

Air Pollution and Health

Shajahan P Sulaiman^a

a. Department of Pulmonary Medicine, Government TD Medical College, Alappuzha*

ABSTRACT

Published on 30th December 2023

Air pollution and consequent health issues are a growing concern all over the world. Both indoor and outdoor air pollution are major environmental health problems which accounted for approximately 6.7 million premature deaths worldwide annually. World health organization (WHO) report says ninety nine percent of the world's population is breathing polluted air. The primary air pollutants found in most urban areas are carbon monoxide, nitrogen oxides, sulfur oxides, hydrocarbons, chlorofluoro carbons and particulate matter. These pollutants are dispersed throughout the world's atmosphere in concentrations high enough to cause health problems.

Air pollution can result in diverse health problems affecting various organs. People who have heart disease, or lung disease, and older people may be very sensitive to exposures. Children feel the effects of lower levels of pollution than adults. The exposure to air pollution increases the risk of pneumonia and asthma among children, and chronic respiratory diseases and lung cancer among adults. There is an association between air pollution and adverse pregnancy outcomes, increase incidence of ischemic heart disease and nasopharyngeal and laryngeal cancers, cataracts and tuberculosis. Apart from these direct effects, air pollution contributes significantly to global warming and related health issues.

The WHO has set an upper limit for various pollutants in air to protect the public from the health effects of these agents. Strict measures to monitor the industrial emissions, control of motor vehicle emissions and promoting public transport system will help to curb this growing menace to great extent. Simple measures such as walking or cycling to travel a short distance and planting trees will also help in reducing air pollution. Reducing air pollution to the safer limits to be taken as a top priority target by the governments, health authorities, scientific bodies like Indian Medical association and the society.

Keywords: Air Pollution, Primary air pollutants, Adverse health effects, Global warming

*See End Note for complete author details

Air pollution and consequent health issues are a growing concern all over the world. Humans probably first experienced harm from air pollution when they were exposed to combustion in poorly ventilated caves. Since then, we have gone on to pollute more and more of the earth's surface. Until recently, environmental pollution problems have been local and minor because of the earth's own ability to absorb and purify minor quantities of pollutants. The industrialization of society, the introduction of motorized vehicles, and the explosion of the population are factors contributing to the growing air pollution problem.

Air pollution, both indoors and outdoors, is a major environmental health problem affecting everyone in developed and developing countries alike and is estimated to cause approximately 6.7 million premature deaths worldwide per year.¹

Clean air is our birth right. With the increase in industrialisation and urbanization this is becoming a distant

dream and world health organization(WHO) report says ninety nine percent of the world's population is breathing polluted air. With diligent efforts, we can reduce the ill effects of air pollution to a great extent and many countries have made spectacular advancement in this area.

Air can be polluted in both cities and villages. In the city, cars, buses and airplanes, as well as industry and construction may cause air pollution. In the country side, dust from tractors ploughing fields, trucks and cars driving on dirt or gravel roads, rock quarries and smoke from wood and crop fires contribute to air pollution.

The primary air pollutants found in most urban areas are carbon monoxide, nitrogen oxides, sulphur oxides, hydrocarbons, chlorofluorocarbons and particulate matter (both solid and liquid).² These pollutants are dispersed throughout the world's atmosphere in concentrations high enough to cause health problems. Serious health problems can occur quickly especially

Cite this article as: Sulaiman SP. Air Pollution and Health. Kerala Medical Journal. 2023 Dec 30;16(1):41-43
| DOI: <https://doi.org/10.52314/kmj.2023.v16i1.619>

Corresponding Author:

Dr. Shajahan P Sulaiman, Professor, Department of Pulmonary Medicine, Government TD Medical College, Alappuzha.
E-mail ID: shajsafar@gmail.com

when air pollutants are concentrated.

One cannot escape air pollution, not even in their own homes. More than half of the world's population rely on dung, wood, crop waste or coal to meet their most basic energy needs. Cooking and heating with such solid fuels on open fires or stoves without chimneys leads to indoor air pollution. This indoor smoke contains a range of health-damaging pollutants including small soot or dust particles that are capable to penetrate deep into the lungs. In poorly ventilated dwellings, indoor smoke contain small particles hundred times that of outdoor air.

Exposure is particularly high among women and children, who spend the most time near the domestic hearth. Every year, indoor air pollution is responsible for the death of 3.8 million people – that is one death every 8 seconds.³ The use of polluting fuels for cooking poses a major burden on the health of poor families in developing countries. The dependence on such fuels is both a cause and a result of poverty as poor households often do not have the resources to obtain cleaner, more efficient fuels and appliances.

