

# Impact of Hydrogen Sulfide Emissions on Health Outcomes

TX RPC Project Legislative Rapid Response Request

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## Key Takeaways

1. Hydrogen sulfide is a gas that occurs naturally and as a byproduct from petroleum or wastewater management.
2. Lower levels of hydrogen sulfide exposure can occur in communities that live by refineries or wastewater treatment plants, but higher concentrations of hydrogen sulfide occur more often from exposure in the workplace.

## What is Hydrogen Sulfide and Where Does it Come From?

Hydrogen sulfide collects in low-lying, poorly ventilated, enclosed areas like basements, sewer lines, underground telephone vaults, and manure pits. (1)

When emitted, it tends to smell like "rotten eggs." (1) Hydrogen sulfide is a colorless, flammable gas, making it extremely hazardous.

Hydrogen sulfide occurs naturally in crude petroleum, natural gases, and hot springs. (1,2) It is created during the breakdown of organic materials and human and animal waste (including sewage treatment plants). (1,3)

Hydrogen sulfide is a byproduct from petroleum or natural gas drilling and refining, wastewater treatment, coke ovens, tanneries, and kraft paper mills. (1)

Hydrogen sulfide: (1)



Colorless



Flammable



Hazardous

**A person can lose their ability to smell hydrogen sulfide gas, even when the gas is still present. DO NOT rely on your sense of smell to identify the presence of hydrogen sulfide.**

## Effects of Hydrogen Sulfide:

Hydrogen sulfide has not been shown to cause cancer in people. (4)

Exposure levels of hydrogen sulfide are as follows:

- Typical background levels in urban communities of hydrogen sulfide emissions are from 0.11 to 0.33 parts per billion (ppb). (1,3) Hydrogen sulfide can be detected by smell at 0.01-1.5 ppm (5)
- Permissible exposure limit of hydrogen sulfide is 20 ppm and should not exceed this exposure limit during an 8-hour timeframe. (6) Prolonged exposure over several hours to levels as low as 2ppm may begin to produce symptoms.
- High concentrations of hydrogen sulfide exposures, which are immediately life-threatening, are considered to be 100 parts per million (ppm). (1,3)

Children and adults living in areas with a higher concentration of sulfur compounds are more likely to report headaches than people living in less-polluted areas. (3)

- Additionally, there was an increase in reports of respiratory symptoms among people living in high-exposure areas compared to those living in low-exposure areas. (3)

## Exposure to Hydrogen Sulfide: (1,7)

### Possible symptoms from chronic low-level concentrations of hydrogen sulfide:

- fatigue
- anxiety
- vertigo
- difficulty breathing

### Possible symptoms from exposure to high concentration of hydrogen sulfide:

- loss of consciousness
- pulmonary edema (excess fluid in the lungs)
- sudden death

## Hydrogen Sulfide Protection

If there is exposure at the workplace (such as refineries), the following actions may be taken: (7)

- The Occupational Safety and Health Act (OSHA) of 1970 allows workers to report hazards in the workplace without fear of retaliation. (7)
  - Visit OSHA's website to see more about worker's rights. (7)
  - File a complaint on workplace hazards and safety. (7)
- If the gas cannot be removed from the space, proper personal protective equipment must be used when entering the space. (1)

**Workers Rights:** [www.osha.gov/workers](http://www.osha.gov/workers)

### To file a complaint:

- Visit: <https://www.osha.gov/ords/osh7/eComplaintForm.html>
- Or call the toll free number: **1-800-321-6742**

## References

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5. U.S. Department of Labor: Occupational Safety and Health Administration. Hydrogen Sulfide. Accessed February 9, 2023. Retrieved from: <https://www.osha.gov/hydrogen-sulfide/hazards>
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The UTHealth School of Public Health's research foci is child health and obesity prevention. This material was translated from research articles provided by a faculty member who has expertise in this area.