

## HEALTH HAZARDS CAUSED BY INCREASING AIR POLLUTION IN PAKISTAN

By  
**Mir Sher Baz Khetran**  
Research Fellow

*Centre for Strategic Perspectives (CSP), ISSI*

Edited by  
**Dr Neelum Nigar**

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*(Views expressed in the brief are those of the author, and do not represent those of ISSI)*



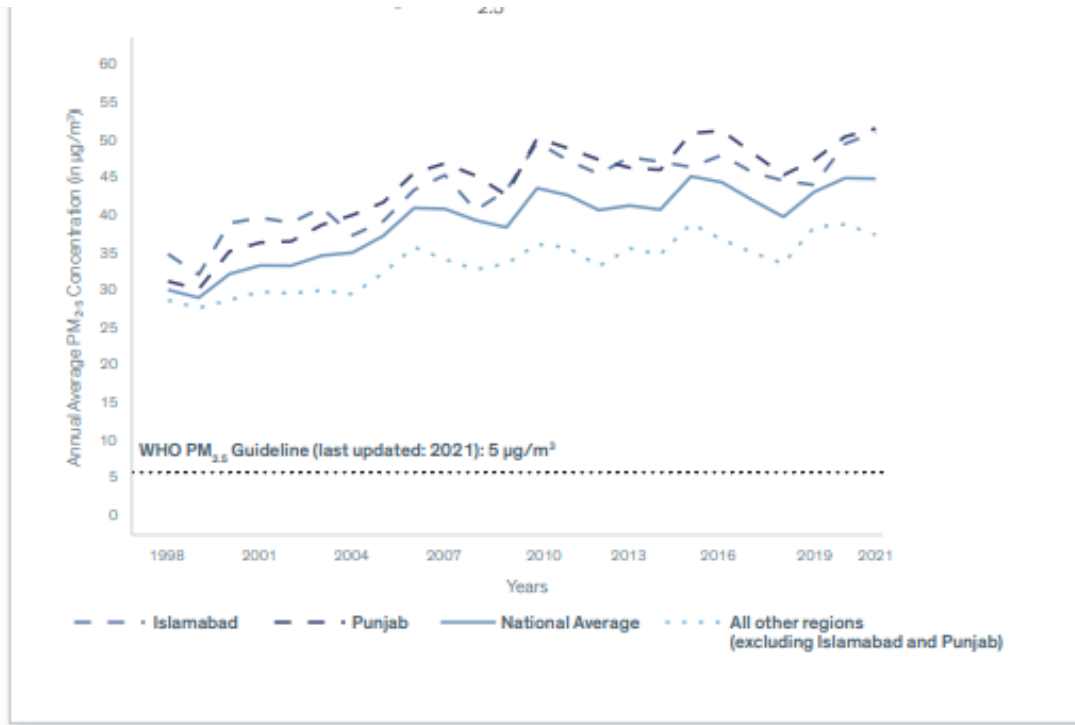
### Background

The air quality in Pakistan's major urban centres has considerably deteriorated over the past five years. Lahore and other cities regularly feature in the list of the most polluted cities globally. Air pollution in Pakistan is a significant environmental and public health concern. Several factors contribute to air pollution in the country, including industrial emissions, vehicular emissions, agricultural activities, and natural sources such as dust storms. Pakistan has witnessed the worst air pollution in recent years from Karachi to Lahore, as a mixture of low-grade diesel fumes, smoke from seasonal crop burn-off, and colder winter temperatures meld into stagnant clouds of smog.

According to a report published by the University of Chicago's Energy Policy Institute (EPIC) in its latest Air Quality Life Index (AQLI), air pollution cuts life expectancy by nearly 4 years in Pakistan.<sup>1</sup> Increasing air pollution in Pakistan may shorten life expectancy by at least seven years in the country's most polluted regions like Lahore, Sheikhupura, Kasur, and Peshawar.

According to AQLI, a pollution index that translates particulate air pollution into its impact on life expectancy, particulate pollution is the second greatest threat to human health in Pakistan (behind cardiovascular diseases), reducing 3.9 years of life on average. In contrast, child and maternal malnutrition, and maternal and neonatal disorders reduce average life expectancy by 2.7 years.

