



The Air We Breathe

Information Ecosystem Assessment of Air Pollution in Indore

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Clean Air Catalyst

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The Air We Breathe
Information Ecosystem Analysis on Air Pollution in Indore
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Abbreviations

AIR	All India Radio
AQI	Air Quality Index
ASHA	Accredited Social Health Activist
BARC	Broadcast Audience Research Council
BCG	Boston Consulting Group
BHC	Building Healthy Cities
Catalyst	Clean Air Catalyst
CII	Confederation of Indian Industry
COPD	Chronic Obstructive Pulmonary Disease
COVID-19	The disease caused by SARS-CoV-2
CPCB	Central Pollution Control Board
DD	Doordarshan
FGD	Focus Group Discussion
FIR	First Information Report
GO	Government of India
HEI	Health Effects Institute
IEA	Information Ecosystem Assessment
IEC	Information, Education and Communication
IMC	Indore Municipal Corporation
IRS	Indian Readership Survey
ISSW	Indore School of Social Work
KII	Key Informant Interview
KVK	Krishi Vigyan Kendra

MOM	Media Ownership Monitor
MP	Madhya Pradesh
NAAQS	National Ambient Air Quality Standard
NARS	National Agricultural Research System
NBSA	News Broadcasting Standards Authority
NCD	Non-Communicable Disease
NGO	Non-Governmental Organization
PCB	Pollution Control Board
PIL	Public Interest Litigation
PM	Particulate Matter
RWA	Residents Welfare Association
TB	Tuberculosis
TOI	The Times of India
TV	Television
USAID	United States Agency for International Development
VOC	Volatile Organic Compound
WHO	World Health Organization

1. Executive Summary

The Clean Air Catalyst (Catalyst) is a new flagship program launched by the U.S. Agency for International Development (USAID). The intention of the program is to accelerate clean air solutions by working with communities around the world to identify and raise awareness of local pollution sources, and to build focused coalitions which deliver interventions leading to cleaner, healthier air. The five-year program will help build capacity for tailored, self-reliant solutions that cut air pollution and improve human health in developing countries.

Indore, India is one of the three initial pilot cities. Through these pilots, the project will create a practical, field-tested playbook for convening collaboration among key stakeholders, identifying and building awareness of air quality priorities, and leveraging USAID missions' strengths to deliver and sustain cleaner air. To understand the underlying information ecosystem as it relates to air quality, Internews, as a pivotal information assessment partner, conducted an Information Ecosystem Assessment (IEA) during the first year of Catalyst.

An IEA is an analytical framework that captures all dimensions of the relationship between information consumers and information supply. The Internews information ecosystem approach seeks a human-centered understanding of how people and communities find, value, trust, and share information within their own local contexts, whether it comes from traditional or new media.

Researchers collected data through the following methods: a survey of 252 respondents spread over six locations (see Fig.1.1), focus group discussions (FGD)

with six groups of people, and in-depth interviews with 23 key informants. Internews obtained consent from each participant to use their responses and information in this report.

This research was completed amid the Covid-19 pandemic, so certain adaptations were made to reach out to the participants following all government-issued safety protocols while also maintaining the principles and standard of the IEA methodology.

2. Recommendations

Consortium Partners/Scientific Community

1. Air pollution information should be disseminated to the community through a multisectoral approach to maximize constituency reach.
2. Most Indore residents do not perceive their air quality as good, but the majority do not register it as a threat. The community is interested in becoming more informed about how air pollution negatively impacts health and the environment. Accordingly, it is essential to generate more information about the linkages between the actual sources of pollution, local impacts, and solutions.
3. Transmit plain-language air pollution data explainers in various formats throughout the community and employ visual impact and storytelling techniques. The data currently presented to the community is very technical, so most people find it incomprehensible.

Communications

4. Indore's successful solid waste management intervention campaign uses a multisectoral and multi-modal means of communication. This includes using songs and jingles as information tools and playing these in public

- spaces across the city including housing colonies, public transport and cinema halls etc. Using similar information tools was recommended by most of this study's key stakeholders to spread awareness about air pollution.
5. Popular community engagements like *goshthis* (groups of people forming a collective to make decisions at community level), *nukkad natak* (street plays), wall paintings, jingles and door-to-door campaigns have been useful means of disseminating information in lower income settlements.
 6. The Indore digital landscape is very viable for running digital campaigns for air pollution, with a high number of WhatsApp groups and YouTube users. Apart from face-to-face communication, YouTube has a special appeal among vulnerable communities due to its visual impact. More emphasis can be directed towards digital inclusion and ownership of technology for women to give them access to timely information.
 7. Journalists should be trained to identify and cover more stories about the impact of air pollution on health and the environment, as well as regarding sources of air pollution and ways to control and protect oneself from the effects of air pollution.

Community Communication and Advocacy

8. Vulnerable populations, especially women from low-income communities, are still dependent on face-to-face communication as a means for getting information, verifying information, and redressing grievances. So, in addition to running campaigns via digital and traditional media, there should be an equal amount of emphasis on face-to-face communication. ASHA (Accredited Social Health Activist) workers trained female community health activists selected from—and accountable to—their respective communities, can also be effective mediums for propagating air pollution information to other low-income women. ASHA workers are already involved in several other health communications in those specific communities.

9. Social influencers, citizen groups, social media, newspaper articles, and the efficient use of hashtags have historically helped in disseminating messages to the urban elite in Indore. Women in positions of authority and power, along with women groups, can be an effective means of influencing women at large.
10. Citizen groups and social influencers like *Indorewale*, which is run by environmentally conscious citizens, are educating, and raising awareness about air pollution in Indore. Form partnerships and conduct training with citizen journalists who produce and disseminate information about air pollution.
11. There is a lack of knowledge in the community as to how they can control air pollution and file complaints with the government. Indore residents currently utilize the popular 311 application to file complaints on civic issues. The application could be more popularly used for registering air pollution-related grievances in addition to other civic grievances.
12. School-age children and college students in Indore have historically played an effective role in leading social campaigns. Working with schools, colleges, and the education department could be an effective way to reach out to young people about air pollution while spreading further awareness in society. A key component of this strategy would be to teach children how to talk to adults in their lives about air pollution and its impacts.

3. Key Findings

Information Supply

- Television (*Aaj Tak* and *Zee News*) and newspapers (*Dainik Bhaskar*, *Nai Duniya*, and *Patrika*) are the most trusted and popular mediums for transmission of information related to air pollution in Indore. Hindi is the preferred language with which to consume information. The survey established that more women than men have access to newspapers (61%) and radio (21%) as mediums of information.
- The survey results reveal that more men (57%) than women (43%) have heard about air pollution information in Indore.
- There has been a steady rise in social media consumption in Indore and the state of Madhya Pradesh, of which Indore is a constituent. WhatsApp is one of the important communication tools employed by multiple groups and associations in Indore. Even though WhatsApp is the most popular medium of information sharing, it is not the most trusted. As indicated during the FGDs, health-related information received by the community through WhatsApp is further verified through their neighbors, health workers and local politicians.
- Healthcare workers (41%) and scientists/experts (40%) are the most trusted sources for air pollution information, according to survey respondents. Women from vulnerable communities are mostly dependent on information

given to them face-to-face by local health workers.

- Among the survey respondents, 32% did not know where to access information about air pollution. Most respondents said they are unable to access air pollution information because they do not know where to find it.
- Display boards, government websites and newspapers are the official sources of information dissemination about Air Quality Index (AQI) data in Indore. Most of the population finds the information presented in these sources to be very technical and difficult to comprehend, a factor that 18% of survey respondents cited as a barrier to accessing air pollution information.
- Key informant interview (KII) respondents identified school-age children and college students as very crucial to the spread of information about air pollution within their community because they have the means to further spread the message to their parents, neighbors, and friends.

Information Demand

- The KII experts believe that a lack of awareness explains why there is so little demand for air pollution information or interventions from the community. Currently, there is no designated system or procedures in place to address air pollution-specific information or complaints. While the highly popular 311 mobile application maintained by the Municipal Corporation of Indore encourages citizens to resolve any civic issues by communicating directly with the administration, the app does not accommodate air pollution redressal.
- The government, media and civil society highlight air pollution issues on specific days, e.g., on Traffic Day or World Environment Day. The experts interviewed for this IEA recommended more transparency and engagement with the air quality monitoring data through the introduction of tools like social audits and citizen data mapping projects.
- Survey respondents mostly requested information pertaining to the effects of air pollution on health (57%), children's well-being (41%), environmental harm (42%), as well as that which contained comprehensible localized

Indore pollution data (47%). There is certainly a gap between the demand for information and what information presently exists in Indore. Currently, the available air pollution information consists of data primarily pertaining to increases and decreases in air pollution as understood through FGDs and newspaper screening.

- Forty-nine percent of survey respondents requested air pollution information daily. Even though fewer women had heard about air pollution information in Indore, more women (54%) than men (44%) wanted daily information on air pollution.
- Respondents from vulnerable communities reported less comprehension about the effects of air pollution on health and the environment. Students from affluent classes who have worked on air pollution-related issues were able to identify the health and environmental impact of air pollution.

Public Perception about Air Pollution

- While most residents reported air pollution as something they can smell or see with the naked eye—smog and darker evening skies, for example—there were few responses which indicated metrics-based/scientific understandings of air pollution, such as what PM_{2.5} (particulate matter) is.
- Most of the respondents (55%) perceive that they are “affected” or “very affected” by pollution, while the rest do not perceive the impact. They either said something to that effect, or seemed neutral, which suggests that the issue is not registering with them.
- Moreover, when asked about the air quality in their neighborhood, 36% of respondents said it was “good” or “very good.” But 47% said it was neither “good” or “bad,” and 18% said the air quality was “poor” or “very poor.” Therefore, while most people do not perceive their air quality to be “good,” they are not registering it as a threat.
- The respondents who perceive themselves to be “very affected” by air pollution were from the areas of Bhawarkuwa and Sudama Nagar. Bhawarkuwa is the education hub of Indore, with congested housing and

coaching institutions¹, while Sudama Nagar is one of the upscale residential localities of Indore and has high levels of vehicle emissions. The respondents who claimed the air quality is “very poor” in their neighborhood were mostly from the industrial hub of Pithampur, which is located on the outskirts of the city.

- There is a mentionable mismatch among the perceived and actual sources of per-sector pollution (Annex A). Most survey respondents (72%) perceived emissions from transport as the major source of air pollution in Indore, followed by industries (57%), waste burning (33%), cigarette smoking (33%), and construction work (25%).
- Both men (73%) and women (71%) perceive vehicle emissions to be the main source of air pollution. More women than men perceive emissions from factories and waste burning to be a major source of air pollution. Stakeholders composed of KII experts, FGD respondents, and even concerned government authorities also think vehicle emissions are the primary source of air pollution in Indore. Waste burning was not identified as a major source of pollution by other KII or FGD participants. An air quality modeling study showed that waste burning is only responsible for 7.8% of the air pollution in Indore (Guttikunda et al. 2019). Stubble burning by farmers during harvest season was perceived to be a source of air pollution by only 22% of the respondents, while most of the KII and FGD respondents identified stubble burning as a major air pollutant during the two- to three-month harvest season.
- The survey further revealed that, due to its past record of successfully implementing Clean India Mission (Swachh Bharat Abhiyan), the IMC was perceived as the most efficient and responsible authority for ensuring clean air to the residents of Indore. There is also trust in the central government (41%), the state government (34%), and in traffic police to control air pollution. There is a slight difference between men and women in the perception of the IMC as being the most responsible authority.

¹ Private preparatory classes held outside classrooms

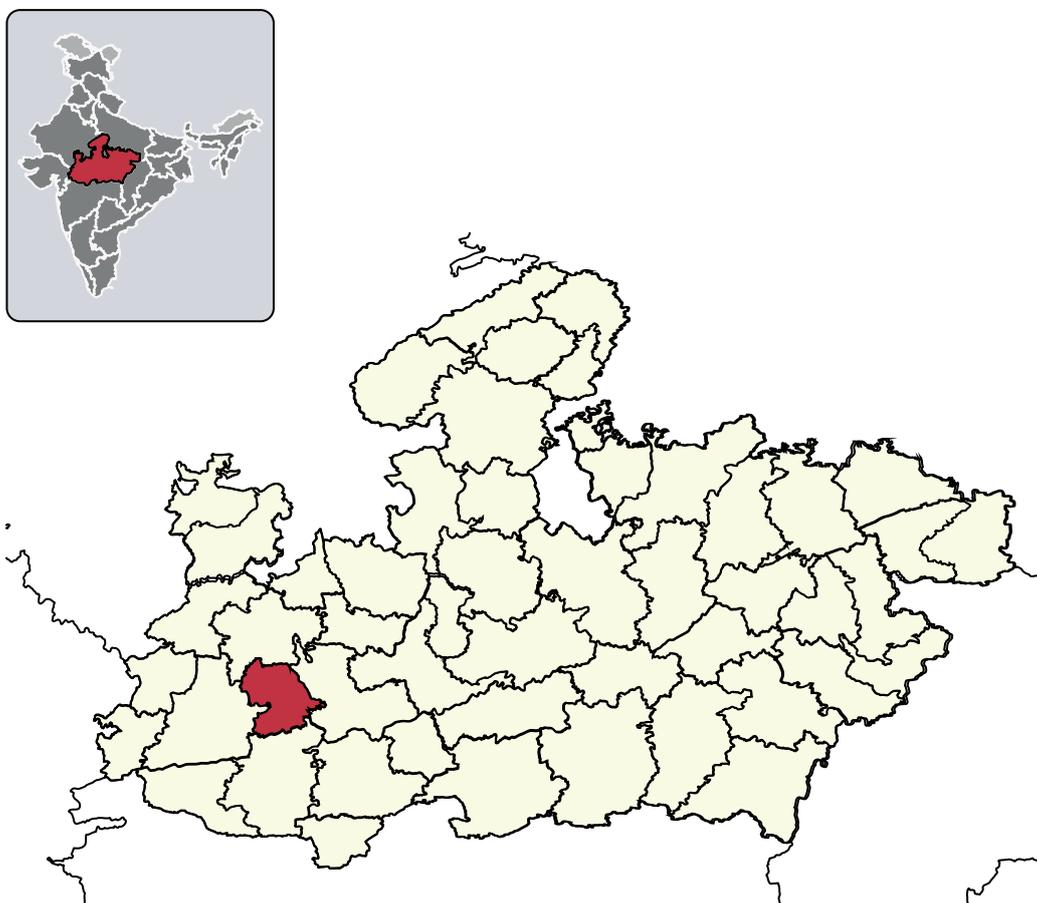
- Interestingly, about 36% of the respondents feel that Indore residents should be responsible for ensuring their own clean air. This finding does not appear to differ based on gender of the respondents. This result suggests that the people of Indore themselves are ready to take collective action to ensure reduction in air pollution.

Annexes

4. ANNEX A: Contextual Profile

1. Background

This IEA was conducted in Indore, one of the busiest commercial cities in the western part of the Indian state of Madhya Pradesh.



4.1.1.1. Map of IEA Location-Indore

The commercial capital of Madhya Pradesh, Indore, is one of the fastest growing cities in the state, with significant ongoing infrastructure development. There is a clear divide in living conditions, however. By IMCs' estimate, 30% of the city's population resides in slums, with only 38% of slum areas having access to parks and

green spaces. In contrast, non-slum areas contain 69% of park or green space in the city (*Building Healthy Cities*)

Per the Madhya Pradesh Disease Burden Profile, air pollution was the second-most prevalent factor behind the number of deaths and disability in Madhya Pradesh (ICMR, PHFI, and IHME; 2017). The top two leading causes of premature deaths in Madhya Pradesh are ischemic heart diseases and lower respiratory infections. A recent study that examined health inequities in Indore found that disease outcomes were highly gendered in nature. While the men were more prone to higher rates of hypertension, women had higher rates of obesity and high blood sugar (Stevens et al. 2020).

Madhya Pradesh is the second-largest state in central India. Agriculture is the main source of economy and livelihood. Soybean, wheat, paddy, *jowar* (sorghum), maize, gram, and mustard are its main crops. According to the 2011 Census, 69.8% of the total workforce in the state is dependent on agriculture. Even though women are active in agricultural activities, they remain vulnerable due to a lack of decision-making opportunities, less access to knowledge, and low levels of engagement in community groups (Solidaridad 2020). In terms of poverty rate, health, and education indicators, the performance of Madhya Pradesh is below the national average.

Hindi and English are the two official languages in India, in addition to 22 other languages. Hindi is the official state language and is spoken by most of the population. The other dialects commonly used by the people of Indore are Malwi and Nimari. In Indore, per the latest Census of 2011, 83.26 % of the population practices Hinduism, followed by Islam (12.67%) and Christianity (0.57%).

There is a notable gap of 9.84% in the literacy level between Indore men and women—while 88.7% of the men are literate, only 78.8% of the women are reported to be literate. (Census of India 2011).

2. Air Pollution in India

Worldwide, air pollution is the fourth leading risk factor for premature death, according to 2019 documentation by Health Effects Institute (HEI). Alarminglly,

as of 2019, India has the highest worldwide exposure to PM_{2.5}, with 1.1 million of its population at risk of premature death due to poor air quality (HEI, 2020). India is in the global spotlight because 21 out of the world's 30 cities with the worst air pollution are located there (Regan 2020).

