Jan 2026

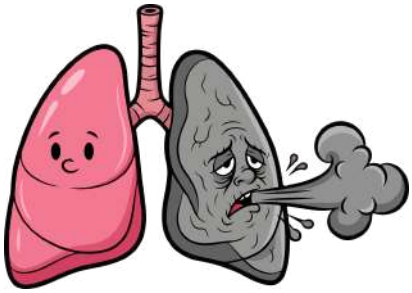
PinkTree Foundation X
NMIMS School of Mathematics, Applied Statistics & Analytics

Community Lung Health Screening & Awareness

THE AIR WE BREATHE

Impact Report on Community Lung Health

Project Location: NMIMS Campus, Mumbai, Maharashtra



In collaboration with
NMIMS School of Mathematics, Applied Statistics & Analytics

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Executive Summary

In Jan 2026, **NMIMS School of Mathematics, Applied Statistics & Analytics** partnered with PinkTree Foundation to conduct a one-day lung health screening camp focused on early detection and prevention.

A total of 75 participants—including 53 students (70.7%), 5 faculty members (6.7%), and 17 non-teaching staff (22.7%)—underwent India's first AI-enabled vocal biomarker screening for lung health risk assessment.

The screening revealed significant respiratory health concerns within the campus community:

Persistent Symptoms

Reported persistent respiratory symptoms lasting more than two weeks

Reduced Stamina

Experienced reduced stamina during daily activities

Never Screened

Had never undergone lung health testing before

Unsafe Air

Of Mumbai residents breathe unsafe air daily

In a city where 90% of residents breathe unsafe air daily and construction dust contributes 35% to air pollution, this screening initiative represents a critical shift from reactive treatment to proactive prevention.

Background: The PM2.5 Crisis in Mumbai

Urban Air Quality and Health Risks

Mumbai faces a severe air quality crisis, with **PM2.5 (particulate matter ≤ 2.5 micrometers)** emerging as a primary health threat. Construction dust alone accounts for **35% of Mumbai's air pollution**, exposing residents—particularly students, faculty, and staff at educational institutions—to daily respiratory hazards. Recent data shows that **90% of Mumbai residents breathe air that fails to meet WHO safety standards.**

PM2.5 particles are particularly dangerous because they penetrate deep into lung tissue, causing inflammation, reduced lung function, and long-term respiratory damage. Studies across India demonstrate that PM2.5 exposure increases risks of:

Respiratory Conditions

- Chronic obstructive pulmonary disease (COPD)
- Asthma exacerbation and new-onset asthma
- Reduced lung capacity and function
- Increased susceptibility to respiratory infections
- Cardiovascular complications linked to respiratory stress

Who Is Most at Risk?

For young adults—the demographic majority at NMIMS—prolonged PM2.5 exposure during critical developmental years can result in **permanent lung function reduction**, impacting lifelong health, productivity, and quality of life.

> The Case for Early Screening: Traditional approaches to lung health focus on symptomatic treatment after conditions have progressed. However, early detection through screening enables intervention before irreversible damage occurs. Persistent cough, breathlessness, and fatigue—symptoms often dismissed as temporary—can signal early-stage respiratory conditions that benefit significantly from timely medical attention.

Educational institutions, where thousands spend 6–8 hours daily in close proximity, represent ideal settings for preventive screening programmes. Campus-based initiatives normalise lung health monitoring, reduce stigma, and create pathways for timely intervention.

Screening Methodology: AI-Enabled Vocal Biomarker Technology

India's First AI Vocal Biomarker Test

PinkTree Foundation deployed an innovative AI-powered vocal biomarker screening tool—**the first of its kind in India**—designed to detect early lung health risks through voice analysis. This non-invasive, rapid technology analyses acoustic features in a **6-second voice recording** to identify patterns associated with respiratory compromise.

Non-Invasive

Requires only a 6-second voice sample—no physical contact, no equipment handling

Rapid Results

Instant Lung Health Risk Score generated within seconds

Accessibility

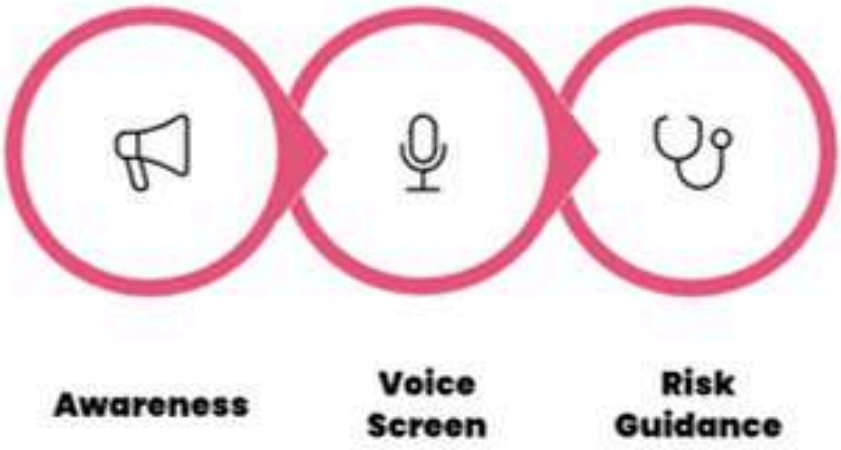
Simple enough for campus deployment; powerful enough for clinical-grade risk stratification

Evidence-Based

Grounded in research demonstrating voice characteristics reflect respiratory function and lung health status

Three-Step Screening Process

The NMIMS lung health camp followed a structured three-step approach:



This structured approach ensured that screening translated into actionable health outcomes rather than mere data collection.

