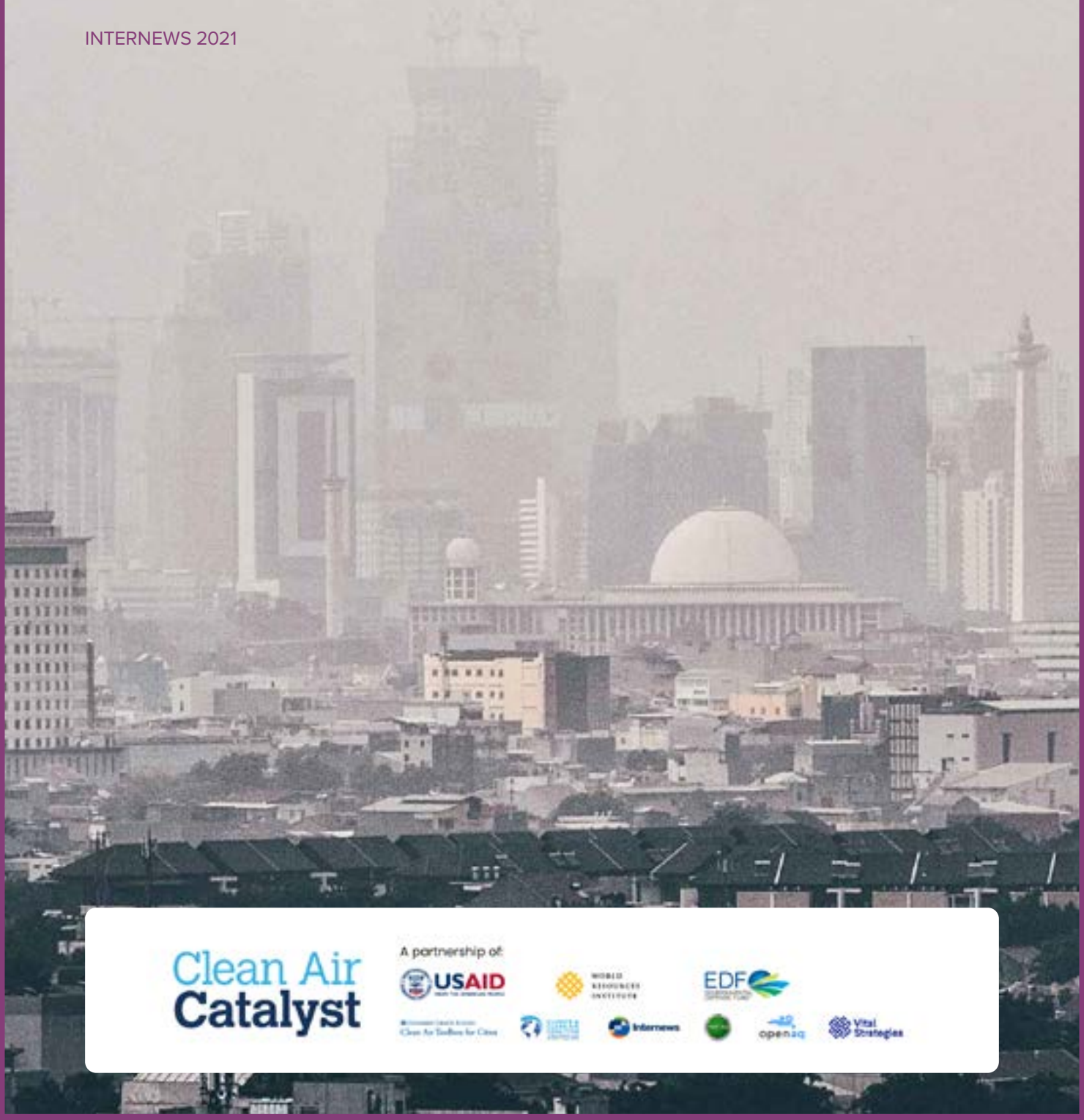
Breathing in Jakarta

Information Ecosystem Assessment of Air Pollution in Jakarta

INTERNEWS 2021



Clean Air Catalyst

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Information Ecosystem Analysis on Air Pollution in Jakarta

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This Clean Air Catalyst publication is made possible by the support of the American people through the United States Agency for International Development (USAID). The contents of this publication do not necessarily reflect the views of USAID or the United States Government. The interviews and focus groups for this Information Ecosystem Analysis were conducted in 2021 and were limited by lockdown restrictions due to the COVID-19 pandemic. Thus, the sample size for data analysis is limited and cannot be considered representative of the views of all the city's inhabitants.

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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 (2020-2025) will help build capacity for tailored, self-reliant solutions that cut air pollution and improve human health in developing countries.

Jakarta - one of the three Clean Air Catalyst project pilot cities, is among the most polluted cities in the world. As one of the efforts to overcome this problem, this research aims to understand the information ecosystem surrounding air pollution in Jakarta. This research examined several aspects, including the landscape of the media industry in Indonesia, the culture of freedom of expression, interaction with information, the perceptions and knowledge of citizens about air pollution, and various others. To gain insights on these aspects, this research adopts the Information Ecosystem Assessment (IEA) methodology developed by Internews.

The intention behind an IEA is to understand how humans produce, consume, interact around, and act on their information supply. This research collects data through the following methods: survey of 210 respondents, focus group discussions (FGD) with seven different groups, and in-depth interviews with 18 key informants.

This report is divided into two sections. The first section describes the supply side of the information ecosystem, covering the social, legal, cultural, and political context of the media landscape. The supply side analysis also features a brief report of digital news and contents on air pollution. The second section focuses on the information demand side. This section analyzes the perceptions and knowledge of air pollution among Jakarta citizens: assessment of air quality, the perceived impact, who holds responsibility, trust on medium and information sources, and various others.

This IEA was conducted amid the Covid-19 pandemic and severe mobility restrictions. So, certain adaptations were made to reach out to the participants following all government-issued safety protocols while also adhering to the principles and standard of the research methodology.

Recommendations

1. Media, civil society organizations, government agencies and stakeholders all need to consolidate their efforts to fill the existing information gap, including educating the public about its misperceptions.
2. Communication strategies and tactics need to consider the following aspects:

    a. Approximately two-thirds of survey respondents stated that they have some scientific air pollution knowledge about the content or substances contained in polluted air. This is an opportunity for public awareness interventions to put more emphasis on the impact of air pollution. These include, but are not limited to, personal and public health, economic loss, and various other aspects. Higher awareness of the negative impacts of air pollution might contribute to wider public attention on the issue.
    b. Information should be shared in a way that is meaningful and impactful to the everyday lives of Jakarta residents. This will require proper adaptation of messaging to diverse communities with different priorities. While social media (66.7%) and online news (37%) are considered effective ways to reach people, survey respondents tend to distrust these two mediums. Consider public service campaigns delivered by trusted messengers on popular channels.

c. Those who encounter air pollution in their daily lives—those who commute by motorcycle or bicycle, or having a respiratory disease, for example—tend to perceive Jakarta air quality as problematic. Almost all survey respondents indicated that vehicle exhaust is the main contributor to air pollution in Jakarta. While half of the respondents identified waste burning as a significant contributor, according to Breathe Easy Jakarta (2017), the contribution of waste burning to air pollution was estimated to be only 5%. This is indicative of a disconnect between perception and reality. Considering that the respondents tend to put more value on what is visible, communication materials need to illustrate the contents in a visually appealing way, especially those which are not immediately visible to the naked eye—like impacts, microscopic particles, patterns, etc.

d. Information on air quality should be presented in the most popular form available, avoid jargon, and provide calls-to-action for individuals and communities to be able to contribute to the cause. This research reveals that air quality messaging programming should be delivered by the most trusted sources—scientists/experts and health workers—rather than by the most untrusted source: celebrities/influencers.

e. Considering that many people are exposed to information only by accident, a strategy is needed to create an ongoing demand for information on air quality.

3. Considering that the main challenge for the public in obtaining information on air pollution is that they lack knowledge of relevant information sources, a priority should be put on building an information infrastructure and addressing data unavailability caused by retribution policies that restrict direct access to some types of data. The information infrastructure includes 1) a website that provides complete, accessible, and easy-to-understand information, 2) social media that targets specific groups, and 3) a strategy to connect academics/experts and scientific research to the wider public.

4. The respondents are aware of their personal contribution to air pollution. This is a major opportunity to stimulate participation among residents. Beware, however, of the tendency to individualize responsibility, as we have seen from the survey that individuals (19.5%) are perceived to be more responsible than the central government (17.6%). Any campaign on air pollution needs to maintain a healthy balance of systemic/structural responsibilities and individual responsibilities.
5. The digital ecosystem presents opportunities and challenges. The public's increasingly intense digital activity shows that this ever-changing technology is a significant medium for messaging campaigns. It should be noted, however, that a campaign that focuses too much on digital platforms will also marginalize groups that have no access, or limited access and ownership of digital technology.
6. Communication strategies and formats must always prioritize inclusivity and leave no one behind. Instructions on how to avoid class bias, ableist bias, gender bias, cultural bias, and political bias need to be outlined in campaign strategies and guidelines.
7. Due to the limitation of this specific research, there is a need to conduct further research that specifically assesses the types of air quality-related communications through various channels, i.e., news, television, radio, social media, etc. Such research, designed to map discourses on air quality issues, could provide a better understanding of what kinds of messaging or communication strategies have already been done related to the "trust/distrust", "perception of responsibility," or "perception of source of air pollution" components of this study.
8. This research leaves an unanswered question: To what extent and in what context is air pollution viewed by the public as an individual or structural problem? The answer to this question is important for understanding the audience more deeply, and to design more effective program strategies. Further research focused on this question deserves consideration.

Key Findings

Digital News and Content on Air Quality

- Public discourse on air pollution has been ongoing for the past few decades. However, public and media attention is fragmented and usually driven by specific moments or events. Examples of this episodic attention include the civil lawsuit against the government over air pollution in 2019, a viral screenshot of unhealthy air report on AirVisual apps, and the #langitjakarta (lit: "Jakarta sky") hashtag that gained traction due to the relatively cleaner air in Jakarta during the early Covid-19 lockdown implementation.
- In addition to environmental organizations like Greenpeace and the Indonesian Center for Environmental Law (ICEL), various social media accounts also have active engagement in the discussions and campaigns on air quality. Notable examples of these accounts are @sehatkanudaraku (lit: "Clean My Air") and @bicaraudara (lit: "Talks on Air").
- Our news media monitoring over the past five years shows that online news media produces stories that are almost identical to one another. These stories are presented in general terms and do not provide thorough elaboration on the impact of air pollution. The most widely covered topics by the media are daily reports on air quality, the causes of air pollution, the health impacts of air pollution, and efforts to reduce air pollution.

Public Perception and Knowledge About Air Quality in Jakarta

- In general, most of the survey respondents do not consider Jakarta air quality to be problematic. Near half—44.3% of 210 respondents—believe that the air in Jakarta is of moderate quality. Just over fifteen percent (15.3%) of the respondents think that their lives are not affected by air pollution. When asked about the impact of air pollution on their lives, 31% of the respondents answered that it is "moderate." Those who encounter air pollution in their daily lives—individuals who commute by motorcycle or bicycle, or having a respiratory disease, for example—tend to perceive Jakarta air quality as problematic.
- Attitudes towards air quality do not appear to differ by gender but do visibly differ by residence area. Respondents who live in North Jakarta show a higher negative sentiment towards Jakarta's air quality.
- A total of 97.6% of survey respondents stated that vehicle exhaust is the main contributor of air pollution in Jakarta. A sizable portion of the respondents perceive waste burning (43.3%) and cigarette smoke (22.9%) as the main contributors to air pollution. It is important to note that, according to Breathe Easy Jakarta (2017), the contribution of waste burning to air pollution is estimated to be only 5%.
- Survey respondents believe that the local government (46.7%) and the central government (17.6%) are the parties most responsible for reducing air pollution in Jakarta. Interestingly, the respondents perceive that individuals (19.5%) hold more responsibilities than the central government.
- Based on our assessment, as many as 63.3% of respondents have basic knowledge about the content or substances contained in polluted air. In addition, 25.2% of respondents were aware of the Air Quality Monitoring Station (AQMS), and 17.6% of respondents know the exact location of the AQMS.
- There are multiple public misperceptions about air pollution. Some respondents consider air quality to be the same as air temperature, while

some believe that polluted air is visible to the naked eye. Some regard air quality measurement tools as a waste of government budgets.

Behavior and Information Demands

- More than half of the survey respondents (57.6%) stated that they have seen information related to air quality in Jakarta. But most respondents think that the quality and frequency of the information they receive is less than adequate.
- Most respondents reported finding air pollution information on social media (55.4%), followed by air quality apps (41.3%) and online media (32.2%).
- The type of information that respondents reported needing most relates to the impact of air pollution on health (63.3%) and notifications when air pollution levels were high (45.7%). Male respondents demanded more information on the health impacts of air pollution and efforts to improve local air quality than did female respondents.
- Social media (66.7%) and online news (37%) are considered effective ways to reach people. However, survey respondents tend to distrust these two mediums.
- The main challenge in obtaining information on air pollution is the lack of knowledge of appropriate information channels (57.4%) and difficulties in understanding the content (19.1%). In addition, the study finds that age group variables predict respondents' experiences, perceptions, and needs in relation to information. Significant variations can be observed, especially among the older adults and younger generations.

Information Dynamics

- Scientists/experts (73.8%) and health workers (48.1%) are the most trusted sources of information on air quality. NGO activists (32.4%) received higher trust than government officials (19%). However, respondents aged 55-and-over placed more trust in government officials (33.3%) than activists (9.1%).

- Celebrities/influencers (56.7%), government officials (30.5%), and religious leaders (24.8%) are considered untrusted sources of information on air pollution. Friends and relatives are untrusted by 15.7% of female respondents compared to 7.6% of male respondents. Meanwhile, more men (22.9%) distrust government officials than women (13.3%).

