

# 'Polluted' babies, millions dead: Scientists sound alarm on global pollution

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By many measures, modern science has greatly improved the American way of life. Advances in chemistry and other technologies over the past century have made food more affordable and transportation more convenient and paved the way for a plethora of consumer goods. About 4 in 5 U.S. households own a computer and smartphone.

But science is revealing the human costs of these advances.

The production and consumption of the foods, fuels and materials that dominate daily life are leading to large-scale environmental pollution that can impact the health of people across the globe.

In early May, a groundbreaking study from the University of California, San Francisco of 171 [pregnant women](#) found more than 9 in 10 had measurable amounts of 19 different chemicals and pesticides in their bodies. Researchers said many of those substances pass through the placenta and into developing fetuses, adding evidence to a National Institutes of Health report that warned babies are born "pre-polluted" with chemicals.

The full extent of health effects from such exposures is unknown, but scientists worry they could contribute to rising U.S. rates of autoimmune diseases, developmental disorders such as autism and reproductive harms, such as the mysterious decline of sperm counts in men.

Tracey Woodruff, a director of the Reproductive Health and Environment Program at the University of California, San Francisco and co-author of the study, said the work only scratches the surface of what Americans are exposed to and the potential health effects.

"Pregnancy is such an important time for susceptibility to [environmental chemicals](#), both for the fetus and the pregnant person," Woodruff said. "Our understanding of exposures is not keeping up. ... What are these chemicals doing?"

Tuesday, a study published in the journal *The Lancet* expanded on pollution concerns globally, revealing that air and [water pollution](#) causes 1 in 6 deaths worldwide. At more than 9 million deaths per year, such pollution kills more people than malnutrition, roadway injuries and drug

and alcohol use combined, the study found.

Most harmed are developing nations in East and Southeast Asia, where historically low levels of environmental protections have led to dangerous and runaway pollution. The report laid out the interconnected nature of the threat.

Richard Fuller, president of the environmental nonprofit Pure Earth, said Americans can be exposed to the pollutants through imported products such as spices and baby food, or as harmful particulates in air traveling across oceans. Air emissions from worldwide manufacturing and transportation contribute to global warming, meaning that no nation escapes the harm they create.

"A good percentage of the air quality in San Francisco is actually from coal-fired burning in China that's crossed the entire Pacific," Fuller said. "These particles will move and cause damage many thousands of miles away from where they started."

Air pollution originating in the USA is still a problem, particularly for "fenceline" communities near industrial facilities.

A report from the nonprofit Environmental Integrity Project this month found that nearly half of 118 U.S. oil refineries, crucial to the production of gasoline and plastics used in consumer goods, emit the carcinogenic [chemical](#) benzene at levels potentially unsafe to residents downwind. Twelve plants, ranging from Pennsylvania to Indiana to Texas, further exceed a safety limit established by the Environmental Protection Agency, the report found.

"EPA and the oil refining industry really need to do more to crack down on these benzene emissions, because the fenceline concentrations at too many refineries are high enough to pose a potential threat to

neighborhoods that are close by," said Eric Schaeffer, executive director of the nonprofit.

Industry pushed back on the notion that common chemicals are linked to health effects.

The American Chemistry Council, a trade association, wrote in an email to USA TODAY that the Centers for Disease Control and Prevention said mere exposure to a chemical "does not by itself mean" it will cause harm. The ACC noted the new study on pregnant women drew no such conclusions. Companies are "serious" about chemical safety as well as performance, the council said.

"Our members undertake extensive scientific analyses to evaluate potential risk of their chemicals, from development through use and safe disposal," the group wrote. "We work with regulators, retailers and manufacturers to provide them with information about our chemicals."

## **Planetary threat**

Though the changing climate is often viewed as the most pressing global environmental threat, researchers warned that on-the-ground pollution poses ecological and humanitarian catastrophes of its own.

Roland Geyer, an industrial ecology researcher at the University of California, Santa Barbara, said the pollution threat is a crisis akin to [climate change](#) and the loss of biodiversity.

In 2017, Geyer found that since the mass production of plastics began in the 1950s, more than 8.3 billion tons have been produced, 79% of which ended up in the environment or landfills. That comes out to about 2,300 pounds for every person on the planet. Half was generated just in the prior 13 years, and the amount is set to double by 2050.

"We were just blown away by how much plastic we've made and how incredibly careless or incompetent we are at managing that material," Geyer said.

Once plastics are in the environment, they can take thousands of years to break down. Larger pieces degrade into "microplastics," which studies have found littered throughout food products and the human body, where they can disrupt hormones, harm the immune system and increase risk of chronic disease.

Experts liken the exposure of humans to plastics and chemicals to past problems with the toxic metal lead.