Step 1: Awareness and Education

Before screening, participants engaged in guided conversations covering:

- Mumbai's daily Air Quality Index (AQI) and its health implications
- PM2.5 exposure from construction dust and vehicle emissions
- Early warning signs: persistent cough, breathlessness, chest tightness, fatigue
- The importance of preventive lung health monitoring

This education phase ensured participants understood the rationale for screening and recognised symptoms they might have previously dismissed.

Step 2: AI-Enabled Voice Screening

Each participant recorded a 6-second voice sample using PinkTree's AI-powered vocal biomarker platform. The system analysed acoustic parameters—including **pitch variation, breathiness, vocal stability, and resonance patterns**—to generate an individualised Lung Health Risk Score.

Step 3: Risk Assessment and Guidance

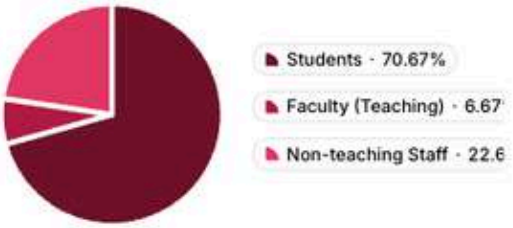
Participants received immediate feedback:

- **Low-risk scores:** Encouraged to maintain healthy practices and undergo periodic rescreening
- **Elevated-risk scores:** Provided guidance on seeking medical follow-up, including pulmonology consultation and spirometry testing where indicated
- **High-risk scores:** Advised on urgent medical evaluation and preventive measures

Participant Demographics and Profile

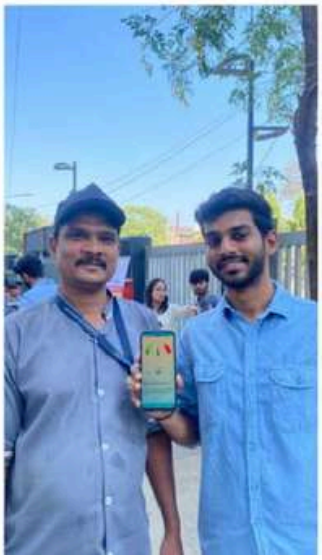
Table 1: Breakdown of screening participants by category. A total of 75 members of the NMIMS community were screened, including 53 students (70.7%), 5 faculty members (6.7%), and 17 non-teaching staff (22.7%).

Participant Category	Count	Percentage
Students	53	70.7%
Faculty (Teaching)	5	6.7%
Non-teaching Staff	17	22.7%
Total Participants	**75**	**100%**



The screening successfully engaged the entire NMIMS community, with students comprising the majority. The inclusion of faculty and non-teaching staff ensured comprehensive campus coverage, recognising that respiratory health risks affect all individuals exposed to Mumbai's air quality regardless of age or role.

Simple enough for campus. Powerful enough for prevention.



Key Findings: Respiratory Symptoms and Risk Factors

Symptom Prevalence

Screening questionnaires revealed significant respiratory symptom prevalence across the NMIMS community:

Symptom or Indicator	Count	Percentage
Persistent cough, breathlessness, or chest tightness (>2 weeks)	20	29.9%
Reduced stamina during activities	29	43.3%
Missed classes/work due to breathing issues	20	29.9%

Table 2: Prevalence of respiratory symptoms among participants

43.3% reported reduced stamina

The most prevalent symptom, indicating widespread subclinical respiratory compromise affecting daily functioning, academic performance, and productivity.

29.9% experienced persistent respiratory symptoms lasting over two weeks

Meeting clinical thresholds that warrant medical evaluation, which may be associated with prolonged exposure to PM2.5 and urban air pollutants.

29.9% had missed classes, work, or activities due to breathing issues

Demonstrating tangible impact on academic and professional engagement.

These findings suggest that nearly one-third of the campus community experiences clinically significant respiratory symptoms, yet many had never sought medical evaluation.

Environmental Exposure and Behavioural Risk Factors

47.8% reported daily exposure to smoke, vehicle fumes, burning waste, or chemicals, reflecting Mumbai's ongoing air quality challenges. Participants living near construction zones, high-traffic areas, or industrial sites may experience higher cumulative exposure.