ANNEX 1:
Contextual Profile

Democracy Index
(The Economist Intelligence Unit, 2020)
Ranked 64th of 167 countries

Index of Civil Liberties
(Freedom House, 2020)
Scored 61 of 100 - partially free

Literacy Rate
(World Bank, 2018)
96%

Human Development Index
(Indonesian Central Bureau of Statistics, 2020)
71.94 (National); 80.77 (Jakarta)

Expenditure per capita
(Indonesian Central Bureau of Statistics, 2020)
Rp.11,013,000 (approx. USD 765.46) per person/year (National);
Rp.18,227,000 (approx. USD 1,266.87) per person/year (Jakarta)

Gender Inequality Index
(UNDP, 2020)
Ranked 107th of 189 countries

The Global Gender Gap Index 2020
(World Economic Forum, 2020)
Ranked 85th of 153 countries

Indonesia is both the largest archipelagic country and the largest Muslim population in the world. In 2020, Indonesia was home to 270.2 million people, with 70.72% of the population in its reproductive years, i.e., between the ages of 15 and 64 (Central Bureau of Statistics, 2020). The island of Java, which covers only 7% of Indonesia's territory, is inhabited by 56.10% of the population (Central Bureau of Statistics, 2020).

Indonesia has recently descended in economic rank from middle income country to lower-middle income country (Hamadeh et al., 2021). Poverty is a fundamental problem in Indonesia, with 10.14% of its population being poor (Central Bureau of Statistics, 2021). In addition to poverty, corruption is a persistent problem, gaining Indonesia 102nd place out of 180 countries in the Corruption Perceptions Index 2020 (Transparency International, 2020).

Jakarta is the capital city of Indonesia, where this study takes place. Jakarta is inhabited by 10.5 million people, with a 4.57% poverty rate (Central Bureau of Statistics, 2020). Kepulauan Seribu (Thousand Islands) is the region with the highest poverty rate, while South Jakarta is the lowest.

As the government, political, and economic center of Indonesia, Jakarta has always been a destination for many people to find work or study. This has an impact on population density, congestion—for which it ranked 10th in the world in 2019 (Tomtom, 2019)—and other social and environmental problems. Due to climate change, Jakarta's landmass is sinking to below the sea level and predicted to be fully submerged by 2050 if no efforts are made to overcome it (Lin & Hidayat, 2018). Due to these problems, the government decided to move the country's capital city from Jakarta to East Kalimantan in 2019.

In recent years, global initiatives such as IQAir have ranked Jakarta among the top 10 cities with the worst air quality in the world: 10th place in 2018, 5th place in 2019, and 9th place in 2020 (IQAir, 2081; 2019; 2020).

According to the Vital Strategies study, vehicular emission is the primary source of air pollution in Jakarta both in the dry season (42-57%) and wet season (32-421%). In addition, coal combustion, construction activities, open burning, paved road dust and other factors contribute to pollution, but each behaves differently by the season.

Polluted air is harmful to physical health and poses social and economic

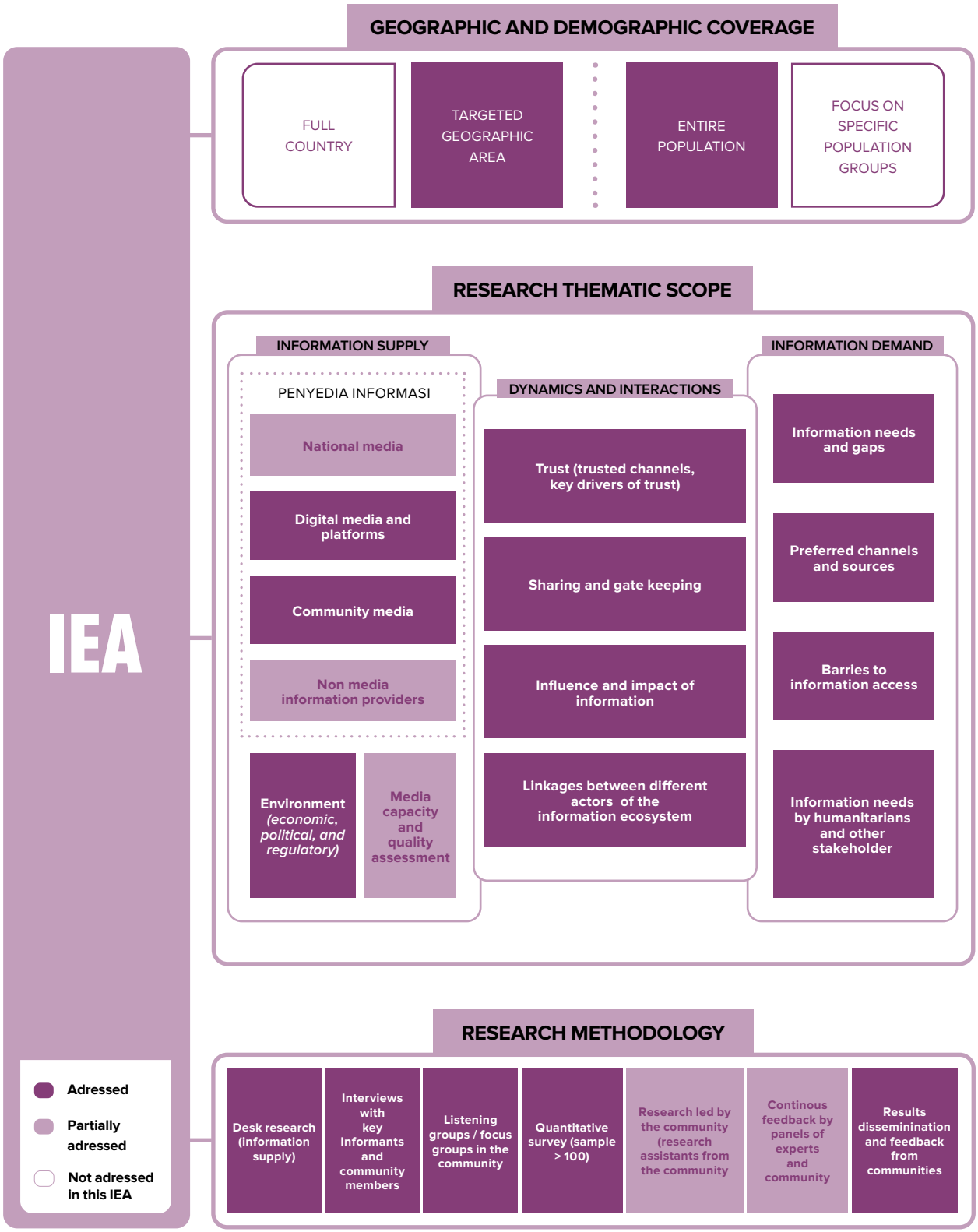
problems. A report conducted by Vital Strategies and the DKI Jakarta Environmental Agency (2020, p. 10) states that these include, "early death, health costs, loss of productivity related to illness, and the cost of patient care."

Due to the worsening air quality in Jakarta, several residents who are members of the Koalisi Inisiatif Bersihkan Udara Koalisi Semesta (Coalition of Clean Air Initiative Coalition of the Universe, hereinafter written as "Koalisi Ibukota") filed a civil lawsuit with the Central Jakarta District Court in July 2019 (Nathania & Fadhillah, 2019). According to the lawsuit, seven parties are allegedly responsible for the poor air quality in Jakarta: The President, the Minister of Environment and Forestry, the Minister of Health, the Minister of Home Affairs, the Governor of DKI Jakarta, the Governor of West Java, and the Governor of Banten.[1]

After the lawsuit, several initiatives were launched by the Jakarta provincial government and other stakeholders. The Jakarta provincial government passed legislation on air quality management (Instruksi Gubernur No. 66 Tahun 2019) and implemented a low emission zone policy in Kota Tua (Old Town).

1 On September 16th, Jakarta District court found the defendants guilty of environmental negligence and ordered them to improve Jakarta air quality with different tasks relating to their roles within government.

ANNEX 2:
Information Ecosystem Assessment (IEA) Methodology



An Information Ecosystem Assessment (IEA) is a methodological approach for understanding how humans produce, consume, interact around and act on their information supply. 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 and stakeholders or not. The information gathered by Internews and its partners through multiple phases of the IEA informs possible solutions to address information gaps and overlooked audiences.

The IEA maps information ecosystems, firstly, by establishing an overview of the quantity and quality of media available to specific populations, as well as the factors that influence it. 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 which affect information flow.

IEA analyses the diverse ways people behave around this information, including that which comes from 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 are:

a. Information Need: The information that people need and value in a measure sufficient for them to seek out.
b. 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 channels—TV, radio, print, digital, social media, and word of mouth.
c. Sourcing: The preferred or most frequently consulted sources that people call upon for the information they need, i.e., media sources, community sources, specific online groups, or individuals.
d. Sharing: The way people pass along sourced information across a landscape of information exchanged between individuals and groups.
e. Trust: The consumer's belief in the relative reliability and truthfulness of various sources as an indicator of their trust in the information itself.
f. Influence: The influence of a trusted source, and how that influence is used by influencers and experienced by consumers.
g. Information Literacy: The degree to which consumers can discern false information in their information ecosystem, in addition to their vulnerability or predisposition to rumor and misinformation, especially pertaining to sourcing, sharing, trust and influence.

Moreover, it is important to note that an IEA is not an end product. IEAs are often used in the first stages of a project, providing insights into contextual realities, preferences, and requirements. They are always connected to recommended actions, whether our own, those undertaken by communities, or the ones by 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.

2.1. On the Application of IEA Methodology

This research implements IEA approaches in the following manner:

- **Scope and theme of the study: air pollution in Jakarta**
  This research focuses on a specific topic and geographical area, i.e., air pollution in Jakarta. Therefore, the subject of the study is unique to this criterion. The media platforms and outlets are those specifically consumed by the Jakarta residents, and the research participants live or work in sectors related to air pollution in Jakarta.
- **Representing Jakarta residents with a diverse sample of respondents**
  As the capital city of Indonesia, Jakarta is a melting pot of diverse communities. Although we acknowledge that it is impossible to represent this diversity perfectly, especially due to the pandemic-induced restrictions on mobility and communication, we strived to maximize the variation of respondents by taking gender composition, economic level, occupation, age, and location into account. We hope that this sampling will capture the subtleties more accurately so that it can better understand, and be understood by, the community we have studied—something that is at the heart of the IEA philosophy.
- **Data collection and methodological approach**
  IEA methodology recommends employing various data collection methods. This research utilizes four methods:

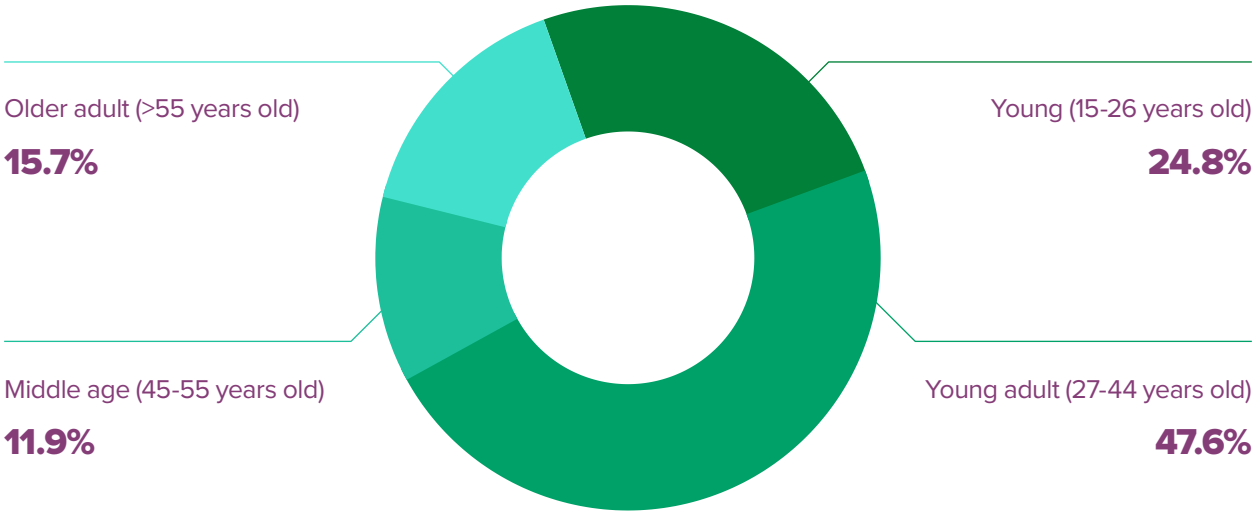
  a. **Desk research**
     This method includes a review of literature relevant to the study. Most of the literature we reviewed is available online. We also conducted a qualitative observation on air pollution news coverage on digital platforms during the last five years. The output of our desk research is stated in the chapter on Information Supply. This activity occurred throughout the research period, from early May 2021 to early August 2021.

b. Survey

This study utilizes a survey to draw up a general description of the respondents' perceptions, knowledge, and behavior. The survey questionnaire was distributed online through social media and messaging apps from mid-June to mid-July 2021.[2] Respondents were collected through a random sampling method. An offline survey was conducted for a day along the streets of Menteng and Gambir, Central Jakarta to reach groups of respondents that are unreachable through online surveys. Due to the low response rate and the increasing number of Covid-19 positive cases in Jakarta, however, we discontinued the offline survey after one week. We then relaunched the survey using virtual communication tools and data sets and collected responses from 210 respondents.

