When the Air Turns Toxic: Understanding India's AQI Crisis & Your Lungs

Every winter, a visible grey haze descends upon many of India's cities—a shared challenge that affects millions and reminds us that protecting our breath is protecting our future. This is not India's unique story alone, but part of a planetary health challenge affecting developing nations worldwide.

A Global Crisis: The Invisible Threat We All Breathe

Last November, Delhi's air quality reached levels that concerned health officials and prompted city officials to take action. Yet this challenge extends far beyond one city or nation. Across the world, from Delhi to Beijing, from Cairo to São Paulo, over 99% of the global population now breathes air that falls short of WHO safety guidelines.

Air pollution has become a planetary health challenge, one that developing nations like India are actively working to address even as they balance rapid industrialization, economic growth, and public health. The visible haze that settles over cities each winter is not just a weather pattern—it's a wake-up call that demands our attention and action.

Understanding this crisis begins with recognizing its scale. What we're facing isn't an isolated incident but a systemic challenge that requires coordinated responses at local, national, and international levels. Every breath we take connects us to this shared environmental reality.

99%

Global Population

Breathing unsafe air worldwide

1.4B

People in India

Managing air quality challenges

The Science of Invisible Harm: What PM2.5 Does to Your Body

At the heart of air quality concerns worldwide lies a microscopic particle: **PM2.5**—matter smaller than 2.5 micrometres, approximately 30 times finer than a human hair. These particles are so small that they bypass the body's natural defences, penetrating deep into the lungs and entering the bloodstream, reaching the heart and brain.

Inhalation

PM2.5 bypasses natural defenses and penetrates deep into lung tissue

Inflammation

Irritates delicate lung structures, triggering chronic inflammatory responses

Systemic Spread

Enters bloodstream, reaching heart and brain, affecting entire body

Immune Compromise

Weakens defenses, increasing vulnerability to infections and diseases

When PM2.5 is inhaled regularly, it irritates the delicate structures inside the lungs, triggering inflammation that can become chronic over time. Research shows that for every 10 μg/m³ increase in PM2.5, respiratory mortality rises by 2%, overall death risk increases by approximately 8.6%, and lung cancer risk can climb significantly. The immune system also becomes compromised, making lungs more vulnerable to infections.

India's Air Quality Challenge in Global Context

While air pollution affects nations globally, countries undergoing rapid development and urbanization, such as India, Bangladesh, and Pakistan, face particularly acute public health challenges. The scale of impact is significant, reflecting the complexity of managing air quality for a population of over 1.4 billion people.

1.5M

Health Outcomes Annually

Estimated health-related outcomes due to ambient air pollution in India.

Rapid Urbanization

Unprecedented city growth and development pressures

Industrial Growth

Balancing economic development with environmental impact

Transportation

Growing vehicle numbers in expanding metropolitan areas

Winter's Grip: Understanding Seasonal Pollution Patterns

During winter months, many parts of India experience seasonal air quality challenges. In November and December, multiple factors converge to create temporary worsening of conditions. These include stubble burning by farmers (a rapid field-clearing method), reduced atmospheric ventilation due to weather patterns, vehicle emissions, construction activities, and industrial output—each playing a role.

Stubble Burning

Agricultural field clearing practices

Industrial Output

Manufacturing and production emissions

Weather Patterns

Reduced atmospheric ventilation traps pollutants

Vehicle Emissions

Concentrated urban traffic congestion

Construction Dust

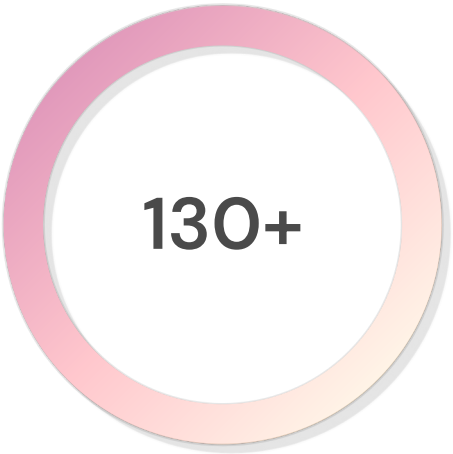
Development activities generate particulates

The phenomenon is not unique to India; similar seasonal patterns occur in China, parts of Europe, and other regions. Recent efforts show progress: stubble burning in Punjab has declined by 41–50% over recent years as farmers increasingly adopt alternative methods, demonstrating that change is achievable with awareness and support.

India's National Response: The Clean Air Programme

Crores Invested

Financial commitment to air quality



Cities Participating

Coordinated nationwide action

The government's **National Clean Air Programme (NCAP)**, launched in 2019, represents India's commitment to systematically address this challenge through coordinated action across multiple levels. With investments of over ₹9,650 crores and participation from 130+ cities, this programme reflects India's recognition of the urgency.

