

Air Pollution and Cancer in India: The Invisible Risk We Must Confront

Dr. (Prof.) JYOTI BAJPAI
MBBS, MD, DM (Medical Oncology)

Medical & Precision Oncology
Lead – Apollo Hospital
Navi Mumbai, Maharashtra



The Unseen Occupational Hazard

Air pollution is no longer just an environmental issue — it is a workplace, public health, and cancer prevention crisis. India is home to 14 of the world's 20 most polluted cities. According to global health estimates, air pollution contributes to nearly 1.6–1.7 million premature deaths annually in India. Among these, a significant proportion are due to cancer, particularly lung cancer.

Outdoor air pollution has been classified as a Group 1 carcinogen. This means the scientific evidence is strong and conclusive: polluted air can cause cancer. Fine particulate matter (PM2.5), which penetrates deep into the lungs and bloodstream, carries toxic metals, hydrocarbons, and carcinogenic compounds capable of damaging DNA.

The Cancer Connection: What Science Tells Us

Lung cancer remains one of the leading causes of cancer-related mortality in India. While tobacco continues to be a major driver, up to 15–20% of lung cancers in India occur in non-smokers — an alarming signal that environmental and occupational exposures play a critical role.

Studies show that for every 10 $\mu\text{g}/\text{m}^3$ increase in long-term PM2.5 exposure, the risk of lung cancer increases by approximately 8–14%. Beyond lung cancer, emerging data links air pollution to bladder cancer, breast cancer, and even hematological malignancies. Chronic exposure triggers systemic inflammation, oxidative stress, and epigenetic changes — biological pathways known to fuel cancer development.

Occupational Exposure: The Overlooked Dimension

For millions of Indians, exposure is not limited to ambient air. Construction workers, traffic police, factory workers, drivers, street vendors, and industrial employees face prolonged daily exposure. Indoor occupational settings may add further risks through diesel exhaust, chemical fumes, and poor ventilation.

In urban centers, employees may spend 8–12 hours a day in polluted environments, turning the workplace into a silent risk zone. This is not merely a public issue—it is an occupational safety priority.

Economic and Human Cost

Cancer is not only a medical challenge; it is an economic burden. Lost productivity, prolonged treatments, and financial toxicity affect families and industries alike. Preventable environmental risks compound this burden. Addressing air pollution is therefore not just a health reform — it is an economic and workforce sustainability strategy.

Solutions: From Awareness to Action

The good news is that air pollution–related cancer risk is preventable. Solutions require coordinated action at individual, institutional, and policy levels.

1. **Policy & Regulation:** Strengthening emission norms, transitioning to cleaner energy, and enforcing industrial pollution controls are critical. Investment in public transport and electric mobility reduces long-term carcinogenic exposure.
2. **Workplace Interventions:** Employers must prioritize air quality monitoring, proper ventilation systems, protective masks in high-risk settings, and occupational health screenings. Corporate responsibility must extend beyond compliance to prevention.
3. **Early Detection & Screening:** High-risk populations — including long-term urban residents and exposed workers — should be considered for risk-based lung cancer screening strategies where feasible. Precision oncology reminds us that prevention and early detection save more lives than treatment alone.



4. **Individual Responsibility:** Reducing personal exposure through air purifiers, masks during high AQI days, avoiding outdoor exertion during peak pollution hours, and advocating for cleaner community practices collectively create change.

The Way Forward: A Leadership Imperative

As healthcare leaders, industry stakeholders, and policymakers, we must shift the narrative — from treating cancer to preventing cancer. Air pollution is a modifiable carcinogen. Scientific evidence is clear. The responsibility is shared.

Clean air is not a luxury. It is a fundamental determinant of health, productivity, and national progress. If we align environmental policy with cancer prevention strategies, India can dramatically reduce future cancer burden.

“When we clean the air, we don’t just protect lungs — we prevent cancers and preserve futures.” ■