The following graphics summarize the respondents' profile:[3]

RESPONDENTS DISTRIBUTION BASED ON AGE GROUP



* Total: 210 respondents

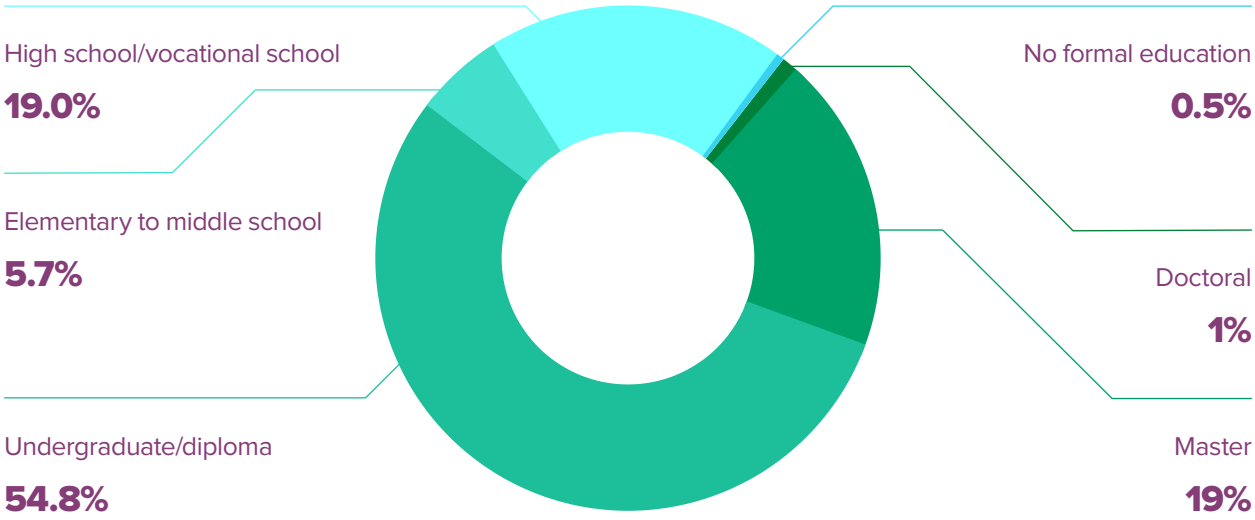
2 The survey was conducted during the COVID-19 restrictions. This might affect respondents' perceptions since air quality was improving during this period.

3 Age, gender, and residence are the variables we utilize in the data analysis to determine whether these variables are useful in predicting patterns among the respondents. However, to keep the report short and easy to navigate, we will only present variables that show a significant amount of variation.

RESPONDENTS DISTRIBUTION BASED ON GENDER GROUP

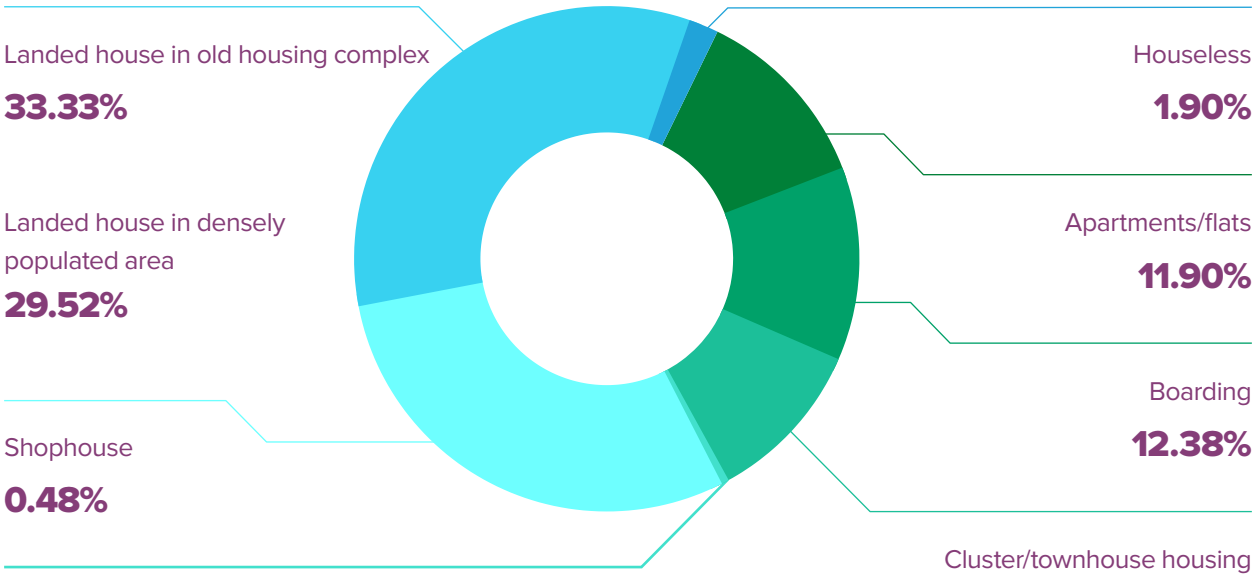
* Total: 210 respondents

RESPONDENTS DISTRIBUTION BASED ON EDUCATION



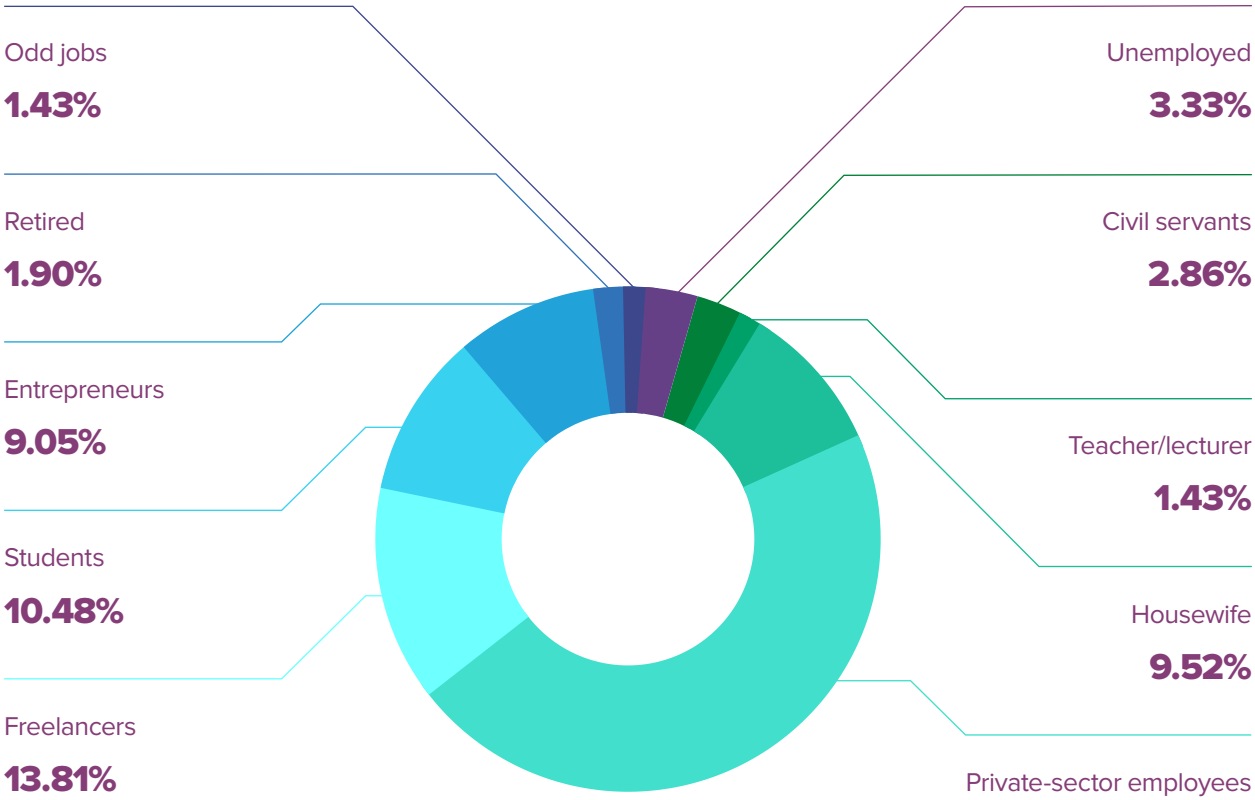
* Total: 210 respondents

RESPONDENTS DISTRIBUTION BASED OCCUPANCY TYPE



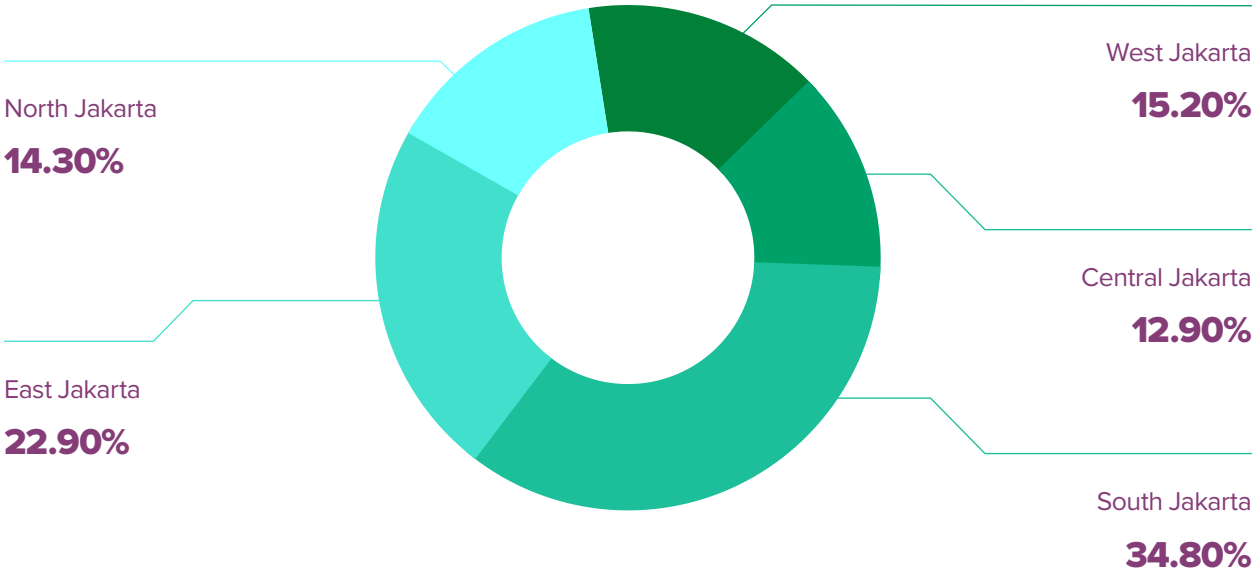
* Total: 210 respondents

RESPONDENTS DISTRIBUTION BASED ON OCCUPATION



* Total: 210 respondents

RESPONDENTS DISTRIBUTION BASED ON RESIDENTIAL AREA



* Total: 210 respondents

c. Focus Groups Discussion (FGD)

Focus Group Discussion is a qualitative data collection method conducted by gathering people with similar backgrounds or experiences to collectively discuss and structure their knowledge and experience. This study implemented seven FGDs, each with six participants with balanced gender composition, except for one FGD with "Asosiasi Ibu Menyusui Indonesia" (Association of Indonesian Breastfeeding Mothers) that consisted solely of female participants. In total, 57.1% of the participants were female and 42.9% were male. One of the participants was a person with a visual disability.

Conducted in mid-June to mid-July 2021, all FGDs were held online due to the rising number of Covid-19 positive cases in Jakarta during the field research period. Seven of the FGDs were held in the following communities to capture the diverse Jakarta citizenry:

- SINDIKASI or Serikat Pekerja Media dan Industri Kreatif (Media and Creative Industry Workers Association) initiated by urban youth in their 20s and 30s
- Grab online on-demand transportation driver community in Lubang Buaya, Jakarta Timur
- Asosiasi Ibu Menyusui Indonesia (Association of Indonesian Breastfeeding Mothers)
- Students (from various universities in Jakarta)
- Federasi Serikat Buruh Persatuan Indonesia (Indonesian Unity Federation of Workers' Associations)
- Jaringan Rakyat Miskin Kota (Urban Poor Network)
- Bike To Work (bicycle community)

d. Key Informants Interview (KII)

Throughout July 2021, we conducted in-depth interviews with 18 individuals from various backgrounds. Each interview lasted for 30-60 minutes. The informants we selected work in fields that intersect with air pollution issues: government, civil society, experts, journalists, and the business sector. We explored their experience and knowledge of air pollution issues, including their perceptions of the information ecosystem around them.

Table 1. **List of Key Informants**

No.	Gender	Position	Institution
1	F	Public advocate	Former Lembaga Bantuan Hukum (Legal Aid) Jakarta lawyer
2	M	Climate and energy campaign officer	Greenpeace
3	M	Coordinator	Koalisi Pejalan Kaki (Coalition of Pedestrian)

No.	Gender	Position	Institution
4	M	President	Center for Indonesian Medical Students' Activities (CIMSA)
5	M	Coordinator	Urban Poor Consortium
6	M	Head of Environmental Impact Management	DKI Jakarta Environmental Agency
7	M	Chief of Data	Jakarta Smart City
8	M	Staff of Environmental Health, Executive Sanitarian of Environmental Health, Labor Health and Sports Health Section	DKI Jakarta Health Agency
9	F	Chief Sanitarian of of Environmental Health, Labor Health and Sports Health Section	DKI Jakarta Health Agency
10	M	Academics	University of Indonesia
11	F	Academics	Bandung Technology Institute
12	F	Academics	Bandung Technology Institute
13	M	Technical Services Manager	Blue Bird
14	F	Senior Editor	Mongabay
15	M	Journalist	Kompas
16	F	Executive Director	Cerah Foundation
17	F	Analyst	Kopernik
18	M	Head of Road Transport	DKI Jakarta Transportation Agency

* Gender composition of the informants: 38.8% female (F), 61.1% male (M).

