

*Acute Public Health Hazard Identified from
Carbon Monoxide Exposure in an Area
Heavily Used by Recreational Watercraft*

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Carbon Monoxide

- Carbon monoxide is an odorless, colorless gas that interferes with oxygen distribution in the blood.
- For years, CO poisonings were thought to occur only in enclosed, poorly ventilated areas.
- Open-air cases of carbon monoxide poisoning have recently been reported from various kinds of watercraft including houseboats, cabin cruisers and ski boats.

CO Poisonings in Lake Havasu City

- Several cases of CO poisoning have been identified by the Havasu Regional Medical Center
- Poisonings usually occur on busy holiday weekends
- A few drownings this year have been partially attributable to CO poisoning

Study Objective

- The objective of our investigation was to determine whether a public health hazard from CO exposure exists during a busy weekend at Lake Havasu City.
- The investigation examined carbon monoxide exposure in recreational boaters in the Rotary Beach area near the London Bridge in Lake Havasu City during the Memorial Day Holiday in 2003.

Carbon Monoxide Sources



Human Exposure to CO



Methods

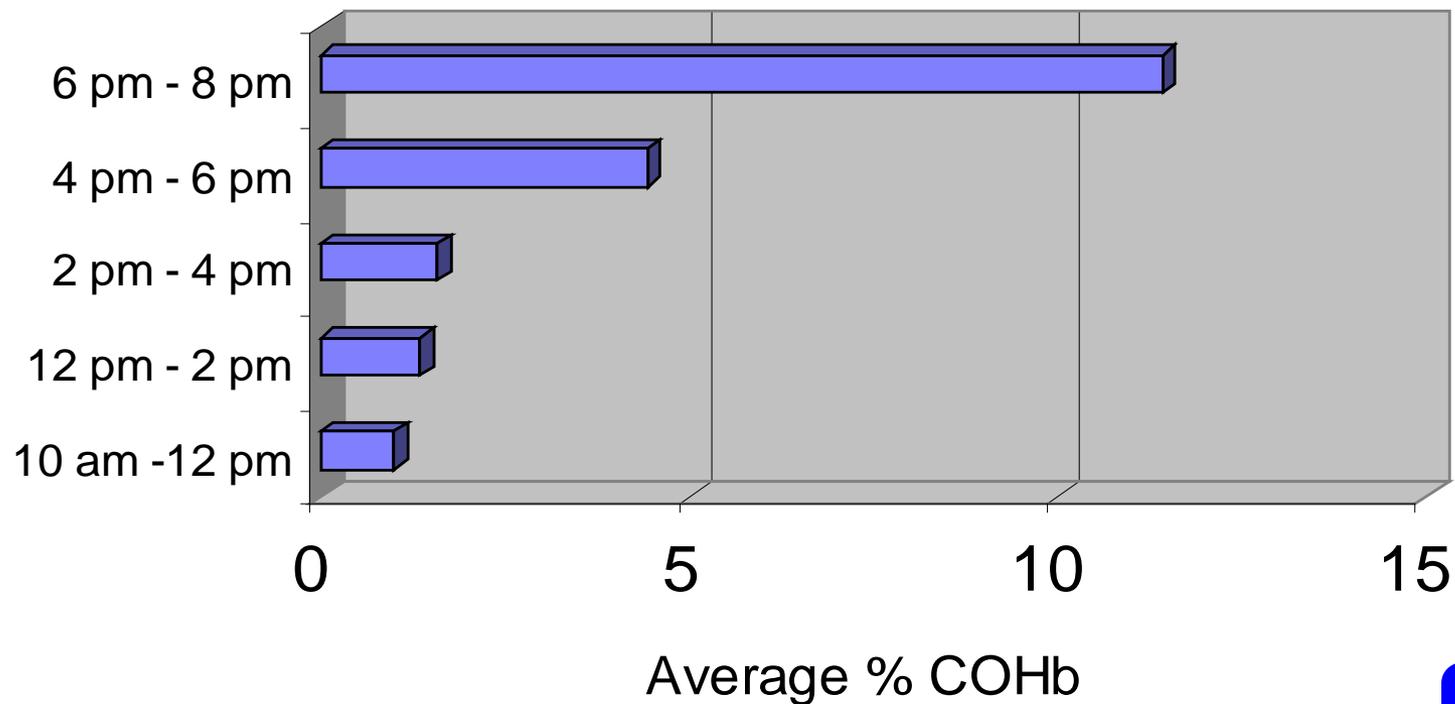
- Exhaled CO was used as a measure of the amount of carboxyhemoglobin (COHb) in the participant's blood.
- Ethanol does not interfere with the analytical results.
- We administered a short questionnaire during the analysis to determine smoking status and activity questions.