According to the latest data published by the World Health Organization (WHO), 5.8 million people in India die from non-communicable diseases like heart and lung disease, stroke, cancer, and diabetes every year (NHP 2019). Air pollution is held to be the second leading cause of death from non-communicable diseases (WHO 2019).

Apart from being a major health concern, air pollution is also an economic burden for communities as much as it is for the government. According to the Clean Air Fund, the total economic loss faced by India due to air pollution is \$95 billion, which is about 3% of India's total GDP (Gross Domestic Product).

Agriculture has been the most dominant source of income for 58 percent of the population in India. Numerous studies have found that there has been a substantial reduction in crop yield and crop quality due to long term exposure of high concentrations surface ozone. According to a 2014 study, the economic loss caused by damages to wheat and rice crops due to ozone exposure is enough to feed 94 million poor people in India (Ghude et al. 2014). The health impact due to poor air quality was financially quantified for the very first time through three direct pathways comprising premature mortality, loss of productivity, and loss of consumer footfall (Clean Air Fund 2021).

Although evidence suggests that men are more susceptible to deaths caused by air pollution in OECD countries due to their exposure to ambient (outdoor) particles, it is important to note that women—especially those from lower economic groups—are particularly more affected by ambient air pollution. The reasons range from differential mobility patterns caused by deep-rooted patriarchal socio-economic conditions to occupational hazards felt by roadside female hawkers in busy streets (Mehra et al. 2021). A recent medical study (Zang et.al. 2019) indicated that high levels of air pollution can cause “silent miscarriages” among women, in addition to the other health complications including strokes, pulmonary diseases, lung cancer, and heart diseases (Singh 2019).

To address rising concerns about air pollution, the Indian government has initiated several policies and regulations. The supply side section of this IEA details city-level infrastructure and regulations that have been adopted to address air pollution.

3. Air Pollution in Indore

Indore has a high population density of 839 inhabitants per square kilometer (2,170/square mile) and a total population of over two million. The IMC administers the city and is entrusted with maintenance of roads, drainage, water and wastewater, transport, street lighting, solid waste management, slum development, and other administrative functions. The city is surrounded by the major industrial zones of Pithampur, Sanwer Road, and Dewas within a radius of 25 to 50 kilometers. The Indian government is currently implementing citizen-friendly urban sustainable living solutions in Indore as part of its “smart city” designation.

Indore has emerged to be the “cleanest city” in India five times in a row as measured by Swachh Sarvekshan². It has already attained open defecation-free status, improved sewer lines, cemented roads, gained a five-star rating for being a garbage-free city, and claims 100% segregation of waste at source (MOHUA 2020, Smart City Indore). Indore was further lauded as India’s first water plus city in 2021 for maintaining the cleanliness of rivers and drains (Livemint 2021). Initiatives like building cemented roads, waste segregation, and five-star garbage-free city do not have any direct bearing on air pollution levels—although they do ensure reduced polluted air emissions in Indore in the form of less open burning and road dust.

According to the *State of the Air Report* prepared by the Catalyst (2021), it has been reported that “PM_{2.5} annual averages measured in 2019 at the three manual monitoring sites in Indore (based on measurements made approximately every third day) are all between 36–39 µg/m³. The highest pollution is measured during the post-monsoon season (October, November) and during the winter months

² Swachh Sarvekshan is an annual survey of cleanliness, hygiene, and sanitation in cities and towns across India. It was launched by the Government of India in 2016.

(December–February), due in part to lower wind speeds during these months”. These readings exceed the WHO annual average standard of 10 µg/m³. Along with 132 other Indian cities, the National Green Tribunal (NGT) found Indore to be a “non-attainment”³ city based on its air quality from 2011 to 2015. It is also named in the non-attainment cities list maintained by the NGT.

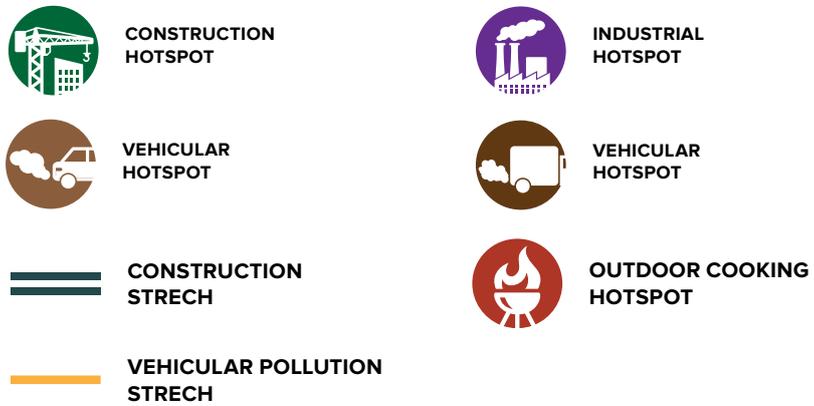
The major sources of air pollution in Indore, as identified by the Central Pollution Control Board, are vehicle emissions, construction activities, and industrial emissions (MOEFCC 2018). A Clean Air Catalyst study, “Sources of Air Pollution: Indore” reconfirms findings that “the largest source contributions in Indore are road transport, dust from construction, and resuspension because of vehicle movement. Residential cooking fuel use and municipal waste burning are the second largest contributors to air pollution, followed by industry, diesel generators, and brick manufacturing industries.” Furthermore, with 3,383 reported road crashes in the year 2019, Indore holds the sixth position in terms of road crashes in India (Government of India 2019).

The city’s latest air pollution control action plan⁴ was prepared per NGT guidelines by Madhya Pradesh Pollution Control Board (MPPCB) in 2018 in consultation with 14 departments in the fields of traffic, construction site management, and solid waste management. The action plan included time-bound implementation targets for source identification monitoring and control of air pollution in Indore. NGT has further directed the states to include *“measures of strengthening Ambient Air Quality (AAQ) monitoring and steps for public awareness including issuing of advisory to public for prevention and control of air pollution and involvement of schools, colleges and other academic institutions and awareness programs.”*

Through the participatory method, the FGD and KII stakeholders were encouraged to identify the air pollution hotspots in their city. Based on their responses, an air pollution hotspot map was developed that reflects vehicle, construction activity, industrial, and outdoor cooking hotspots.

³ Cities are declared non-attainment if over a 5-year period they consistently do not meet the National Ambient Air Quality Standards for PM 10 (particulate matter) that is 10 microns or less in diameter) or NO₂ (Nitrogen Dioxide).

⁴ <https://cpcb.nic.in/Actionplan/Indore.pdf>



4.3.1.1. Air Pollution Hotspots in Indore

ANNEX B: Research Scope and Methodology

4. Information Ecosystem Assessment Methodology

The overarching goal of Internews' IEA methodology is to gain a deeper human-centered understanding of how people and communities find, share, value, and trust information within their local contexts, irrespective of whether it comes from media agencies or not. The information gathered by Internews and its partners through multiple phases of the IEA process informs workable solutions to address information gaps and reach overlooked audiences.

The IEA methodology is based on the following four key principles.

Putting the Community at the Core of Research

Internews and its partners endeavor to be at the core of the communities they serve. Within this context, Internews endeavors to involve the community during the IEA research period. This can take different forms and establish various levels of participation and influence. Internews strives to design multiple ways and methods to gather feedback from community members and representatives. In pursuance of the same, it may hire researchers and data collectors from inside the community, and partner with community members to disseminate results and gather feedback. Community members comprising students, *tuk tuk* (driver associations), industrial area residents, women from informal communities, and street sweepers were involved during this research for data collection activities across research sites, and a participatory approach was taken across all focus group discussions.

Following a Human-Centered Research Design

Internews and its partners aim to develop a holistic understanding of people's information practices. The focus in this IEA, therefore, is on understanding demand and supply in a broad sense and not only about media outlets or media actors. The scope of analysis is also defined by how people access and consume information, and not simply through predefined categories. The aim is to understand practices which

are common, as well as the specific needs and behaviors of groups—especially those composed of the most vulnerable people.

Marrying Qualitative and Quantitative Data

Internews and its partners seek to extract and combine mixed method data to understand the supply and demand of information and how the two interact to produce a dynamic ecosystem. Using qualitative data to explore behavior, knowledge, and practices, combined with the larger trends conveyed by quantitative data help set up a detailed and reliable analysis.

Integrating Research and Action

Internews and its partners do not consider IEAs to be an “end product.” IEAs are often the first stage of project design, and provide insights into contextual realities, preferences, and requirements. They are always connected to recommended actions, whether our own or those undertaken by communities, partners, and other key stakeholders in the ecosystem. By understanding information ecosystems, policymakers and practitioners can design the most appropriate and effective strategies to serve even the most information deprived communities and societies.

Internews maps information ecosystems based on these four principles by first establishing an overview of the quantity and quality of media available—and the factors that influence media—to the populations it is interested in. This is the supply side of the ecosystem, which provides an overview of the physical and institutional infrastructure that supports information flow. This includes the geography and reach of traditional media and digital media, the legal and regulatory environment, and the political, economic, legal, and technological factors affecting information flow.

Internews analyzes the diverse ways people behave around this information, including informal and non-media sources. To understand this behavior, we work with people to find out about the demand side elements of the information ecosystem. The demand side perspective is critical to a full understanding of any information ecosystem, as it is more than a network of news, media, and information channels. It includes informal, personal, civic, community, and trust-based information flows that may or may not be influenced by news or media. Most importantly, information

ecosystems are uniquely defined by the information behavior of the people who live in them. In the constant quest of humans to connect with information, the ways in which they consume, produce, contribute to, interact with, and behave around their information supply is what makes information ecosystems dynamic and diverse.

The acquisition of qualitative insights will allow us to explore which channels, platforms, formats, or people the audiences we work with prefer and trust. The key components of the demand side of an information ecosystem that is of interest to Internews are:

- **Information Need:** The information that people need and value in a measure sufficient for them to seek out.
- **Access:** The ways in which people typically gain access to the information they seek, and the level of risk they are willing to undertake to do so through all possible channels—TV, radio, print, digital, social media, and word of mouth.
- **Sourcing:** The preferred or most frequently consulted specific sources that people call upon for the information they need—media sources, community sources, specific online groups, or individuals.
- **Sharing:** The way people pass along sourced information results in patterns of information flow, as well as an exchange between individuals and groups, and sets up a landscape in which certain actors and groups gain significance, for better or worse (see “Trust and Influence”).
- **Trust:** The consumer’s belief in the relative reliability and truthfulness of various sources as an indicator of their trust in the information itself.
- **Influence:** The influence that is given to and comes from being a trusted source, and how that influence is used by influencers and experienced by consumers.
- **Information Literacy:** The degree to which consumers can discern false information in their information ecosystem, in addition to their vulnerability or predisposition to rumors and misinformation (especially pertaining to Sourcing, Sharing, and Trust and Influence).

Interacting and learning from the community and its members is the essence of an information ecosystem. Restrictions due to the massive COVID-19 outbreak in Indore created a shift to virtual collaboration with most of the information consumers. To avoid missing the voices of respondents who do not have access to phone or internet, we conducted four FGDs offline when the Covid restrictions were eased by the administration. The team was particularly careful to follow all the mandated COVID-19 restrictions and guidelines of the Government of India while conducting the in person FGDs.

5. Research Tools

This IEA was conducted through purposive sampling comprising 23 key informant interviews, five focus group discussions, a survey with 252 respondents, deep hanging out⁵, and desk research.

Desk Research

Desk research was conducted between April 2021 and July 2021 at various stages of the process, mostly through online resources. This helped in narrowing down key stakeholders, the air pollution situation in the targeted geographical location, and in conducting media monitoring. The results from the media monitoring are available in the supply side of this report.

Surveys

A short digital questionnaire, mostly containing multiple options, was sent out to the community through informal networks in the selected geographical locations of Indore to capture the perceptions of the participants about air pollution and information networks. This survey tool was not designed to generate copious amounts of quantitative data, but to provide a further layer of qualitative data about

⁵ Deep hanging out is a term developed by anthropologist Clifford Geertz. It is a research methodology in which the researcher immerses oneself in the community as participant observer to observe the socio-cultural groups experiences in an informal level.

information needs and practices from the different target regions. The questions were clustered in the following themes:

- Perception about air quality in Indore
- Information and knowledge about air pollution in Indore
- Sources and mediums used as communication channels
- Trusted source and mediums for information
- Information needs
- Information barriers

It was initially planned that 200 respondents would be selected through snowball sampling using informal networks. Survey questionnaires were sent out through WhatsApp and emails to the representatives of local nongovernmental organizations (NGO), influencers, and residents welfare associations (RWA). They further sent out the e-surveys within their network. The local NGOs, influencers, and RWAs already have a strong presence in the communities that reside within the air pollution hotspots of Indore. The researchers followed up with the respondents through telephone calls to fill in the survey forms and kept a vigil on the representativeness of the sample as they were being filled in by the respondents. This sampling methodology of contacting respondents through informal networks was considered by the researchers to gain access to those respondents living in the specified geographical areas where the networks are active. This method was also adopted to create enhanced interest/trust among the respondents to fill in the survey forms as they were coming from familiar networks.

The team first administered the survey through online informal networks from June 9, 2021, until June 20, 2021. When analyzing the data, the team discovered that out of 200 participants who completed the survey, only 32% of the participants were women. In order to reach out to more women, the researchers modified their methodology and tried to reach out to targeted women networks through student groups and NGOs, and even went out in the field whenever possible between July 5 and July 24, 2021, to do an offline survey.

Due to the pandemic, and due to women’s restricted mobility due to socio-cultural norms as analyzed in a recent [report](#) from Clean Air Catalyst–USAID, very few women were found by the field researchers on the streets of Indore. Those with whom the team engaged were not comfortable answering survey questions on a one-to-one basis, even though the field team included women.

Therefore, even after modifying the data collection and reaching up to 252 participants, only 46% of survey respondent were women. In previous street surveys it has been found that women do hesitate to participate in surveys due to the survey topic (air pollution in this case) and response burden (Goyder 1987; Smith 2008:8).

The difficulty in reaching out to female participants online for this survey has been a finding in itself about access to information and use of technology among women. Therefore, any information campaign in Indore should be multisectoral and multi-modal to make the information more inclusive specially for vulnerable women who have less access or ownership of digital technology.

Tool of Collection	Area	Male	Female	Total
Survey	Chhoti Gwaltoli	11	6	17
	Pithampur	11	12	23
	Bhawarkua	40	34	74
	Rajwada	24	15	39
	Vijay Nagar	26	37	63
	Sudama Nagar	24	12	36
Total		134	116	232

4.5.1.1.1. Survey Tool

Key Informant Interviews

Key actors responsible for information institutions and flows participated in the KIIs. There were respondents from government departments, media, social influencers, health experts, industry heads, and NGOs. The participants had the freedom to choose the language for the interview, as well as the choice of platform (through telephone or online voice communication.) The initial target sample was 25, but due to the pandemic and the additional burden within the government, some of the key government stakeholders were not available to participate in the KIIs. In the end, 23 KIIs were conducted.

List of Key Informants				
No.	Name	Gender	Position	Organization
1	Alok Deshwal	M	Scientist	Agriculture Extension Centre
2	Ambrish Kela	M	Founder Member	Sciencetech Technologies CEO - Forum for Clean Air, Indore
3	Anil Bhandari	M	Vice President	Centre for Environment and Research Centre
4	Anupa Madharia	F	Training Co-ordinator	Pahal Jan Sahayog Vikas Sansthan
5	Atul Bharat & Aditya Awasthi	M	Group Director and Faculty Member	Acropolis Institute
6	Bakul Sharma	M	Project Manager	Madhya Pradesh Voluntary Health Association
7	D.K. Waghela	M	Chief Chemist	Madhya Pradesh Pollution Control Board
8	Gautam Kothari	M	President	Indore Industry Association
9	Harsh Neekhra	M	Founder	Novorbis
10	Hema	F	Asha Worker	Government of India
11	RJ Ishaan	M	Radio Jockey	Radio Mirchi – Indore
12	Jagtap Gopal	M	Founder	Basix
13	Neeraj Mishra	M	City Project Officer	Building Healthy Cities

List of Key Informants				
No.	Name	Gender	Position	Organization
14	Nilesh Trivedi	M	Assistant Director	Ministry of Micro, Small and Medium Enterprises Development, Indore
15	Praveen Joshi	M	Media Coordinator with Government and Editor with a health magazine	Arpan Samarpan
16	Rahul Srivastava	M	District Tuberculosis Officer- Indore	Government of India
17	Rajendra Sharma	M	Professor	Indore School of Social Work
18	Dr Salil Bharghava	M	Head of Respiratory Medicine Chairperson- Indore	MGM Medical College, Indore Clean Air Champions
19	Sameer Sharma	M	Founder	Indorewale
20	Sandeep Pare	M	Journalist	Patrika
21	Shabnam Verma	F	Consultant	Urban Health Resource Centre
22	Sunil Singh Baghel	M	Journalist	Dainik Bhaskar
23	Umakant Chaudhary	M	Deputy Superintendent of Police	Indore Traffic Police

4.5.1.1.2. List of Key Informants

The KII participants were chosen after doing an exhaustive secondary literature review. The literature review and consultation with Catalyst partner organizations helped contact administrative leadership in Indore for assistance selecting the KII participants.