<sup>1</sup> 'AQLI, 'Pakistan Fact Sheet,' University of Chicago's Energy Policy Institute (EPIC), August 2023  
[https://aqli.epic.uchicago.edu/wp-content/uploads/2023/08/Pakistan-FactSheet-2023\\_Final.pdf](https://aqli.epic.uchicago.edu/wp-content/uploads/2023/08/Pakistan-FactSheet-2023_Final.pdf)



**Figure:** Annual average PM2.5 concentration in Pakistan, 1998-2021<sup>2</sup>

### Health Hazards Caused by Air Pollution

Increasing air pollution in Pakistan can cause severe health hazards for its residents. The country faces significant challenges related to air quality, with several pollutants contributing to adverse health effects. Some of the health hazards caused by increasing air pollution in Pakistan include:

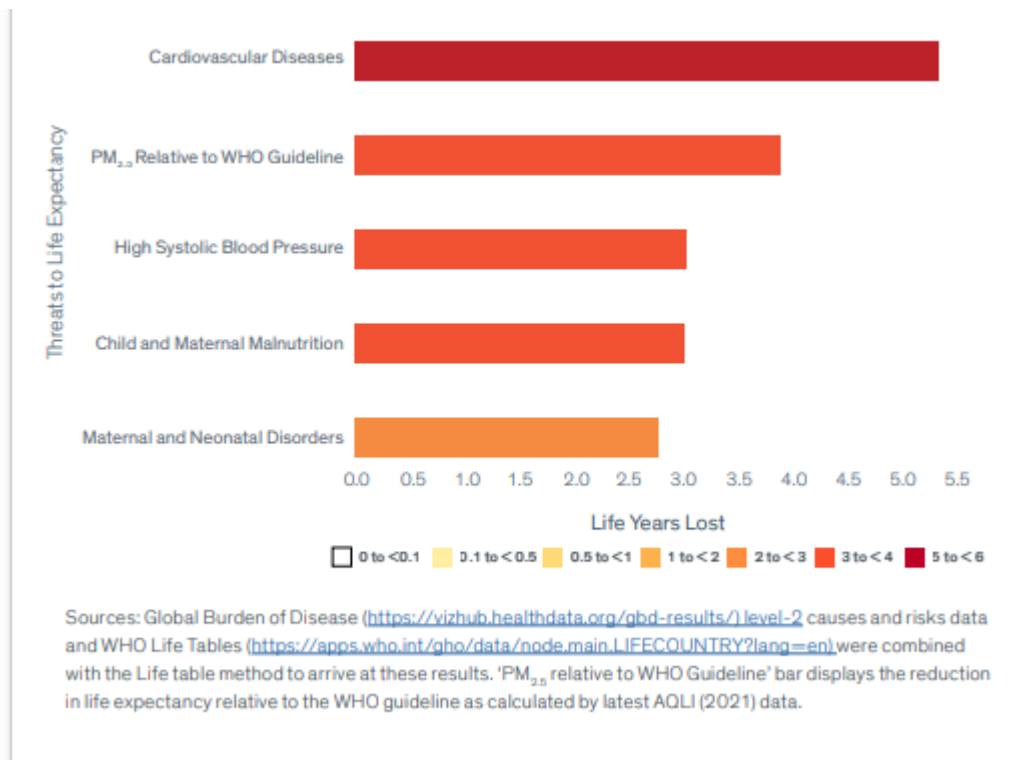
- **Respiratory Problems:** Air pollution can lead to respiratory illnesses, including bronchitis, asthma, and chronic obstructive pulmonary disease (COPD). Particulate matter (PM), sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), and volatile organic compounds (VOCs) are common pollutants that can irritate the respiratory system and worsen these conditions.
- **Cardiovascular Diseases:** Long-term exposure to air pollution has been linked to an increased risk of heart diseases, including heart attacks and strokes. Fine particulate matter (PM<sub>2.5</sub>) and ground-level ozone are particularly harmful to cardiovascular health.
- **Increased Mortality:** High levels of air pollution are associated with premature death. Prolonged exposure to polluted air can lead to a higher mortality rate due to respiratory and cardiovascular diseases, as well as other health complications.