- **Combining quantitative and qualitative data**
  The research utilized both quantitative (survey) and qualitative (FGD and in-depth interview) data collection methods to draw on a more comprehensive

understanding of the subject of the study. While quantitative methods are beneficial in obtaining generalized descriptions, qualitative methods are valuable due to their explanatory power in interpreting data.

2.2. The Limitation of the Study

This research faced challenges during its execution, both from external factors such as the Covid-19 pandemic, and internal factors such as bias and the limitations of researchers. The following points are important to note to properly situate the findings of the study.

- **The Covid-19 pandemic situation prevents direct contact with research subjects—something that's considered essential and is normally required by the Internews IEA methodology**
  Meeting, observing, listening, talking, and building mutual trust with the subjects of the study are essential aspects of the IEA methodology. By keeping direct and close interaction with the communities being studied, IEA's research is not only aimed at capturing in-depth insights, but also positioning the communities as the subject, *not the object*, of the study. Unfortunately, it is harmful for researchers and communities to be engaged in direct physical interactions amidst the Covid-19 pandemic. Due to physical distancing measures, all meetings were conducted online, including the meetings among the research team, which only met once during an offline survey. To overcome this, we carried out FGDs by targeting relatively organized— but economically disadvantaged—communities to ensure more efficient coordination and implementation of the FGD sessions.
- **The size and distribution of the samples is not ideal**
  We are aware that the size and distribution of the sample in this study is inadequate in representing the diverse population in Jakarta accurately. Furthermore, due to the Covid-19 pandemic, most survey participants were obtained through online distribution, which therefore limits those who are inactive digitally from being recruited as participants. Considering

this constraint, it is important not to treat the survey findings as accurate representations of the entire population. Within IEA methodology, surveys are not intended to obtain generalization. On the contrary, the research findings are intended as estimation and snapshots of the subjects of the study. To gain a more complete picture, the study confirms and elaborates the survey findings through FGD and in-depth interviews with KIIs that represent a broader cross-section of income, socioeconomic class, and levels of education among the population.

- **The absence of health and medical personnel as key informants**
  Doctors, especially pulmonologists, were indispensable informants for this study. However, after contacting various parties, we were unable to interview any doctors due to the high demand of medical personnel during the worsening Covid-19 pandemic conditions in June-July 2021. We have made up for this lack of medical informants by processing available secondary data, such as press releases from medical professional organizations and media coverage. To accommodate health perspectives further, we also interviewed representatives of the DKI Jakarta Health Agency.

ANNEX 3:
Information Supply

How information is produced and distributed

World Press Freedom Index

(Reporters Without Borders, 2021)

Poor. Ranked 113th of 180 countries

Digital Freedom Index

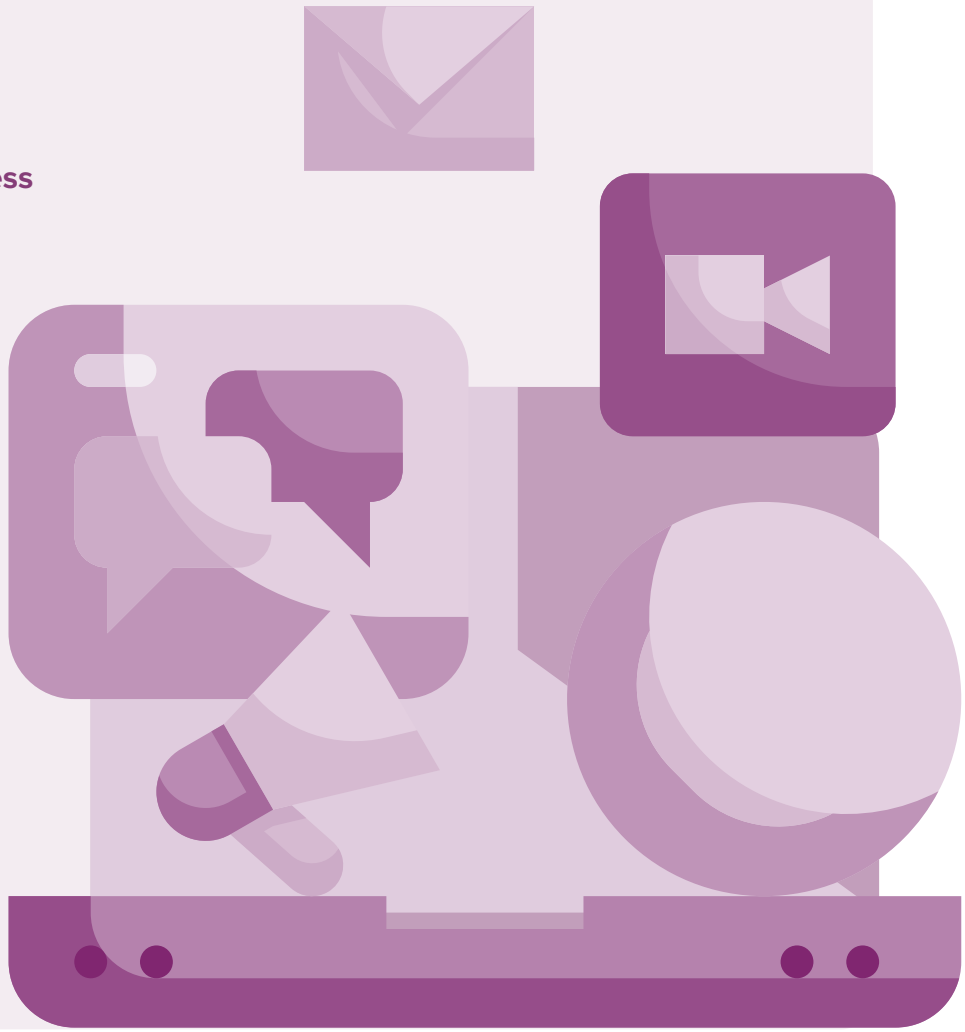
(Freedom House, 2020)

Partly free. Scored 49 out of 100

Public trust on the press

(Reuters Institute, 2021)

39%



3.1. Media Landscape Overview in Indonesia

The year 1998 is an important marker in the history of democracy in Indonesia. The fall of the authoritarian and militaristic New Order regime prompted reforms in various sectors. The press industry is one sector that has experienced dramatic changes since the revocation of the Press Publishing Business License (SIUPP) and the passing of the 1999 Press Law. This situation allowed the media business to be run by entrepreneurs outside the New Order circle: Anyone could become a journalist without being required to be a member of the Persatuan Wartawan Indonesia (lit: "Union of Indonesian Journalists", the only professional journalist organization sanctioned by the New Order). Inevitably, thousands of new media were published simultaneously.

During 2014-2016, the Press Council (Prasetyo, 2017, p. 14) estimated that Indonesia had around 47,000 news media, of which 43,300 were online media and 2,000 to 3,000 were print media. Out of these numbers, however, only 168 online media and 321 print media have been verified by the Press Council as professional media. In 2015, the Press Council noted that there were 674 radio stations and 523 television stations throughout Indonesia.

Before the Covid-19 outbreak, the Indonesian media industry—especially print media—had already faced serious economic challenges. Various strategies have been implemented to address this issue, ranging from reductions in the number of pages and publishing days, to switching to digital platforms, and mass layoffs. Despite desperate measures, many of the print media have been driven out of business. The Alliance of Independent Journalists, citing Nielsen, noted that 16 newspapers and 38 magazines stopped operating in 2015 (Yuganto, 2015). Although there has been a drastic shift of audiences from print to digital, print media still survives with an 8% market penetration due to reader trust (Nielsen, 2017).

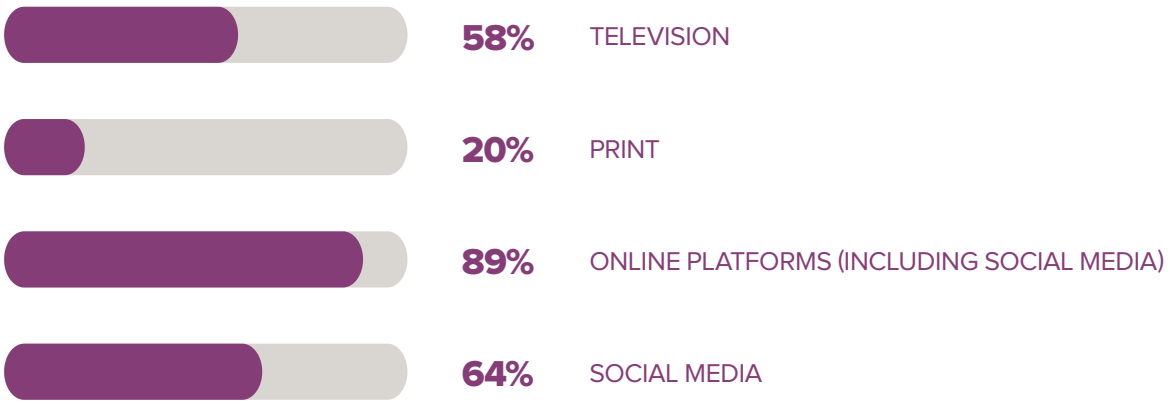
In general, most online media depend primarily on advertising, and only a few implement a paid subscription system or paywall. This business model presented another economic challenge during the Covid-19 era due to the 25% decrease in advertising spending during the early months of the pandemic (Rahman, 2020). Moreover, the media also have to compete for advertisements dollars with

rising numbers of influencers and social media celebrities. Due to this situation, the government provided seven incentives to help the press industry survive the pandemic. These incentives include paper price subsidies, electricity bill subsidies, and diverting the government's advertising spending to local media companies (Arigi, 2020).

Television is the most accessible medium in Indonesia, penetrating 96% of the population in 2017 (Nielsen, 2017). Consequently, this market domination also translates as advertising revenue: Television controlled 85% of the advertising revenue in 2019 (Nielsen, 2019). Currently, the Indonesian television industry is controlled by a handful of large companies, all of which are located within Jakarta. This centralization, which violates the Broadcasting Law, presents an unfair playing field for broadcast industry players outside of Jakarta.

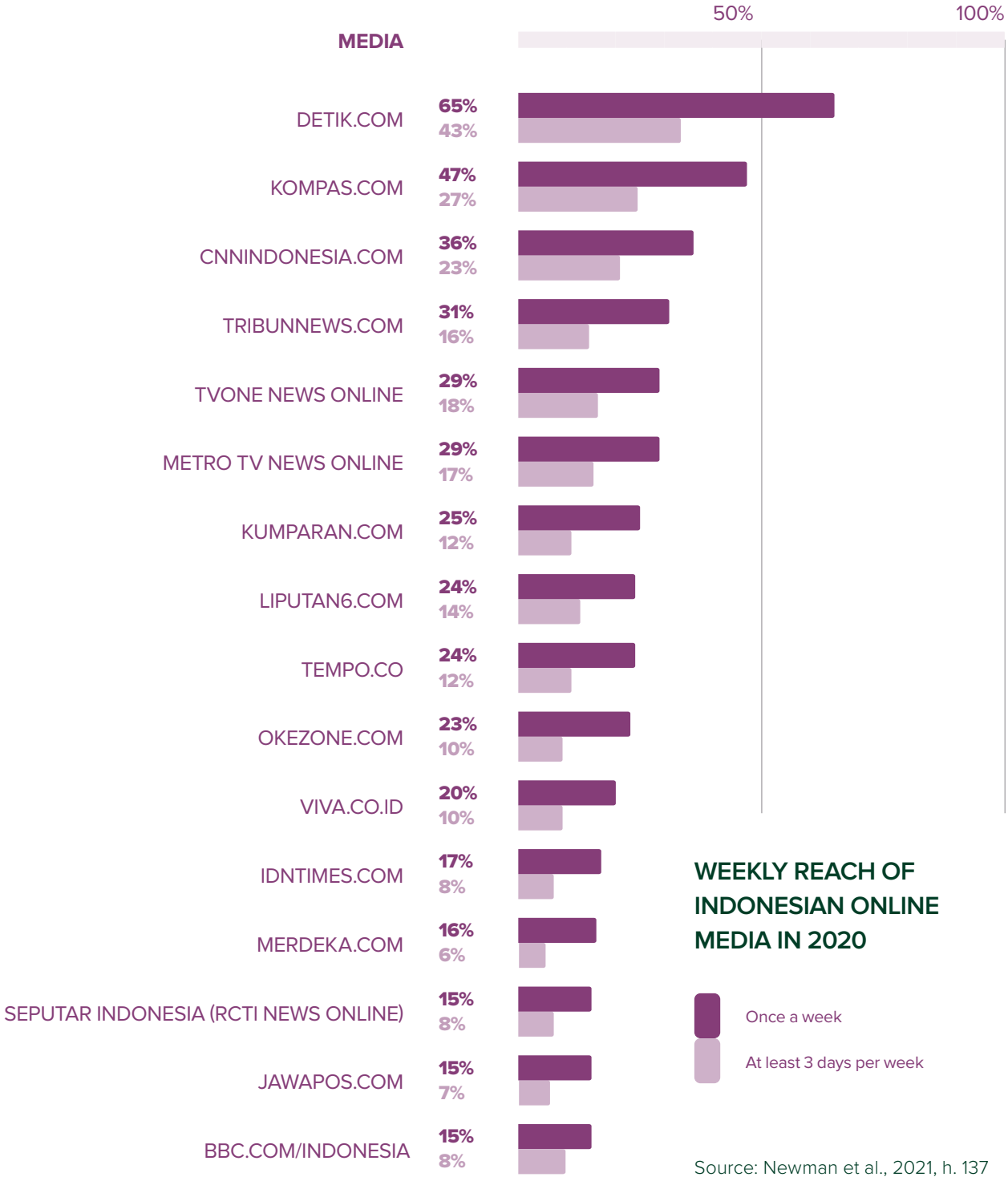
After decades of state control and serving as a propaganda tool, TVRI was reorganized as the only public broadcasting service in Indonesia under the Broadcasting Law in 2002. To this day, however, TVRI has not fully succeeded in carrying out its role as a public broadcasting service due to various internal conflicts, mismanagement, and political interventions.