Focus Group Discussions

Discussion groups continue to be an ideal method for allowing participants with common positionality to share their ideas with each other, which helps in exploring

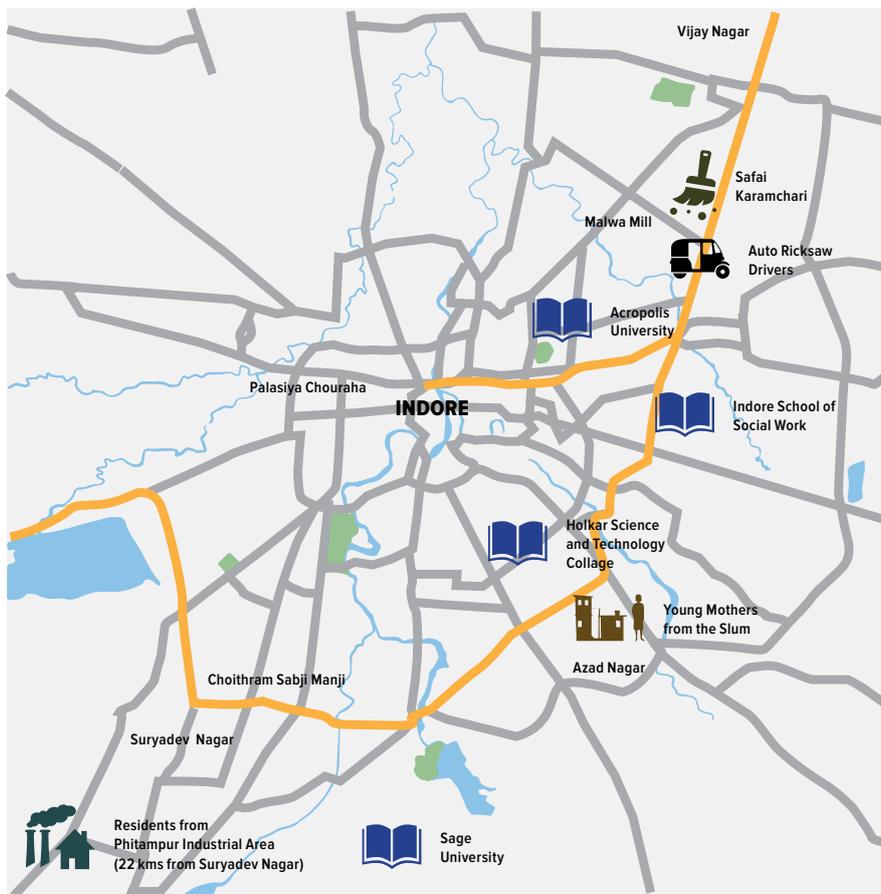
a range of views and experiences. The local researchers conducted five FGDs with different vulnerable sections of the community most affected by air pollution. In this case, the respondents were particularly useful for looking at shared experiences and beliefs regarding air pollution, and their sources for such information.

The FGDs were the last tool implemented during the IEA due to the government's Covid restrictions. A total of four FGDs were conducted in person with low-income vulnerable populations who were most affected by air pollution in Indore and was comprised of residents from Zone 2—one of the most air pollution-dense zones—of Pithampur Industrial Area, young mothers from Azad Nagar informal settlement, auto-drivers, and *safai karamcharis* (street sweepers). One FGD was also conducted online with students, as per their preference.



FGD with women in Azad Nagar

The interviewers received consent to conduct and record the FGD prior to starting the process. The scope and purpose of the FGD was explained to the participants in their local language, as well as in English. While conducting the offline in-person FGDs, the researchers abided by all the Covid protocols, including social distancing and usage of masks and sanitizers, which were also distributed to the participants at the beginning of the FGD.



- Safai Karamchari * > Malwa Mill
- Auto Rickshaw Drivers* > Malwa Mill
- Students' Group** > Indore School of Social Work
Holkar Science and Technology College
Acropolis University
Sage University
- Residents from Industrial Area > Pithampur
- Young Mothers from the Slum > Azad Nagar

*Safai Karamchari and Auto Rickshaw Drivers are from different parts of the city but brought together in a central location for the FGD.

**Students' groups FGD was conducted virtually. The students participated from four different city collages / universities of Indore.

Communities engaged in FGD across Indore

Tool	Groups	Male	Female	Total
FGD	Student Group	5	4	9
	Residents from industrial areas	4	5	9
	Safai Karamcharis	4	4	8
	Auto rickshaw drivers	6	0	6
	Young mothers in slum areas	0	8	8
Total		19	21	40

Table. 4.5.1.1.3. FGD Tool

1. Deep Hanging

Immersive experience transit walks in the community, also known as deep hanging out (Geertz 1998), is a tool adopted in this research to spend time with communities located in air pollution hotspots such as community centers, places where air quality screeners are installed, markets, traffic signals, and eateries. The exercise was conducted in April 2021, although it was unexpectedly halted due to the Covid lockdown during the second wave in Indore. The researchers went back to the community for deep hanging in July, but as there were extant restrictions in some parts of the city, it became difficult to carry out a full-fledged implementation of this tool.

Nevertheless, the researchers were able to capture very interesting pictures of some leading sources of air pollution in the city which are presented in this assessment.

6. Data Analysis and Ethical Protocol

The survey questionnaire included a consent statement, the definition of air pollution, and the scope of the survey. This information, along with the survey questions, was

translated from English to Hindi for better engagement and ease of understanding for the respondents.

The survey was conducted through Google Forms so that the data was directly saved and analyzed through that platform. The qualitative interviews conducted for FGD and KII were recorded with due consent from the participants and thereafter sent for transcription. The transcriptions were read and assigned a specific label as per the respondent's group, location, and category. In the next step, the content analysis template was created as per the objective of the IEA and analyzed.

Ethical considerations are very important in research studies that require human participation. One of the most critical ethical guidelines is respect for people participating in the study. This recognizes the capacity and rights of all individuals to make their own choices and decisions. It signifies respect for the autonomy and self-determination of all human beings and acknowledges their dignity and freedom. Interviews obtained consent from each participant to use their responses and information in this report. Furthermore, throughout the interviews the researchers interviewing the respondents promoted effective communication techniques that encouraged active listening, individualizing, and requesting restatement by the subject.

7. Limitations

- The pandemic significantly delayed the IEA process along with the data collection process due to the restrictions imposed during the lockdown. With the second wave and lockdown for several consecutive days in between, the IEA process was halted, and the team had to significantly distance itself from direct engagement with the community. The survey and KIIs were done online, while four out of five FGDs were conducted offline, and deep hanging in the community did not bring out the actual picture as the lockdown restrictions led to limited activities being conducted in public areas.
- Outreach of survey respondents through informal networks has created a selection bias in choosing respondents, especially while reaching out to

vulnerable populations who do not have access to a mobile phone, internet, or who lack reading skills. The researchers tried to mitigate this through triangulation of other research tools like FGDs and deep hanging as is explained later in this assessment.

- The survey failed to reach out to an equal number of men and women, even after targeted interventions. Since this was an online survey, the respondents were limited to men and women who had access to smartphones and fast internet.
- As per the latest Census conducted in 2011, 14.09% of the population in Indore is Muslim. The survey, which was conducted mostly online through known local networks, failed to capture any Muslim voices. The FGD in Muslim dominated Azad Nagar was conducted to specifically capture the information access behaviors and practices of the Muslim community.

ANNEX C: Supply Side (Media Landscape Review)

8. Media Landscape

At the time of its adoption in 1949, Article 19 of the Indian Constitution provided the fundamental right to freedom of speech and expression. It was later interpreted to include freedom of the press. Various legal decisions strengthened the position of press laws and emphasized the role a free press plays in strengthening democratic institutions. In the seminal legal case *Indian Express Newspapers vs. Union of India*, it was established that the freedom of the press comprised of three essential elements: freedom of access to all sources of information, freedom of publication, and freedom of circulation (Mahuli 2021).

In India, media is self-regulated, diverse, and is produced in multiple languages. Media ownership lies with a handful of founding families, corporations that have varying interests in investing in media companies, and individuals with political ties (Newman et al. 2021). Though most of Indian news companies have incorporated specific policies on gender equality and sexual harassment in workplace, only 28% of women at any occupational level are represented in the field of journalism (Byerly 2018).

According to Reporters Without Borders' World Press Freedom Index, India ranked 142 out of 180 countries in 2020 and 2021 (Reporters Without Borders 2020, 2021). The poor performance in the study resulted in substantial backlash for press freedom from across the country. To counter the narrative, the Indian government formed a panel of 15 members in 2020 to enhance the press freedom in the country. The panel recommended that the government decriminalize defamation in the Indian Penal Code and take consent of the Press Council of India prior to the filing any First Information Report⁶ against a journalist (Dutta 2021).

⁶ First Information Report (FIR) is a written document prepared by the police when they receive information about the commission of a cognizable offense (where police can arrest without any warrant).

There has been considerable freedom in the digital platform and social media sphere. Yet recently, after the introduction of the new rules of the Information Technology Act in 2021, there has been a substantial threat to freedom of expression and privacy even for internet users. The new changes are - compulsory appointment of compliance officer and publication of monthly compliance report disclosing removal of all objectionable contents pro-actively. In the previous regime there were “safe harbor” provisions for social media/ content platforms. This meant the platform could not be held liable for hosting objectionable data unless there was gross negligence on their part. Under the new bill unless the platforms follow a very strict protocols they will not get the benefit of “safe harbor” provisions. Therefore the freedom of expression can be undermined as the strict compliance of the bill can lead to over-censorship. Secondly the privacy of a citizen can be hampered by the government with the inclusion of very loosely worded “national security” clause

Indicators		India
Press Related Index	Civil Liberties (including Freedom of Expression) *	33/60
	Press Freedom Index 2020 (out of 180 countries) **	142
	Press Freedom Index 2021 (out of 180 countries) **	142
<small>*Source: Freedom House Global Freedom Status—the Freedom House uses 15 questions to determine the score for each country (4 points for each of the 15 questions). The highest score a country can attain is 60. **Source: Reporters Without Borders</small>		
Freedom of the Net	Obstacles to Access (0=Worst; 25 = Best)	12
	Limits on Content (0= Worst; 35= Best)	21
	Violation of User Rights (0= Worst; 30= Best)	18
	Freedom of the Net Score 2019	55
	Freedom of the Net Score 2020	51
<small>* Source: Freedom House Freedom of the Net</small>		
ICT	Internet Penetration Rate (2018)	34.5%
	Mobile Phone Penetration Rate (2018)	86.9%
<small>* Source: United Nations Human Development Reports</small>		

4.8.1.1.1. Access to Information Indicators for India

9. Media Providers

1. Television

Television has deep penetration in India, with over 183 million TV-viewing households accounting for over 50% of India's total population (Laghate 2021). Traditional sources like print media and radio have much less outreach compared to television as shown in the table below. Table 6 shows the media presence in India from data received through rolling average of four quarters of Quarter 1 (Nov18–April 19), Quarter 2 (April 19–July 19), Quarter 3 (August 19–Nov 19) and Quarter 4 (Dec 19–March 20) as analyzed by Indian Readership Survey (IRS), Report 2019.

%of reach within 12+ individuals	IRS 19–Q1	IRS 19–Q2	IRS 19–Q3	IRS 19–Q4	Trend
Universe Size	1078543	1087143	1095874	1104726	
Total Media Consumption	82	83	83	83	–
TV Viewer	77	76	76	76	–
Newspaper Reader	39	39	38	36	↓
Radio Listener	20	20	20	20	–
Internet Accessed	24	29	35	41	↑

Table 4.9.1.1.1. Indian Readership Survey (IRS) data on Media Presence in India

Due to recent rapid digitalization, all the major print and television outlets have an e-paper and online presence. Additionally, there are news portals that are exclusively digital in nature.

According to the India Census (2011), 75.5% of households in Madhya Pradesh owned a television set and 32.5% owned a radio. Television ownership increased by 3%, while radio ownership decreased by 5% from the 2001 Census. According to a 2021 Reuters Institute Digital News Report, 73% of Indians use mobile phones, and 37% use computers for news consumption. Still, as per the report, 56% Indians prefer to view news or news-based programs on television rather than online.

Broadcast Audience Research Council (BARC) of India publishes television ratings in the country. Last year (2020) the news rating data published by the agency came under scrutiny due to alleged data tampering by three media houses. Consequently, BARC is currently suspended from publishing news channel ratings in India. A Media Ownership Monitor study reported that due to regulatory flaws and lack of transparency about audience data, there is an absence of public consultation and meaningful research in India (Reporters Without Borders 2019).

According to the last available BARC weekly broadcast ratings issued in 2020, the highest English news viewership across all platforms were *Republic TV*, *Times Now*, and *Doordarshan India*, and the highest Hindi news viewership across all platforms was from *Aaj Tak*, *Zee News*, and *News 18 India*.

In Madhya Pradesh, including Indore, the consumption of Hindi news channels is much higher than English. During the survey, the respondents ranked Hindi language news from *Aaj Tak* and *Zee News* as credible sources of information.

2. Print

As of 2020, newspaper revenue across India amounts to about 184 billion Indian rupees (approximately \$2.45 billion USD) annually (Statista Research Department 2021). Print media has been experiencing the lowest growth rate in recent times, yet the digital news sides of the same media companies are reporting significant revenue. The ownership pattern of the print media is similarly concentrated in the hands of a few people found to be close to the ruling political powers.

According to the 2019 Indian Readership Survey, which collated data on a rolling average of four quarters from December 2018 to March 2020, there has

been a steady decline in the readership percentage nationally, as well as in the state of Madhya Pradesh.

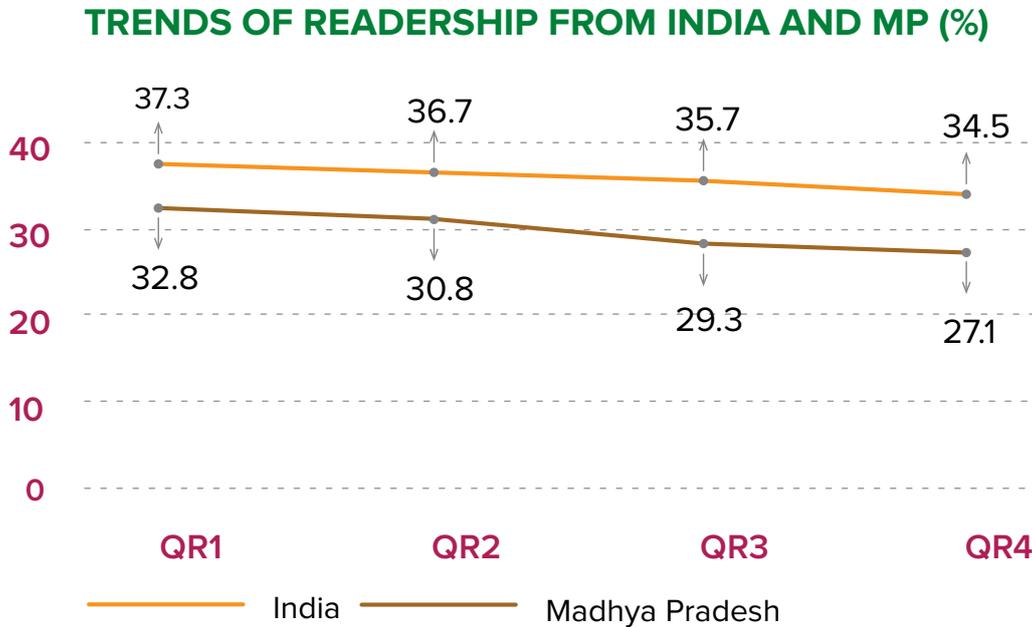


Figure 4.9.1.2. Trends of Readership from India and Madhya Pradesh

The top four Hindi newspapers which have the highest readership in Indore are *Dainik Bhaskar*, *Patrika*, *Agniban*, and *Nai Duniya* as per the 2019 Indian Readership Survey Report.

3. Radio

India has a state monopoly for radio news. The sole authority to produce radio news in India is the state-operated public broadcaster, All India Radio (AIR), which is a part of Prasar Bharati Corporation of the Government of India. FM and other community radio stations only have the license to run music, entertainment content, and “unaltered news,” i.e., news produced and broadcast by the Indian government.

The only radio broadcaster in India until 1993 was AIR. Currently, there are over 550 registered radio stations (FM and community radio) throughout the

country. In 2013, after years of strong criticism by private citizens and civil society, a Public Interest Litigation was filed by Common Cause, an NGO, in the Supreme Court of India. The judgment ushered in a new set of rules “to allow broadcast of ‘unaltered news bulletins’ on IR on private FM stations free of cost” (*Reporters Without Borders*). Apart from FM, there are also several community radio stations in India. There are currently approximately 180 community radio stations operating in India, with 14 of them broadcasting from Madhya Pradesh.

According to Media Ownership Monitor data, about 19% of the population in India listens to radio, including AIR and private FM channels (*Reporters Without Borders*).

4. Digital Media Landscape

A joint study by the Boston Consulting Group (BCG) and Confederation of Indian Industry (CII) concluded in 2017 that there are 250 million digital screens present in India, including smart phones, tablets, laptops, and desktops (Aggarwal et al. 2017). The internet penetration in the country is about 34.5%, and the Government of India has further embarked on a mission to digitally transform India with high-speed internet as a core utility service (UN 2018).

