Keep Communities Safe* (2012).
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- Wheeler-Martin, Katherine, et al. "Impact of mandatory carbon monoxide alarms: An investigation of the effects on detection and poisoning rates in New York City." *American journal of public health* 105.8 (2015): 1623-1629.
- Johnson-Arbor, Kelly, Daniel L. Liebman, and Elizabeth M. Carter. "A survey of residential carbon monoxide detector utilization among Connecticut Emergency Department patients." *Clinical toxicology* 50.5 (2012): 384-389.
- Mehta, Samir, and Helen J. Binns. "What do parents know about lead poisoning?: The Chicago Lead Knowledge Test." *Archives of pediatrics & adolescent medicine* 152.12 (1998): 1213-1218.
- CO graphic: Courtesy of: Brigade B.G.C.P Fire Department Municipalité de l'Île-du-Grand-Calumet (Québec)

## Results

Figure 1. Survey Respondent by Healthcare Provider/First Responder Status (N=256)

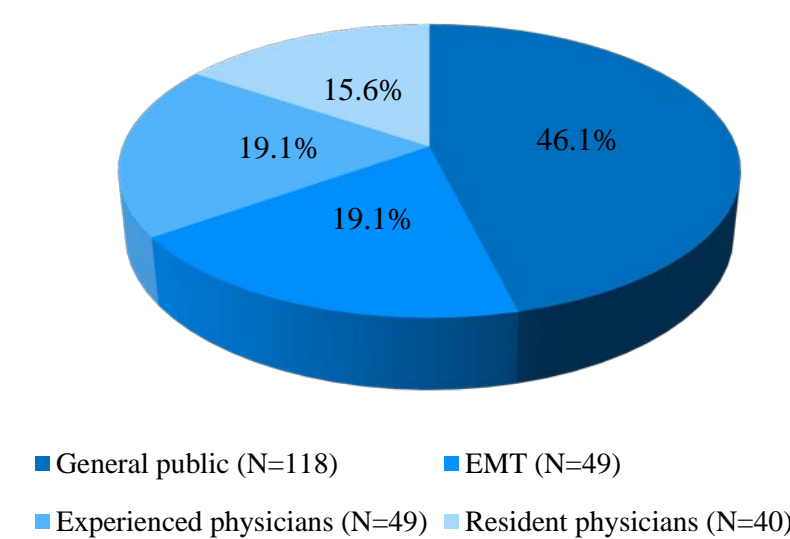


Figure 2. Mean Score

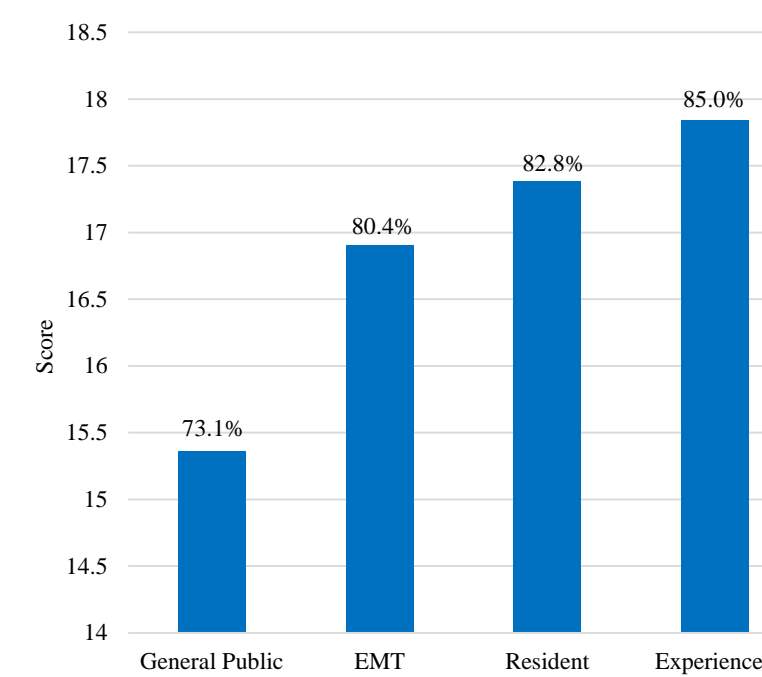


Figure 3. Distribution of Scores

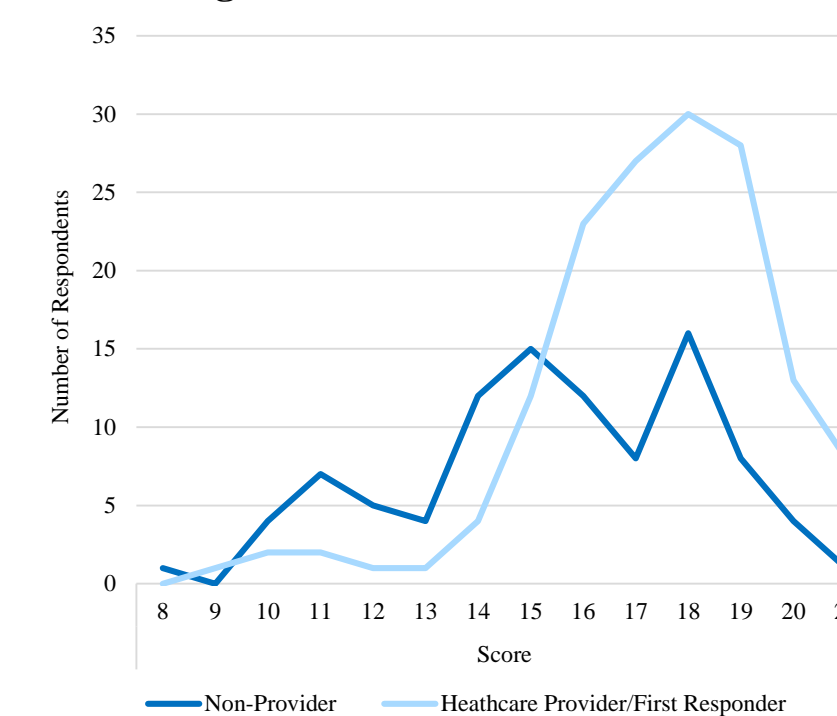
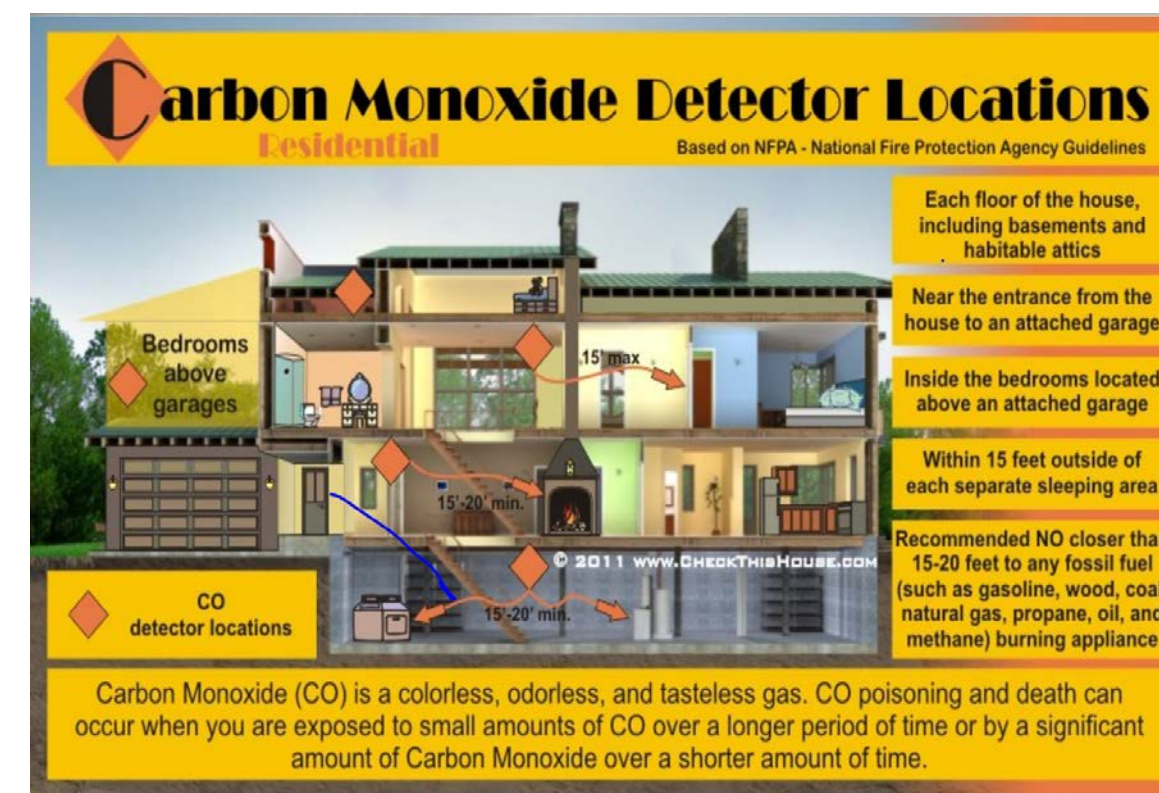
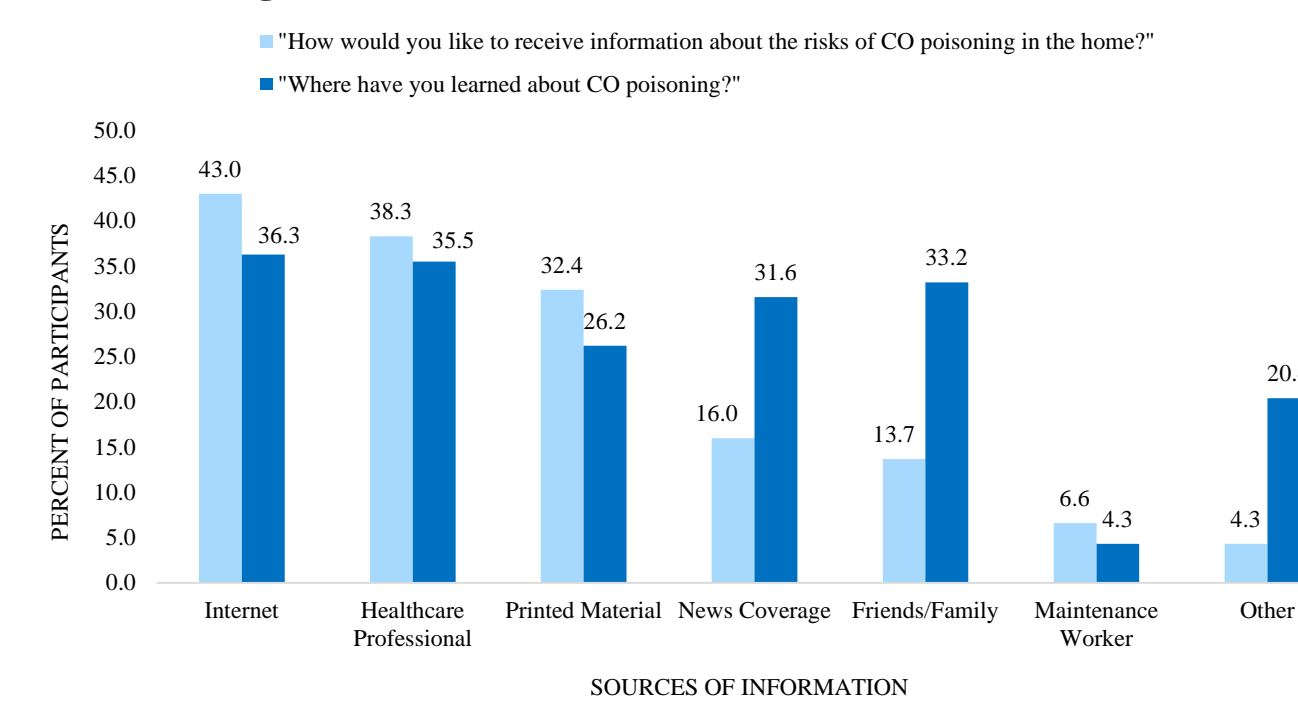


