A GENERATION UNDER SIEGE

A ONE-OF-ITS-KIND SURVEY OF PERSPECTIVES OF CHILDREN IN DELHI-NCR ON AIR POLLUTION

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ABOUT CHINTAN ENVIRONMENTAL RESEARCH AND ACTION GROUP

Chintan is a non-profit Circular Society Do-Tank that improves the lives, livelihoods and leadership of the people who contribute the least to environmental pollution and climate change while combating the excessive and inequitable consumption that causes it.

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Glossary

Air Pollution:	The presence in ambient atmospheres of substances, generally resulting from the activity of man, in sufficient concentration, present for a sufficient time and under circumstances such as to interfere with the comfort, health or welfare of persons or with the reasonable use or enjoyment of property.[1]
AQI:	Air Quality Index is a colour-coded index for reporting air quality information and forecasting to the public.[2]
Airshed:	An airshed is a part of the atmosphere that behaves coherently for the dispersion of emissions.[3]
Annual average PM 2.5:	The average yearly concentration of fine particulate matter (PM2.5) in the air, used as a key global air pollution measure.[4]
Digital Questionnaire:	An online survey tool used to collect responses electronically from participants through mobile phones or computers.
Exposure:	The act of breathing polluted air over a period of time. Longer or repeated exposure increases health risks, especially for children.[5]
National Capital Region:	National Capital Region shall comprise the area of Delhi and nearby cities as notified under the National Capital Region Planning Board Act, 1985.[6]
Snowball Sampling:	A method used by researchers to generate a pool of participants for a research study through referrals made by individuals who share a particular characteristic of research interest with the target population. It is also referred to as chain sampling or chain referral sampling.[7]
Protective Measures:	Actions taken to reduce exposure to polluted air, such as wearing masks N-95 masks, staying indoors or limiting outdoor activity.

Executive Summary

AIR POLLUTION remains a severe and persistent crisis in the National Capital Region (NCR), especially for children growing up in Delhi NCR.

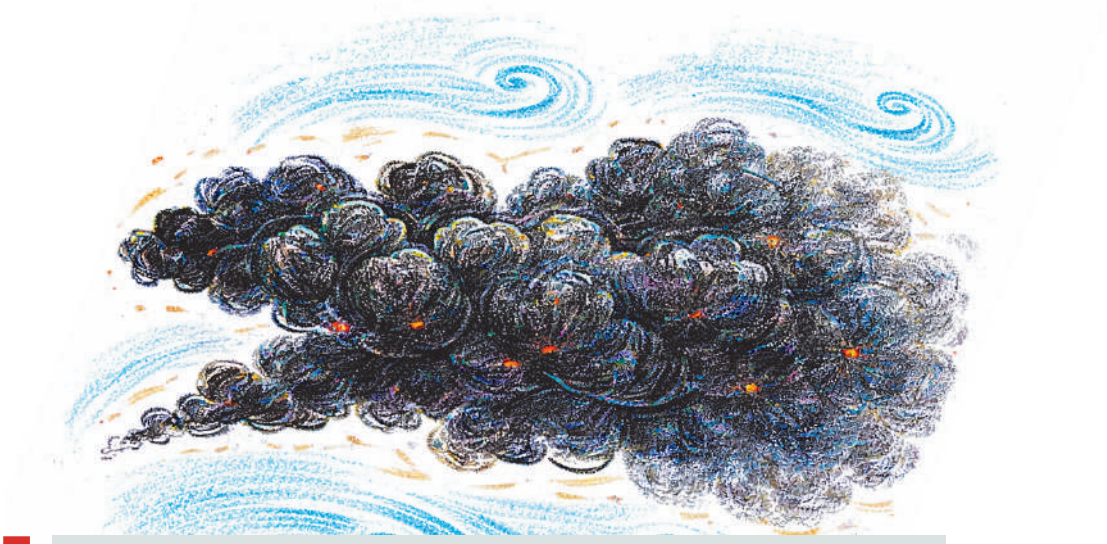
Air pollution is no longer only a seasonal issue. It has become a daily problem that affects how children breathe, travel, study, and play. As PM2.5 levels routinely exceed national standards, children are exposed to hazardous air for prolonged periods. This study emphasises understanding this crisis from children's perspectives.

This study draws on responses from 1,257 children aged 6–15 across Delhi-NCR, collected during the peak pollution months of December 2025 and January 2026. Twenty-three percent of children were from low-income households and were physically surveyed, while online surveys were used for 77% of children. The online survey was mainly circulated through hobby groups, mothers' groups, and school networks.