There is no data available regarding households with access to the internet in Indore. In this survey, there were 26 respondents for whom lack of access to the internet became a hindrance to obtain information about air pollution. Internet’s affordability aside, there remain challenges in terms of gender, language, slow internet speed, and frequent digital shutdown by the government which leads to a digital divide. In India there is a 20% mobile gender gap between men and women (GSMA 2020). The good news is that per the Mobile Gender Gap Report (2020), “the percentage of women who were aware of mobile internet rose from 19 percent in 2017 to 50 percent in 2020” due to focused digital literacy awareness campaigns by civil society and government. There should be continued digital literacy emphasis across the country and especially with women from tier two cities like Indore.

The mobile penetration in India is at a high of 89.6%. Mobile phones are used by 99% of the population across India to access the internet given the affordability

of the devices and cheap data plans. The local government, civil society, and private societies like RWAs have a practice to communicate with their constituency digitally apart from other established traditional means of communication.

A citizen run Facebook page named “Indorewale” has more than 71,000 followers and claims to engage with 12 *lakh* (1.2 million) Indore people daily. In addition to Indorewale, a civil society organization called Basix has a local presence in Indore and a WhatsApp group presence in every ward.

The IMC, along with other prominent government departments, has introduced e-services to ensure accessibility, convenience, transparency, and timely delivery of services. The IMC also administers the 311 Helpline number to provide residents with a single platform with which to access information about numerous services as well as seek resolutions for public services. The respondents in the KIIs and FGDs referred to 311 as their “go-to place” for any grievance or complaint regarding civic issues. Citizens from lower economic groups, despite knowing about this service, prefer to engage with their local political or health representatives as they reside in the same neighborhood and are accessible most of the time.

10. Media and Journalist Associations and Regulators

The Indian media operates in a self-regulatory mode. The Press Council and the News Broadcasting Standards Authority (NBSA) for television news have minimal authority to censor or admonish journalists or news agencies for breaking codes of conduct such as misreporting, invasion of privacy, or defamation (Suresh 2019). Since membership in NBSA is voluntary, this allows television channel operators to break the code of conduct by virtue of not being part of NBSA.

11. Legal Environment (Information-related law)

India’s Constitution guarantees freedom of speech and expression under Article 19 (1)(a), which, as previously iterated, has been interpreted by the Supreme Court to include freedom of the media. This guarantee notwithstanding, there currently exists a constant fear for free and fair journalism within India.

Numerous journalists have been jailed without trial under a colonial British-era sedition law for reporting on the government's handling of the COVID-19 pandemic (Bajpai and Kaushik 2021). There have also been instances of prolonged restrictions on internet speed, and at times, the internet has even been shut down, denying the people's fundamental right to information. India topped the list of 29 countries with the greatest number of internet disruptions in the year 2020. In Indore during the pandemic, the district administration issued an order under Section 144(1) of the 1973 Code of Criminal Procedure mentioning "comments made on Social Media platforms related to breaking of Corona transmission chain in an unrestrained manner." Noncompliance with this order carried the threat of prosecution by authorities. According to the 2021 Press Freedom Index by Reporters Without Borders, India has been listed under the category of countries considered "bad" for journalism and is among the most dangerous places in the world for journalists. Furthermore, India is known to be the deadliest country for environment journalists, according to an RSF report (Priyadarshini 2015).

In 2015, the year the RSF report was published, two journalists from Uttar Pradesh and Madhya Pradesh were murdered for covering illegal sand mining environment-based stories. Environment journalists have also faced lengthy defamation cases for reporting on pertinent environmental issues (RSF 2020). There is a reasonable sense of fear and tension among Indian journalists for covering stories pertaining to natural resources, pollution, and exploitation of the environment.

In 2021, the Indian government adopted the "Information Technology Rules" (Intermediary Guidelines and Digital Media Ethics Code) to regulate content on digital news media platforms. Digital news organizations in India must appoint authorized officers for maintaining compliance and a code of ethics, grievance redressal mechanisms, and blocking of content (Ministry of Electronics and Information Technology, Government of India 2021).

12. Overview of News Monitoring on Air Pollution

For this assessment, the research team conducted a mini rapid study of news covered in newspapers from 2017 to 2021 on India and Indore. The methodology involved

googling specific keywords and analyzing the content of the news items for specific time periods and geographical locations. As a rapid scan of content, the intention is simply for anecdotal evidence. This analysis only incorporated the first and second page of Google results available for each year under specific keywords. News sources which are not archived on the internet were not included in this study.

The following are some of the major findings:

1. There is much more news coverage on air quality in the national news than local news from Madhya Pradesh and Indore. In national news, more emphasis is on the air quality in Delhi. The focus on Delhi, and lack of pan-India air pollution data or discussion, is a serious hindrance to research and policy aspects of air pollution in other states of India. This trend is reported in news articles as well (Shah 2021).
2. Issues surrounding climate change—economic impact, financial allocation to combat air pollution, weak/ineffective policies, legislative steps, and advisory by experts—are covered more in national than in local news.
3. There is no data or news available about the impact on health due to air pollution locally in the local media coverage. Only recently has there been some coverage on air pollution and its impact on patients suffering from COVID.
4. In local news from Indore, the most news coverage is given to air pollution data released every two weeks to the press by the Madhya Pradesh Pollution Control Board.
5. The announcement of new technology by local authorities to measure or control air pollution and government advisory or warnings to different sectors (transport, industry, or construction) to control air pollution are the second-most covered stories on air pollution by local Hindi newspapers in Indore.
6. Differential effects of air pollution on gender or vulnerable populations were not reflected in any of the national or local dailies.
7. The local news coverage from Indore has had minimum news coverage on the sources of air pollution. In the last two years, there has been coverage

about stubble burning from agriculture as the main source of air pollution in Indore (Dainik Bhaskar 2020, Nai Duniya 2021). During 2017–18, there has also been mention of how effective waste management and the cleanliness of roads have ensured better air quality, while use of open clay ovens (*tandoor*) by hotels and construction work was identified as sources of air pollution in Indore by officials after a noticeable increase in air pollution data (Naiduniya 2021, The Times of India 2018). Local news reporting on air pollution issues and sources is usually attributed to information released by local authorities but often fails to provide the scientific research behind the information.



Stubble Burning in Indore

ANNEX C: Information Demand

This section details the community's information needs, gaps and behaviors.

13. Information Needs and Gaps

Mediums for Information

Traditional information sources, like television (61%) and newspapers (36%), are the most prominent mediums of information used by the survey respondents to access information relating to air pollution. The most popular newspapers in Indore, according to the FGD participants, are *Dainik Bhaskar*, *Nai Duniya*, and *Patrika*. The research indicates that women have more access to newspapers and radio as mediums of information than men, while men have more access to internet sources than women.

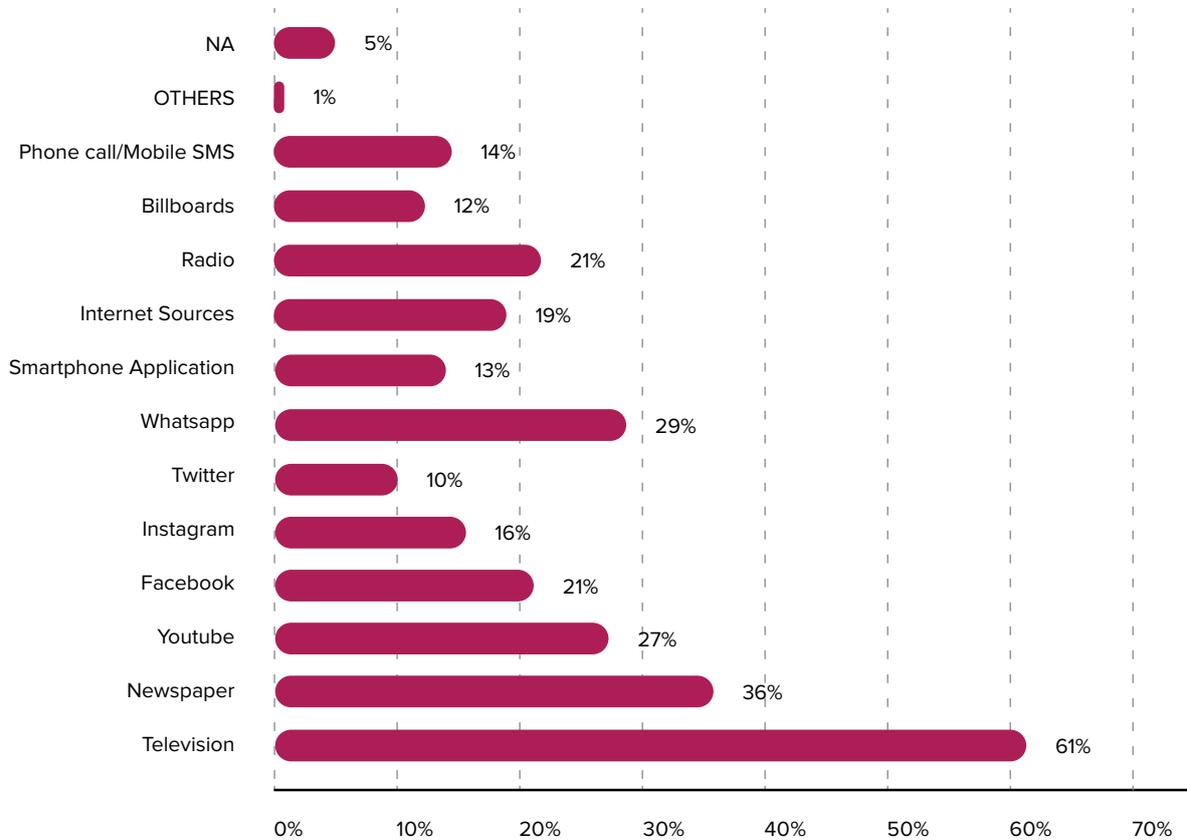


Figure 4.13.1.1. Common Mediums to Access Information for Air Pollution in Indore

Radio (21%) is also identified as a popular medium for receiving information on air pollution by survey respondents. One of the prominent Indore radio jockeys interviewed for this study explained, “So the main target of my show is ‘Infotainment’... I explore important local news in my own style and present it to the people in an entertaining manner.” This shows that apart from being popular, radio is also a portal where fact based air pollution information can be presented as snippets in between regular entertainment slots. The response from FGDs and KIIs also confirm radio as an important source for information dissemination as health and government officials are regularly invited by radio channels to discuss information about health and environment. Smartphone applications (13%) for air pollution data like Air Visual, Breezometer, and AQI India were not found to be popular mediums for dissemination of information about air pollution in Indore.

WhatsApp (29%), YouTube (27%), and Facebook (21%) are the popular mediums identified by the respondents for accessing information about air pollution. WhatsApp is the most common source of information in social media, and there was mention of several WhatsApp groups which are involved in the dissemination of information for health and environment. More women (14%) than men (12%) had access to information on air pollution through Facebook than any other social media platforms. Despite India leading the world in WhatsApp users, the majority of FGD and KII respondents had credibility issues with WhatsApp. Similar sentiments of distrust regarding information received from WhatsApp were echoed by survey respondents. YouTube videos are created and shared by health providers and civil society actors to disseminate health and environment related information through WhatsApp groups.

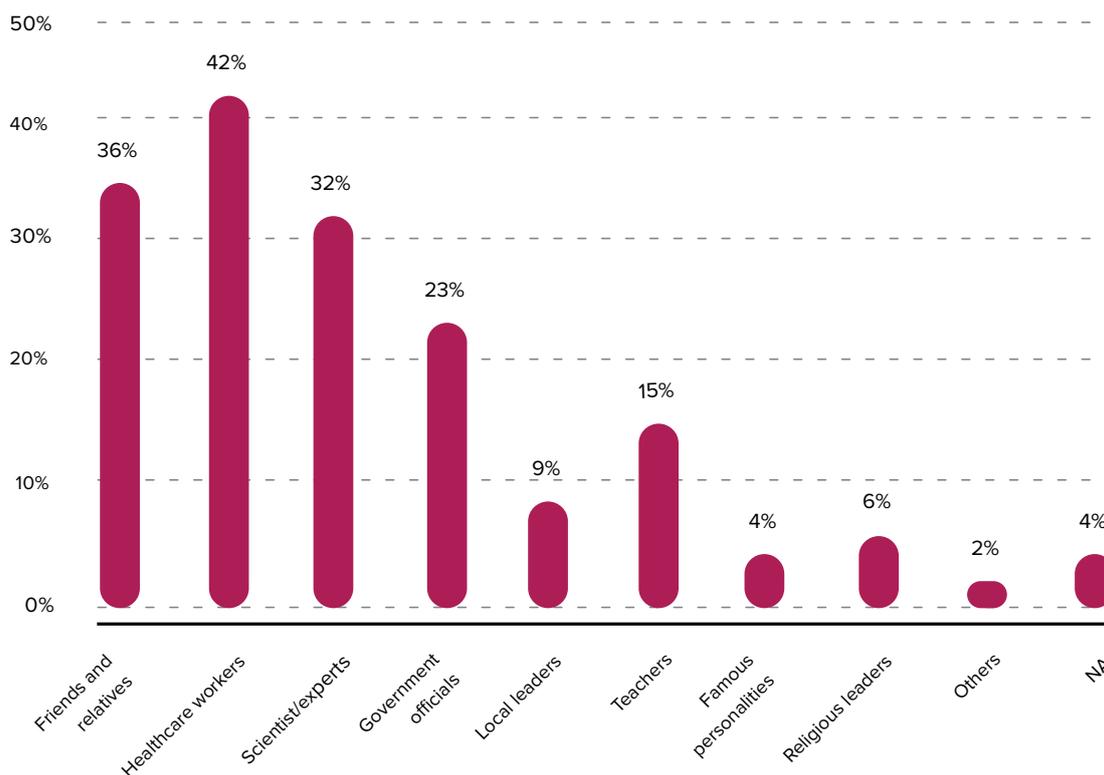
As mentioned earlier, there is a unique local information dissemination platform called Indorewale, which was referred to during the FGD with student groups. The founder was later interviewed during the KII. It started as a collective of start-up founders interested in sustainable and green initiatives. The platform, operated on Facebook and WhatsApp, aims to inform and educate people from Indore about the environment, promote sustainable and green initiatives, and bring people together to take positive social action. The information uploaded in their portals is always internally verified, they do not take any payment from any sources for

uploading information, and they promote this group through word of mouth only. In recent years, the platform has begun disseminating data about air pollution from government sources as well as through their own hand-held sensors. The Indorewale group gathers information and informs targeted stakeholders through various WhatsApp groups: senior citizens, traffic volunteers, and social influencers. While display boards, also known as *screeners*, installed by the Pollution Control Board to disseminate information about air pollution are currently inoperable, the FGD participants do recall those boards as a source of air pollution information. Most of the KII experts also find the way the data is presented in the screeners as unsuitable for engagement with residents due to their placement at traffic signals and issues with readability of data.

Sources for Information

Sources of information and mediums of information were segregated for better analysis purposes. While relevant mediums of information were discussed in the previous section, this section focuses on the sources of information. Healthcare workers (42%) are the most popular source for delivering information relating to air pollution, according to online survey responses. More women (50%) than men (35%) trusted healthcare workers as a source of accessing air pollution information. Healthcare workers are a broad group of professionals like doctors, nurses, and ASHAs⁷ in urban areas of Indore. Among healthcare professionals, the ASHA workers are regularly in touch with women from lower economic groups for health screening and information dissemination for health and hygiene. They could surely be considered as catalysts to carry vital air pollution information among the women from lower economic groups who have less access or ownership over formal means of information. The doctors who were interviewed in the KII elaborated how they disseminate information by networking with several NGOs, authoring articles in newspapers, and talking about air pollution on prime time shows during television interviews.

⁷ Female health activist



4.13.1.2. Sources for Accessing Information of Air Pollution in Indore

Air pollution information passed down by informal sources like friends and relatives (36.9%) was also identified as an important source, especially by men. The auto rickshaw drivers stated that information and anecdotes passed along by their friends about traffic situations, pollution, and health ailments are important sources. Educating children about air pollution to further inform their family members was a key recommendation given by several experts interviewed for KIIs.

Scientists/experts (32.1%) and government officials (22.6%) are also important sources of information identified by the survey respondents for accessing information about air pollution. The participants also identified women leaders like Indore Mayor Malini Gaur, Municipal Commissioner Pratibha Pal, Padma Shri Janak Palta McGilligan, a social worker honored with the fourth highest civilian award, and ASHA workers at the community level as the most equipped sources to deliver air pollution information in the community. The other leaders who were identified were Ambrish Kela, the founder of an NGO called Jaivik Setu, Anurag Shukla, and Sameer Sharma (Indorewale).

Religious leaders and local leaders were considered significant sources of information in the FGDs conducted at Azad Nagar. The Maulvi (religious scholar of Islam who ministers to the religious needs of fellow Muslims) informs and spreads valuable information at the community level through a loudspeaker from the mosque in Muslim dominated areas. The Maulvi and local leaders are also the local representatives who are initially approached by the community to confirm any information received through external sources.

The ASHA worker from Azad Nagar recalled, “When there was significant hesitancy to take vaccines during Covid, we called in the Maulvi to take the vaccine. After the Maulvi took the vaccine, several people turned up voluntarily to take the vaccine.”

Anupa Madharia from Pahal, an NGO that provides services to women, notes that “[i]t is important to talk about control as well as access of information by women” while planning any gender inclusive project. According to Madharia, while there is a movement to ensure that women have access to information, unless women have control of the information resources, the mission is unsustainable. Introduction of tools like social audit⁸ and citizen data mapping will further increase control of information, transparency, and accountability of pollution data among women and members in the community.

