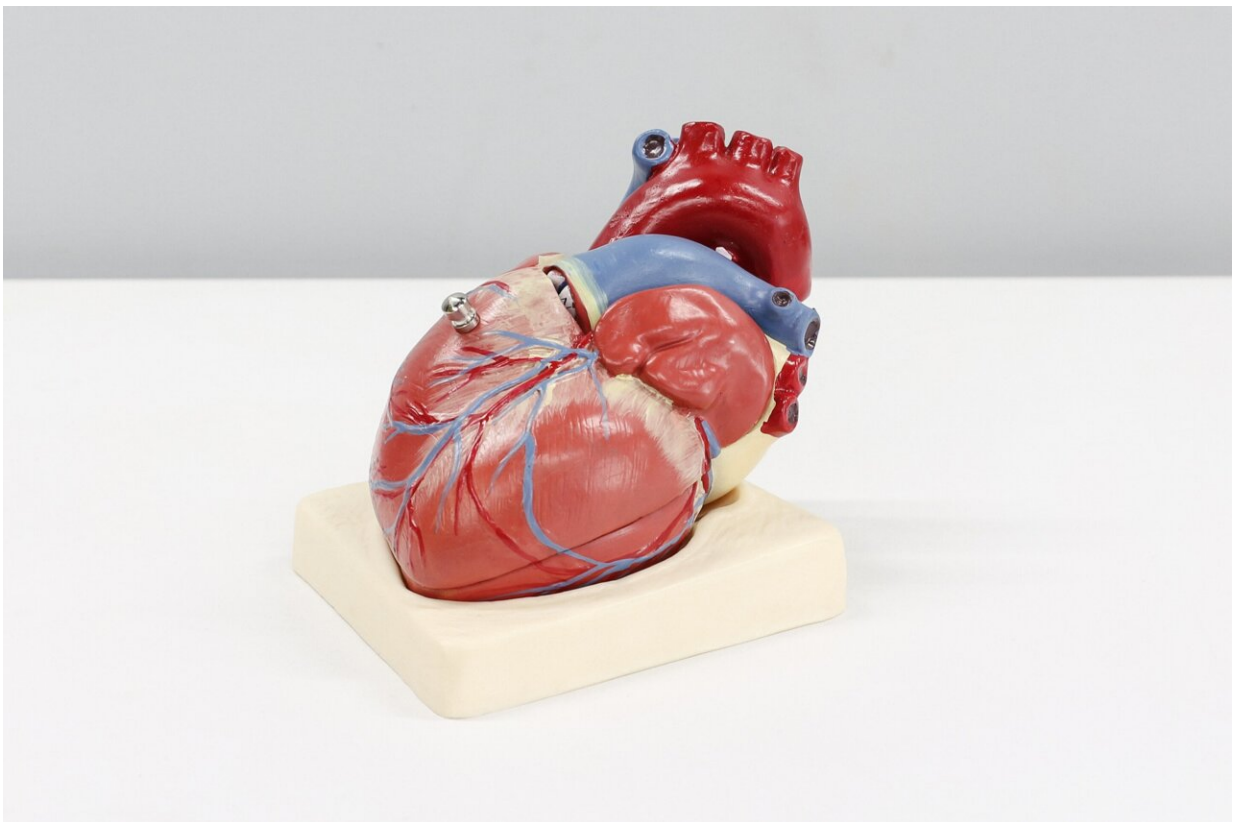


# 30 years of data: Lead and other environmental toxins linked to CVD deaths in US, UK

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In a comparison of cardiovascular disease (CVD) deaths associated with environmental toxins over the past 30 years, lead exposure has

contributed more to CVD death risks in the U.S. compared with the United Kingdom, while the U.S. has fared better in terms of CVD death risks linked to particulate matter when compared to the United Kingdom, according to preliminary research to be presented at the American Heart Association's Scientific Sessions 2022. The meeting, held in person in Chicago and virtually, Nov. 5-7, 2022, is a premier global exchange of the latest scientific advancements, research and evidence-based clinical practice updates in cardiovascular science.

Environmental exposure to toxins, such as lead, smoking, secondhand smoke and [air pollution](#), plays a role in the development and progression of CVD and in CVD-related deaths. In addition, recurrent exposure to toxins is linked to heart disease, [high blood pressure](#) and hardening of the arteries.