<sup>2</sup> 'AQLI, 'Pakistan Fact Sheet,' University of Chicago's Energy Policy Institute (EPIC), August 2023  
[https://aqli.epic.uchicago.edu/wp-content/uploads/2023/08/Pakistan-FactSheet-2023\\_Final.pdf](https://aqli.epic.uchicago.edu/wp-content/uploads/2023/08/Pakistan-FactSheet-2023_Final.pdf)

- **Lung Cancer:** Air pollution, especially from the presence of carcinogens like benzene and formaldehyde, can increase the risk of lung cancer. People exposed to high levels of pollution over extended periods face a higher likelihood of developing this deadly disease.
- **Low Birth Weight and Preterm Births:** Pregnant women exposed to air pollution may be at risk of delivering low birth weight or preterm babies, which can lead to a range of health problems for the infant.
- **Reduced Lung Function in Children:** Children exposed to air pollution can experience reduced lung growth and development, leading to long-term respiratory issues. This can impact their overall health and quality of life. Studies show that air pollutants contain chemical substances that cause direct damage to the lungs' inner lining and prevent DNA repair of an already damaged inner lining. This imbalance in damage and repair can promote abnormal cell growth, leading to lung cancer.<sup>3</sup>
- **Aggravation of Existing Health Conditions:** Air pollution can worsen existing health conditions, making it more challenging for individuals with respiratory or cardiovascular diseases to manage their conditions effectively.
- **Allergies and Skin Problems:** Air pollution can exacerbate allergies and skin conditions, leading to increased discomfort and symptoms for affected individuals.
- **Neurological Effects:** Emerging research suggests that air pollution may have neurological effects, potentially increasing the risk of neurodevelopmental disorders in children and cognitive decline in adults.
- **Mental Health Impacts:** Prolonged exposure to poor air quality can lead to stress, anxiety, and depression, as it can contribute to a decreased quality of life and overall well-being.

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<sup>3</sup> Sanval Nasim, "Gasping for air: Punjab's perennial air pollution woes," *Dawn*, October 29, 2021  
<https://www.dawn.com/news/1521879>



**Figure:** Top 5 threats to life expectancy in Pakistan<sup>4</sup>

### Policy Recommendations

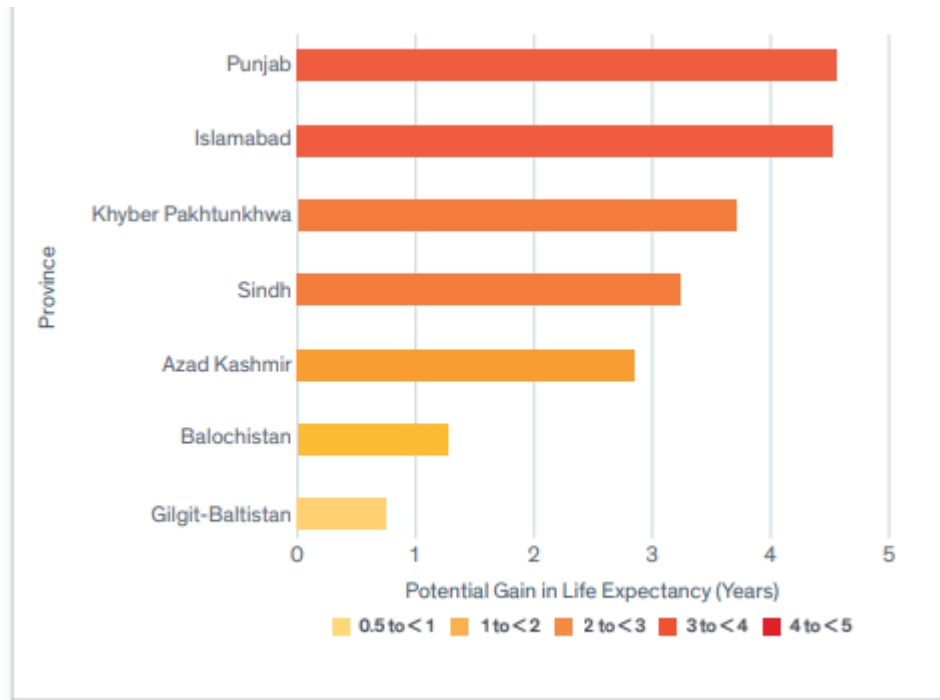
Addressing air pollution in Pakistan is a complex and long-term challenge, but taking decisive action is essential to protect public health and the environment. Persistently hazardous air quality suggests that Pakistan lacks a framework to mitigate pollution. However, Pakistan has a rich history of environmental legislation and successive governments have instituted departments, laws, and mandates over time to manage air quality. For example, national and provincial legislative acts establish environmental protection agencies, delineate the agencies' governance structures and responsibilities, and mandate air quality and pollutant-specific standards. Despite such frameworks, Pakistan has struggled to clean its air. Implementing standards requires several departments to coordinate and share responsibilities. Here are several strategies that Pakistan can adopt to mitigate the health risks associated with air pollution:

1. **Air Quality Monitoring:** Establish a comprehensive air quality monitoring network across the country. This network should provide real-time data on air pollution levels, enabling authorities to take timely action to inform the public and encourage the transition to cleaner

<sup>4</sup> 'AQLI, 'Pakistan Fact Sheet,' University of Chicago's Energy Policy Institute (EPIC), August 2023 [https://aqli.epic.uchicago.edu/wp-content/uploads/2023/08/Pakistan-FactSheet-2023\\_Final.pdf](https://aqli.epic.uchicago.edu/wp-content/uploads/2023/08/Pakistan-FactSheet-2023_Final.pdf)

energy sources such as natural gas and renewables, while phasing out the use of highly polluting fuels like coal and low-quality diesel.

2. **Vehicle Emissions Control:** Implement and enforce strict emissions standards for vehicles. Encourage the use of electric and hybrid vehicles, improve public transportation, and promote carpooling and ridesharing to reduce the number of vehicles on the road.
3. **Public Awareness:** Launch public awareness campaigns about the health hazards of air pollution and the steps individuals can take to protect themselves, such as using air purifiers, wearing masks, and limiting outdoor activities on highly polluted days.
4. **Industrial Pollution Control:** Ensure that industries adhere to pollution control measures and invest in cleaner production technologies. Conduct regular inspections and impose fines for non-compliance and enforce and strengthen air quality regulations and standards for industries, vehicles, and construction activities. Regularly update these standards to reflect advancements in pollution control technologies.
5. **Waste Management:** Improve waste management practices to reduce the open burning of garbage, which releases harmful pollutants into the air. Promote recycling and waste-to-energy projects and increase green spaces and urban tree cover. Trees help absorb pollutants and improve air quality. Promote rooftop gardens and green building practices to mitigate pollution in urban areas.
6. **Healthcare Infrastructure:** Strengthen healthcare infrastructure to deal with the health effects of air pollution. This includes increasing the availability of healthcare facilities, specialized treatment for pollution-related illnesses, and medical research on the impacts of air pollution.
7. **Research and Data Sharing:** Invest in research on the sources and impacts of air pollution in Pakistan. Share data and research findings with the public, policymakers, and international organizations to support evidence-based decision-making and provide incentives and subsidies for the adoption of cleaner technologies and practices in both the industrial and transportation sectors.
8. **Policy Coordination:** Establish a central coordinating body or agency responsible for addressing air pollution issues to ensure a coherent and integrated approach and develop a comprehensive, long-term strategy to reduce air pollution, with clear targets and milestones.



**Figure:** Potential gain in life expectancy from reducing PM2.5 from 2021 levels to the WHO guideline in all provinces of Pakistan

## Conclusion

If Pakistan meets the World Health Organization (WHO) guidelines of limiting average annual PM 2.5 concentration to 5 micrograms per cubic meter, the average resident in the country could gain 3.9 years. Even though Pakistan's carbon emissions are very low in comparison to the rest of the world, it is among the most polluted countries in terms of ambient (outdoor) air pollution and water contamination. It is essential for individuals, communities, and governments in Pakistan to take measures to reduce air pollution through better industrial practices, vehicular emission controls, and the promotion of clean energy sources. Additionally, individuals can protect themselves by staying informed about air quality levels, using air purifiers, and reducing outdoor activities during periods of high pollution. Public health awareness and policy interventions are crucial to mitigate the health hazards associated with increasing air pollution in Pakistan. Addressing air pollution in Pakistan requires a multi-faceted approach. Therefore, it is essential to mitigate the adverse impacts on public health and the environment while promoting sustainable development.

<sup>5</sup> 'AQLI, 'Pakistan Fact Sheet,' University of Chicago's Energy Policy Institute (EPIC), August 2023  
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