⁸ Social audit is a powerful scheme for examination and assessment of a program/scheme in a public assembly where all the details of the program or scheme is scrutinized with active involvement of people, where official records are compared with actual ground realities.

HEARD ABOUT AIR POLLUTION IN THEIR NEIGHBOURHOOD

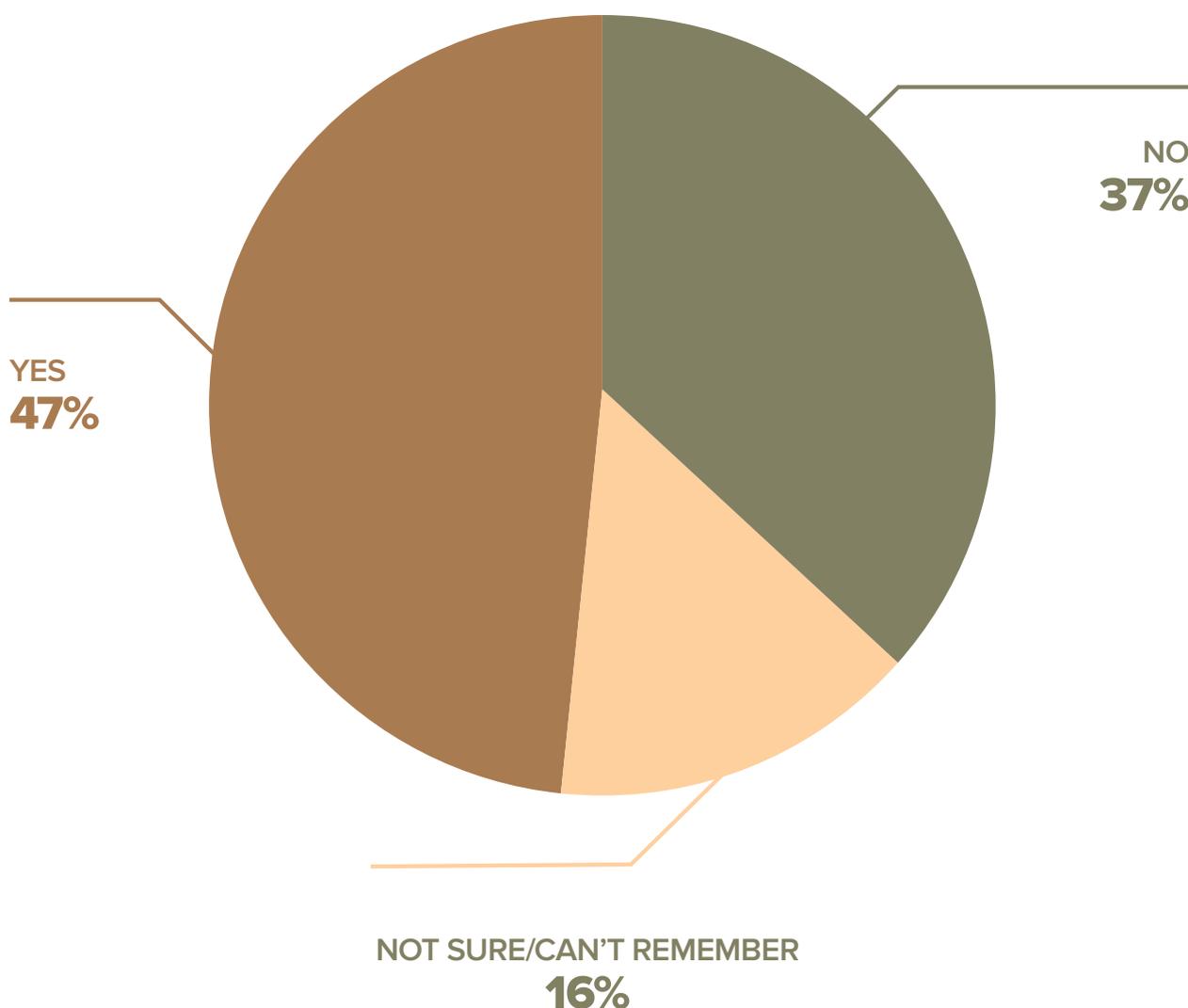


Figure 4.13.1.3. Heard Information about Air Pollution in the Neighborhood

47% of the respondents have heard about air pollution in their neighborhood, while 37% have not heard anything, and the remaining 16% of the respondents are not sure or cannot remember if they have heard any information pertaining to air pollution. More men (59%) than women (43%) have heard about information relating to air pollution in their neighborhood.

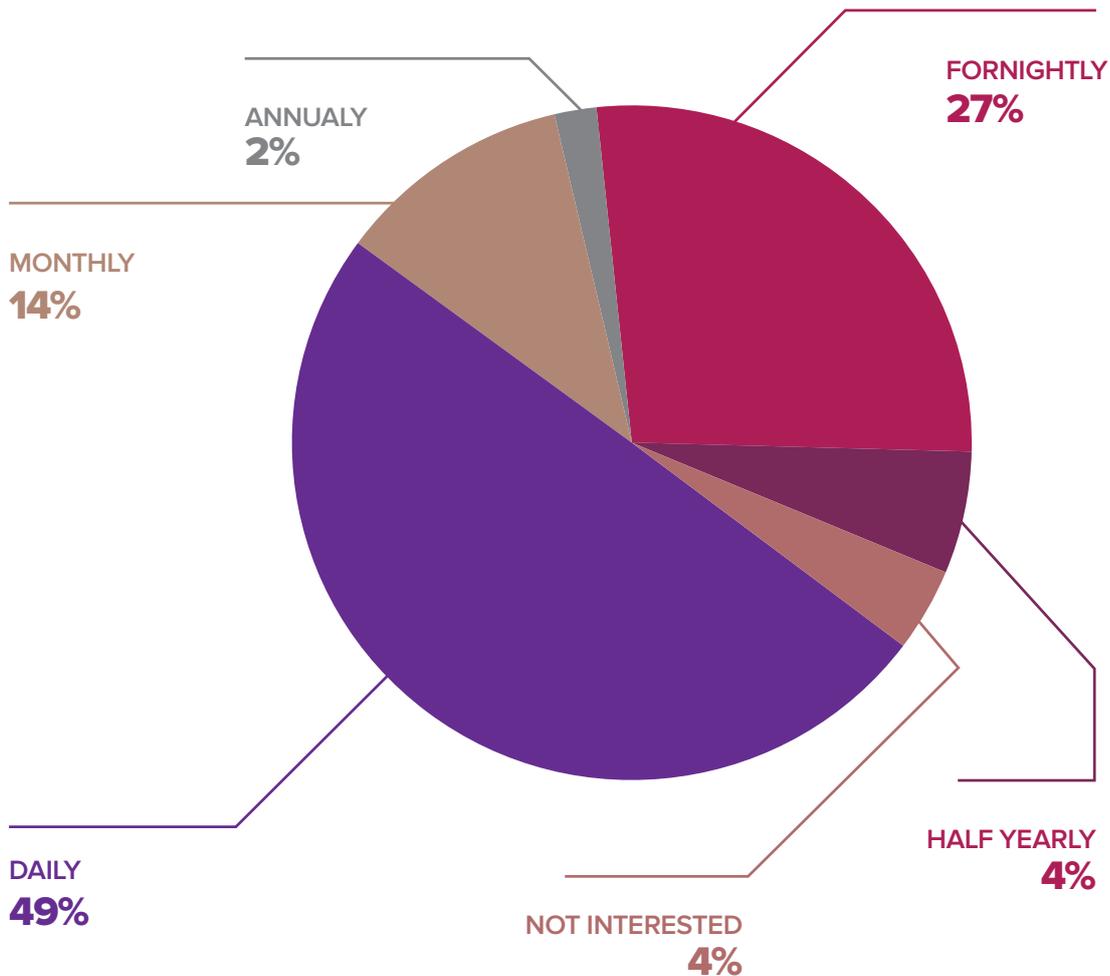


Figure 4.13.1.4. Frequency of Need for Air Pollution Information

Nearly half of the survey respondents evinced interest in receiving information relating to air pollution daily. The others expressed interest in getting information every two weeks (27%) or monthly (14%). Only five respondents (2%) were interested in receiving information annually, while 10 respondents (4%) were not interested in receiving information on air pollution. More women (54%) than men (44%) expressed interest in receiving daily information on air pollution, even though in the current scenario, a smaller number of women have access to air pollution-related information. There is not much coverage in relation to creating awareness as to how to control air pollution, sectors responsible for air pollution, and the effect of air pollution on health and the environment. The local newspapers produce news

items relating to air pollution every two weeks as per the raw data released by the pollution control authority. The data published in the newspaper is not explained to the audience, and as a journalist of the leading daily of Indore mentioned, “eventually the people reading the news have no idea how good or bad the air quality is as they are not aware of PM2.5 and PM10”.

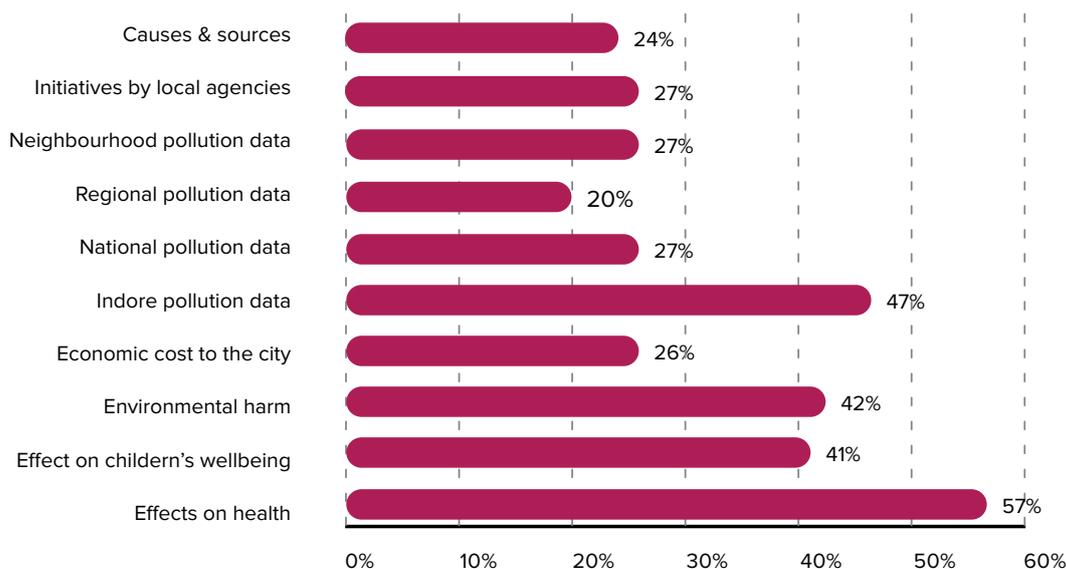


Figure 4.13.1.5. Information Need for Air Pollution

The survey results further indicated that most of the respondents were interested in different issues regarding air pollution. The issues in which there was maximum interest from the community were related to effects of air pollution on human health (57%), air pollution data of Indore (47%), environmental harm due to air pollution (42%), and the effects of air pollution on children's well-being (41%). The effect of air pollution on health was equally demanded by both men and women. A considerable number of women showed interest in receiving information about the effects of air pollution on children's well-being.

During the FGD, the auto rickshaw drivers expressed interest in accessing information about air pollution within 10 kilometers of their radius, like how they receive weather data.

All the interviewed KII unanimously believe that there is no spontaneous demand or interest in air pollution data from the common people, and, until now,

only a few people were directly concerned with air pollution. A Pollution Control Board officer stated during a KII that he gets information demand for air pollution level data from civil society, university professors, and private bodies. A prominent media reporter mentioned a new trend among the people in Indore seeking air quality data of a particular area before investing in real estate. There is a mentionable mismatch in the perceived interest of air pollution information among people of Indore and the real need for air pollution information as expressed by the community members in the survey. Key policy experts in the city should be made aware of the local citizens' air pollution information needs to explore more effective avenues for disseminating air pollution information.

Barriers in Accessing Information

The top barrier in accessing information according to 32% of the survey respondents is that they do not know where to access information regarding air pollution. No access to electricity (21%), not having time to access information (19%), and not being able to read information (18%) are also reported as challenges to accessing information. More women cited not being able to read the information as a major challenge to access information.

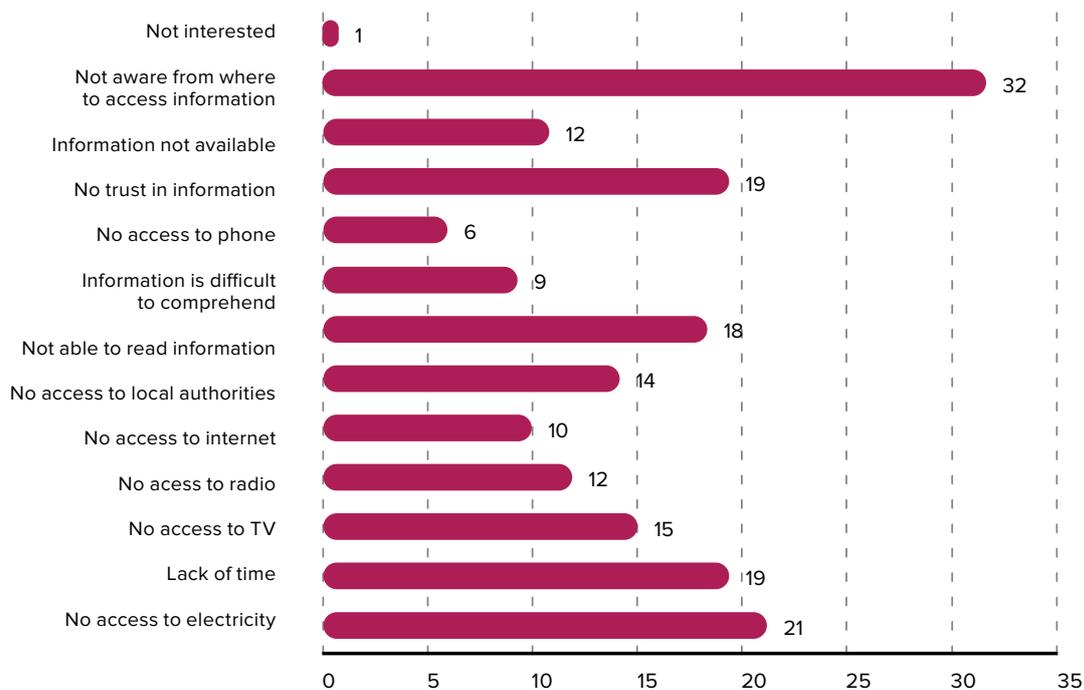


Figure 4.13.1.6. Barriers to Access Air Pollution Information

As per the latest census, there is 99% electrification in Indore, but lately, especially during the monsoon season, there have been cases of frequent power outages as reported by the local dailies of Indore, indicating a probable reason for a range of respondents choosing “no access to electricity” as a barrier for not getting access to information.

Discussing barriers to access information about air pollution, a young mother from Azad Nagar explained, “There is a lot of fake news around, so it becomes difficult to decide which information is true. Additionally, there are people who do not want the good of others, so they also do not share any information.” The residents living near the industrial area of Pithampur further added, “As we are poor people, so we do not have a voice ... Therefore, no one cares about air pollution and our health hazard”. The communities from Pithampura particularly communicated of not having access to reliable sources of information as a basic barrier to accessing information relating to air pollution. There is a general sense of discord and distrust among the vulnerable populations about the functioning of formal institutions and the sources of information that are supposed to give them information.

14. Information Dynamics

Trusted Sources and Features of Trusted Sources

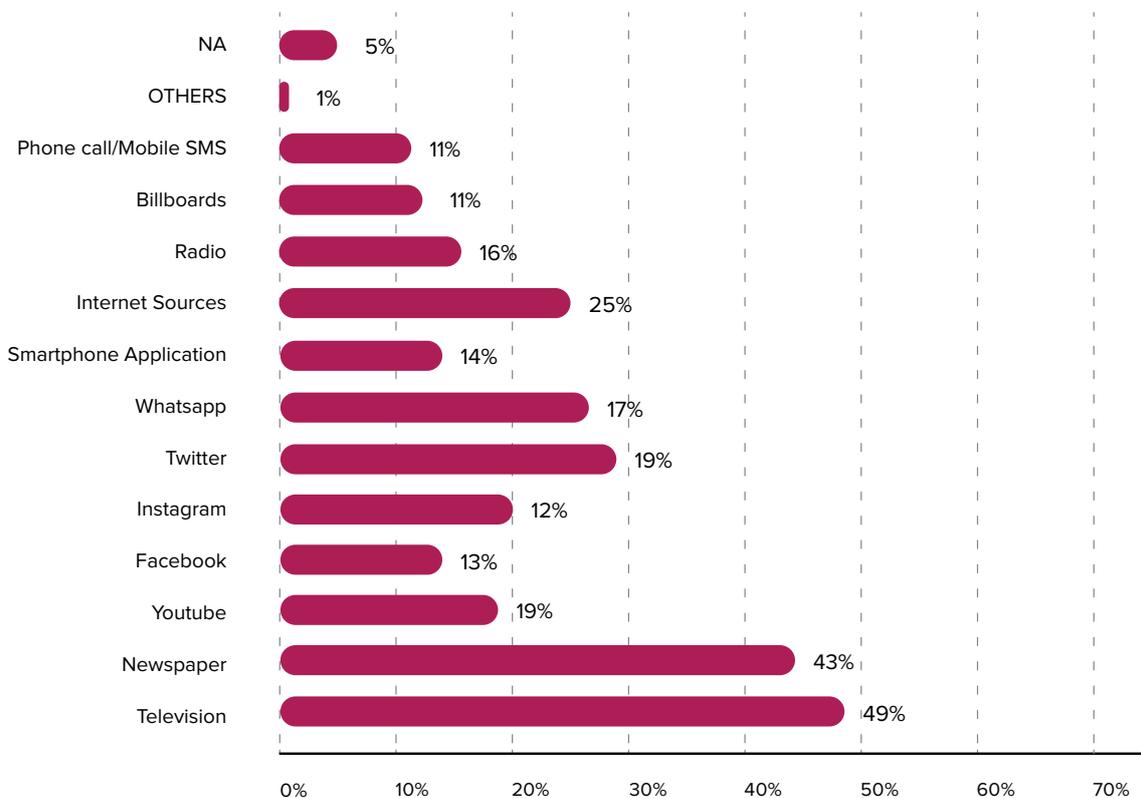


Figure 4.14.1.1. Comparison between Common and Trusted Sources of Information

There is a high level of trust among survey respondents on information received from healthcare officials (41%) and scientists/experts (40%). Information received from friends and relatives (29%) and from government officials (26%) are also trustworthy sources of information for the respondents, 11% of whom find the information received by local leaders/ward councilors to be credible. Almost an equal number of men (41%) and women (40%) have trust in information received from scientists/experts. More men than women trust information received by friends and relatives, while more women trust information received from health workers.