Results

- Significant carbon monoxide exposure occurred among participants during the investigation.
- The average % COHb in nonsmokers increased during the day from an average of 1% at noon to 11% after 6 pm.
- The average % COHb in smokers increased from 3% at noon to 13% after 6 pm.

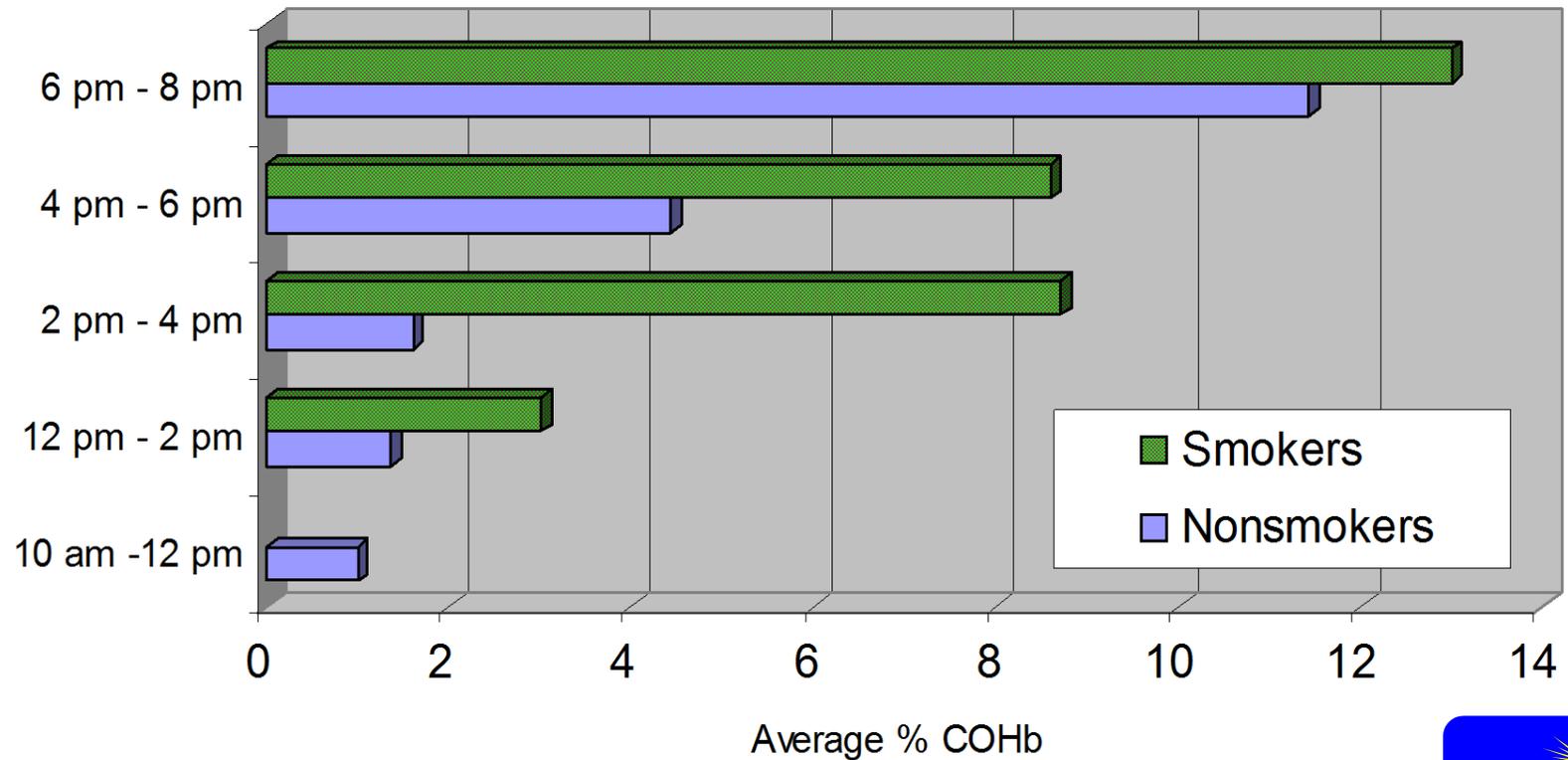
Results

Average % COHb in Nonsmokers by
Time of Day - Rotary Beach
(n=46)