INDONESIAN AUDIENCE'S NEWS SOURCES IN 2020



Source: Newman et al., 2021, h. 137

Although television has the highest penetration rate in terms of news, digital media (including social media) is the most preferred source of news (Newman et al., 2021, p. 137). In this context, *Detik.com*, *Kompas.com*, and *CNNIndonesia.com* are the most accessed media outlets (Newman et al., 2021, p. 137).



Source: Newman et al., 2021, h. 137

In 2021, Indonesia ranked 113th out of 180 countries in the World Press Freedom Index (Reporters Without Borders, 2021). The Index categorized Indonesia as having poor press freedom. Apart from media ownership concentration (Tapsell, 2017), this poor ranking is also caused by several other factors such as the high rate of violence against journalists, information restriction in West Papua, and the problematic formulation and implementation of Electronic Information and Transaction Law (UU ITE).

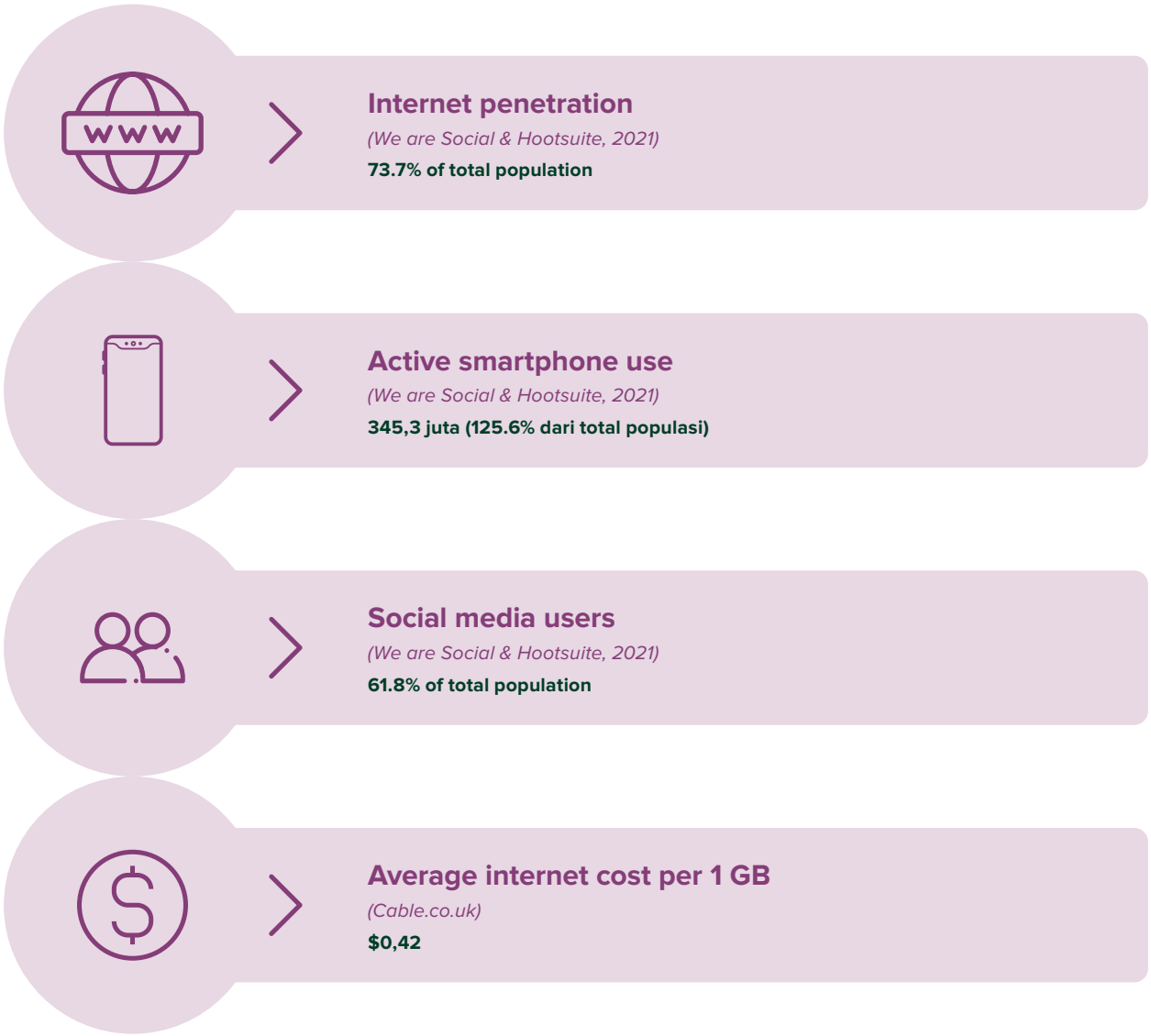
During the last decades, Indonesia saw a growing trend of criminalization of individuals who are critical of the government and corporation practices on the grounds of several ambiguous articles in the IET law. Amnesty International Indonesia noted that, in 2020, there were 119 cases related to the ITE Law with a total of 141 suspects, including 14 activists and 4 journalists. Indonesia is also experiencing a trend of information manipulation and opinion mobilization by "buzzers" and "cyber troops" who are actively silencing critics by hijacking social media accounts, blocking sites, internet blackouts, and doxing. A SAFEnet (2020) assessment indicates that digital freedom in Indonesia is under threat from authoritarianism.

Media companies and media regulatory bodies are not well respected by the public. The Indonesian Broadcasting Commission, who are responsible for protecting public interest in the broadcasting industry, is deemed incompetent, according to Remotivi (Listiyarini, 2015). The Indonesian Press Council, which embodied the press community's self-regulation, is regarded as passive and only waiting for public complaints on which to act (Ali, 2014). In addition, we found low public trust in the media institutions (67.2%) in comparison to the police (70.3%), the central government (81.6%), or the provincial government (79. 9%) (Fossati, et al., 2017). Reuters Institute (Newman et al., 2021) gave an even lower number: General public confidence in news is only 39%.

Amid these challenges, community media presents a shining ray of hope in meeting the citizenry's right to information and communication. Ironically, despite the massive development of the media industry, community media does not have the same opportunity to develop. The Broadcasting Law, for example, implements various restrictions which make it difficult for community radio and television to

exist and grow (Nugroho et al., 2012). Similarly, the Press Law did not recognize community media as press entities, and therefore did not provide much needed security and protection for community media journalists (Putra & Lamia, 2021, pp. 34-35).

3.2. Digital Media Landscape



There are 345.3 million smartphones in use in Indonesia in 2021 (We Are Social & Hootsuite, 2021). Although this amount is equivalent to 125.6% of the Indonesian population, smartphone use is not evenly distributed. Only 57.48% of the population

are smartphone users, of which more men (62.22%) are using smartphones than women (52.69%) (Central Bureau of Statistics, 2020).

A digital divide is apparent in the contrast of smartphone use in Western and Eastern Indonesia. Jakarta has the highest number of mobile phone users (71.25%), significantly higher than Papua (36.91%) and East Nusa Tenggara (39.19%), the two cities with the lowest number of mobile phone users.

Wafi and Arief (2020) argue that Indonesia experiences a digital divide on three levels: access, skills, and outcomes. On the access level, the divide is indicated by the unequal distribution of electricity, ownership of electronic devices, and high internet tariffs, while on the skill level the divide is apparent from the low digital literacy required to operate the technology (Indonesian Ministry of Information and Communication, in Wafi and Arief, 2020). On the outcome level, the divide is indicated by the unequal economic, cultural, and social outcomes from digital technology use.

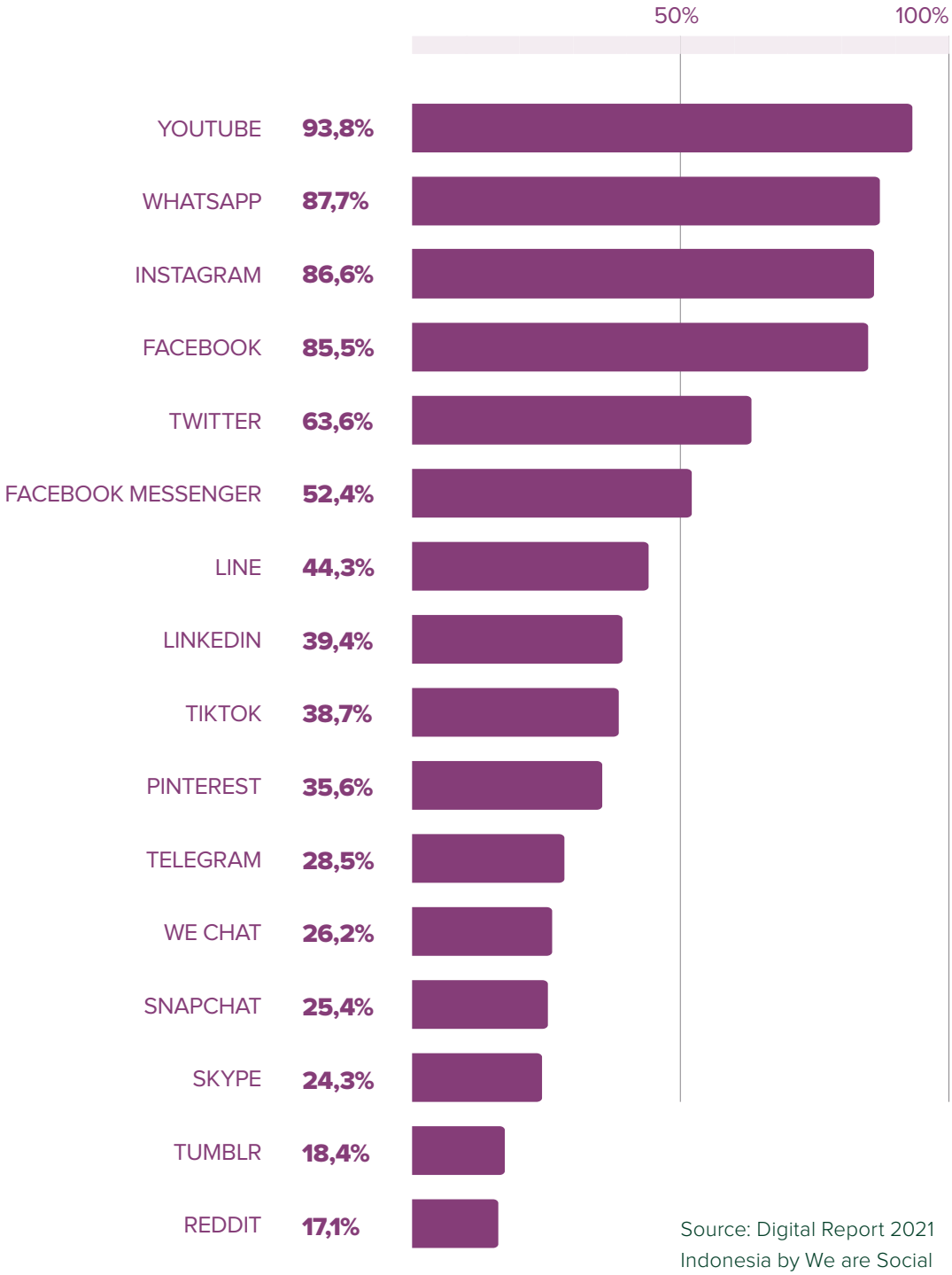
In addition to the digital divide, hoax and misinformation is a major issue in the Indonesian digital landscape.

3.3. Digital Media Content and News Coverage on Air Pollution

The #langitjakarta (Jakarta sky) hashtag trended on Twitter in April 2020. Many people shared photos depicting clean and bright Jakarta sky due to the significant decrease of air pollution during government-imposed lockdown measures. The view of Mount Salak, located 60 kilometers from the city center, is usually blocked by Jakarta's thick air pollutants, but was captured clearly on camera (Rahmadi, 2020). This hashtag sparked public discussion on Jakarta's air quality.

Apart from occasional social media trends, social media also saw the emergence of numerous accounts focusing on air quality campaigns. Accounts such as @nafasJKT (lit: "breath of Jakarta") and @SehatkanUdaraku (lit: "make my air healthy") that are active on Facebook, Instagram, and Twitter, are producing educational content on air quality. On Instagram, BicaraUdara (lit: "Talks about Air") is one of the most frequent content producers in advocating civil lawsuits against the government over air quality filed by Koalisi Ibukota.

MOST USED SOCIAL MEDIA PLATFORMS IN INDONESIA



Source: Digital Report 2021 Indonesia by We are Social & Hootsuite

Environmental NGOs, such as Greenpeace, ICEL, Walhi, and Vital Strategies, are also engaging audiences through their social media and official websites. Interestingly, Infokom the JakMania, social media account of Jakarta's football (Persija) team

fans club, have also posted content on air pollution, especially on the cigarette and firework smoke often found in football matches.

The 2014 presidential election and the 2017 DKI Jakarta governor election have created extraordinary political polarization among Jakarta residents. After the election, this polarization persisted. Worst of all, the polarization clouded discussion on almost all public discourses (Thaniago, 2018). Air pollution is not an exception to this. We find that air pollution content and talk on digital platforms like YouTube are trapped in political favoritism. This means that, rather than presenting objective and scientific discussions on air pollution, digital content and talk shows are centered on defending or attacking specific politicians. On YouTube, this kind of content appears on non-journalistic channels, and sparks politically loaded debates in the comments section.

Our observations on air pollution coverage in online media published in 2017-2021 found that news sites tend to cite similar news sources. Consequently, four news sites we have observed in the study—*tempo.co*, *kompas.com*, *detik.com*, and *liputan6.com*—have almost identical news stories. The most widely reported topics are daily reports on air quality, the causes of air pollution in Jakarta, its impact on health, and efforts to reduce air pollution.

