

## Background

- Hydrogen sulfide is a highly toxic gas found in sewers and volcanos
- It is potent chemical asphyxiant forming complex chemical bonds in mitochondrial cytochrome enzymes, thus preventing cellular respiration.
- HS is used in industry in the formation of thioorganic compounds, in the formation of metal sulfides, and to separate deuterium oxide, or heavy water, from normal water via the Girdler sulfide process.

## Objective

- This study sought to describe work-related cases of hydrogen sulfide exposure reported to poison centers.

## Methods

- Cases were hydrogen sulfide exposures reported to a statewide poison center system during 2000–2013 where the exposure reason was “occupational” or the exposure site was “workplace.”
- Exposures to “sewer gas” were excluded. The distribution of cases by selected factors was determined.

## Results

- In a total of 638 cases
- There were 38 multiple-person events involving 102 people (mean, 2.7 persons per event; range, 2–7 persons).
- The annual number of exposures increased from 31 in 2000 to 88 in 2013.
- The rate per 1,000,000 population was 89.2 in rural counties and 16.2 % in urban counties.
- Of 567 patients with a known age, the mean age was 36 years (range, 17–66 years);
- 91 % of the patients were male.
- The exposure routes were inhalation (90 %), dermal (9 %), ingestion (7 %), ocular (4 %), parenteral (0.2 %), and unknown (1 %).
- 83% of the patients were already at/en route to a healthcare facility; 9 % were managed on-site.
- The medical outcome was no effect (10 %), minor effect (30 %), moderate effect (27 %), major effect (7 %), and death (0.3 %).
- The most common clinical effects were headache (27 %), nausea (25 %), dizziness/vertigo (20 %), vomiting (16 %), dyspnea (15 %), cough/choke (10 %), chest pain (9 %), hypertension (8 %), syncope (8 %), throat irritation (7 %), and drowsiness/lethargy (6 %).
- The most common treatments were oxygen (52 %), fresh air (36 %), IV fluids (18 %), dilution/irrigation/wash (15 %), and bronchodilators (9 %).

## Conclusions

- Potentially adverse work-related hydrogen sulfide exposures may involve multiple patients and are more likely to occur in rural areas and involve males.
- The majority of exposures will occur through inhalation. The number of cases in this study increased over the time period, possibly related to the increasing oil and gas production in the US.
- The majority of patients were managed at a healthcare facility, possibly because hydrogen sulfide is known to be toxic. However, the majority of exposures were not serious.
- The most common symptoms affected the neurological, gastrointestinal, respiratory, and cardiovascular systems.

## Effects