*A subset of participants also indicated behavioural and environmental exposures, including tobacco use and **PM2.5 from construction dust and vehicular emissions,** which together may influence overall respiratory health risk.*

The Testing Gap: 87.7% Never Screened Before

Prior lung health testing status	Count	Percentage
Never tested lungs before	65	86.7%
Previously diagnosed with lung condition	10	13.3%

Table 4: Prior lung health testing and diagnosis history

This gap is particularly concerning given:

High Symptom Prevalence

43.3% with Prevalence of reduced stamina

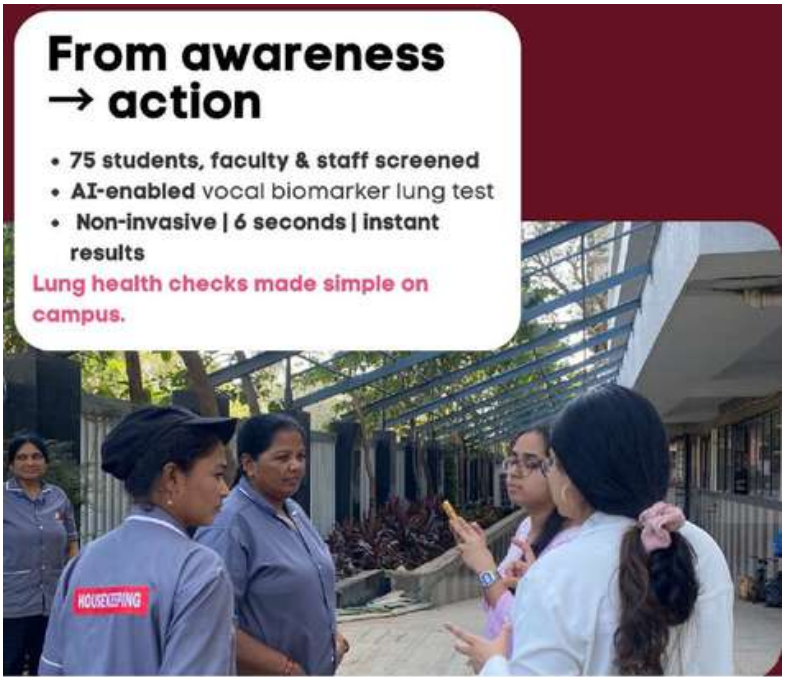
Significant Environmental Exposure

47.8% daily pollution exposure

Documented Air Quality Crisis

Mumbai's ongoing PM2.5 emergency

Among the 12.3% who had been previously diagnosed, conditions included **asthma, post-COVID respiratory complications, bronchitis, and sinus-related issues**. The screening provided many participants their first opportunity to assess lung health proactively.



Discussion: Hidden Burden of Respiratory Risk

Early Risks in Young, Active Populations

The NMIMS screening challenges the misconception that lung health concerns primarily affect older adults or heavy smokers. Among this predominantly young, active, urban student population:

- Nearly half (43.3%) experienced reduced stamina affecting daily functioning
- Three in ten (29.9%) reported symptoms lasting over two weeks
- Almost half (47.8%) faced daily environmental pollution exposure

These findings align with emerging research demonstrating that early lung health risks exist even in young, active, urban populations exposed to chronic PM2.5 pollution. Symptoms dismissed as **"lack of fitness" or "normal tiredness"** may signal early respiratory compromise requiring intervention.

From Awareness to Action

The screening successfully bridged the gap between awareness and action. By providing **education** on Mumbai's air quality and respiratory health risks, **accessible screening** through non-invasive, rapid AI technology, and **actionable guidance** for participants with elevated risk scores, the camp normalised lung health monitoring as routine preventive care—comparable to blood pressure checks or dental cleanings—rather than crisis-driven intervention.

Public Health Significance

Campus-based lung health screening offers scalable public health impact:

→ **Early Detection**
Enables intervention before irreversible damage

→ **Reduced Missed Diagnoses**
Among populations without regular health monitoring

→ **Educational Settings**
Reach young adults during critical developmental periods

→ **Normalisation**
Of preventive screening reduces stigma and increases health-seeking behaviour

In cities where 90% breathe unsafe air, early detection is not optional—it is essential.

Conclusions and Recommendations

The NMIMS × PinkTree lung health screening demonstrated the feasibility, acceptability, and necessity of campus-based respiratory health monitoring in urban India. Key takeaways include:

1

High Symptom Burden

43.3% of participants reported respiratory symptoms affecting daily functioning

2

Critical Testing Gap

87.7% had never undergone lung health screening despite living in a city with documented air quality hazards

3

Technology-Enabled Accessibility

AI-powered vocal biomarker screening provided rapid, non-invasive risk assessment suitable for mass screening

4

Successful Community Engagement

75 participants across students, faculty, and staff demonstrated strong interest in preventive health initiatives

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Recommendations

Institutionalise Annual Lung Health Screening

As part of routine campus health services, similar to immunisation drives or health check-ups

Expand Screening to Other Educational Institutions

Across Mumbai and urban India, prioritising areas with high AQI and construction activity

Integrate Screening with Follow-Up Care Pathways

Including partnerships with pulmonology departments for medical evaluation of high-risk individuals

Conduct Longitudinal Tracking

Of participants to assess progression, intervention effectiveness, and long-term outcomes

Advocate for Policy Measures

Addressing campus air quality, including construction dust mitigation and indoor air quality monitoring


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