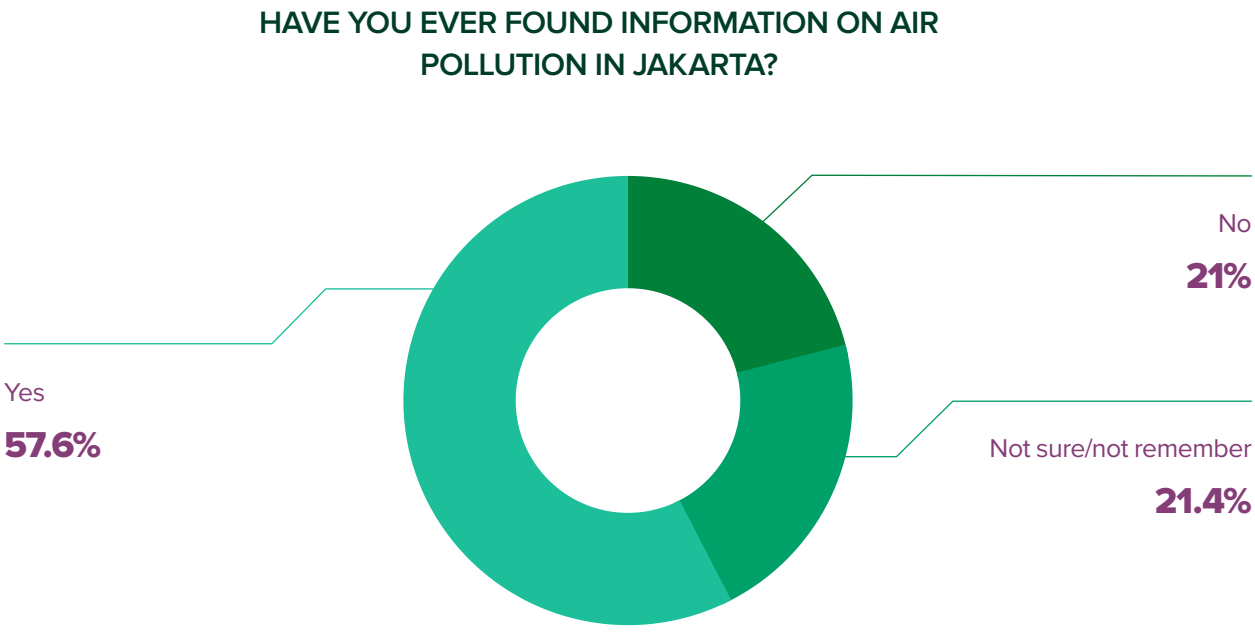
News coverage on air pollution is often associated with specific events, such as the implementation of social distancing measures, the 2018 Asian Games, traffic management policy, or NGO press releases. Overall, coverage of air pollution tends to present the issue in general terms and does not mention the impact of air pollution in detail. The exceptions are *Mongabay* and *Equatorial*, news media that focus on environmental issues. These two media reported detailed information on the causes and impacts of air pollution and used more diverse sources.

Table 2. **News Sources on Air Pollution**

Persons	Others
• Bondan Andriyanu (Greenpeace Indonesia) • Karliansyah (Direktur Jenderal Pengendalian Pencemaran dan Kerusakan Lingkungan - Kementerian Lingkungan Hidup dan Kehutanan) • Budi Haryanto (Universitas Indonesia) • Ahmad Safrudin (Komite Penghapusan Bensin Bertimbel) • Anies Baswedan (Gubernur DKI Jakarta)	• AirVisual • World Air Quality Index • WHO (World Health Organisation) • Laporan dan siaran pers dari Greenpeace • Laporan dari Centre for Research on Energy and Clean Air (CREA)

ANNEX 4:
Information Supply and Information Demand

4.1. Consumption of Information on Air Pollution



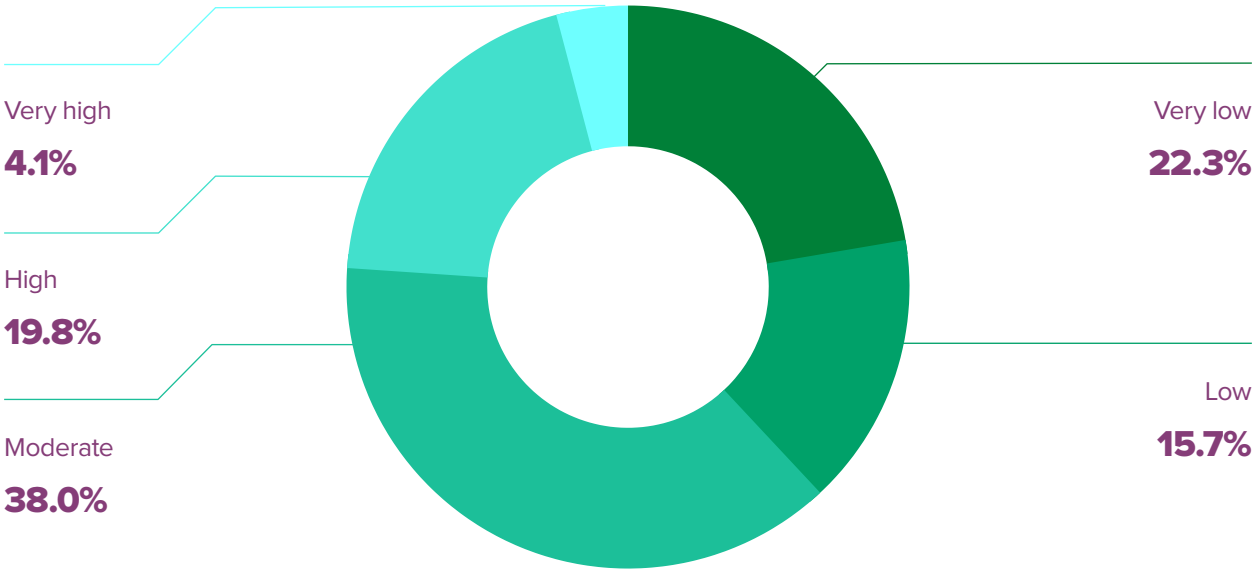
* Total: 210 respondenTS

Knowledge and perceptions are formed by the received information. Our findings show that more than half of the survey respondents (57.6%) have received information related to Jakarta's air quality. However, most respondents think that the quality and frequency of the information they receive is less than adequate.

During the FGD session, the participants confirmed these findings and stated that they very rarely received or read information on air quality, especially compared to other types of information. When the information happens to be available, however, it is usually circulated through social media, television, or online news.

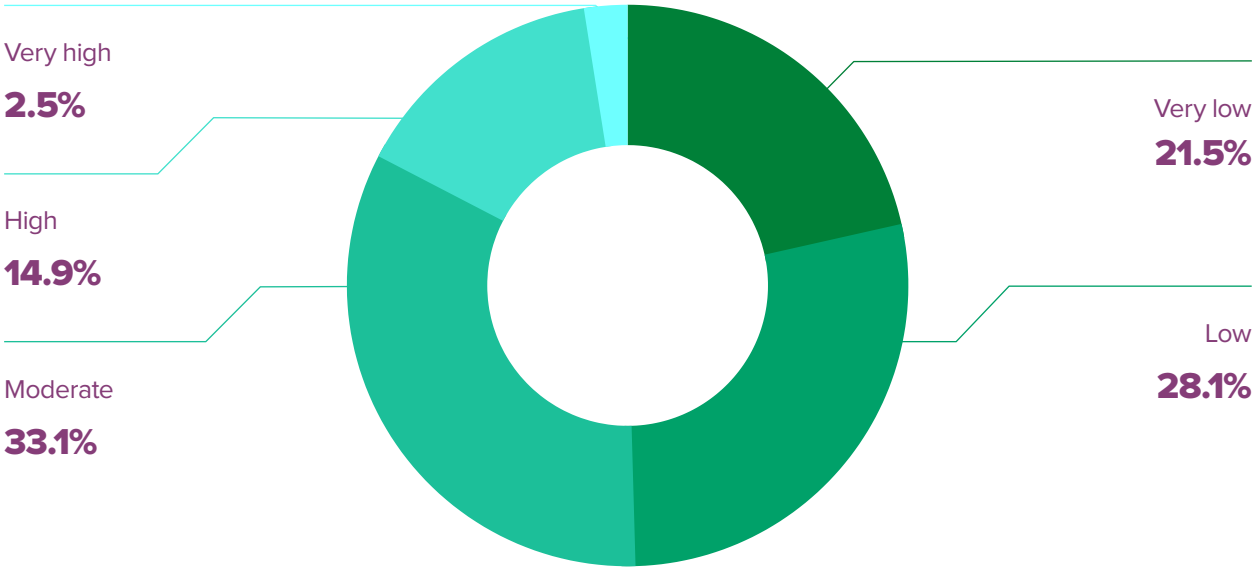
Most of the survey respondents found information on air pollution through social media (55.4%), followed by air quality applications (41.3%), and online media (32.2%). One of the FGD participants (female, 31 years old) stated that she looks for information on air quality only if she has a sore throat when she returns from a trip out of the city.

WHAT DO YOU THINK OF THE QUALITY OF INFORMATION ON AIR POLLUTION IN JAKARTA YOU HAVE FOUND SO FAR?



* Number of respondents who have found information on air pollution: 121

IF YOU HAVE FOUND INFORMATION ON AIR POLLUTION, HOW MUCH INFORMATION ON AIR POLLUTION HAVE YOU RECEIVED?



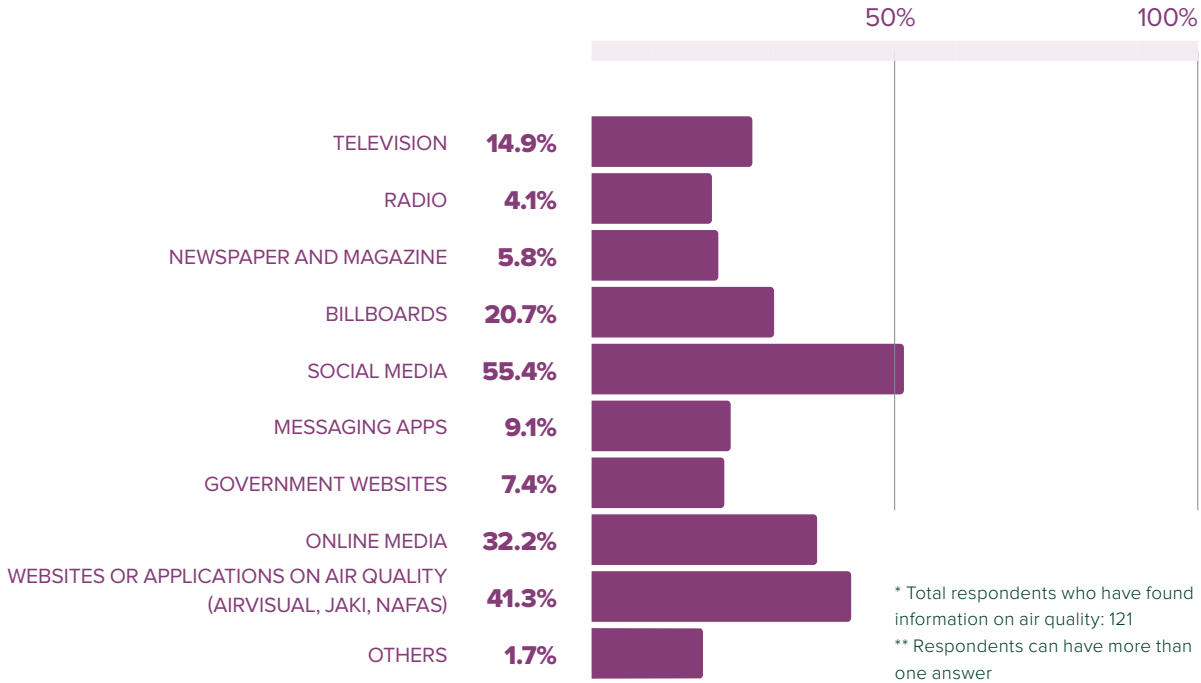
* Number of respondents who have found information on air pollution: 121

QUOTES 1

”As citizens, we have never got any appeal (on air pollution). We only got them on TV, when there are cases of forest burnings”

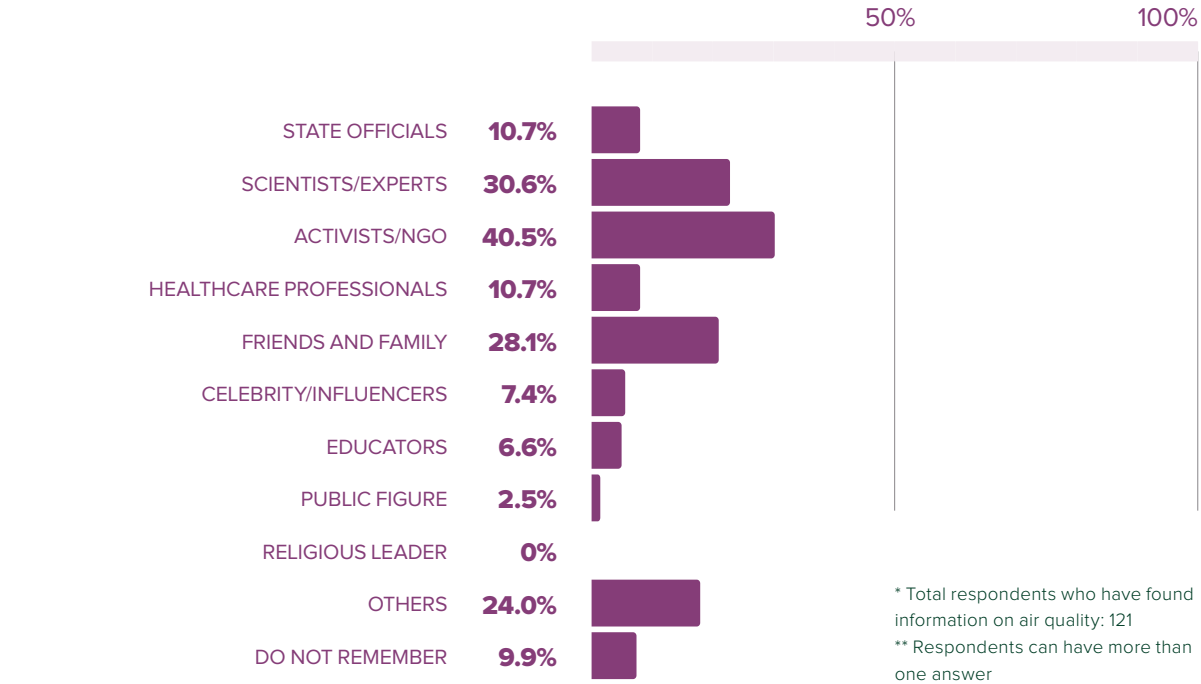
—Housewife, 47 years old —

WHERE HAVE YOU FOUND INFORMATION ON AIR POLLUTION IN JAKARTA?