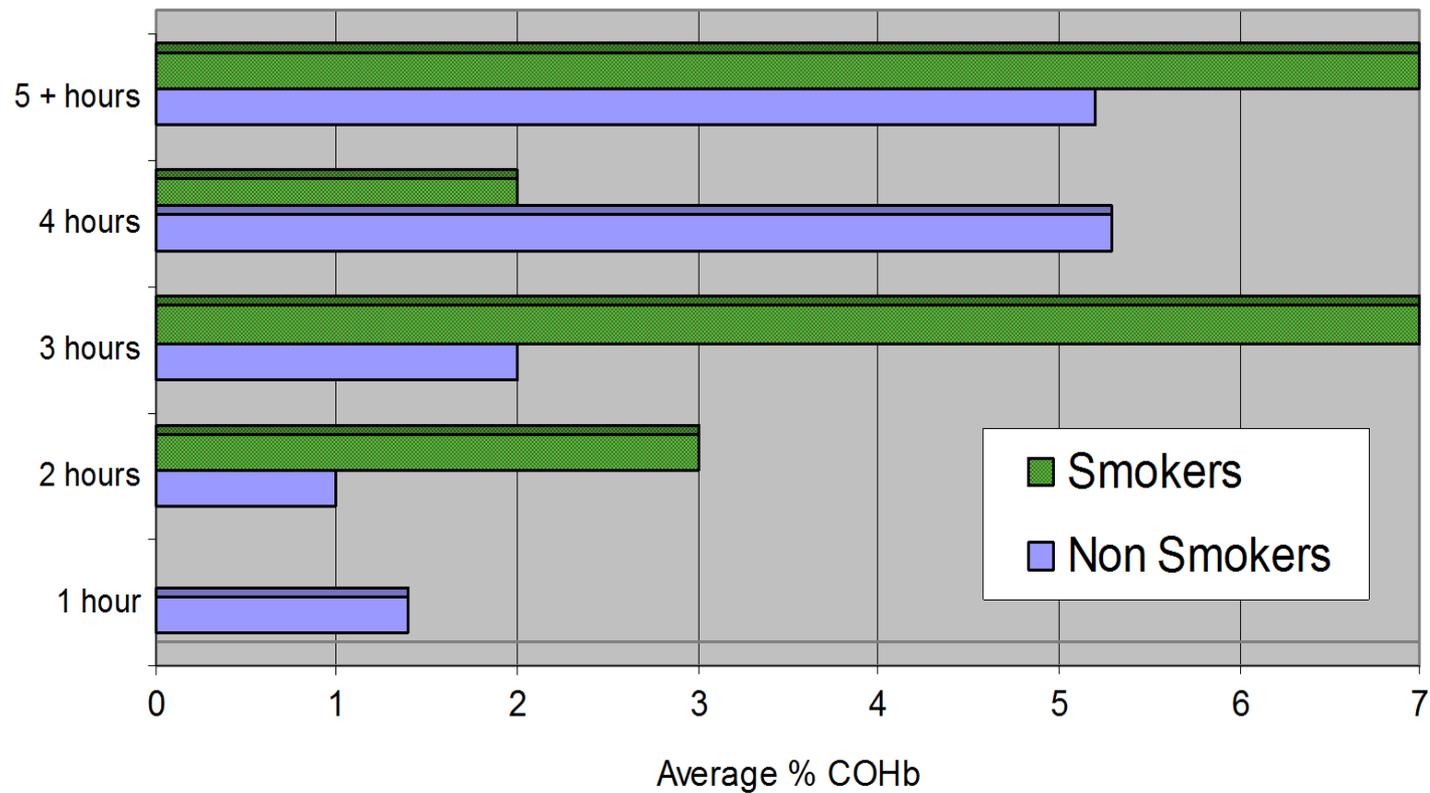
Results

Average % COHb in Smokers
and Non Smokers by Time of Day
(n=62)



Results

Average % COHb by Number of Hours on Rotary Beach
(n=62)



Discussion

- Alcohol consumption was common among the participants.
- Alcohol consumption causes similar symptoms as carbon monoxide including headache, impaired judgment, nausea and vomiting.
- The combination of alcohol consumption and carbon monoxide exposure likely creates a more significant health hazard (drowning & trauma).

High Risk Activities



Conclusions

- Significant carbon monoxide exposure occurred among participants during the investigation.
- The cumulative carbon monoxide exposure increased as the day progressed.
- The COHb levels observed late in the day posed a public health hazard.

Conclusions

- The combination of alcohol consumption and carbon monoxide exposure creates a more significant public health hazard.
- The recreational activities conducted during the investigation were predominately in or near water, creating a drowning hazard for those with impaired judgment or more severe symptoms of carbon monoxide exposure and alcohol consumption.

Thank You for Your Attention

