

- Plastics

HOT SCIENCE

THE AVERAGE HUMAN REGULARLY INHALES MICROPLASTICS INTO THEIR AIRWAYS AND LUNGS. NEW RESEARCH IS LOOKING INTO THE IMPACT THIS HAS ON OUR BODIES.



ARE MICROPLASTICS HARMING OUR HEALTH?



MICROPLASTICS are everywhere. Everyday items like clothing, food packaging, cosmetics, and car tires shed tiny particles of plastics, which in turn find their way into our blood, baby poop, placentas, and breast-milk. According to recent research, plastics are even in the intricate, delicate tissue that makes up our lungs.

Research from 2019 suggests that we might breathe in up to 11.3 microplastics per hour, or up to 272 microplastics in 24 hours. A study published in the journal *Physics of Fluids* in 2023 discovered that those plastics can get lodged into our airways and stay there over time.

“People never thought that we could inhale microplastic, so the data is underestimated and the result is more severe,” says Saidul Islam, the paper’s lead author and a professor at the University of Technology Sydney.

DESPITE THE ubiquity of microplastics, scientists don’t fully understand

their long-term impacts on our health. A 2019 report published in *Environmental Science & Technology* found that people in the U.S. consume about 39,000 to 52,000 particles of microplastics each year through food and water. Lab experiments have shown that microplastics can cause damage to human cells, as well.

Most studies tend to solely focus on the ingestion of microplastics, even though we are inhaling these plastics, too, Islam says. His study is among the first of its kind to quantify just how much we’re breathing in, and how they’re deposited in the upper airways. For example, slower breathing associated with sleeping was linked with smaller particles lodging deep inside the lungs.

“How it is actually affecting our respiratory health is still unknown,” says Islam. Air pollution particles are known to enter the body and cause millions of early deaths a year — it’s just unclear how much of that is due to microplastics.

Experts are starting to correlate microplastics with lung inflammation, shortness of breath and a higher risk of lung cancer. Research on rats suggests that when microplastics infiltrate lung cells, they can start to jumble up the composition of those cells. This suggests that exposure to microplastics can cause lung injury in humans, too.

“We need more studies on how plastic embeds in the lung surface, and how it creates the diseases,” Islam says. “We’re only starting to understand how it transports in the airways.”

RESEARCH ON microplastics and human health is still in its early days, says Mary Johnson, a principal research scientist at Harvard T.H. Chan School of Public Health. But one thing is clear: each stage of the life cycle of plastic disproportionately impacts vulnerable communities.

“In general, vulnerable populations are at even greater risk of the negative health impacts from the production, use and degradation of plastics,” says Johnson. She cites a 2021 United Nations report on global plastics pollution that detailed Indigenous communities’ displacement for oil extraction, contamination of water supplies in low-income communities, health problems among predominantly Black communities living near oil refineries in the South, and other dangers faced by at-risk communities.

Another study, published in 2023 in *Annals of Global Health*, found that fossil-fuel workers, plastic producers, and communities living near plastics production and disposal sites experienced higher rates of certain cancers, respiratory disease, and pregnancy and birth complications.

Many known human carcinogens and endocrine disruptors, such as so-called forever chemicals, are added to plastics during production to enhance performance. “Plastics are highly toxic,” says Islam. “Because when we are inhaling the plastics, [they] could also actually carry some more toxic chemicals.”

—SOFIA QUAGLIA