



News

Air pollution below EPA standards linked with higher death rates



For immediate release: June 3, 2015

Boston, MA – A new study by researchers at Harvard T.H. Chan School of Public Health found that death rates among people over 65 are higher in zip codes with more fine particulate air pollution ($\text{PM}_{2.5}$) than in those with lower levels of $\text{PM}_{2.5}$. It is the first study to examine the effect of soot particles in the air in the entire population of a region, including rural areas. The harmful effects from the particles were observed even in areas where concentrations were less than a third of the current standard set by the Environmental Protection Agency (EPA).

“Most of the country is either meeting the EPA standards now, or is expected to meet them in a few years as new power plant controls kick in,” said senior author Joel Schwartz, professor of environmental epidemiology. “This study shows that it is not enough. We need to go after coal plants that still aren’t using scrubbers to clean their emissions, as well as other sources of particles like traffic and wood smoke.”

The study appears online June 3, 2015 in *Environmental Health Perspectives*.

Previous studies have linked both short- and long-term exposure to PM_{2.5} with increased mortality, through mechanisms such as [heart disorders](#), increased blood pressure, and reduced lung function.

The researchers used satellite data to determine particle levels and temperatures in every zip code in New England. This allowed them to examine the effects of PM_{2.5} on locations far from monitoring stations, and to look at the effects of short-term exposures and annual average exposures simultaneously. They analyzed health data from everyone covered by [Medicare](#) in New England – 2.4 million people – between 2003 and 2008 and followed them each year until they died.

They found that both short- and long-term PM_{2.5} exposure was significantly associated with higher death rates, even when restricted to zip codes and times with annual exposures below EPA standards. Short-term (two-day) exposure led to a 2.14% increase in mortality per 10 µg/m³ increase in PM_{2.5} concentration, and long-term (one-year) exposure led to a 7.52% increase in mortality for each 10 µg/m³ increase.

“Particulate air pollution is like lead pollution, there is no evidence of a safe threshold even at levels far below current standards, including in the rural areas we investigated,” said Schwartz. “We need to focus on strategies that lower exposure everywhere and all the time, and not just in locations or on days with high particulate levels.”

First author of the study was Liuhua Shi, a doctoral student in the Department of Environmental Health.

This study was funded by NIEHS ES000002, and by EPA grant RD-83479801.

[“Low-Concentration PM_{2.5} and Mortality: Estimating Acute and Chronic Effects in a Population-Based Study,”](#) Liuhua Shi, Antonella Zanobetti, Itai Kloog, Brent A. Coull, Petros Koutrakis, Steven J. Melly, and Joel D. Schwartz, *Environmental Health Perspectives*, online June 3, 2015, doi: 10.1289/ehp.1409111

Visit the Harvard Chan website for the [latest news](#), [press releases](#), and [multimedia offerings](#).

###

For more information:

Todd Datz

tdatz@hspph.harvard.edu

617.432.8413

photo: iStockphoto.com

###

Harvard T.H. Chan School of Public Health brings together dedicated experts from many disciplines to educate new generations of global health leaders and produce powerful ideas that improve the lives and health of people everywhere. As a community of leading scientists, educators, and students, we work together to take innovative ideas from the laboratory to people's lives—not only making scientific breakthroughs, but also working to change individual behaviors, public policies, and health care practices. Each year, more than 400 faculty members at Harvard Chan teach 1,000-plus full-time students from around the world and train thousands more through online and executive education courses. Founded in 1913 as the Harvard-MIT School of Health Officers, the School is recognized as America's oldest professional training program in public health.

Copyright © 2020 The President and Fellows of Harvard College

□