* Total respondents who have found information on air quality: 121
** Respondents can have more than one answer

WHO DO YOU RECEIVE INFORMATION ON AIR POLLUTION FROM?



* Total respondents who have found information on air quality: 121
** Respondents can have more than one answer

When asked during the FGD session how they find information on air pollution, many participants mentioned Google search. Social media is also often mentioned. Through social media, respondents are exposed to air quality information from applications such as IQAir and AirVisual whose screenshots were widely shared in 2019. One of the FGD participants says that she often uses IQAir or AirVisual as a comparative platform against air quality data issued by the government.

4.2. Air Pollution Information Demand

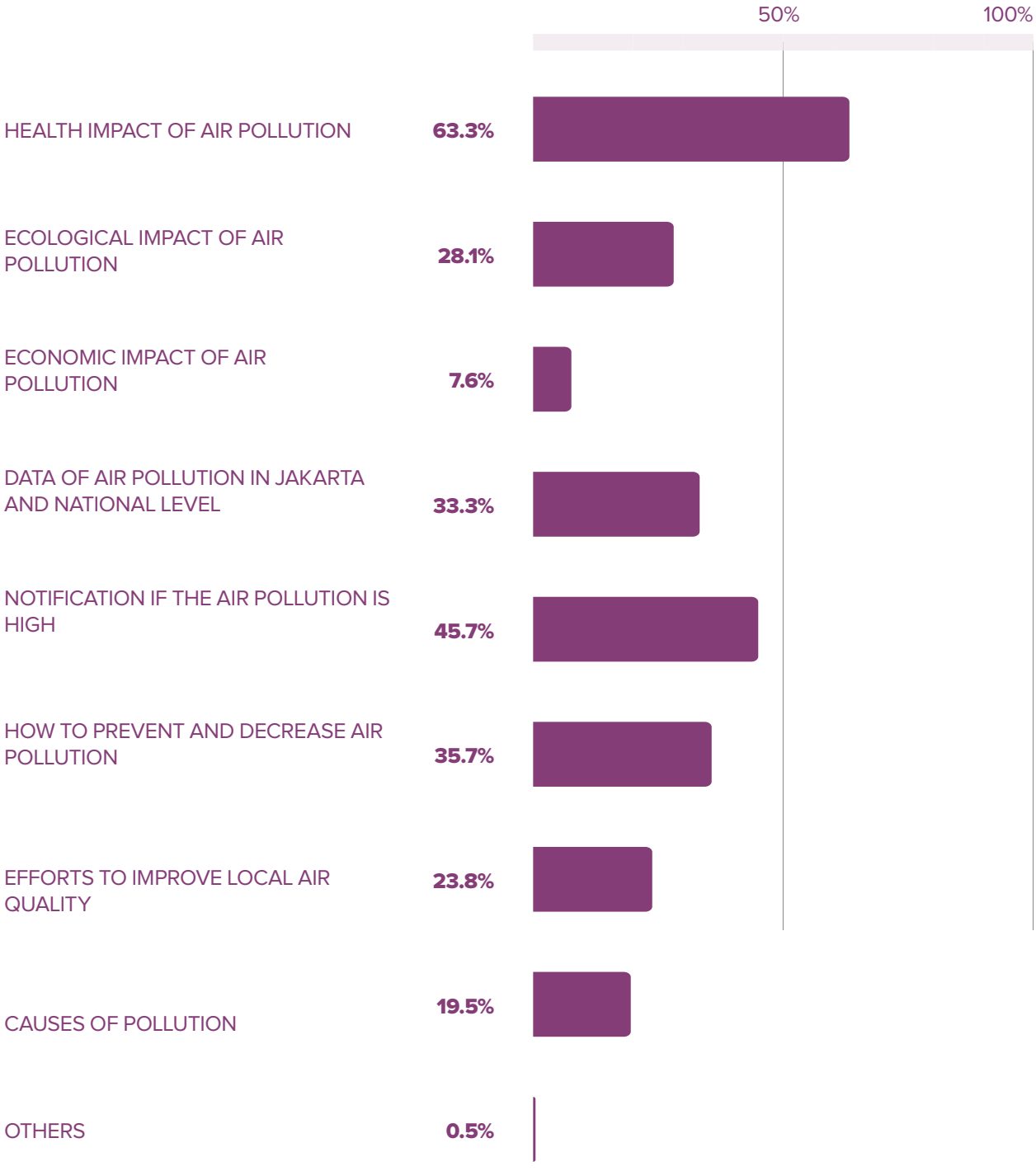
Based on the study, we conclude that what the public *needs to know* about air pollution is consistent with what the *public demands*.[4] During the interviews with key informants, we found that the public at least needs to receive information that is concrete and close to their daily life, such as the impact of pollution on health and real-time information on air quality around their neighborhood. Our key informants also stated that the public needs to be informed about the causes of pollution in their surroundings.

Our survey findings affirm these sentiments. The respondents demand information regarding the health impact of air pollution (63.3%) and to receive notifications if the air pollution level is high (45.7%). Young and young adult age groups appear to have a higher demand for information on the ecological impact of air pollution. Efforts to improve local air quality are significantly in demand among younger age groups compared to other age groups.

Male respondents had significantly higher demand for information on health impact than female respondents, and slightly higher demand for information on the ecological impact of air pollution, while female respondents demanded notification when the air quality is deteriorating, and regarding efforts to improve local air quality.

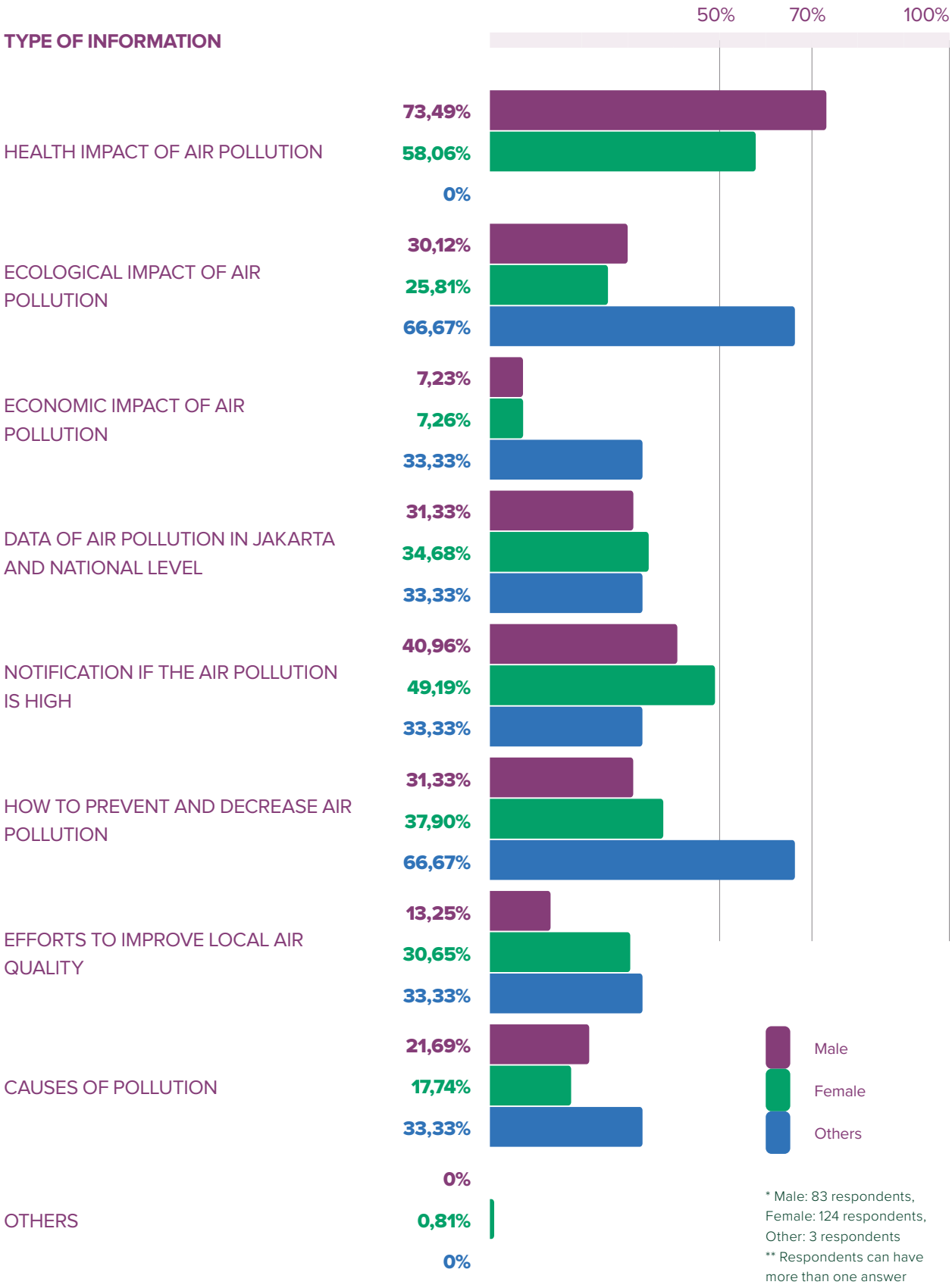
4 We define "public demands" as types of information our respondents wish to receive, based on the survey, and "what public needs to know" as types of information our key informants argue should be known by the public (based on the interviews).

WHAT KIND OF INFORMATION DO YOU WANT TO HAVE ON AIR POLLUTION/AIR QUALITY?

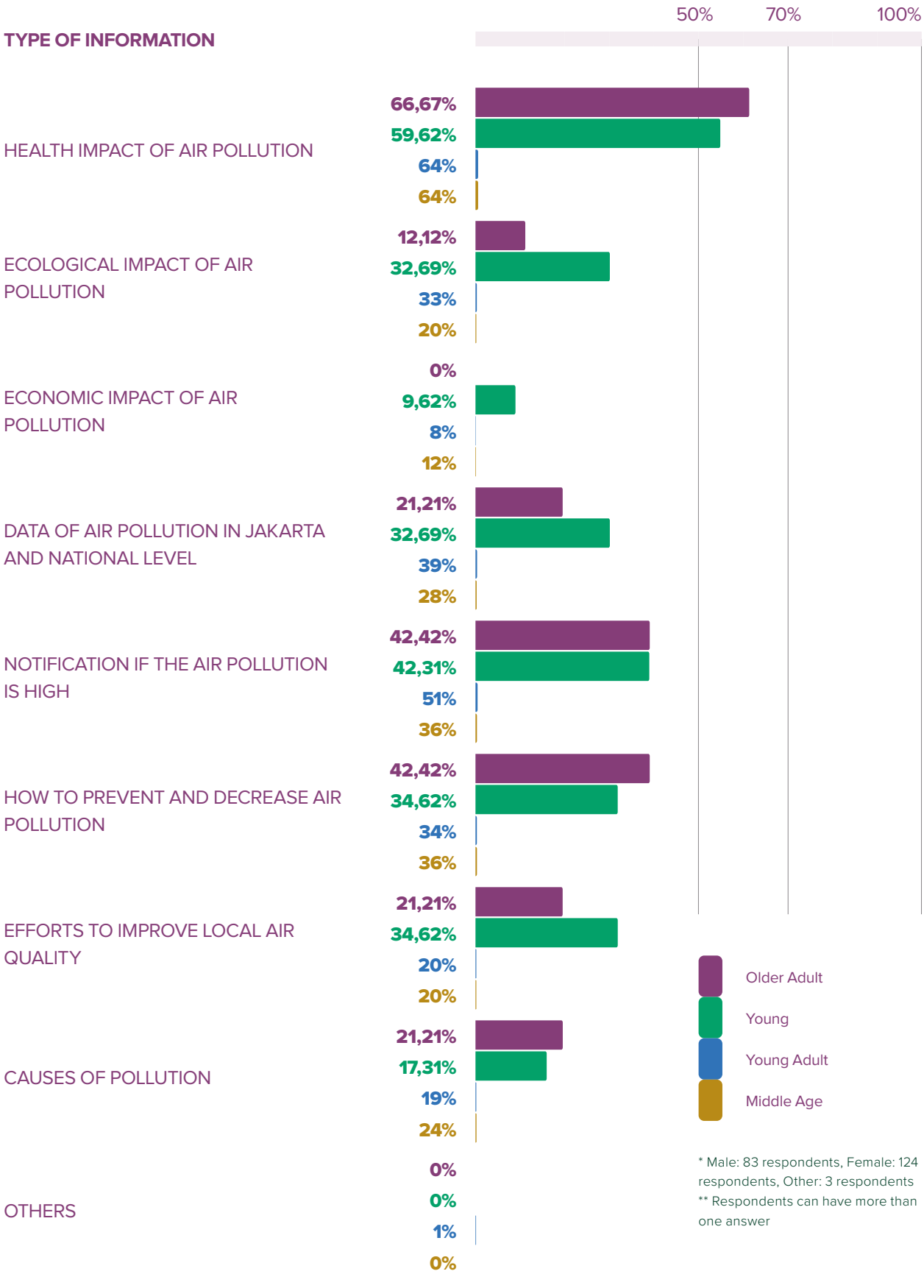


* Total respondents: 210
** Respondents can have more than one answer

INFORMATION NEEDS, BASED ON GENDER



INFORMATION NEEDS, BASED ON AGE GROUP



* Male: 83 respondents, Female: 124 respondents, Other: 3 respondents
** Respondents can have more than one answer

During the FGD session, participants expressed more diverse information needs. One of the FGD participants—a 34-year-old female lecturer—said that she did not only want to receive information, but also wanted suggestions of what she could do as an individual to reduce air pollution, i.e., a call-to-action message. Other FGD participants expected daily guidelines to prevent health risks from air pollution. There are also FGD participants who stated that there should be information on which companies caused pollution or environmental damage, in addition to what the government has done to prevent or mitigate the pollution.