Figure 4. Preferred Sources of Information about CO



- There is a statistically significant relationship between percent correct/overall score and whether the participant was a health care provider. ( $p=0.002$ ). (Figure 2)
- While respondents in general were aware that CO could cause death (99.6% correct) and headache (94.5% correct) they were less aware that CO could also cause flu-like symptoms (70.6% correct) and nausea (85.9% correct).
- Frequent incorrect answers pertained to information about sources of CO specifically ice rinks and smoking.

Percentage Correct for Selected Questions by Occupation

Question Topic	Public	All Health Professionals	Physician	EMT
Ice rinks are a source of CO poisoning	44.1%	60.1%	56.2%	67.3%
Opening a window or going outside can reverse CO poisoning	38.1%	52.9%	59.6%	40.8%
CO poisoning can present with flu-like symptoms	57.6%	81.2%	83.1%	77.6%

## DANGER!



## Discussion

- While knowledgeable about some symptoms of CO poisoning, a substantial percentage of general public respondents were not aware that symptoms may be similar to the flu.
- As determined by the discrepancy between respondents' current sources of information and preferred sources of information, information about CO in internet and printed materials is a priority for additional education.
- Despite history of large-scale poisoning events in Vermont, many respondents were not aware of risks of CO exposure at hockey rinks.

## Recommendations

- Organizations concerned about CO poisoning should focus educational and outreach efforts through the internet and printed material.
- Healthcare providers should be encouraged to discuss CO poisoning with patients as winter months approach.
- Public education should address identified knowledge gaps, specifically:
  - Hockey arenas, a place where many people gather in the winter in VT, present an unrecognized risk of CO poisoning.
  - Opening windows is insufficient to reverse CO poisoning indoors.
  - The use of combustion engines indoors is dangerous and should be avoided.
  - CO poisoning can cause flu-like symptoms.