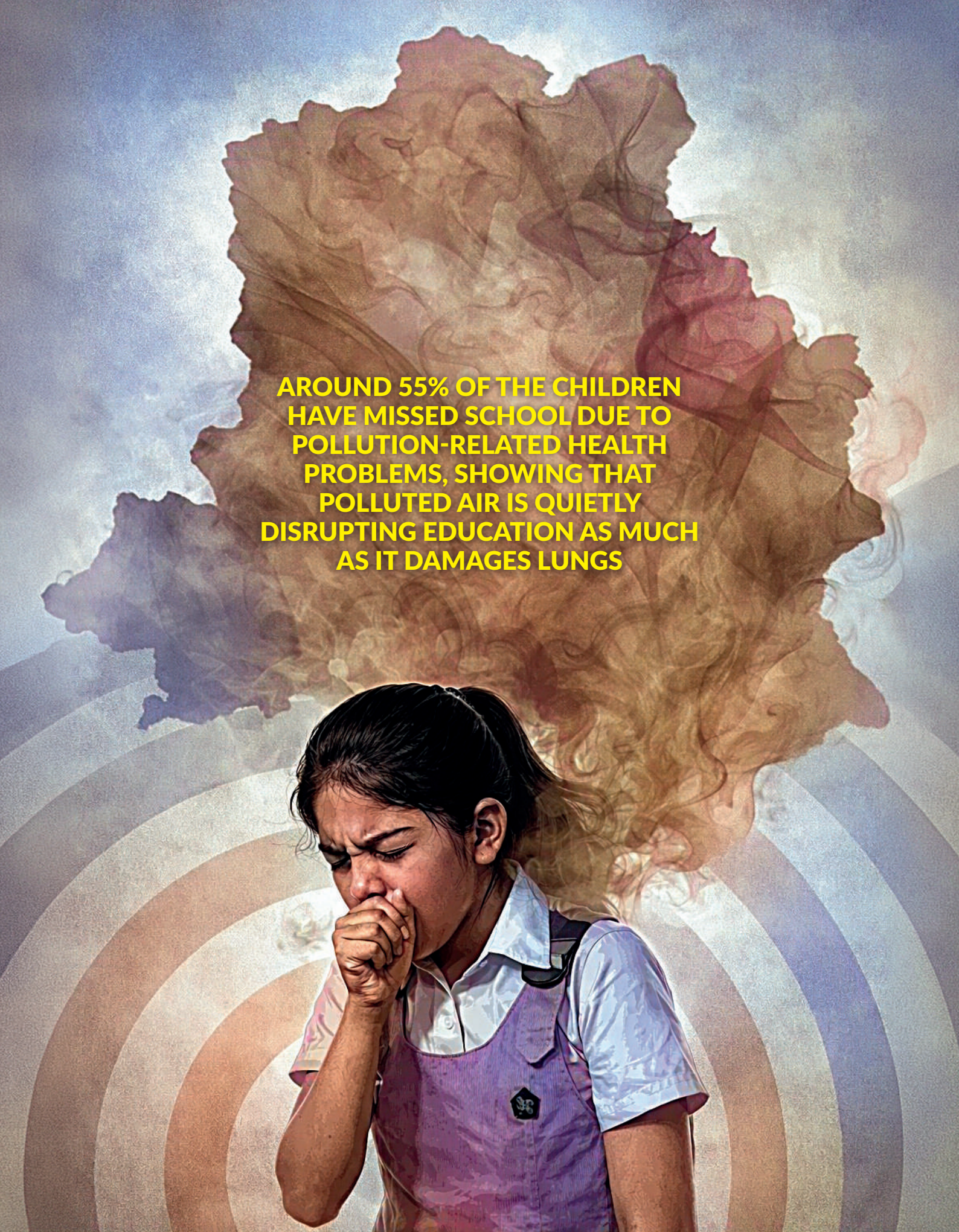
The results show that children are aware of air pollution and its effects on their health. They also believe the protective measures they take are inadequate. They also feel that insufficient action is being taken to protect them.

The key insights from the study are summarised below:

AWARENESS: Children are partly aware of air pollution. Sixty-Five Percent (65%) of children check the Air Quality Index every day, mostly through mobile apps and websites. Most know that air pollution is a serious problem. However, this awareness is uneven. Around Forty-Six Percent (46%) of children are aware of PM2.5 and PM10, but only about 40% understand how AQI is



A Generation Under Siege survey finds that children understand the health risks of air pollution, feel that protective measures are inadequate, and believe that too little is being done to safeguard them


AROUND 55% OF THE CHILDREN HAVE MISSED SCHOOL DUE TO POLLUTION-RELATED HEALTH PROBLEMS, SHOWING THAT POLLUTED AIR IS QUIETLY DISRUPTING EDUCATION AS MUCH AS IT DAMAGES LUNGS

Seven in ten children say air pollution leaves them anxious or distressed, with girls affected more than boys. Nearly half say they would leave Delhi–NCR if they could, as polluted air undermines their sense of safety and belonging

actually measured. Many children know that polluted air is harmful, but they do not fully understand what pollutants are present or how they affect health.

PERSPECTIVES ON HEALTH IMPACTS: The health effects of air pollution are immediate and widespread. Almost 86% of children believe that polluted air harms their health. Nearly 44% have visited a doctor since October 2025, and many required more than one visit for breathing problems, cough, headaches, and fatigue. Air pollution is not affecting children alone; most report that their parents, siblings, and grandparents are also falling ill. Around 55% of the children have missed school because of pollution-related health problems, showing that polluted air is quietly disrupting education as much as it damages lungs.

MENTAL HEALTH IMPACT: A key insight is related to the health toll of air pollution on the children surveyed. Nearly 70% of children say polluted air makes them anxious, irritated, fearful, or distressed. Girls report this psychological strain more often than boys. About 46.6% say they would choose to leave Delhi-NCR if given the option. These responses suggest that air pollution is affecting children's sense of safety and belonging.

