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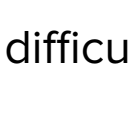
The Effects Of Air Pollution On Human Health

No one can escape the dangers.



By Anna Almendrala

The immediate effects of air pollution are hard to ignore. Watery eyes, coughing and difficulty breathing are acute and common reactions.

An estimated 92 percent of the world's population live in areas with dangerous levels of air pollution and, even at seemingly imperceptible levels, air pollution can increase one's risk of cardiovascular and premature death.

Air pollution is almost as deadly as tobacco. In 2016, it was linked to the deaths of 6.1 million people, according the University of Washington's Institute for Health Metrics and Evaluation.

And it might harm you even before you take your first breath.

Exposure to high levels of air pollution during pregnancy has been linked to miscarriages as well as premature birth, autism spectrum disorder and asthma in children.

Air pollution may damage children's brain development, and pneumonia, which kills almost 1 million children under the age of 5 every year, is associated with air pollution. Children who breathe in higher levels of pollutants also face a greater risk of short-term respiratory infections and lung damage.

Other conditions associated with high levels of air pollution include emphysema and chronic bronchitis, as well as lung cancer.

Pollutants can affect cardiovascular health by hardening the arteries and increase the risk of heart attack and strokes, and there is even emerging evidence that air pollution may be linked to mental health conditions and degenerative brain diseases such as Alzheimer's disease, Parkinson's disease and schizophrenia.

How Air Pollution Damages The Body

While air pollution's link to respiratory disease may seem obvious, its relationship to heart, brain and fetal health is less so. There are at least two possible mechanisms by which air pollution can harm parts of the body besides the nasal cavity and lungs, said Anthony Gerber, a pulmonologist at National Jewish Health in Denver.

The first has to do with inflammation, which is the body's way of repairing itself after an injury or illness.

When the toxic soup of chemical particles and liquid droplets emitted by cars, power plants, fires and factories known as particulate matter is inhaled, the microscopic toxic dust can irritate nasal passages and result in an allergic-type response to the pollution, with symptoms like coughing and a runny nose.

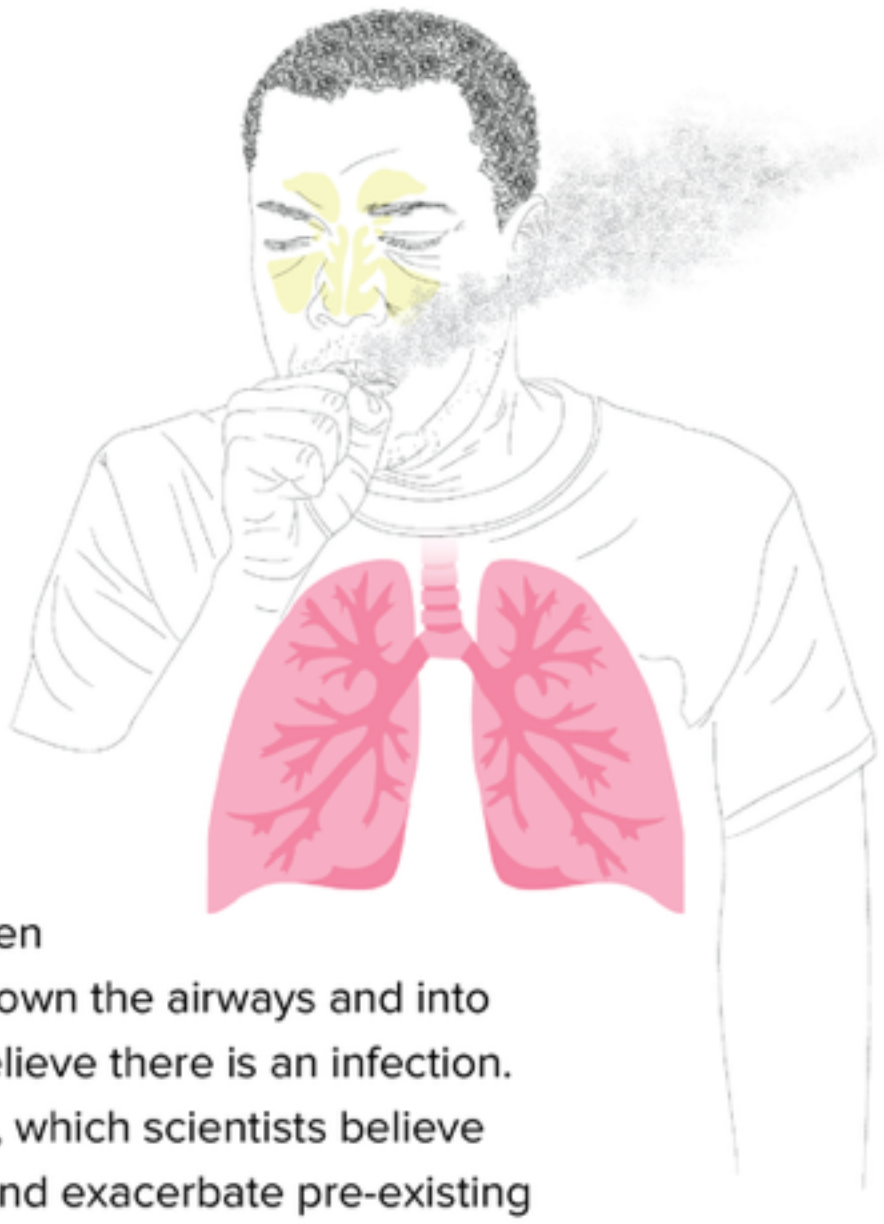
Scientists believe that as the particles make their way deeper into the airways and into the lungs, the body may mistake it for an infection, triggering an inflammatory response.