Some cities have already begun showing results through innovative approaches and sustained commitment to change.

Delhi

Real-time air quality sensor networks for monitoring and response

Bangalore

Expanded solar rooftop initiatives driving clean energy adoption

Kolkata

Advanced clean transport transitions reducing urban emissions

These strategies collectively contribute to long-term air quality improvement, demonstrating that coordinated action produces measurable results. Each city's success provides a model for others to follow and adapt.

Silent Voices: Children and Vulnerable Communities

Children worldwide face heightened vulnerability to air pollution due to their developing lungs, faster breathing rates, and more outdoor time. In India's context, children in polluted urban areas and rural regions using biomass fuels are among the most at-risk populations.

Over 72% of rural Indian households still rely on biomass fuels (wood, dung, agricultural waste) for cooking—a reality that reflects both economic circumstances and infrastructure limitations across developing regions. Women who manage cooking duties in these settings face daily exposure to high PM concentrations in home kitchens, creating long-term respiratory challenges.

This is not unique to India; similar patterns exist in low-income households across Africa, Southeast Asia, and other developing regions. The solution lies in expanding access to clean cooking alternatives.

India's **Pradhan Mantri Ujjwala Yojana (PMUY)**, which has supported millions in transitioning to LPG cooking, represents a pragmatic approach to reducing this burden. Continued investment in this direction, combined with awareness and support, offers a pathway forward.

72%

Rural Households

Still using biomass fuels

The Invisible Epidemic: Undiagnosed Lung Conditions

55 Million	33 Million	Many Undiagnosed
People with COPD in India	People with asthma in India	Limited access to screening

India, like many countries, faces challenges with timely diagnosis of respiratory conditions. An estimated 55 million people with COPD and 33 million with asthma represent a significant health burden, yet many cases remain undiagnosed due to limited access to spirometry equipment, shortage of trained healthcare workers, and low symptom awareness.

Why Cases Go Undiagnosed

- **Limited spirometry access:** Diagnostic equipment not widely available in rural and remote areas
- **Healthcare workforce gaps:** Shortage of trained respiratory specialists and technicians
- **Low symptom awareness:** People normalize persistent cough and breathlessness as "just getting older"
- **Systemic capacity:** Healthcare infrastructure struggling with universal screening demands

The Impact of Delayed Diagnosis

This diagnostic gap is not a failure of individuals but rather a systemic challenge: most developing healthcare systems struggle with universal screening capacity. When these conditions go undiagnosed, they can worsen over time and reduce quality of life.

Yet they are highly manageable with early detection and proper treatment. The key lies in expanding access to screening tools and raising awareness about respiratory symptoms that warrant medical attention.

From the Field: PinkTree Foundation's Compassionate Response

In communities across India—from Mumbai's informal settlements like Govandi and Deonar to rural villages—the **PinkTree Foundation** has been witnessing and responding to the health impacts of respiratory challenges. In August 2025, a lung health camp in Govandi revealed that many residents were experiencing chronic cough and breathlessness, often silently accepting these symptoms as normal.

1 Community Outreach

Meeting communities in Mumbai's informal settlements and rural villages

2 Health Screening

Identifying residents experiencing chronic respiratory symptoms

3 AI Innovation

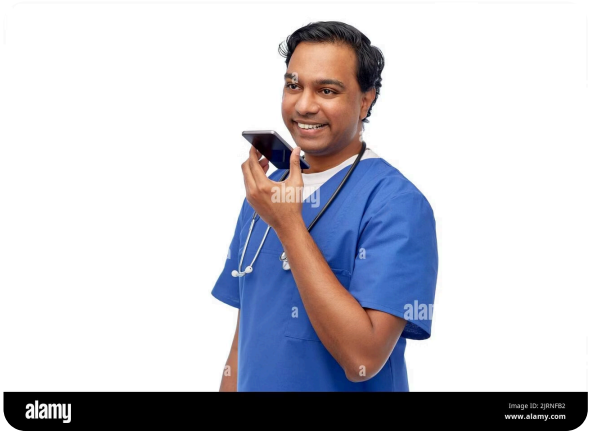
Introducing Vocal Biomarker Analysis Technology for rapid assessment

4 Awareness Building

Creating conversations about respiratory health as everyone's right

Pioneering Accessible Diagnostics

What made this camp meaningful was not just the screening, but the introduction of innovative approaches: PinkTree Foundation pioneered the use of Vocal Biomarker Analysis Technology—an AI-powered voice-based assessment that can identify possible respiratory concerns within minutes, making screening accessible and non-invasive.



Community members also participated in awareness sessions and shared their experiences, creating a space where respiratory health was brought into conversation—not as crisis, but as something everyone deserves to understand and manage.

PinkTree's Philosophy: Meeting communities where they are, with dignity, compassion, and practical solutions. Through grassroots partnerships, education, and awareness, the Foundation is working to transform how lung health is understood and addressed in India.