"The good news is that the U.S. and the United Kingdom have been doing remarkably well at reducing certain environmental factors that may contribute to cardiovascular death. However, despite reductions made, our study suggests that there is still a significant difference between the U.S. and the United Kingdom when comparing cardiovascular death risk factors such as lead and [particulate matter](#)," said lead study author Anoop Titus, M.D., a third-year internal medicine resident at St. Vincent Hospital in Worcester, Massachusetts. "Physicians may counsel their patients about the cardiovascular risks of [environmental toxins](#); however, it takes a community to achieve change."

Researchers gathered the combined cardiovascular mortality data from the 2019 Global Burden of Disease study for both countries over the past 30 years, which totaled 33 million deaths. Based on exposure to four risk factors—lead, particulate matter, secondhand smoke and smoking—the researchers calculated the proportion of CVD deaths associated with these four cardiovascular risk factors during those 30 years.

This new analysis is an effort to identify the differences, after accounting for population size (ratio in [population size](#) was used to make the countries comparable), between the U.S. and the United Kingdom since both share many similarities and risk factors (high-income countries with similar risk factors and Western lifestyle).

The study found:

- The United States had a higher risk-attributable cardiovascular death rate associated with [lead exposure](#), at 2.4% over the 30 years compared to 1.4% in the United Kingdom.
- In contrast, the United Kingdom had a more significant proportion of cardiovascular deaths associated with exposure to particulate matter at 6.5%, compared to the United States at 5.0% during the same 30-year period.
- There were no significant differences in cardiovascular deaths between the countries for smoking and exposure to secondhand smoke over the 30 years.
- In the U.S. and U.K., the share of risk attributed to cardiovascular death remains the same today as in 1990, with smoking being the highest risk factor in both countries followed by particulate matter. Lastly, lead and secondhand smoke were next in the U.S. with secondhand smoke and lead coming next in the United Kingdom.

"We expected that there would be no difference between these countries because there have been comparable public health policies to increase preventive care and environmental regulations to reduce exposure to toxins," Titus said. "In the U.S., lead exposure is still high, which most often comes from paint, drinking water, plumbing and dust in old houses, while exposure to particulate matter has significantly reduced in the past 30 years. The United States is not as densely populated as the United Kingdom and that could also explain the higher secondhand

smoking risk in the U.K. In the past 30 years, about 20% of people who died from cardiovascular disease in the U.S. and the U.K. were smokers."

When trends for the four environmental factors (lead, smoking, secondhand smoke and air pollution) were analyzed, they discovered a steady decline in cardiovascular deaths associated with all factors in both countries over the 30 years.

"Our study revealed that we are still tackling the beast. Patient counseling by physicians and cardiologists is required to educate patients regarding these four [environmental factors](#) linked to cardiovascular disease," Titus said. "More research on how environmental [risk factors](#) impact our daily lives is needed to help policymakers, public health experts, and communities see the big picture. Better anti-smoking campaigns need to be developed as well as changes that move us away from [fossil fuels](#)."

While this study does not prove a direct cause between environmental toxins and the risk of cardiovascular death, it suggests a difference in cardiovascular mortality in these geographically separated yet demographically similar countries, Titus noted.

In 2021, the [American Heart Association](#) joined with three other leading cardiovascular organizations urging the medical community and health authorities to mitigate the impact of air pollution on people's health. According to the statement, an estimated 6.7 million deaths in 2019, or 12% of all deaths worldwide, were attributable to outdoor or household air pollution. As many as half of these were due to cardiovascular disease. Air pollution also increases the risk of heart attack, stroke, Type 2 diabetes and respiratory diseases. Air pollution was the 4th leading risk factor for early [death](#) worldwide in 2019, surpassed only by high blood pressure, tobacco use and poor diet.

"Air quality is an important contributor to cardiovascular risk, and worrisome environmental exposures include wildfires, fossil-fuel generated particulate matter in the air and [secondhand smoke](#) from tobacco products," said AHA past president and co-author of the joint statement Robert A. Harrington, M.D., FAHA, who is also the Arthur L. Bloomfield Professor of Medicine, and chair of the department of medicine at Stanford University. "In this abstract, the authors suggest some reasons that there might be differences between the U.S. and the U.K., which certainly make sense and may serve as hypotheses for more research into needed policy changes that govern the quality of our air across the globe."

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**More information:** Abstract: [www.abstractsonline.com/pp8/?& ...  
1/presentation/11269](http://www.abstractsonline.com/pp8/?&.../presentation/11269)

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