PROTECTING THEMSELVES: When the air turns toxic, children do try to protect themselves. Almost 85% use some form of protection. Around 39% use N-95 masks or air purifiers, while 37% stay indoors or avoid outdoor activities. However, only a small number believe these measures are fully effective. About 85% still report symptoms such as eye irritation, cough, headaches, and tiredness even after taking precautions. Many parents also use home remedies such as ginger-honey tea, turmeric milk, and Holy Basil (*Tulsi*) to manage symptoms. These coping strategies show resilience, but they also reveal how families are left to manage a public health crisis privately.

REDUCED QUALITY OF LIFE: Air pollution is also reshaping daily routines. Children continue commuting, attending school, and playing even on severe pollution days because they have little choice. Instead of limiting exposure, 58% of all children are opting to adapt to air pollution by making lifestyle changes. Over time, this constant exposure risks not only physical disease but also reduced activity, social withdrawal, and long-term developmental harm.

TRUST IN INSTITUTIONAL ACTION: A mere 3.5 - 4 score has been given by the children in government efforts. This indicates low confidence in institutional action. Many feel that neither personal precautions nor public systems are sufficient to ensure clean air. Although children take steps to protect themselves, they do not feel adequately supported.

Overall, the findings show that air pollution in Delhi-NCR significantly affects children's lives. It impacts their physical health, mental well-being, education, and daily routines. Children are learning how to adapt to polluted air, but they themselves are neither happy about it nor do they believe they are safe from pollution.

I. Context

IN THE National Capital Region (NCR), air pollution remains a severe and persistent health and environmental challenge. Delhi was the second most polluted city in India for PM2.5 in 2025, with an annual average of about 96 µg/m^3, almost twice India's national standard of 60 µg/m^3.[8] The capital exceeded daily PM2.5 standards on around 285 days during the year, indicating prolonged exposure to polluted air for residents.[9] Across the NCR, 12 of the 14 cities with adequate monitoring breached annual standards. Ghaziabad and Noida were among the worst affected, with Ghaziabad recording the highest number of days exceeding the daily PM2.5 limit.[10]

Although the NCR is defined by administrative boundaries, air pollution spreads across the broader regional airshed (a connected atmospheric zone in which pollution generated in one area can travel and affect air quality in others).[11] Studies estimate that about 65% of Delhi's PM2.5 in 2025 originated outside the city, from neighbouring NCR districts and the Indo-Gangetic plains, highlighting the combined impact of local sources such as vehicles, industry, construction dust, and waste burning, along with regional pollution transport.[12]

Children are among the most vulnerable to air pollution. Their developing lungs and immune systems, combined with higher air intake per unit body weight, increase the risk of respiratory infections, asthma, and impaired lung development.[13] Research has linked air pollution to low birthweight, preterm birth, developmental delays, anemia, and long-term respiratory and cardiovascular impacts. Beyond health, pollution imposes major economic costs through higher healthcare spending, lost productivity, and reduced educational outcomes, weakening human capital and economic growth.[14]

In this context, Chintan undertook this study to understand air pollution from the perspective of the most affected yet least-heard group - children. While air pollution is usually assessed through technical indicators, health statistics, and policy debates, limited attention is given to how children experience polluted air in their everyday lives. This study bridges that gap by documenting children's observations, health concerns, and mental responses to air pollution.

The study is based on the lived experiences of 1,257 children aged between 6 and 15 across Delhi-NCR during the peak pollution months of late 2025. Of the total respondents, 51.8% were male, 46.8% were female, and the remaining preferred not to state their gender. The study examines children's awareness of air quality indicators such as AQI and key pollutants, the ways pollution disrupts daily routines and schooling, the protective measures they adopt, and the physical and psychological health impacts they face. By centering children's voices, the study presents air pollution as a lived reality that affects their health, education, and future.

II.Methodology

THIS STUDY was based on the assumption that children are often not heard, although they are among the most affected by air pollution. In order to nudge their voices, perspectives and needs to be heard more widely, Chintan undertook a study, '*A Generation Under Siege*,' reflecting both their vulnerability in the public horizon.

Research Timing

Chintan adopted a descriptive, cross-sectional study design to survey children's perspectives on air pollution in the National Capital Region (NCR). The methodology was designed to centre children's lived experiences, perceptions, and self-reported impacts of air pollution during the peak pollution period from December 2025 to January 2026, a time characterised by persistently high particulate matter concentrations across the NCR, when the AQI hovered above 200 and was categorised as poor, very poor, or severe. The timing was intentionally chosen to allow children to respond based on recent and ongoing experiences of pollution-related health symptoms, behavioural restrictions, and mental stress.

Data Collection Tool and Sampling

The study was conducted using a structured digital questionnaire. To ensure broad and diverse participation, the survey link was disseminated online through platforms such as WhatsApp and other digital communication channels, using a snowball sampling approach. The primary mode of circulation involved sharing the questionnaire across schools and community-based WhatsApp groups, enabling rapid outreach among students, parents, and educators.