There is a higher level of trust for healthcare workers than for any other institution because they reside within the local communities and are regularly engaged in delivering prominent services and information.

There is a divide in trust for local political leaders among respondents belonging to the higher and lower economic strata. In the FGDs, the respondents from informal settlements mentioned local councilors as credible sources for verifying news forwarded to them, while student groups from elite colleges and social influencers have the least trust in information received from local politicians.



4.14.1.2. Trusted Medium of Information

Television (49%) and newspapers (43%) are not only the most popular, but also trustworthy sources for getting information on air pollution. During the FGD, the respondents named newspapers like *Dainik Bhaskar*, *Agnibaaan*, and *Patrika* as the most trusted newspapers. The most trusted sources of information in TV news are *Aaj Tak*, *Zee News*, and local cable channels. The respondents further indicated that they believe in information received from TV since they can see the news visually and the anchors question and debate with the respondents.

Both men (49%) and women (48%) find television information to be a trustworthy source of information. More women than men trust information received from newspapers (61%). This indicates that information in written form does have more credibility for women participants. There is a gender gap of 8% between men and women on information received from internet sources.

Among social media, there is most trust in information received through YouTube (19%). Although WhatsApp is more frequently used (29%), it has low (17%) trust level within the community.

Radio is considered as a trustworthy source of information by almost 16% of the respondents. More women (21%) than men (11%) access information on air pollution from radio. The FGD with the drivers agreed that “FM channels like Radio Mirchi give important news.”

Information Verification and Grievance Redressal Mechanism

The IEA delved deeper into information-seeking behavior of the respondents by probing how they verified, shared, and sought to redress any incidence of air pollution in the community.

There is currently no dedicated redressal mechanism available in the community specifically for an air pollution related grievance. Yet the KII and FGD participants overwhelmingly recalled the 311-helpline number and Chief Minister (CM) helpline on 181 as grievance redressal mechanisms available within the community for civic issues. The respondents informed that there is quick redressal to their complaints through 311, and the problem gets solved immediately. The FGD members from Azad Nagar also submit grievances to the ward councilors, ASHA representatives, and Municipal Corporation by visiting them personally.

Any valuable information that is received by the community through WhatsApp forwards is discussed during meetings with Mahila Arogya Samitis, and with religious leaders like the Maulana in the community. Friends and neighbors are also consulted to verify news. One of the auto rickshaw drivers in the FGD group mentioned, “If we get the same information from different sources, we do believe that information to be important.” The respondents shared that they normally forward important information received through WhatsApp to their friends and relatives. They also said that if they hear any important information regarding health and environment from external sources or through posters, they discuss and share it verbally with their friends, family, and relatives.

A three-month market survey conducted by Building Healthy Cities (BHC) revealed that complaints related to health comprised 15%–25% of the total complaints on the 311 app of the Indore Municipality (BHC).

1. 1. Information Sharing Practices among Different Stakeholders

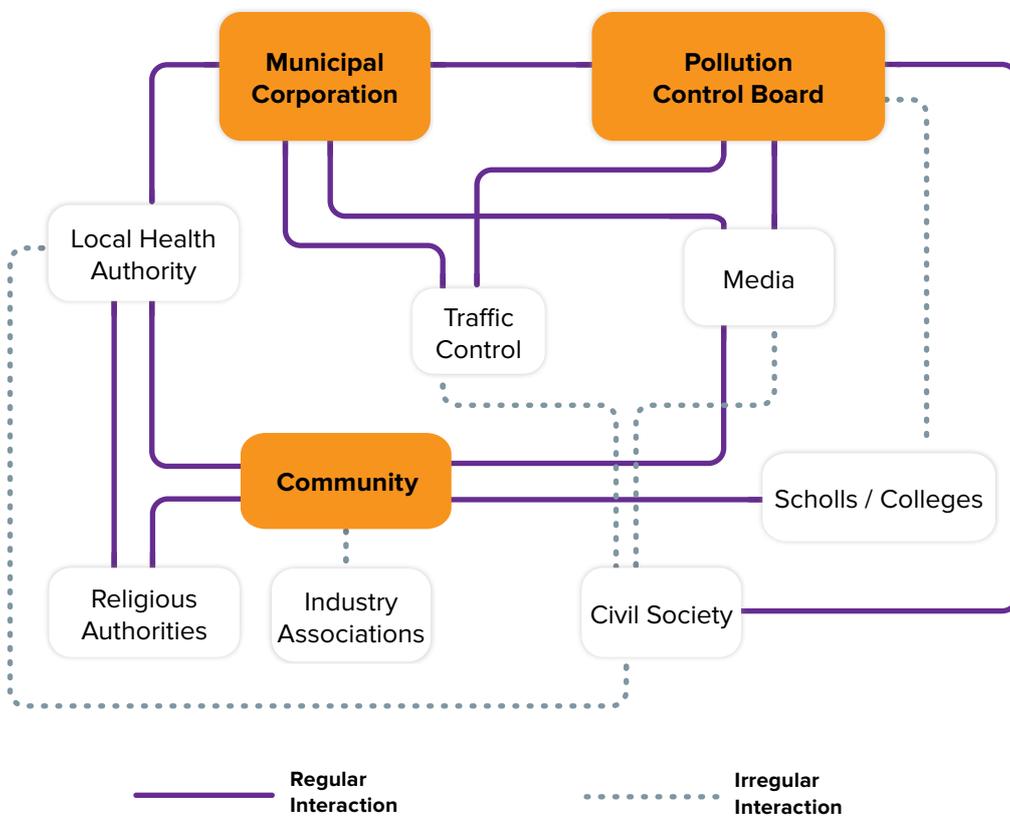


Figure 4.14.1.3. Information Sharing Practices among Stakeholders

The Pollution Control Board is currently the main body responsible for generating information on air pollution in Indore, and that information is then disseminated through the media. The board regularly shares data on air pollution with media, traffic control, and IMC. Industries get notices, warnings, and air pollution regulations from it. Industry associations also inform the industries about good practices and air pollution mandates.

15. Information Sharing Practices Among Different Sectors

This section provides a snapshot of the information-sharing mediums, content and practices on air pollution by relevant stakeholders in Indore. It must be noted that out of all the sectors, only the health sector and a few civil society organizations have women-centered communication outreach engagements.

Sector	Information Sharing Practice
Pollution Control Board	Information relating to air pollution data is regularly shared in the form of advisories to Municipal Corporation and the Collector. Realtime AQI data is shared with media (newspapers) and to school/college students during lectures. Flashing real time AQI data through four display boards in the city. Awareness programs and exhibition stalls during city fairs.
Traffic	Indore Traffic Department conducted 730 awareness programs on traffic rules and regulations with various associations, agencies, schools, and colleges. Collaborated with media (print, TV, local cable, FM, and social media influencers) to spread awareness among local public about traffic congestion, pollution control certificates, etc. Apart from schools and colleges, there are also many coaching centers in Indore which are targeted to spread information. There are groups of volunteers who work with the Traffic Department to spread information and manage traffic. The Traffic Department also connects directly with the people of Indore through social media to solve their problems and seek suggestions. Reports are commissioned to educational institutes like IIMs who do studies and provide recommendations.
Small and Medium Scale Industry	To promote clean technology and waste minimization from the industries, the Department of Micro, Small and Medium Enterprises is working with the Ministry of Environment and Forest, Central Pollution Control Board, and Municipal Corporation to spread awareness. The schemes and subsidies that are present for promoting clean technologies are made popular through industrial associations, technology institutions, and colleges through posters, webinars, and training programs. There are two target groups—existing industries and young entrepreneurs or start-ups.

Sector	Information Sharing Practice
Agriculture Training Institutes	<p>Agricultural Extension Centers usually referred to as Krishi Vigyan Kendra (KVK) are an integral part of the National Agricultural Research System. The KVK–Indore is engaged in spreading information and awareness about composting and waste decomposers to reduce stubble burning among the farmers through demonstrations to groups of 15–20 farmers. The knowledge is then spread to other farmers through demonstration. 37,000 farmers from surrounding areas of Indore are registered with the KVK. Fairs and WhatsApp groups are a relevant information sharing platform for them.</p>
Community Health Workers	<p>The health and sanitation information in each community is delivered through ASHA and Anganwadi workers at the community level. They conduct door-to-door surveys at regular intervals with young mothers and pregnant women. There is also Mahila Arogya Samiti in each area, and they meet once every month to discuss critical health information in order to educate locally. YouTube videos, initially passed through ASHA supervisors, are further circulated through WhatsApp by ASHA workers in the community.</p>
Doctors	<p>Respiratory physicians and tuberculosis (TB) doctors regularly collaborate with the health department to develop information, education and communication materials to spread awareness in the community. Doctors find face-to-face communication, especially with the lower strata of the community, to be the best medium to attain maximum awareness, along with posters and loudspeaker announcements. The information is spread through ASHA workers, doctors, and volunteers in the community. Dedicated YouTube and Facebook channels are maintained by the health department to spread awareness about TB, and those videos are shared in the community during campaigning. “Chaupal” is also an established medium of spreading information in the rural belt where a few influential gatekeepers are called from the community to spread information about a specific health issue. There is no specific communication about air pollution in the TB control communication guideline. The ASHA workers conduct a monthly Mahila Arogya Samiti in each community where health information is specifically provided to women since they have lesser avenues to access information. Furthermore, under the National Health Mission (NHM)⁹, ASHA workers have been the point of engagement for health communication for women across the country.</p> <p>The respiratory physicians are also associated with several associations and groups like “Collaboration to Eliminate TB Amongst Indians”, “TB Free Cities”, “Clean Air Champions”, and “Indian Chest Society–MP Chapter” to create awareness on TB and clean air. Doctors also appear on TV channels and write editorials in newspapers to communicate recent developments in the field to the masses. The doctors feel that people affected with diseases due to air pollution are the best advocates to spread further awareness in the community, just as patients affected by oral cancer are the best advocates for tobacco control.</p>

⁹ <https://nhm.gov.in/images/pdf/communitisation/task-group-reports/guidelines-on-asha.pdf>

Sector	Information Sharing Practice
Civil Society	<p>The civil society organizations in Indore, especially those with women as their target group, prefer face-to-face communication to spread information in the community through house visits and group meetings. Banners, street plays (nukkad natak), and handbills are also popular means of communication. Due to COVID-19 restrictions in the last two years, information dissemination is primarily done through WhatsApp groups. The civil society members said that even though there are devices to display air pollution information, they are not engaging or easily readable. Overall, there are negligible sources of information about air pollution available to the most vulnerable communities. Until now, they said, government departments like the Municipal Corporation or the Pollution Control Board have not come forward to engage and communicate with the public about air pollution.</p> <p>JSI (John Snow, Inc.), which is working for an USAID project called “Building Healthy Cities,” is collecting air quality data through 20 low-cost sensors at various locations of Indore. The data from the sensors are attached to an integrated dashboard through which air pollution data from all 20 locations can be accessed. Presently this data is not available in the public domain. JSI is also developing clean air guides where the community can get information and air quality data through their mobile phones. Social media platforms are also used to disseminate information.</p>
Academia	<p>Academic institutions are not directly involved in raising awareness in the city about air pollution, but they do promote cleaner air, carry out mapping of cities, and publish research reports for air pollution as social enterprises. Students also attend webinars and training programs on air pollution.</p>
Media	<p>The media uses its own platforms of print, radio, and social media to send out messages about air pollution to subscribers. The air pollution coverage in print and radio is very minimal, and there is no demand for such information from the users.</p> <p>A group of relevant social influencers created the page Indorewale to disseminate information about air pollution in Indore, along with other environmentally sustainable actions. They send out air pollution data received from handheld sensors to circulate information on air pollution.</p>
Industrial Associations	<p>The industrial associations under the banner of CII are also developing a program to deploy 30 sensors to collect air pollution data. Apart from this initiative, both CII and Pithampur Industrial Association regularly share information about air pollution with their members through meetings, emails, and WhatsApp groups. Pithampur Industrial Association has 850 members.</p>

16. Perception About Air Pollution and Air Quality

Most of the respondents understood air pollution to be something which they could visually see—like black smoke or dust. Pungent and foul smells in the slums and near trench landfill sites were also understood as effects of air pollution. The students interviewed during FGDs gained scientific understanding of air pollution through

training and were able to emphasize PM, gases, etc., to determine air pollution due to their scientific understanding of air pollution through trainings and awareness programs.

The survey respondents were asked about their perception of outdoor air quality in their neighborhood and how they are affected by air pollution in Indore through a psychometric response scale. Fifty-five percent of respondents perceive they are affected or very affected by pollution, while the remainder of respondents did not perceive an impact—they are neutral about the phenomena, which suggests that the issue is not registering with them. Most of the respondents who said they are very affected by air pollution were residents of Bhawarkuwa and Sudama Nagar. Bhawarkuwa is a middle-income area congested by students and cheap rental accommodation, tutoring centers, markets, and roadside eateries. Sudama Nagar is a centrally located upscale area of Indore with considerable vehicle traffic.

HOW AFFECTED ARE YOU BY AIR POLLUTION

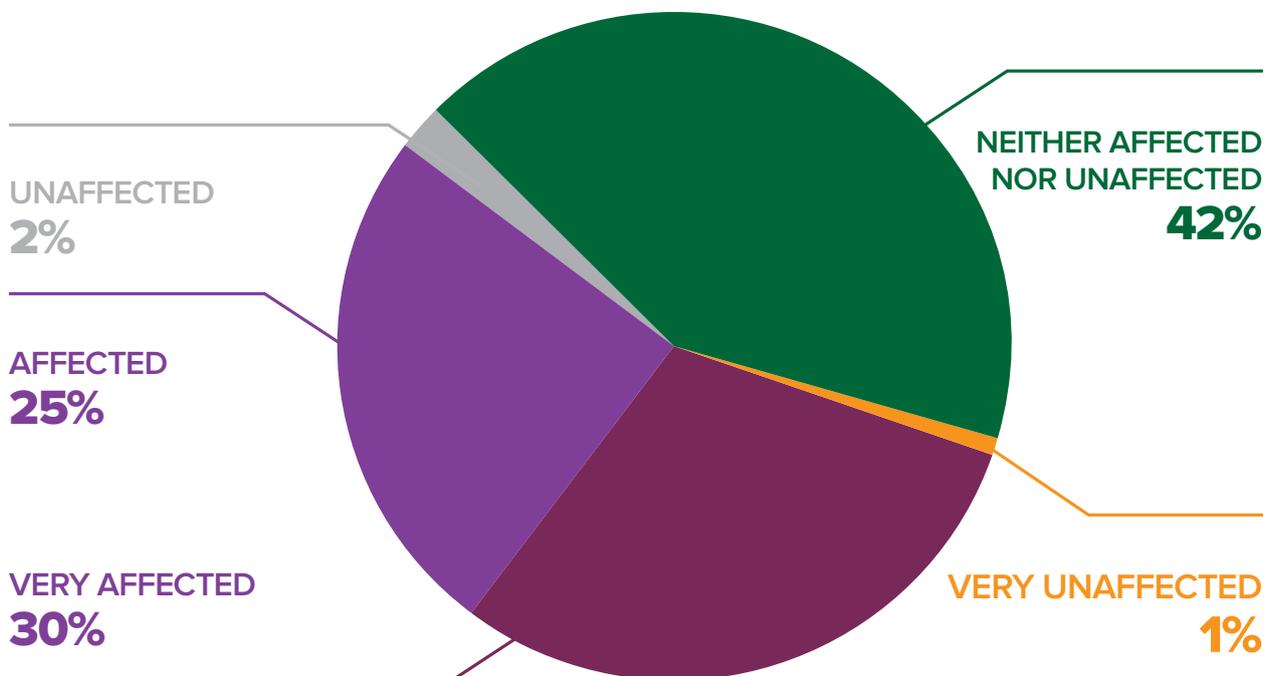


Figure 4.6.1.1. Affected by Air Pollution

Auto rickshaw drivers who drive to different parts of the city, street sweepers, and residents from Pithampur explained during FGDs how they are affected by air pollution because they are either engaged in hazardous work or stay in extremely air polluted areas. During an FGD, young mothers from the densely congested slum of Azad Nagar pointed out how most of the families who live near the main road of Azad Nagar face breathing difficulties and said there had been an increase in cases of tuberculosis (TB) or cancer among the residents of Azad Nagar. Apart from Azad Nagar, MPVA project officer informed Motitabela, Chandan Nagar, Khajrana, and Musakhedi to be few of the hotspots of TB patients in Indore. All these areas are congested lower-income group settlements. One of the FGD participants residing near the main road mentioned that “smoke and dust comes in as soon as we open the door.” The street sweepers who oversee sweeping the streets from Malwa Mill area early in the morning “can see” the black dust around them while cleaning the streets, especially in densely populated market areas and along routes taken by lorries at night.



