Air pollution cuts are saving lives in New York state

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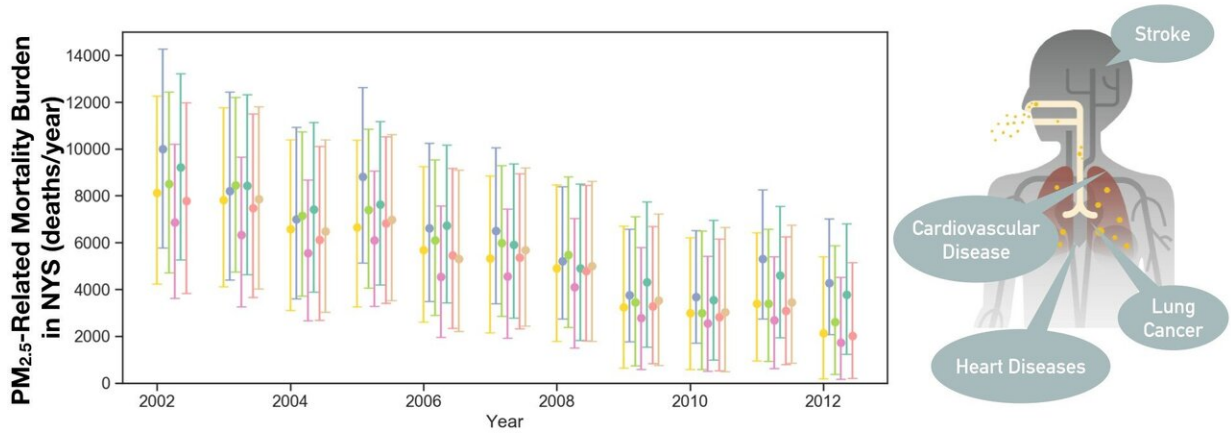

A new study charts declines in New York State air-pollution-related deaths due to various ailments over a decade. Credit: Xiaomeng Jin

Lower air pollution levels saved an estimated 5,660 lives in New York State in 2012, compared to 2002 levels, according to a new study.

Published in *Environmental Research Letters*, the study—led by Columbia University's Lamont-Doherty Observatory atmospheric

chemistry research group—looked at New York State levels of a specific kind of pollution known as fine particulate matter, or "PM2.5." These microscopic particulates are a mixture of solid particles and liquid droplets. Some come from burning fuel, and others form in the atmosphere as a result of complex reactions of chemicals such as sulfur dioxide and nitrogen oxides from power plants, industries and automobiles. Long-term exposure to PM2.5 can lead to respiratory and cardiovascular problems.

The study compared seven datasets, including both on-the-ground and satellite measurements, to analyze trends in PM2.5 levels across New York State. The researchers found that PM2.5 levels dropped by 28 to 37 percent between 2002 and 2012. They calculated that this drop cut the air pollution mortality burden for New York State residents by 67 percent—from 8,410 premature deaths in 2002 to 2,750 deaths in 2012.

"What's novel about this study is that we use seven different PM2.5 exposure estimates to analyze the long-term change in mortality burden, and they all show a consistent decrease in mortality burden," said Xiaomeng Jin, the Lamont researcher who led the study.

The study considered four ailments triggered by long-term exposure to fine particulate matter: chronic obstructive pulmonary diseases, ischemic heart disease, lung cancer, and cerebrovascular and ischemic stroke.

The study provides evidence that emission controls on air pollutants, initiated by the Clean Air Act of 1970—and expanded under amendments passed in 1990 that required a review of scientific evidence on which standards are set and implemented—have improved public health across New York State, said the researchers.

"Those reviews have sometimes resulted in stricter standards being set, which in turn set in motion the process of emission controls to meet

those standards," said Lamont atmospheric chemist and co-author of the study Arlene Fiore.

Among the other factors that have helped clear the air: continued progress in cleaner vehicles; additional programs to reduce air pollution, including programs targeting diesel fuel, a source of sulfur dioxide; and the reduction of high sulfur dioxide-emitting coal-burning power plants.

More information: Xiaomeng Jin et al. Comparison of multiple PM2.5 exposure products for estimating health benefits of emission controls over New York State, USA, *Environmental Research Letters* (2019). DOI: 10.1088/1748-9326/ab2dcb

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