The questionnaire was designed to cover key thematic areas, including awareness and understanding of air quality indicators such as the Air Quality Index (AQI) and particulate matter (PM2.5 and PM10), self-reported physical health symptoms, disruptions to daily activities, including school attendance and outdoor play, and the impact on children's mental health due to prolonged exposure to poor air quality.

> Conducted during peak pollution (AQI above 200), the study centres children's lived experiences — capturing real-time health symptoms, behavioural restrictions, and mental stress across Delhi-NCR

> With 23% participation from slum settlements and 77% through digital outreach, the survey reveals air pollution as a lived, ongoing reality for children — not a distant environmental issue

Data Collection Process

The survey was undertaken across Delhi–NCR using a mixed-mode data collection approach. Surveyors were trained to administer the questionnaire both in person and digitally. For digital collection of data, a structured online questionnaire (Annexure 1) was developed and shared in both English and Hindi to ensure accessibility.

Primary data collection was conducted physically in five selected slum settlements, where trained surveyors facilitated participation among children who had limited access to smartphones or the internet. Through this approach, almost 23% of the total sample was surveyed. The remaining responses were collected digitally through WhatsApp groups of schools, parents, and community networks, enabling wider outreach across Delhi–NCR. This mode accounted for about 77.3% of the total sample.

Before participation, all respondents were provided with clear information about the purpose of the study, and their voluntary, informed consent was obtained. Participation was entirely voluntary. No personal information was collected, and confidentiality of responses was maintained throughout the survey and documentation process.

Data Analysis

Survey responses were analysed using descriptive statistics to identify patterns and trends across thematic areas. Results were presented by reporting individual responses. Where relevant, responses were disaggregated by gender to examine differences in experiences and coping strategies among children.

Findings

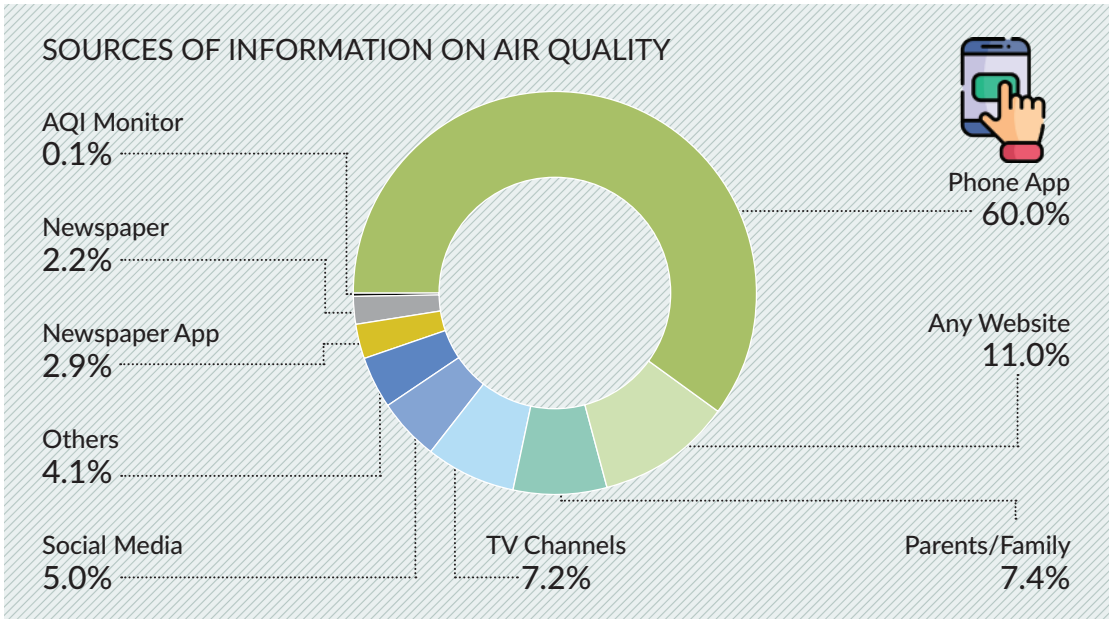
The study examines how air pollution shapes children's awareness, health, emotions, daily routines, and trust in action across Delhi-NCR, revealing pollution as a lived and ongoing reality rather than a distant environmental issue. The study captured nuances across themes. Some of them have been identified for the first time.

Section 1

KNOWLEDGE AND AWARENESS OF AIR POLLUTION

THE STUDY reveals that children have a basic awareness that air pollution is a serious problem, but their understanding remains uneven. Nearly two-thirds of respondents (63%) reported checking the AQI daily, of whom 67% were male and 62% were female. The majority (77%) believed that air quality during this period was poor.

When asked how they learn about daily air quality, nearly 60% of children relied on smartphone-based applications and social media websites, followed by news channels (16.5%) and parents (9.26%), showing frequent and real-time access to pollution updates. However, when assessed for the knowledge regarding pollutants such as PM2.5 and PM10, only 45% have heard about these terms. Only about 38% of girls were confident that they knew how the Air Quality Index (AQI) is calculated, compared to 40% of boys.