Street sweepers of Indore Municipal Corporation participating in FGD

47% of the survey respondents said they found the outdoor air quality in their neighborhood neither good nor bad. A substantial number of respondents found the air quality to be very good (12%) or good (24%) around their neighborhood. Only 6% of the respondents reported the air quality around their neighborhood to be very poor, and majority of those respondents were from the Pithampur industrial area.

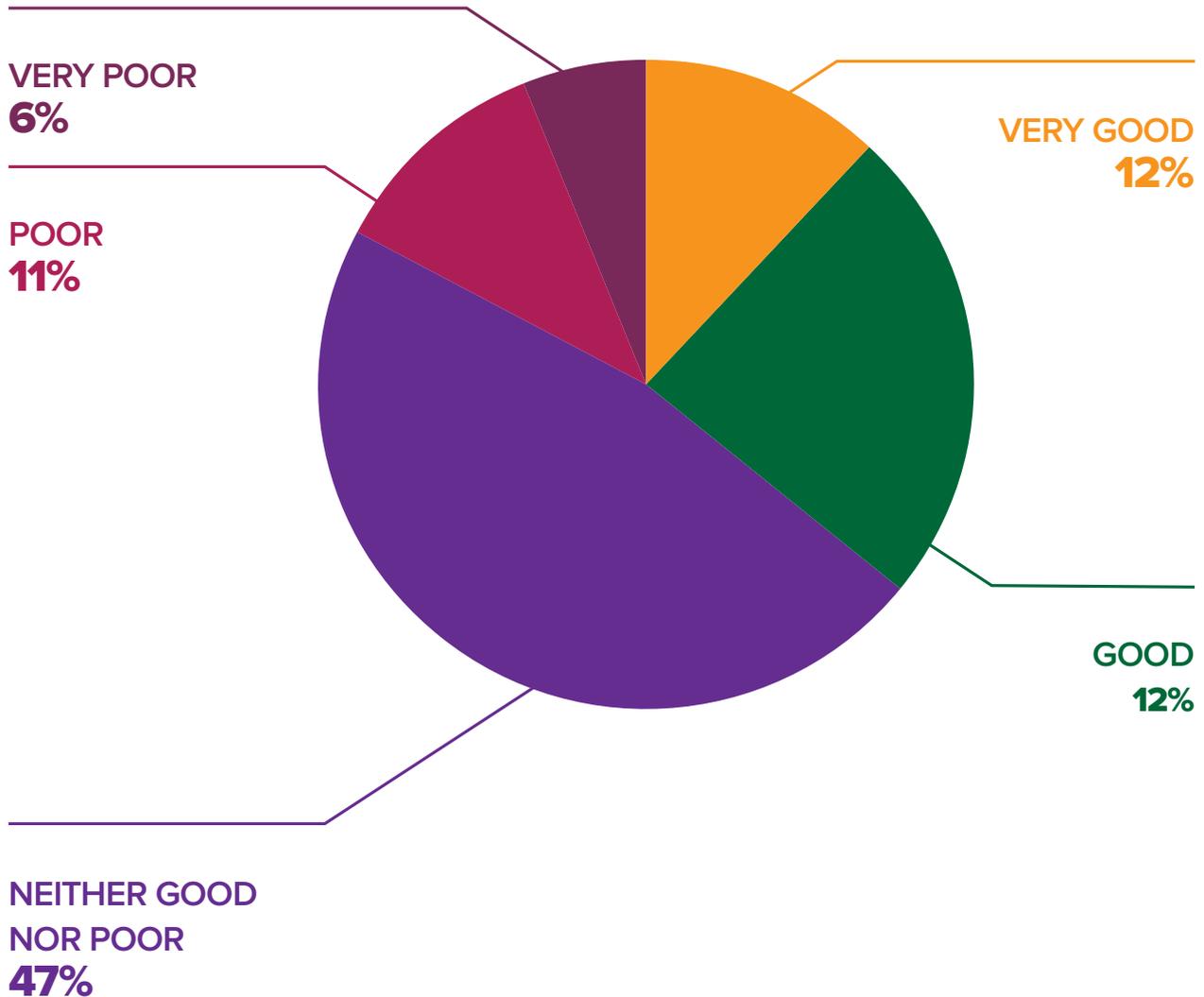


Figure 4.16.1.2. Perception of Outdoor Air Quality in the Neighborhood

Although most of the respondents are not being affected by the impact of air pollution or were satisfied with the air quality in their neighborhood, the data available from the last five years indicates that “*PM_{2.5} concentrations in Indore exceed WHO annual average standards of 10 $\mu\text{g}/\text{m}^3$ and are increasing,*” according to the State of Air (2021).

“The PM_{2.5} annual averages measured in 2019 at the three manual monitoring sites in Indore (based on measurements made approximately every third day) are all between 36–39 µg/m³. The highest pollution is measured during the post-monsoon season (October, November) and during the winter months (December–February), due in part to lower wind speeds during these months” (CAC 2021).

When it comes to air quality in Indore, there is certainly a gap between perception and reality.

Sources/Causes of Air Pollution

In the survey, about 72% of respondents perceived emissions from transport to be the main source of air pollution, followed by industries (57%), waste burning (34%), cigarette smoking (34%), construction work (25%), and agricultural stubble burning (22%). More women than men perceive emissions from factories and waste burning as a major source of air pollution in Indore.

According to a recent air quality modeling study based on the emissions inventory done by Guttikunda et al. 2019), road transport and dust from construction combined (48%) is the largest contributor to air pollution in Indore followed by waste burning (7.8%) and domestic cooking (8.1%).

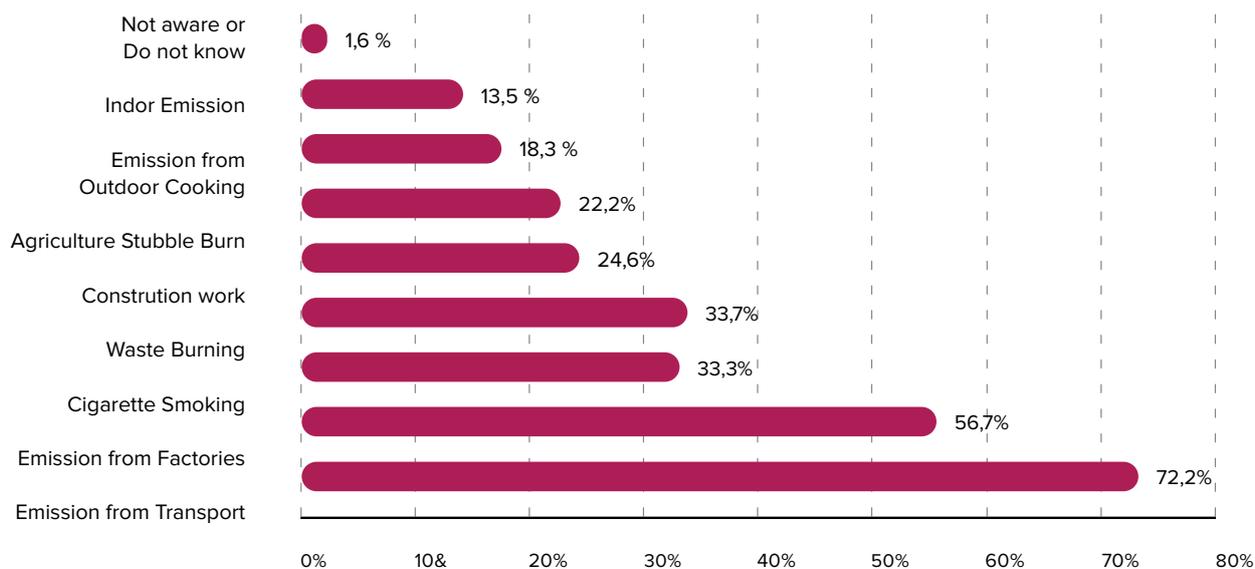


Figure 4.16.1.3. Major Sources of Air Pollution

The KII and FGD respondents gave the following reasons for believing vehicle emissions contributed most heavily to air pollution in Indore:

- Middle income and higher income groups have access to multiple cars, and due to there being inadequate parking spaces, vehicles are parked on the road—causing major traffic congestion. Lack of modern traffic management and a public transportation system are also responsible for increased vehicular emissions. There are two types of auto rickshaws: two-stroke and four-stroke. In Indore, most of the auto rickshaws are two-stroke, having inefficient IC and a separate tank for oil and gas. Two-strokes are cheaper but emit lots of smoke and air pollution.
- In Indore, there are about 18 *lakh vehicles*, which are those registered as vehicles older than 15 years, as stated by one journalist during a KII.
- In Indore, heavy vehicles, including all trucks, are allowed only during the night in areas perceived to have heavy traffic congestion, but trucks are still perceived as a major source of air pollution, especially by the municipal road-cleaners who clean dust from the roads during the early morning hours.
- Due to constrained mobility and access to transport use (Mehra et al. 2021), the women in the FGDs pointed to only those hotspots located near their

own residence or workplace, while the men were able to locate air pollution hotspots across Indore.



Road Dust

Violations of pollution norms by industries and factories in and around Indore is the second-most cited source for air pollution in Indore as per the survey respondents. The respondents from FGD and KII specifically pointed out areas and industries which are responsible for air pollution:

- Several small industries within and around Indore
- Malwa Mill area and Sukholia are affected by the brick kilns which are still using coal
- Fabrication unit cluster in Hathipal area
- Sanwer Road industrial area and Navlakha area, which has daal (pulse de-husker) mills
- Lakhani footwear factory and tire factories were identified by street sweepers as industries which are engaged in waste burning

- The residents from Pithampur complained about companies in Pithampur who throw industrial waste on the mountainside and even burn waste illegally, affecting both humans and animals. It has been pointed out that in zones two and three of Pithampur, air pollution levels are very high due to the presence of soybean and plastic plants

The spokesperson of the industrial association stated that the frequent violators of air pollution norms are chemical and steel factories that dump waste in public places as a cost-cutting measure.

Construction activity as a source of air pollution in Indore was identified by multiple sources, especially the bridge construction from Bengali Square to Pipiliyana and Takina Squares. The respondents, students who are engaged in air pollution monitoring from Indore School of Social Work, have regularly seen violations of norms—like covering the sites with plastic sheets and wet green sheets to cut down on construction costs. Apart from big commercial and administrative construction as a part of smart city, residents from Azad Nagar informal settlement complained of incidents of cutting trees illegally to build houses next to each other. This illegal construction and cutting of trees make the settlements congested and unhealthy for living, an ASHA worker from Azad Nagar informal settlement reported during a KII.

Some survey respondents (33%) perceived waste burning as a major source of air pollution. Yet during KII and FGD, all respondents—irrespective of gender—disagreed with this narrative and reported that waste burning has been considerably reduced in Indore by strict monitoring, the imposition of fines, and suspensions of licenses by government authorities. Waste dumping and burning are taken very seriously by Indore authorities, and if a person or industry is found to be burning waste in landfills or communities, they are levied heavy fines on the spot. The difference in narratives among the survey respondents could be a result of pre-2015 memories of waste burning across the city or nearby areas. A young social entrepreneur working on air pollution solutions identified releases of volatile organic compound gases from rotten vegetables in congested market areas—such as Choithram Sabzi Mandi—as a source of air pollution. Stubble burning on the periphery of the city by farmers



Construction Protocols

after the wheat harvest and use of chemical fertilizers are also major sources of air pollution identified by several groups, especially during the months of summer. Garbage disposal by hospitals was also identified as a key source of air pollution by three KII experts. Praveen Joshi, a science magazine writer, explains, “There are about 300 hospitals in Indore, so one can imagine the amount of waste generated there.” The respondents also reported witnessing disposal and burning of hospital waste within hospital compounds and in public places.

Another source of pollution are the kitchen chimneys used by outdoor food outlets between Chhappan Dukan to Sarafa Market in Indore. These chimneys are faulty and operating without any routine checks. Cremation grounds were identified as a new source of air pollution due to the exponential rise in the number of deaths in the city during the second wave of COVID-19 pandemic. Other sources of air pollution are commercial buildings operating in the city, which mostly run on diesel generators due to frequent power cuts, and which also release gases from air conditioning in closed commercial complexes.

The government stakeholders are also aware—and in agreement about—vehicle and industrial emissions being the major source of air pollution.

Effects of Air Pollution on Health

Only the respondents from the student group and a few of the auto rickshaw drivers could articulate the effects of air pollution on health during the FGD. The student group explained that the health problems caused by elevated amounts of air pollution are asthma, headache, watery eyes, respiratory issues, TB, and cancer. Few of the auto rickshaw drivers also mentioned that many of them have diseases like TB, asthma, and chronic breathing problems because they are exposed to “bad air” throughout the day.

The student group shared how they feel breathless in heavily congested areas like Rajwada and Loha Mandi. The community expert who worked with the communities in Shanti Nagar, which is located near a landfill, reported how the communities feel suffocated between 3 p.m. to 5 p.m., when the gates of the trenching ground are open. The district TB control officer also confirms that Indore has the highest number of tuberculosis patients within Madhya Pradesh because it is a densely populated city with adjoining industrial areas and a high level of migration from neighboring areas.

Dr Salil Bhargava, a respiratory physician, and the chair for Clean Air Champions—Indore, explained during the KII with him that polluted air damages the normal flora of airways and lungs. The compromised health of the respiratory system makes it easier for the virus and bacteria entering the lungs to quickly infect the human body. He goes on to explain:

“They are more prone to have diseases like cancer, interstitial lung diseases, COPD, more attacks of asthma will be there, and other disorders like pneumonia will be more in these types of patients,” he said. “In these types of persons, I am not calling them patients, and air pollution itself causes leading development of COPD, early chronic bronchitis, acute bronchitis, chronic bronchitis then leading to COPD, and suddenly cancer of various types in the body. So, it has a very bad impact on the body of the person who is breathing polluted air.”

A few of the KII experts from the local government believe that the effects of air pollution are universal and felt across all sectors without any distinction by gender or class. However, medical experts and female representatives from local organizations disagreed and said that air pollution has much more severe effects on women, children, and the elderly. Salil Bharghav, who is also the head of the Respiratory Medicine Department at Mahatma Gandhi Medical College, said that the health experts who were interviewed are of the opinion that due to cultural norms, women are much more affected by air pollution than men because they delay care which results in late diagnosis and treatment. He further explained that women are considered the “*last priority in the family*” as far as their health is concerned, so delayed healthcare is the norm among women in Indore.

Authorities Responsible for Reducing Air Pollution in Indore

More than half of the respondents feel that the IMC is the responsible and capable authority for improving air quality in Indore. IMC is the responsible authority for assuring clean air since they have created goodwill and trust among the people through their waste management efforts, a sentiment which was reflected in the responses during the FGDs and KIIs. The street sweepers pointed out that the IMC has already created an initiative for clean air by promulgating effective waste management, spring machines, and automatic cleaners for cleaning the dust from

the road. More women (54%) than men (51%) consider IMC to be the authority responsible for providing clean air.

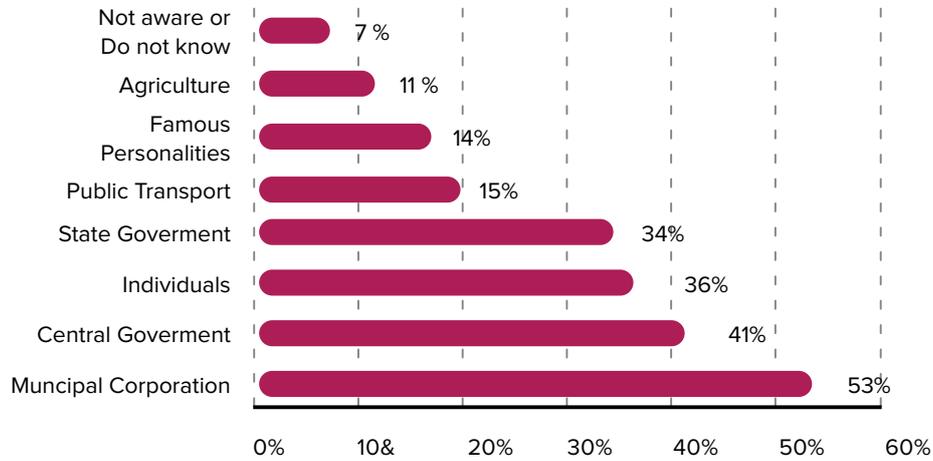


Figure 4.16.1.4. Responsible Authority for Clean Air

Apart from IMC, the respondents even consider the Central Government (41%) and state government (34%) effective bodies for reducing air pollution in Indore. Interestingly, 36% of the respondents feel that individuals and households have a responsibility to ensure clean air in the environment.



