

Air pollution now major contributor to stroke, global study finds

Scientists say finding is alarming, and shows that harm caused by air pollution to the lungs, heart and brain has been underestimated

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Air pollution has become a major contributor to stroke for the first time, with unclean air now blamed for nearly one third of the years of healthy life lost to the condition worldwide.

In an unprecedented survey of global risk factors for stroke, air pollution in the form of fine particulate matter ranked seventh in terms of its impact on healthy lifespan, while household air pollution from burning solid fuels ranked eighth.

Valery Feigin, director of the National Institute for Stroke and Applied Neurosciences at Auckland University of Technology, said that while he expected air pollution to emerge as a threat, the extent of the problem had taken researchers by surprise.

“We did not expect the effect would be of this magnitude, or increasing so much over the last two decades,” he said. “Our study is the first to demonstrate a large and increasingly hazardous effect of air pollution on stroke burden worldwide.”

The result is particularly striking because the analysis is likely to have underestimated the effects of air pollution on stroke, as the impact of burning fossil fuels was not fully accounted for. Emissions from fossil fuels are more harmful to the cardiovascular system than the fine particulate matter the team analysed, Feigin said.

Scientists in the field said the “alarming” finding, published in the journal *Lancet Neurology*, showed that harm caused by air pollution to the lungs, heart and brain had been underestimated.

About 15 million people a year suffer a stroke worldwide. Nearly six million die, and five million are left with permanent disabilities, such as loss of sight and speech, paralysis and confusion.

Feigin analysed a haul of medical data from the Global Burden of Disease Study 2013 to build a picture of how different risk factors for stroke left people disabled and cut their lives short in 188 countries between 1990 and 2013. The study highlighted the most important contributors to stroke worldwide as high blood pressure, a diet low in fruit, obesity, a high salt diet, smoking, and not eating enough vegetables.

Nearly three quarters of the global burden of stroke was linked to lifestyle choices, such

as smoking, bad diet and too little exercise, suggesting that people can do a lot to reduce their risk of stroke. Meanwhile, ambient air pollution was linked to 17%, and household air quality to 16%, of the burden of stroke, measured by the years of healthy life it reduced. Pollution in homes from burning solid fuel for heat emerged as a risk factor for stroke only in low and middle income countries.

From 1990 to 2013, the global harm caused by stroke due to poor diet, smoking and almost every other risk factor rose, with only secondhand smoke and household pollution falling. Environmental air pollution came from vehicles, power plants, industry and fossil fuels, with traditional burning of biomass a major source in developing countries.

Over the long term, air pollution is thought to increase the risk of stroke by hardening arteries in the brain, making blood thicker and raising blood pressure, so boosting the risk of clots in the brain. But it may have acute effects too, such as rupturing the plaques that build up in arteries, which can then go on to cause blockages.

“As one of the main sources of air pollution is car emissions, staying away from the streets, especially at rush hour, or avoiding busy roads, can help to reduce exposure to air pollution,” said Feigin. On days when air pollution is high, he said people should stay indoors as much as possible.

The study follows a report in February from the Royal College of Physicians which blamed air pollution both inside and outside homes for at least 40,000 deaths a year in the UK.

Stephen Holgate, professor of immunopharmacology at Southampton University, who led the Royal College of Physicians report, said it had long been known that air pollution was a driver of cardiovascular disease from work that had focused on heart attacks.

“This impressive international survey now throws into stark relief a major effect of air pollution as a risk factor in stroke,” he told the Guardian. “It adds further to the increasing evidence highlighted by the recent Royal College of Physicians Report showing that air pollution has severe adverse toxic effects at multiple sites in the body from conception to old age. Air pollution is a major public health hazard and demands action to improve air quality both in the developed and developing world.”

In a comment piece that accompanies Feigin’s study, Vladimir Hachinski at the University of Western Ontario and Mahmoud Reza Azarpazhooh at Mashhad University of Medical Sciences in Iran, stress the global nature of the air pollution problem.

“The most alarming finding was that about a third of the burden of stroke is attributable to air pollution. Although air pollution is known to damage the lungs, heart, and brain, the extent of this threat seems to have been underestimated,” they write. “Air pollution is not just a problem in big cities, but is also a global problem. With the ceaseless air streams across oceans and continents, what happens in Beijing matters in Berlin.”

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