"When you have a bad head cold, you feel sick everywhere and your muscles might ache," Gerber said. "The same thing can happen when you breathe in pollution."

Scientists also suspect that some toxic particles can escape the lungs and enter the bloodstream.

What Air Pollution Does To The Body

When air pollution enters the body, it can have both short-term and long-term effects on health. See how particulate matter, which is the most commonly studied type of air pollution, can cause serious respiratory and cardiovascular distress.



When **particulate matter** is inhaled, it can **irritate tissue** in the **nasal cavity** and cause coughing and a runny nose.

Large particles can get stuck in your nose and sneezed out, but some scientists suspect that when finer particulate matter travels down the airways and into the **lungs** , it makes the body believe there is an infection. This could trigger **inflammation**, which scientists believe can cause shortness of breath and exacerbate pre-existing respiratory symptoms in people who have **asthma** or **chronic obstructive pulmonary disease**.

Scientists hypothesize that this inflammation can spread from the lungs to other parts of the body, increasing risk of **heart attack**, **stroke** and other kinds of **cardiovascular disease**.

In pregnant people, air pollution may trigger **inflammation** throughout the body, including the **uterus**, which increases the risk of **preterm birth**.

In children, air pollution has been linked to **lung damage** and can inhibit **growth of lung function**. It's unclear whether this permanently reduces lung function into adulthood.

As **particulate matter** pollution goes down, **life expectancy** goes up. This may be because of particulate matter's effects on the **heart** and **lungs**. Globally, three percent of **heart and lung disease** deaths, and five percent of **lung cancer** deaths, are linked to particulate matter.

Sources: National Park Service, American Heart Association, American Lung Association, Environmental Protection Agency, Johns Hopkins Bloomberg School of Public Health, World Health Organization, USC Children's Health Study

Alissa Scheller/HuffPost

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Studying The Dangers Of Air Pollution

Scientists believe there's strong evidence to suggest high levels of air pollution negatively affect health. And a growing number of correlative studies have shown that when people move to cleaner regions, or when air pollution levels decrease, health outcomes improve, says Carrie Breton, an environmental health researcher at the University of Southern California's Keck School of Medicine.

USC's Children's Health Study has studied the long-term effects of air pollution on children over the past 25 years and found that kids who move to areas with lower levels of pollution have improved lung function growth and performance. Similarly, scientists have found that as the air pollution levels in Southern California have dropped, so too have rates of bronchitic symptoms such as coughing, congestion and phlegm. Long-term lung function in children has also improved over the last 20 years as air pollution rates in the Los Angeles basin have gone down.

"When you start to see many different studies in different places in the world ... showing similar results, the body of evidence makes it more and more believable," Breton said.

While randomized controlled trials on outdoor air pollution are rare, they do exist. A recent experiment by researchers in London asked people to take a two-hour walk along traffic-heavy Oxford Street or in Hyde Park. They found the health benefits were canceled out for all participants, on account of reduced lung function and increased airway resistance, which continued for a period after the trial ended.

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