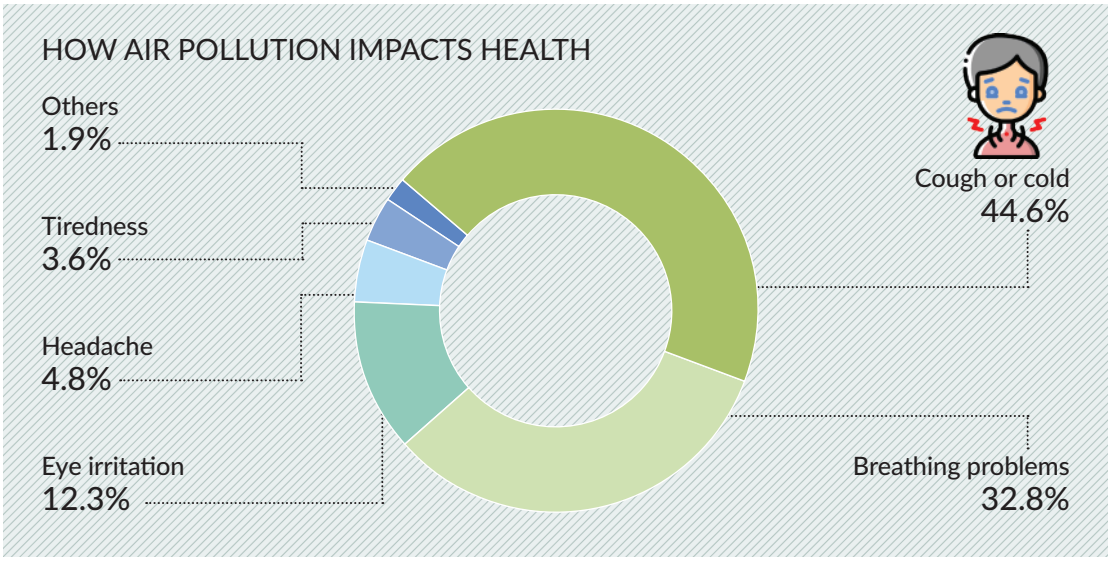


Although children are aware that air pollution is a serious concern, this awareness does not translate into a clear understanding of the issue. Children know that polluted air affects their health, but many lack an understanding of how it affects their health and daily lives.

Section

AIR-POLLUTION-RELATED ILLNESS

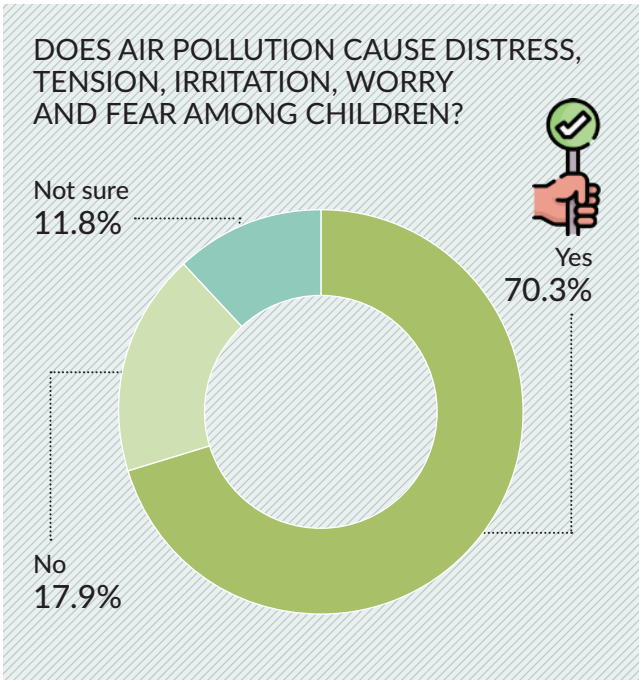
HEALTH IMPACTS stand out as a key theme in how children talk about air pollution. Health impacts emerge as one of the most compelling narratives that children spoke about when asked about air pollution. An overwhelming 85.9% of children believe that air pollution adversely affects their health. Nearly half of the respondents (44%) reported visiting a doctor since October 2025, of whom almost two-thirds (63%) required multiple visits for pollution-related illnesses. The impact extends beyond children themselves, as 68% indicated that other family members were also affected. Despite this, more than 70% of children rely primarily on home remedies to manage symptoms. A majority (55%) reported missing school due to air pollution-related health issues, of whom 54% were male and 56% were female.



Mental Health Impact

The mental health burden of air pollution on children is striking. Nearly 70% of surveyed children—72% of girls and 69% of boys—reported that poor air quality causes them discomfort, distress, worry, fear, irritation, or tension, indicating that pollution affects not only their bodies but also their mental well-being. Almost 46.6% said they would choose to leave Delhi NCR if given the option.

This reflects a deeper sense of anxiety, fatigue, and alienation from their environment, suggesting that for many children, air pollution has begun to erode their sense of safety, belonging, and optimism about the place they call home.



Air pollution is producing not just physical illness but mental fatigue and fear among children. This highlights an often-overlooked mental health dimension of environmental exposure.

Protective Measures and Their Limitations

While almost 85% of children in Delhi NCR use some form of protective measure to reduce exposure to air pollution, behaviour is another area where girls lag behind. Compared to boys (42%), only 40% of girls reported wearing N95 masks while travelling. Additionally, staying indoors during smog episodes and using air purifiers at home and in school classrooms—especially during the winter months when pollution peaks—are other practised preventive measures. These choices suggest a higher level of caution and responsiveness to air quality advisories.

