

Emissions have declined, but sulfur dioxide air pollutant still a concern for asthmatics

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Emissions of the air pollutant sulfur dioxide have been dramatically decreased during the past 30 years but for some people even a little inhaled sulfur dioxide may still be too much.

"Asthmatics are particularly sensitive to [sulfur dioxide](#) and can be more likely to suffer asthma complications but scientists still don't know exactly why that is so," said Bill Ameredes, director of the Inhalation Toxicology Core Facility of the Sealy Center for Environmental Health and Medicine at the University of Texas Medical Branch at Galveston.

There are about 250 million people worldwide who suffer from asthma, according to the World Health Organization. Sulfur dioxide and other air pollutants may be associated with an increase in asthma complications but how and why that is remains poorly understood, according to a paper Ameredes co-authored.

To better understand what was known about asthma and sulfur dioxide, Ameredes and researchers at UTMB and the University of Texas Health Science Center at San Antonio reviewed previously published studies. In a paper in April's *Environmental Health Insights*, the researchers found previous studies indicated that sulfur dioxide can lead to adverse effects in asthmatics even when present in very small amounts and asthmatics may not be able to counter the inflammatory response in the lung as non-asthmatics can.

Sulfur dioxide is produced when fossil fuel is burned, when metal is

extracted from ores and when gasoline is extracted from oil. Due to federal emissions regulations, there has been an over 80 percent reduction in the amount of sulfur dioxide in the ambient air in the United States over the past 35 years, Ameredes said.

But studies show that even when the amount of sulfur dioxide is below what can be detected by the sense of smell, it can have [adverse effects](#) for asthmatics, Ameredes said.

In high enough concentrations, at about 5 to 10 parts per million, sulfur dioxide can cause a burning sensation in the eyes and coughing. The rotten egg odor of sulfur dioxide can be detected at 1 to 3 parts per million. However, an asthmatic could start to experience airway irritation and difficulty breathing with as little as 0.5 parts per million sulfur dioxide in the air, Ameredes said.

"Thus, if you were an asthmatic, it would be possible that you wouldn't even know that there is sulfur dioxide in the air," Ameredes said. "You'd just be having breathing difficulties and coughing, but you would not be able to detect the odor, therefore wouldn't know why you were having that experience."

It could also be more difficult for asthmatics to stop or control an irritation and inflammation response once it begins because of their inability to produce interleukin-10, a major anti-inflammatory cytokine, a protein released by cells, considered to be an "off-switch" that stops the inflammatory process, Ameredes said.

Scientists don't yet understand why [asthmatics](#) lack the ability to make interleukin-10 and it is one of the many areas still requiring study, Ameredes said.

Provided by University of Texas Medical Branch at Galveston

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