The other sources of indoor air pollution include mould and microbe-harboring air conditioning systems and ducts, cleaning fluids, cigarette smoke, carpet, paint, vinyl molding, linoleum tiles, and building materials and furniture that emit air pollutants such as formaldehyde. Another major indoor air pollutant is Radon-222, a naturally occurring radioactive gas produced by the radioactive decay of uranium-238. Radon exposure is a cause of great concern as it is an important factor in the development of lung cancer.

The adverse health effects of air pollution

Air pollution can irritate the eyes, throat and lungs. Burning eyes, cough and chest tightness are common with exposure to high levels of air pollution. Different people react very differently to air pollution. Some people may notice chest tightness or cough, while others may not notice any effects. Because exercise requires faster, deeper breathing, it may make the symptoms worse.

People who have heart disease, or lung disease, such as asthma or emphysema and older people, may be very sensitive to air pollution exposure, and may have early onset of symptoms. Also, children feel the effects of lower levels of pollution than adults. They also experience more illness, such as bronchitis and earaches, in

areas of high pollution than in areas with cleaner air.⁴

The exposure to air pollution increases the risk of pneumonia and exacerbation of asthma among children, and chronic respiratory diseases like chronic bronchitis, emphysema, and lung cancer among adults.² Data also suggest an association between air pollution and adverse pregnancy outcomes, particularly increased number of abortions, low birth weight and neonatal deaths.⁵ Increase incidence of Ischaemic heart disease and nasopharyngeal and laryngeal cancers, cataracts and tuberculosis are also reported with the decrease in the quality of breathing air.⁶

Apart from the direct effects of air pollution, there are indirect dangers too. Air pollution contribute significantly to Global warming, the threat of the era. The increased menace of mosquitoes, reappearance of the controlled/ eliminated infections and emergence of new infections, increase incidence of skin cancers and asthma are related to the effect of global warming.⁷

Reducing Air Pollution

Exposure to air pollutants is largely beyond the control of individuals and requires action by public authorities at the regional, national and international levels. Health education to increase public awareness and legislative measures help significantly in this regard. The WHO has set an upper limit for various pollutants in air to protect the public from the health effects of these agents.⁸ Strict measures to monitor the industrial emissions, control of motor vehicle emissions by updating permissible amounts of various toxic agents and promoting public transport system and car-pooling for office commuting will help to curb this growing menace.

Citizens can also contribute significantly to reduce global air pollution. Simple measures such as walking or cycling to travel a short distance instead of using a bike or car, planting trees and avoid purchasing products that contain chlorofluorocarbons will help in reducing air pollution.

Air pollution does not spare anyone. It affects everyone indiscriminately, compromising not only lung health but also the proper functioning of other essential organs, leading to a diminished quality of life. It is essential that governments, health authorities, and society prioritize reducing air pollution to safer levels, ensuring cleaner air and a healthier world. Let us unite in our efforts to create a pollution-free world.

END NOTE

Author Information

Shajahan P Sulaiman, Professor,
Department of Pulmonary Medicine,
Government TD Medical College, Alappuzha.

Conflict of Interest: None declared

REFERENCES

1. WHO. "Types of Pollutants." Accessed March 9, 2024. [Internet]
2. Bălă, Gabriel-Petrică, Ruxandra-Mioara Râjnoveanu, Emanuela Tudorache, Radu Motian, and Cristian Oancea. "Air Pollution Exposure-the (in)Visible Risk Factor for Respiratory Diseases." *Environmental Science and Pollution Research International* 28, no. 16 (April 2021): 19615–28.
3. WHO. "Household Air Pollution." Accessed March 9, 2024.
4. "Who Is Most Affected by Outdoor Air Pollution? | American Lung Association." Accessed March 9, 2024.
5. Rani, Prena, and Archana Dhok. "Effects of Pollution on Pregnancy and Infants." *Cureus* 15, no. 1 (n.d.): e33906.
6. Gall, Elliott T., Ellison M. Carter, C. Matt Earnest, and Brent Stephens. "Indoor Air Pollution in Developing Countries: Research and Implementation Needs for Improvements in Global Public Health." *American Journal of Public Health* 103, no. 4 (April 2013): e67-72.
7. Pacheco SE, Guidos-Fogelbach G, et al ; American Academy of Allergy, Asthma & Immunology Environmental Exposures and Respiratory Health Committee. Climate change and global issues in allergy and immunology. *J Allergy Clin Immunol.* 2021 Dec;148(6):1366-1377
8. WHO global air quality guidelines. Particulate matter (PM2.5 and PM10), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide. ISBN 978-92-4-003422-8 (electronic version). ISBN 978-92-4-003421-1 (print version)