However, only 28% of children reported that these preventive measures were sufficient. The majority of girls (73%) feel that masks, purifiers, and staying indoors do not fully shield them from Delhi NCR's polluted air, compared to 70% of boys. Many reported frequent episodes of eye irritation, colds or coughs, headaches, and tiredness, even when they followed protective steps and took medication for relief. Their experiences highlight that individual actions can only go so far in an environment where pollution levels remain persistently high.

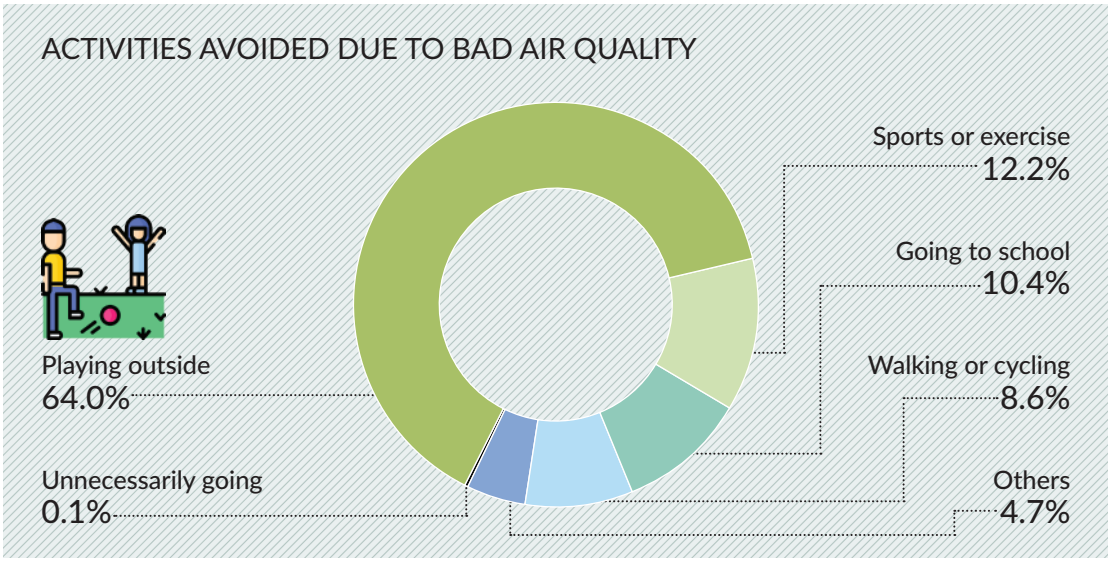
Additionally, 73% of children confirmed that their parents treated them with home remedies to address the health impacts of air pollution exposure, with the number reaching 75% among girls compared to 71% among boys. Ginger-honey tea, turmeric (*haldi*) milk, and *tulsi* leaves remain the top remedies parents use to help children cope with air pollution.

Disruption to Daily Life

Air pollution has emerged as a persistent constraint on children's everyday lives, extending well beyond its health impacts. While almost 77% of children reported being taught about the do's and don'ts of protecting themselves from air pollution, 58% reported using N95 masks and air purifiers as protective measures. Shockingly, only 42% opted to stay indoors and avoid outdoor activities.

This pattern suggests that many children are compelled to continue daily routines such as commuting to school, playing outside, or attending activities even during severe pollution episodes.

> Nearly three- fourth of parents rely on home remedies such as ginger-honey tea, *haldi* milk, and *tulsi* to help their children manage recurring symptoms, including eye irritation, cough, headaches, and fatigue