After research linked lead to kidney and cardiovascular damage in adults, as well as brain and nervous systems in children, the United States banned its use in paint in 1978 and in gasoline in 1996. Though [lead poisoning](#) from old paint and water pipes remains a concern, particularly in marginalized communities with older housing stock, the median blood level of children has fallen more than 15-fold.

Geyer noted it took decades for enough scientific evidence to accumulate before the phaseouts were made, a timeline that troubles him as plastics proliferate.

"It's a bit like running a giant global experiment," Geyer said.

The *Lancet* study found lead still contributes to nearly a million deaths a year across the globe, primarily in India and Central and Western Africa. Much of it can be attributed to the improper recycling of lead-acid batteries and "e-waste" (outdated electronics) originating from wealthier nations.

"It's done in backyards, and a lot of the lead is released into the land and

poisons local kids and floats down to their pastures and gets picked up by (agricultural) products," Fuller said.

Air pollution, which kills about 6.5 million every year and contributes to global warming, often comes from factories in developing nations that export goods to wealthy trading partners, according to *The Lancet* report.

Though environmental laws such as the Clean Air Act and Clean Water Act have decreased the amount of many toxins in the environment over the past 50 years, experts said regulators remain far behind in catching up to the threats of the modern era, particularly in newer chemicals.

Of the more than 40,000 chemicals in commerce, only a fraction have been robustly studied for potential human health effects, Woodruff said.

Some of the most concerning are PFAS, or "forever chemicals," which are commonly used in water-resistant products and nonstick pans. Studies show more than 96% of Americans have at least one PFAS in their blood, some of which have been linked to cancer, high cholesterol, reproductive harm and other health effects.

Woodruff places responsibility with the EPA's chemical safety program. Employees of the agency told USA TODAY it has not been able to thoroughly evaluate new chemicals before companies place them into commerce. Woodruff said even when chemicals are found to be hazardous and phased out, her study of 171 American women shows replacement chemicals are often utilized before being fully evaluated.

"Chemicals that had been a focus of regulatory or market-based campaigns, they seem to be either remaining stable or going down" in women, Woodruff said. "But their replacements are going up."

In response, the American Chemistry Council said it interacts with six

[regulatory agencies](#) under 12 different laws meant to ensure the safety of products, and it supported the overhaul in 2016 of the Toxic Substances Control Act, the nation's primary chemical safety law.

"We continue to work with EPA, FDA and other federal agencies to strengthen our regulatory system and help ensure that policies are made using the best-available science and the weight of the evidence to make decisions," the group wrote.

In a statement, the EPA said although the change to the chemicals law in 2016 gave the agency unprecedented authority to analyze the safety of chemicals, Congress has not appropriated additional funding. That led to a doubling of the workload without new staff and caused the agency to miss deadlines for 90% of an initial set of chemical reviews, it said.

"EPA ... will continue to struggle to review the safety of new chemicals quickly absent additional resources," the agency said, adding that the White House asked Congress for an additional \$64 million and 200 employees.

## **Pollution solutions**

Efforts to cut down on pollution have often focused on the "end fate" of materials, such as recycling plastics or repurposing materials. Research has shown such solutions to be mostly futile. Geyer's study found that just 9% of all plastic created has been successfully recycled.

The figure is lower in the USA—about 6%—and even European nations that invest deeply in recycling top out at about 40%, Geyer said. Globally, the majority of plastic still ends up in the environment or landfills, and smaller fractions are incinerated.

Stephanie Wein, a clean water advocate with the nonprofit

PennEnvironment, said that such solutions misplace responsibility. Though the group has successfully advocated for plastic bag bans in Pittsburgh and Philadelphia to help clean up neighborhoods, Wein noted such efforts "don't solve the plastics crisis." Even well-intentioned consumers find it difficult to cut down on plastics in a world where nearly every product is encased in it, she said.

"The onus should not be on local governments or consumers to deal with the waste," Wein said. "The onus should instead be on the companies that create it."

Geyer said the magnitude of the problem requires that governments determine a sustainable annual amount of plastic and chemical production, then work to ratchet industry down to those levels.

"There will always be plastic ... it's such a cheap and incredibly useful material," Geyer said. "But we need to agree that this is too much, and we need to bring it down."

Other experts said solutions need to come from bolstered federal agencies such as the EPA, with help from Congress through more funding and new authorities.

John Beard, executive director of the Port Arthur Community Action Network in Port Arthur, Texas, is among those who say the agency could be doing more now.

In Port Arthur, a French-owned Total Energies oil refinery is one of 12 facilities the Environmental Integrity Project calculated was emitting benzene at levels above EPA limits. Beard said the city is rife with cancer, but little is being done to understand and address hazards.

"We need more monitoring along the fenceline communities, and also



beyond the fenceline, because the effects are carried downwind," Beard said. "We have to regulate how these refineries go about their business."

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