IMC Vehicles carrying garbage are covered so no garbage is lost in transit

The auto rickshaw drivers perceive traffic police to be an effective instrument for controlling air pollution because police issue *challan*¹⁰ to vehicles causing air pollution. One of the auto rickshaw drivers narrated an incident in which he saw traffic police getting involved to manage vehicular air pollution: “They have a machine that shows the pollution levels emitted by the vehicles and then they give a yellow card as warning,” he said Interventions such as the installation of RLVD cameras to stop traffic violators, message boards with pollution statistics erected on main roads, and the introduction of e-rickshaws in the city are few of the initiatives taken up by city administration.



RLVD cameras to catch traffic violators



LED display messages

During their KIIs, civil society and media members expressed that since industries are one of the main sources of air pollution, they should also actively take part in efforts to control air pollution—though at present there is hardly any intervention from industries in Indore to control air pollution.

The civil society members who were interviewed as a part of KII believe that air pollution in Indore can be controlled through awareness at the individual level, as well as by bringing about structural changes. A few of the structural changes that were recommended by civil society members which would help in effective control of air pollution were: managing traffic congestion, left turn-free roads, traffic diversions, timer-based traffic signals, community parking slots, promoting and

¹⁰ Traffic ticket which is issued on breaking traffic rules and regulations.

incentivizing cycling, boosting electric transport systems, and better coordination among government departments to ensure good air quality in the city. None of the civil society members made any specific suggestions to address the belief that pollution disproportionately impacts women's health.



E-buses and rickshaws in operation

College students and school-age children have been identified by various KII stakeholders and FGD participants as an important group for spreading awareness about air pollution by involving the education department.

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Survey Tools

Clean Air Catalyst Information Ecosystem Assessment (IEA) – SURVEY TOOL Internews Earth Journalism Network

Hi, this is a survey to understand the public perception and knowledge about air pollution in Indore. *Air pollution is the presence of harmful substances in the air you breathe, which can change from day to day and season to season, depending on the weather or human activities happening inside or outside the city. For the purposes of this survey/discussion, we are talking about OUTDOOR pollution, not indoor pollution from activities like cooking or home heating. When we talk about air quality in this (survey), we refer to the degree to which the air we breathe is clean and free of pollution.*

Thank you again for agreeing to participate in this survey!

1. Name:

2. Age:

18- 30	31- 50	51- 70
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3. Gender:

Male	Female	Other
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4. Highest Level of Education Received

- No schooling, literate
- Primary Schooling
- Secondary Level
- Technical/ Vocational Schooling
- In College/ University
- Completed College/ University
- Graduate Degree

5. What area do you live in?**6. Average Monthly Income:****7. What type of dwelling do you currently live in?**

- Scanty (Juggi Jhopri)
- Apartment/ Flat
- Independent House
- Government Housing Scheme (Pradhan Mantri Awas Yojna)
- Homeless
- Others_____

8. How would you rate the outdoor air quality in your neighborhood between 1- 5.

1	2	3	4	5
Very Poor	Poor	Neutral	Good	Very Good

9. In which season do you particularly feel the air pollution to be worst?

Summer (March to May)	Monsoon (June to September)
Autumn (October- November)	Winter (December to February)

10. What do you believe are the major sources of air pollution in your neighborhood? (Multiple Choice/ You can choose more than 1 option)

- Emissions from transport
- Emissions from factories
- Emissions from outdoor cooking
- Construction Work
- Waste Burning
- Emissions from indoor through faulty furnace/ unvented gas stove, wood stove and kerosene heaters
- Cigarette Smoking
- Agriculture Stubble Burn
- Not Aware or Do not know
- Other _____

11. Have you come across any information relating to air pollution in your neighborhood?

- Yes
- No
- Not Sure or can't remember

12. We receive our news and information from different sources, like television, social media networks, websites, or the radio. Where do you recall seeing or seeking information about air quality or pollution in Indore?

(Multiple Choices/ You can choose as many options as are true for you)

Medium
Television
You Tube
Facebook

Medium
Instagram
Twitter
Whatsapp
Smart Phone Application- (Airvisual, Breezometer, AQI-India)
Internet sources other than social media, such as a government website, a newspaper website
Radio
Billboards and Screeners at Public Area
Newspaper
Phone call/ Mobile SMS
Others
Not Available, or you don't seek that information

13. Now, who do you get information about air quality or pollution or who do you go to for that information? (select as many options as are true for you)

(Multiple Choices/ You can choose as many options as are true for you)

Sources
Friends and Relatives
Newspaper
Religious Leader
Healthcare Workers
Government Officials
Local Leaders/ Ward Councilors
Teachers
Famous Personalities- Movie star/ Sports Personality
Scientist/ Experts
Others
Not Available, or you don't look to anyone for this information

15. Which medium of information is most trusted by you to receive information about air quality or pollution?

(Multiple Choices/ You can choose as many options as are true for you)

Medium
Television
You Tube
Facebook
Instagram
Twitter
Whatsapp
Smart Phone Application- (Airvisual, Breezometer, AQI-India)
Internet sources other than social media, such as a government website, a newspaper website
Radio
Billboards and Screeners at Public Area
Newspaper
Phone call/ Mobile SMS
Others
Not Available, or you don't seek that information

16. Who do you trust the most to receive information about air quality or pollution?

(Multiple Choices/ You can choose as many options as are true for you)

Sources
Friends and Relatives
Newspaper
Religious Leader

Sources
Healthcare Workers
Government Officials
Local Leaders/ Ward Counselors
Teachers
Famous Personalities- Movie star/ Sports Personality
Scientist/ Experts
Others
Not Available, or you don't look to anyone for this information

17. What kinds of information do you wish to receive about air pollution ?

(Multiple Choice/ You can choose more than 1 option)

- Effects on human health
- Effects on children's wellbeing
- Environmental harm
- Economic cost to the city due to air pollution
- Air Pollution Data in Indore
- Pollution Data at National Level
- Pollution data at Regional Level
- Pollution Data of your own Neighborhood
- Initiatives taken by local agencies to improve air pollution
- Causes and sources of pollution

18. At what frequency do you want to access information regarding air pollution?

Daily	Fortnightly
Monthly	6 months
Annually	Not Interested to access information

19. What prevents you from getting information related to air pollution?(Multiple Choice/ You can choose more than 1 option)

No access to electricity	Not able to read information
I do not have time to access information	Information is difficult to comprehend
Do not have access to TV	Do not have access to phone
Do not have access to radio	I do not trust the information
I do not have access to internet	Information not available
No access to local authorities for seeking information	I do not know where to access information regarding air pollution
Other	I am not interested in receiving information about air pollution

20. Who is responsible for making sure the air you breathe is clean? (Multiple Choice/ You can choose more than 1 option)

- Central Government
- State Government
- Municipal Corporation
- Industries
- Public Transport
- Agriculture
- Individuals or households
- Other_____
- I don't know

21. How affected are you by air pollution?

Very Affected	Affected	Neutral	Unaffected	Very Unaffected
1	2	3	4	5

22. What kind of initiatives would you want to see in Indore to improve air quality?

Clean Air Catalyst
Information Ecosystem Assessment (IEA) – KII Tool
Internews Earth Journalism Network

RESEARCHER TO NOTE:

The questions in red are not direct questions to be asked to the stakeholders. However, the questions below them should help answer those in red. If they don't, researcher should add additional probes to help answer those questions.

READ THIS OUT TO THE RESPONDENT:

TAKING CONSENT:

Good morning XXX. I am YYY a researcher from Clean Air Catalyst. First of all, I would like to thank you for taking part in this interview - It plays an important part in our efforts to achieve a better understanding about air pollution.

We would be interviewing number of stakeholders across Indore and each interview would be about 30 to 45 minutes. Your participation in this interview is completely voluntary and you are free to withdraw from the interview at any stage. The insights received from you would be used in compiling a report to interpret the perceptions and behavior and information needs of the community for air pollution.

With your due permission we would like to record the interview so that we do not miss out on any valuable information that is being shared by you. If you are ready – we would now start the interview

DEFINING KEY WORDS:

The aim of this KII is to intercept the perception, behavior and information needs of the community for air pollution. Before we begin would like to define how we perceive air pollution and air quality for this research.

Air pollution is the presence of harmful substances in the air you breathe, which can change from day to day and season to season, depending on the weather or human activities happening inside or outside the city. For the purposes of this survey/discussion, we are talking about OUTDOOR pollution, not indoor pollution from activities like cooking or home heating. When we talk about air quality in this (survey), we refer to the degree to which the air we breathe is clean and free of pollution.

PROFILE OF THE STAKEHOLDER

1. Could you please mention since when have you been associated with this sector? What are your current roles and responsibilities?
2. Educational Qualification?
3. Do you have a role with regards to information dissemination to the community?
4. Probes: What is your role with regards to information dissemination to the members of your community? Who are your target audience? How do you disseminate information? How frequently is information provided?
5. According to you, what are the major sources for air pollution in Indore? What are the major hotspots for air pollution?
6. Who is most responsible for the reduction of air pollution?
7. How are the local communities of Indore accessing information about air-quality?
8. In the scale of 1- 5 rate the air quality of Indore? Here 1 means very dissatisfied and 5 being very satisfied.
9. Which time in the year does Indore experience worst air quality?

Theme 1: Access to Information

1. **Air pollution data quality present in Indore?**
 - What kind of air quality data is maintained in your office?
 - Who maintains it?
 - How often is it updated?
 - Is it available in the public domain? How are you making the data available and usable?
2. **Demand for air pollution data among people in Indore?**
 - What kind of information has been demanded for air quality data by any of the agencies or by the public in the last three years?
 - Please share some examples
 - Proactive disclosure is maintained

3. Level of awareness present for air pollution data in Indore?

- How aware are the people of Indore about air pollution?
- Can you please list the top five sources available for accessing information about air pollution in Indore?
- Have you done any campaigns or public messaging on air pollution in the last three years in the city of Indore? If Yes, Please share the specific messages that you shared during your campaigns

4. Which are the trustworthy sources present for creating awareness about air pollution in Indore?

- Who are the most vocal champions of air pollution in Indore?
- Which are the voices that people of Indore trust the most while receiving any form of information?
Probe- health information and information relating to air pollution, which are the most relevant traditional media? How effective are the new age social media platforms like twitter, facebook or you tube for spreading information about air pollution
- Which medium of communication is most effective for reaching out to the people in the community?

5. Redressal mechanism present for reporting information gaps about air pollution

- What kind of information is missing from the public domain about air pollution?
- What are the barriers in creating awareness about air pollution for the people of Indore?
- Measures of grievance redressal present for access of information for air pollution
- What kind of feedback mechanism is present for recording grievances/ opinion of the residents for general issues and especially for air pollution?
Probes: Do you get regular grievances in that number on air pollution? Please share (if any) some air pollution related grievances that you received from

the community?

- Is there a specific helpline number or agency to register complains from citizens? *Probes: Is it popular? What are some of the common grievances that you received?*

Theme 2: Initiatives

1. Initiatives to control air pollution in Indore

- What are the most prominent initiatives being taken to control air pollution in Indore?
- Probes: Are there any government regulations or private sector association mandate that is being followed to control air pollution in Indore?
- There are lots of developments and construction planned in the citizen charter of the smart city plan- while doing all the construction and renovation are going on is there any component of managing air quality?
- Have you conducted any awareness program/ developed any communication materials/ advisory for raising awareness about air pollution? If yes, what was the content of the materials, how was it shared with the public and what has been the response?

2. Who are the Partners, Stakeholders and Allies for Air pollution control in Indore

- Who are the prominent stakeholders with whom you are effectively working for controlling air pollution?
- How are you working together? What are the common forums, engagements and interests? Any information network present among all of you? What more can be done to strengthen this group?

3. Which are the major/important sources of air pollution in Indore and what initiatives are being taken to control them?

- Which sources/ sectors are the most responsible for causing air pollution in Indore city?
- Who is responsible for particular sector/ source?
- What measures are being taken to control them?

- What are the components for creating a sustainable action plan for combating air pollution?
4. **Challenges and hindrances for combating air pollution in Indore?**
- What kinds of challenges/hindrances are being faced at present to control air pollution in Indore?
 - What needs to be done further to create more awareness about air pollution

Tool 3: Focus Group Discussion (FGD)

This tool will be used to engage community members during Focus Group Discussions. It is designed to get insights into information needs, used and preferred methods to access such information, and goes into experiences of trust and distrust. The FGDs will take around 1.5 hrs. It is estimated around 8- 10 people will participate in the groups.

1. Explanation of the research and questions – 5 min

The researcher will explain the research and its purpose and procedures. The research team will define air pollution and air quality as understood in this research.

READ THIS OUT TO THE RESPONDENT:

DEFINING KEY WORDS: Air pollution is the presence of harmful substances in the air you breathe, which can change from day to day and season to season, depending on the weather or human activities happening inside or outside the city. For the purposes of this survey/discussion, we are talking about OUTDOOR pollution, not indoor pollution from activities like cooking or home heating. When we talk about air quality in this (survey), we refer to the degree to which the air we breathe is clean and free of pollution.

2. Consent – rights and procedures of the FGD will be explained and verbal consent would be gained – 5 min.

The research assistant will explain the consent process, the rights of the participants, and the rules of the FGD. Consent will be documented on spreadsheet.

READ THIS OUT TO THE RESPONDENT:

TAKING CONSENT: Good morning XXX. I am YYY a researcher from Clean Air Catalyst. First of all, I would like to thank you for taking part in this interview - It plays an important part in our efforts to achieve a better understanding about air pollution.

We would be interviewing number of stakeholders across Indore and each interview would be about 30 to 45 minutes. Your participation in this interview is completely voluntary and you are from to withdraw from the interview at any stage. The insights received from you would be used in compiling a report to intercept the perception, behavior and information needs of the community for air pollution

With your due permission we would like to record the interview so that we do not miss out on any valuable information that is being shared by you. If you are ready – we would now start the interview.

3. Ice- Breaker activity- 10 mins

A picture of air pollution would be shown to the participant and a brief discussion would be started around it. The main point around the discussion would be centered around:

What do they perceive about this picture? Where is this picture located? Is air pollution a big deal? Is it something which worries you a lot? (Do they want to receive information on air pollution? Is it something very crucial to their life)

4. Knowledge, information access and needs- 1 hour

KNOWLEDGE

What do you know about air pollution?

What did you hear? How did you hear- what was the medium of receiving the information? How did the information impact you- knowledge, did you make any effort to change anything after receiving the information? Is there an area in the city where you experience the worst air quality? Is there a chemical or substance that you know or believe is causing dangerous pollution in Indore?

<p>Do you know how air pollution affects our lives? Ask economical, healthwise, climate change, social and economic</p>	
<p>What are the sources of air pollution? Ask at community, state and national</p>	
<p>What should be done to combat air pollution around us?</p>	
<p>Which are the sectors most responsible for air pollution in Indore? Why? Transport, waste, industry, government</p>	
<p>Who are the most responsible actors in solving air pollution? Why? Transport, waste, industry, government</p>	
ACCESS TO INFORMATION	
<p>What information channels are available for accessing information? e.g. word-of-mouth, community events, through mobile phones, news (which newspaper and news channel?), social media (whatsapp, twitter, facebook, insta), radio, etc. Among these which is most suitable for giving information on air pollution? Do you know how to access information on air quality status in Indore? Have you seen the air quality monitor in (location) and do you find the information helpful?</p>	

<p>What kinds of information are you interested to receive for air pollution?</p> <p>Geography- National, state, community. Level of air pollution, impact of air pollution</p>	
<p>Who are the most trusted sources for providing information especially information relating to health? Why?</p> <p>Take a quick voting and jot down opinion of all the members</p>	
<p>Which are the sources that you trust the least for access to information especially information relating to health? Why?</p> <p>Take a quick voting and jot down opinion of all the members</p>	
<p>Are you aware of fake news? What do you do when you cannot trust the news source?</p>	
<p>What are the barriers in accessing information?</p> <p>Literacy, comprehension of data and text, money, gatekeepers and access to social contacts, gender, access to infrastructure- electricity, broadband, mobile</p>	
<p>What you do with the information you access about air pollution?</p>	
<p>How would you like to access this type of information? (time, frequency, format, languages, etc.) (discussion)</p>	
<p>How can development partners help to ensure trusted information provision in air pollution? (discussion)</p>	
<p>NEEDS</p>	
<p>Do you need more information about air quality to make good decisions for you and your family ? (Voting) Why?</p>	

Which information platforms are most necessary to have enough information to make good decisions for you and your family? (voting!) Why? (discussion)	
What information platforms/ information do you currently don't have access to but would you like to?	
How would you like to access this type of information? (time, frequency, format, languages, etc.) (discussion)	
How can development partners help to ensure trusted information provision? (discussion)	
Which person/ agency are most equipped to provide information and infrastructure for clean air in your area? (what kind of information or infrastructure has been provided in the past, accessibility, availability, further needs)	

5. Closing activity – 5 min

A closing activity will thank the participants for their time, and give the opportunity to people to ask questions about the research, Internews' activities and any other business.