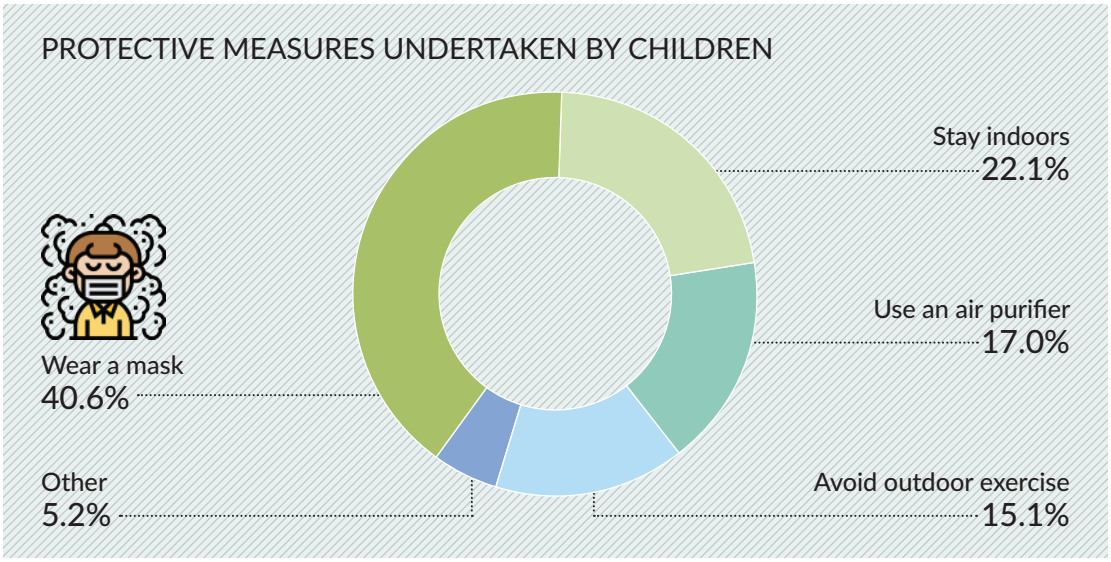


As a result, children adapt to polluted environments rather than being protected from them. Over time, such chronic, low-level exposure can contribute not only to respiratory and cardiovascular risks but also to reduced physical activity, altered social behaviour, and long-term developmental consequences. These findings underscore the limitations of individual-level protective strategies and highlight the need for systemic interventions in schools and urban environments to meaningfully reduce children's exposure to air pollution.

Perceptions of Action and Responsibility

Children's responses reveal mixed and largely limited confidence in existing actions to address air pollution. On a 10-point rating scale, the perceived effectiveness of government action averaged only 3.5–4, indicating children's limited confidence in the existing system. While many reported taking personal or household protective measures such as wearing masks, staying indoors, or using air purifiers,

> Even during severe pollution episodes, many children continue their daily routines, such as commuting to school and engaging in outdoor activities, adapting to toxic air instead of being shielded—thereby risking long-term health consequences



only about 28% of children believed these steps were sufficient to protect their health. In contrast, around 41% believed these measures were not enough. This indicates scepticism among children about the effectiveness of government action.

Together, these findings suggest that children feel compelled to adapt and protect themselves, yet lack confidence that either personal measures or public systems are adequately safeguarding their right to clean air.

Children feel compelled to protect themselves, but do not feel fully protected. This gap between the responsibility placed on individuals and the expectations from institutions reflects a growing sense of vulnerability and limited agency.

SCHOOLS MUST PLAY A STRONGER ROLE, NOT ONLY IN AWARENESS BUT IN PROTECTION, WITH ENFORCEABLE STANDARDS FOR CLEAN INDOOR AIR, SAFE OUTDOOR ACTIVITY GUIDELINES, AND ACCESS TO PREVENTIVE MEASURES THAT DO NOT DEPEND ON HOUSEHOLD RESOURCES

III. Way Forward

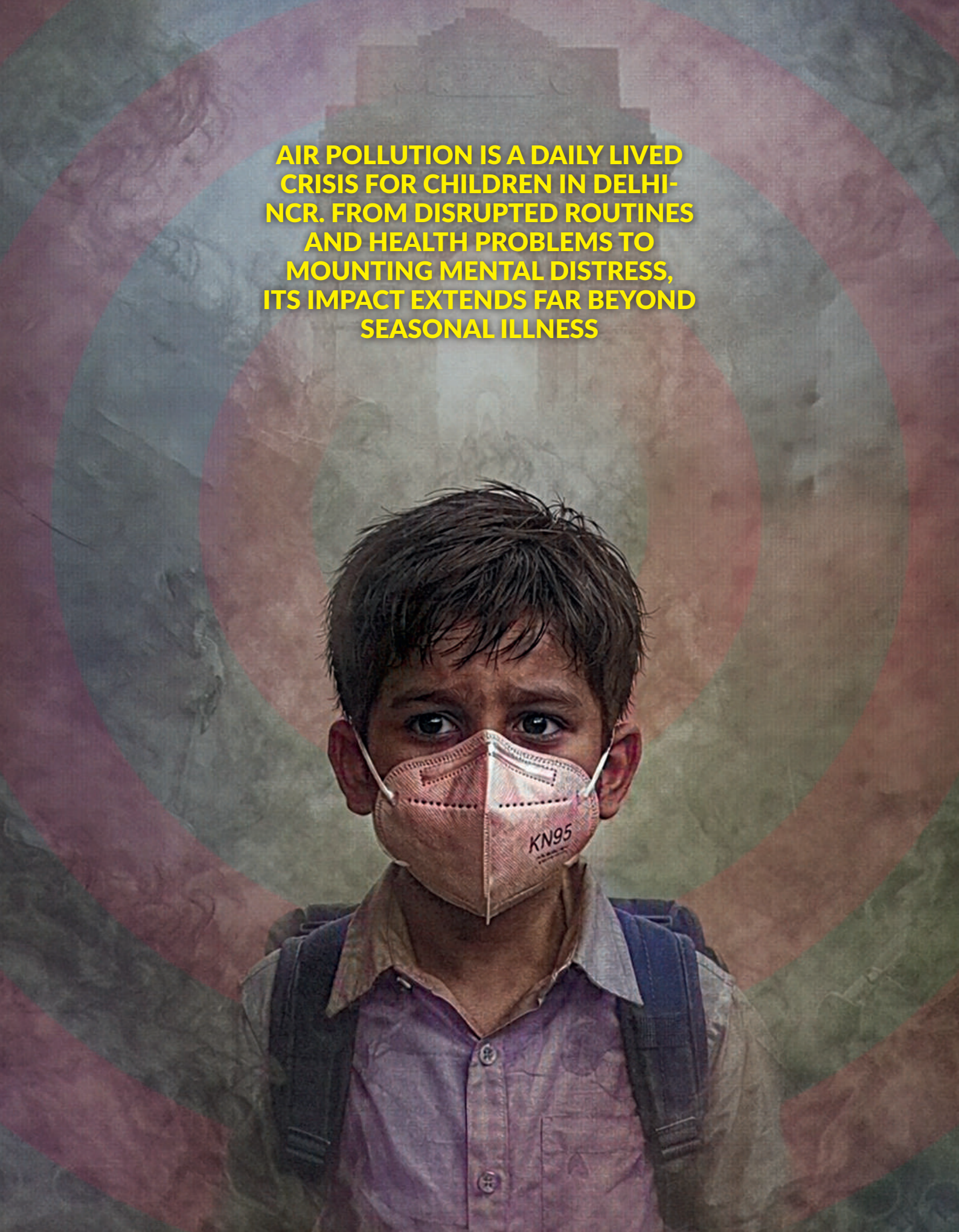
THESE FINDINGS point to an urgent need to re-centre air pollution policy around children's health and lived experience, rather than treating it solely as a technical or seasonal issue.

