

High pollution cuts most Indian lives short by three years

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The World Health Organization rates India's air pollution as some of the worst—ranking 13 of the country's cities among the 20 most polluted in the world. Credit: Hans Braxmeier

India's air pollution, ranked among the world's worst, is reducing the life expectancy of over half of the country's population by more than three years, according to a new study.

Researchers from the University of Chicago, Harvard and Yale wrote in this month's *Economic & Political Weekly* that more than 660 million Indians live in areas where fine-particulate matter pollution exceeds levels considered safe by Indian standards. If India reverses this trend to meet standards, those 660 million people would gain about 3.2 years onto their lives—saving a total of 2.1 billion life-years.

"India's focus is necessarily on growth. However for too long, the conventional definition of growth has ignored the health consequences of air pollution," said Michael Greenstone, an author of the study and director of the Energy Policy Institute at the University of Chicago. "This study demonstrates that air pollution retards growth by causing people to die prematurely. Other studies have also shown that air pollution reduces productivity at work, increases the incidence of sick days and raises health care expenses that could be devoted to other goods."

The new figures come after World Health Organization estimates showed 13 of the 20 most polluted cities in the world were in India, including the worst-ranked city, Delhi. India has the highest rate of death caused by chronic respiratory diseases anywhere in the world.

Rohini Pande, a study co-author and director of Evidence for Policy Design at the Harvard Kennedy School, said, "The loss of more than two billion life years is a substantial price to pay for [air pollution](#). It is in India's power to change this in cost-effective ways that allow hundreds of millions of its citizens to live longer, healthier and more productive lives. Reforms of the current form of regulation would allow for health improvements that lead to increased growth."

The study co-authors, who include Nicholas Ryan of Yale University; Janhavi Nilekani and Anish Sugathan of Harvard; and Anant Sudarshan, director of EPIC's India office—offer three cost-effective policy

solutions that would decrease India's pollution. One initial step would be for India to increase its monitoring efforts and take advantage of new technology that allows for real-time monitoring. Intermittent sampling of plants taken once or twice a year is not enough to identify violators, the authors wrote. Further, there is not enough pollution monitoring stations for the public to learn about ambient concentrations. As one point of comparison, Beijing has 35 monitoring stations, while the Indian city with the most monitoring stations, Kolkata, has only 20. The authors argue increased monitoring would put more pressure on polluters to comply with existing regulations. While the government has taken important steps to improve monitoring, there is room for further expansion.

The authors added that a greater reliance on civil rather than criminal penalties would instill a "polluter pays" system that would provide polluters with an incentive to reduce pollution. India's flagship environmental laws, the authors wrote, are built on an outdated criminal system with draconian penalties such as imprisonment or industry closure. Because these penalties are so severe, they are difficult to enforce.

Building on more rigorous monitoring and financial penalties, the authors suggest India should begin to adopt a market-based approach toward regulating emissions, like an emissions trading system. Such an approach has been proven to reduce pollution at the lowest possible cost, making it compatible with the continued economic growth that is vital for India's future.

The study draws from an earlier study that Greenstone conducted in China, in which he and his co-authors compared pollution in northern China—where a policy subsidized coal use for home heating—to southern China. Through this study, he was able to separate the effect of pollution from other factors that also affect mortality to find an

important metric: Every additional 100 micrograms of total suspended particulate matter per cubic meter in the atmosphere lowers [life expectancy](#) at birth by three years. That metric was then applied to the Indian data.

More information: "Lower Pollution, Longer Lives: Life Expectancy Gains if India Reduced Particulate Matter Pollution."

[www.epw.in/special-articles/lo ... on-longer-lives.html](http://www.epw.in/special-articles/lo...on-longer-lives.html)

"Evidence on the impact of sustained exposure to air pollution on life expectancy from China's Huai River policy." *PNAS* 2013 110 (32) 12936-12941; published ahead of print July 8, 2013, [DOI: 10.1073/pnas.1300018110](#)

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