What Each of Us Can Do: Practical Steps for Healthier Lungs

While systemic change requires coordinated policy and investment, there are meaningful actions everyone can take to support their respiratory health. Each step, however small, contributes to protecting your lungs and improving your quality of life.

1

Stay Informed About Air Quality

Check local AQI measurements through apps and official sources when available. Understanding your local air quality helps you make informed decisions about outdoor activities—treat AQI awareness like weather awareness.

2

Protect Yourself When Needed

On days with poor air quality, N95 or KN95 masks can provide meaningful protection when outdoors. Proper fit matters; replace masks as recommended.

3

Create a Cleaner Home Environment

Use air purifiers where feasible, maintain healthy indoor humidity (30–50%), and avoid burning incense or mosquito coils indoors.

4

Support Clean Cooking Transitions

If using biomass fuels, ensure good ventilation. Where possible, explore transitions to cleaner cooking methods—a meaningful health investment.

1

Nourish Your Respiratory Health

Foods rich in antioxidants—citrus fruits, leafy greens, turmeric, garlic—support lung function. Stay well hydrated, especially during dry seasons.

2

Stay Active Safely

Gentle exercise indoors or during periods of better air quality supports lung capacity. Breathing exercises can strengthen respiratory muscles.

3

Seek Timely Care

If you experience persistent cough, breathlessness, or wheezing, consult a healthcare provider. Early identification of

4

Advocate for Change

Support policies and initiatives that promote clean energy, reduce emissions, and improve air quality monitoring. Community voices

The Path Forward: India's Active Efforts & Global Collaboration

India's challenges with air quality are real and significant, but equally real are India's investments in solutions. The National Clean Air Programme demonstrates governmental commitment at scale. Cities like Delhi, Bangalore, and Kolkata are implementing innovations in technology, renewable energy, and clean transport. The declining stubble burning rates show that farmer awareness and alternative methods can create measurable change.

National Policy Action

NCAP coordinating efforts across 130+ cities with significant financial investment

Urban Innovation

Cities implementing technology, renewable energy, and clean transport solutions

Agricultural Shift

41-50% reduction in stubble burning through farmer education and alternatives

Global Partnership

International collaboration on transboundary pollution and research initiatives

International Collaboration Deepening

India works with neighboring countries on transboundary pollution strategies, participates in global air quality research initiatives, and shares learnings with other developing nations facing similar challenges.

This collaborative approach recognizes that air pollution doesn't respect borders, and solutions benefit from shared knowledge, technology transfer, and coordinated regional action.

What India Needs

What India needs is not blame, but sustained support: continued investment in clean technology, expanded access to diagnostic equipment, workforce training, and international partnerships that recognize the scale of the challenge and the commitment already underway.

A Breath of Hope: Protecting Our Shared Future

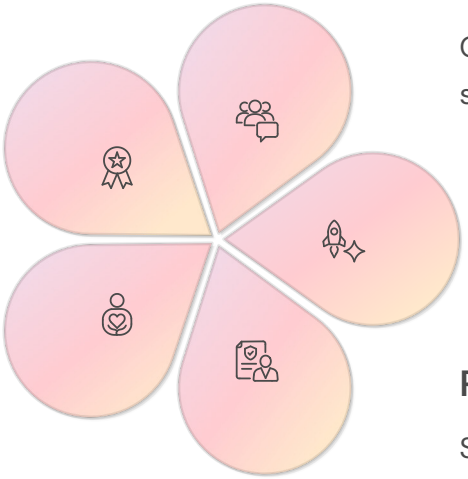
The PinkTree Foundation's work—from community health camps to advocating for policy change—reflects a commitment that extends beyond individual organizations to represent a movement. As the Foundation's mission emphasizes: lung health is everyone's right. It requires us to listen when people describe their symptoms, to invest in solutions, and to create spaces where breathing cleanly is not a luxury but an achievable goal for all.

Awareness

Understanding air quality and its health impacts

Compassion

Meeting communities with dignity and care



Community

Grassroots partnerships and shared responsibility

Innovation

Technology and new approaches to diagnosis

Policy

Systematic governmental action and investment

> *"Every breath we take connects us to this shared environmental reality. Protecting our lungs means protecting our future—and that future is one we build together, through awareness, action, and unwavering commitment to health as a fundamental human right."*

The challenge is significant, but the path forward is clear. Through individual actions, community initiatives like PinkTree Foundation's work, governmental programmes like NCAP, and international collaboration, we are creating momentum toward cleaner air. Each person who checks the AQI, each household that transitions to clean cooking, each city that implements monitoring systems, and each policy that prioritizes public health contributes to this shared goal.

The grey haze that descends each winter doesn't have to be our permanent reality. With sustained effort, compassionate response, and collective will, we can transform the air we breathe—ensuring that future generations inherit not a crisis, but a solution built on knowledge, care, and hope.