- Children's exposure must be acknowledged explicitly in planning and communication, moving beyond city-level averages to understanding what children are breathing at home, in schools, and on their daily routes. This calls for specific measurement around schools, residential areas and improved, denser air quality monitoring across the NCR. The data should be freely available and used to act on improving air quality, children's exposure and health.

- Schools must play a stronger role, not only in awareness but in protection, with enforceable standards for clean indoor air, safe outdoor activity guidelines, and access to preventive measures that do not depend on household resources.

- Children's perceptions reinforce the need for a coordinated airshed approach across the NCR, recognising that pollution sources and impacts transcend city boundaries. Finally, children's voices themselves must be treated as evidence

- Regular, ethical engagement with children can help guide more empathetic policies, rebuild trust, and ensure that clean air is recognised not as a privilege, but as a basic right essential to healthy childhoods and India's future human capital.


AIR POLLUTION IS A DAILY LIVED CRISIS FOR CHILDREN IN DELHI-NCR. FROM DISRUPTED ROUTINES AND HEALTH PROBLEMS TO MOUNTING MENTAL DISTRESS, ITS IMPACT EXTENDS FAR BEYOND SEASONAL ILLNESS
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IV. Conclusion: A Generation Under Siege

THE FINDINGS from *A Generation Under Siege: A One-of-its-Kind Survey of the Perspectives of Children in Delhi-NCR on Air Pollution* make one reality unmistakably clear: air pollution is a lived crisis for children. Across age groups and cities, children demonstrate an acute awareness of polluted air, report tangible impacts on their health and daily lives, and express mental distress linked to prolonged exposure. Many have already altered how they play, commute, and attend school, while a significant proportion have sought medical care or relied on home remedies, signalling that the impacts extend beyond routine seasonal illness.

Most concerningly, the study reveals that even the youngest citizens recognise the scale of the crisis, feel its consequences, and believe that they are not adequately protected.

Children do not vote, yet through their voices they have indicted institutions for failing to protect them.

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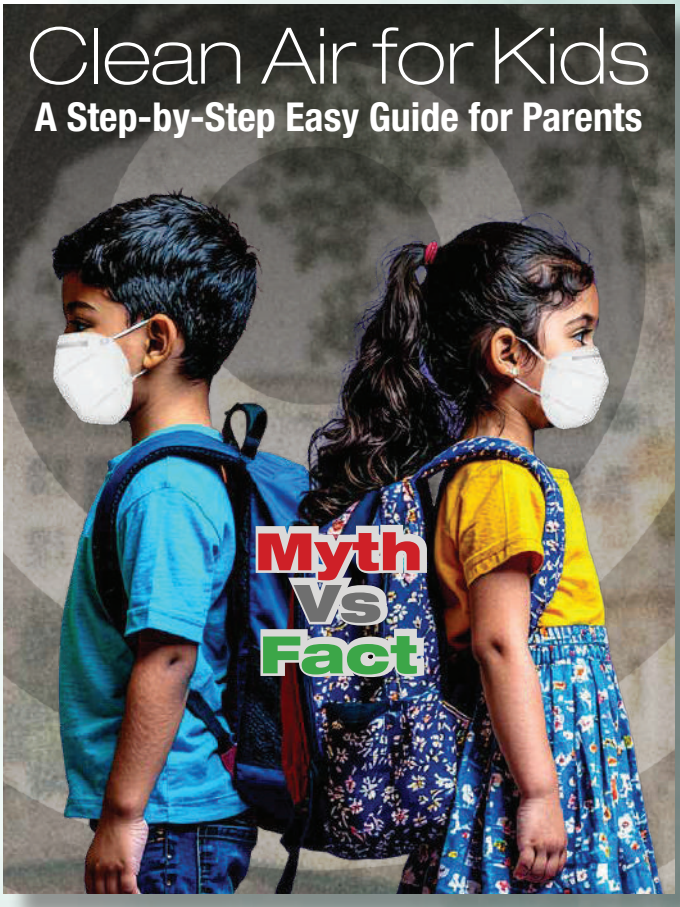

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