QUOTES 2

"This might sound aggressive: I think we need to name-call the corporations that make a major contribution to air pollution. The public needs to know and, if we are lucky, they might boycott (the corporations)."

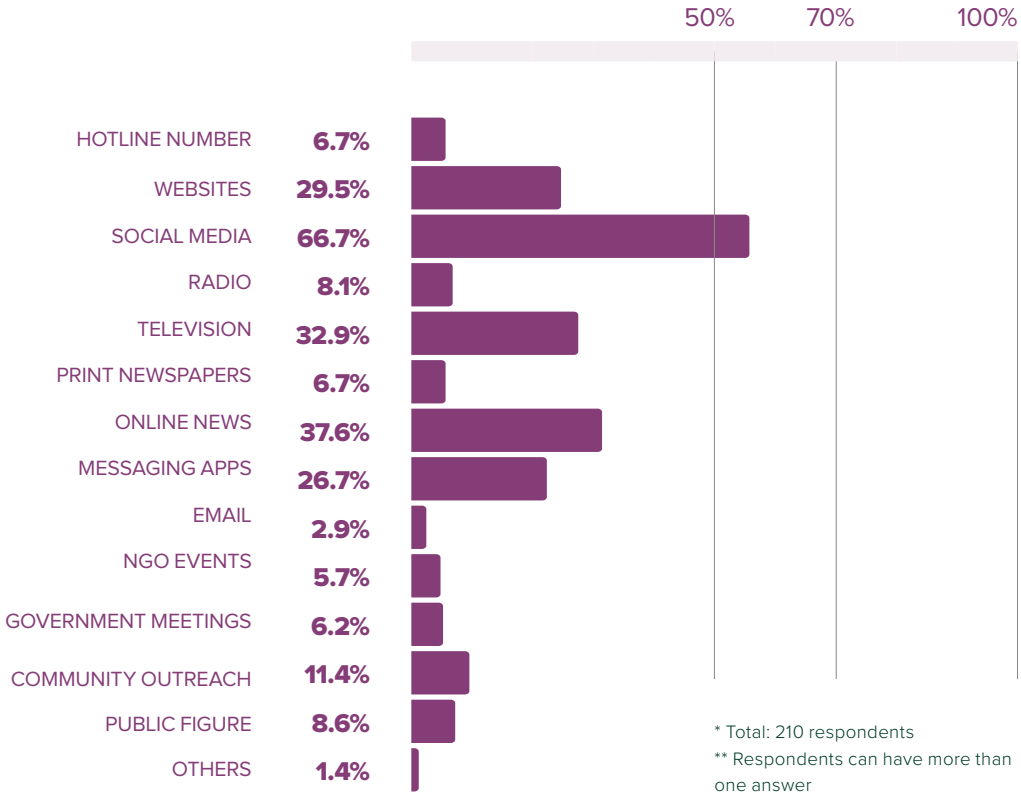
—Female, 34 years old, lecturer—

4.3. Preferred Information Transmission Method

There is no single most preferred or effective method in relaying information on air pollution. During the FGD session, some participants stated that they want to receive direct information without having to access certain sites or applications, for example through SMS blasts when passing through an area, or advertisements on television and billboards. In addition, the FGD participants also hoped that there would be direct outreach to communities, especially in densely populated areas in Jakarta. They believe that direct interaction with experts might have more impact on communities.

When asked which method is considered the most effective way to reach people, most respondents mentioned social media (66.7%), followed by online news (37%). Although considered effective, the number of respondents who trust those two mediums is low. This will be discussed further in the chapter "Information Dynamics".

WHAT PLATFORM DO YOU THINK MOST EFFECTIVE TO DISTRIBUTE INFORMATION ON AIR QUALITY?



4.4. Challenges in Accessing Information on Air Pollution

The most significant challenge to accessing information on air pollution is the lack of knowledge on information sources (57.4%). Some of the FGD participants say that they are familiar enough to look for information related to weather forecasts, but that is not the case for information on air quality. Some of the FGD participants said they do not know where to look for information on air pollution and they do not know which institutions measure and share the information relating to air pollution. In addition, difficulty in understanding information (19.1%) is also considered to be an obstacle—how to read air quality indicators, for example. The air quality indicators are mostly just numbers and people do not understand which number indicates good or bad air quality.

During the FGDs when we first talk about air quality or pollution, participants from lower socio-economic backgrounds tend to talk about the hot temperature in Jakarta instead of the air quality.

In general, people rarely receive or read information on air quality. They know where to get weather information (day temperature, rain) because it is readily available on their phone and they know the official institution that measures temperature (BMKG) and therefore can check in the institution's website or social media. However they do not know where to get air pollution information.

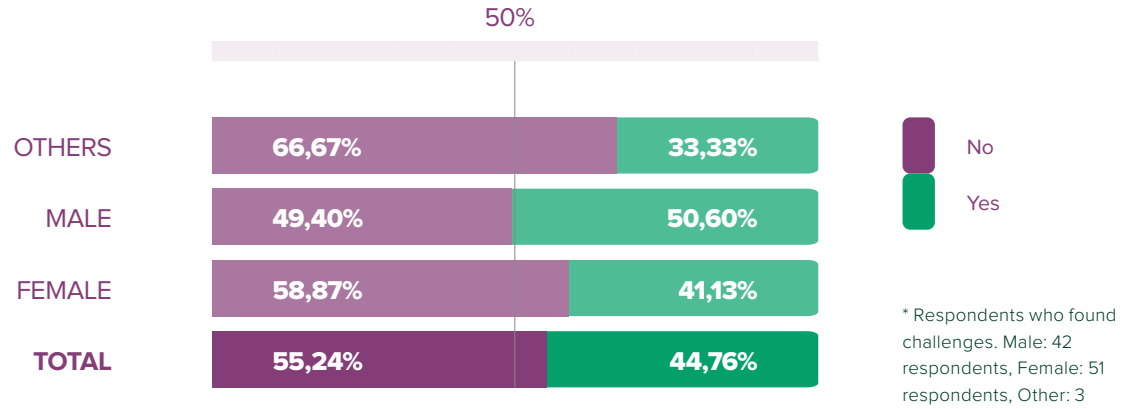
Some of the FGD participants who know where to look for air quality information are mostly tech-savvy youth from upper-middle class backgrounds who use social media. This section of population, mentioned that they come across air pollution or air quality information from social media and an application called AirVisual. This AirVisual application is only available in English, therefore it is mostly used by people from upper-middle class with access to English language education and not accessible by people from lower class who are not familiar with English language.

The FGD participants mentioned that they come **across information on air pollution in social media or television** *"by accident" instead of actively looking for the information. Most of the FGD participants, even the members from most affluent*

class do not look for air quality information on daily basis but only when they feel that the pollution is worse than usual and want to find out the causes.

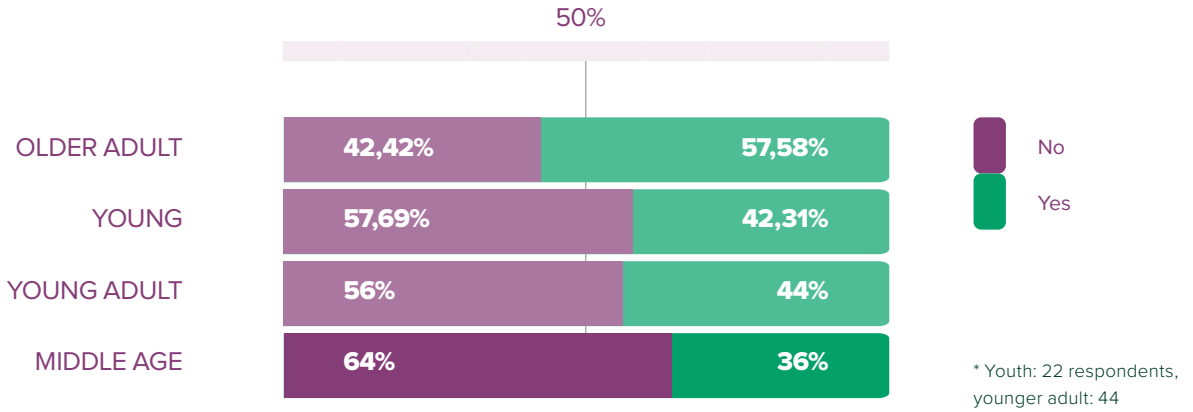
Older adults reported more challenges in obtaining air pollution data than younger population cohorts. Women and men do not seem to differ in access to information.

HAVE YOU EVER ENCOUNTERED CHALLENGES IN OBTAINING INFORMATION ON AIR POLLUTION? (BASED ON GENDER)



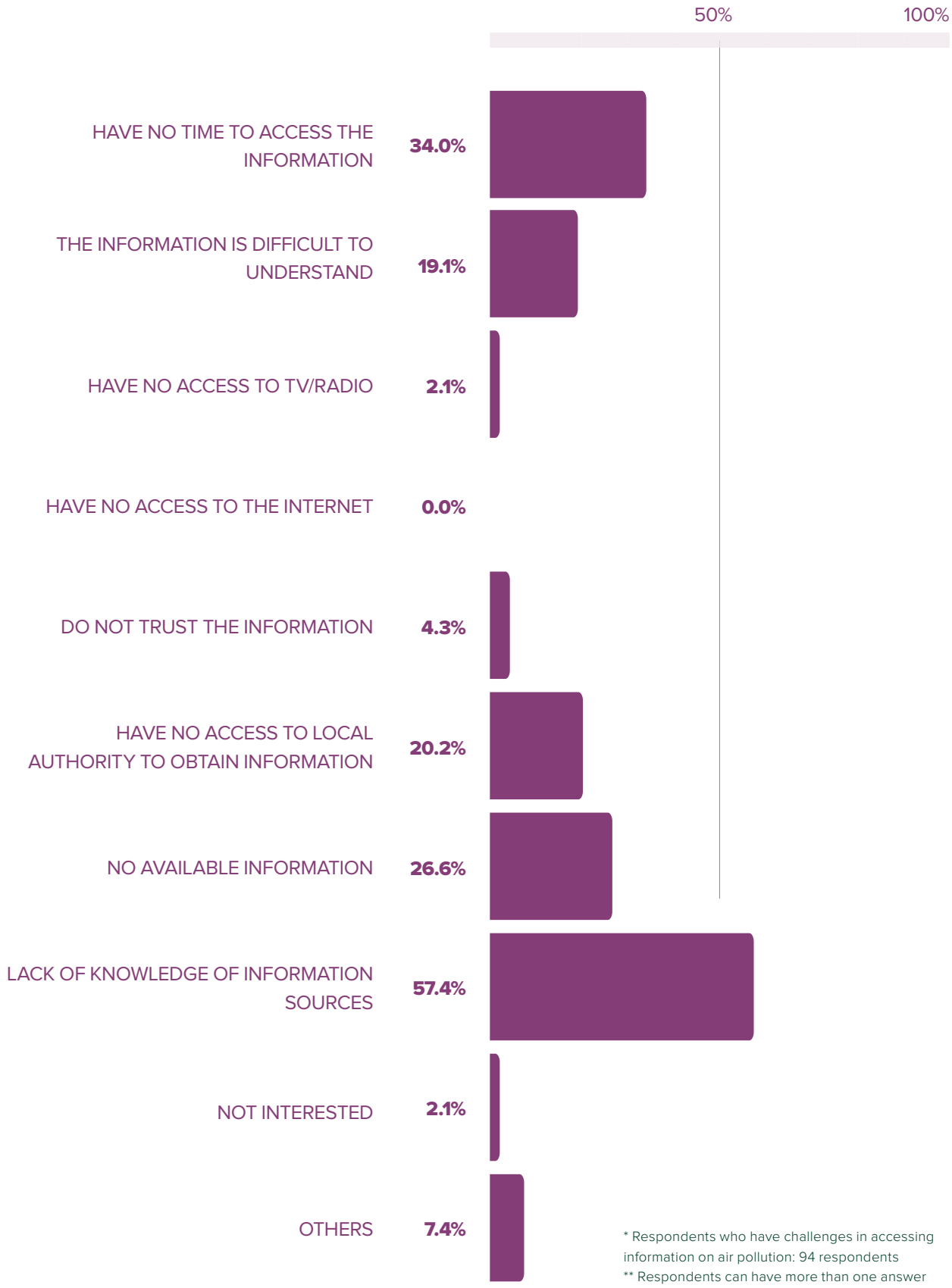
* Respondents who found challenges. Male: 42 respondents, Female: 51 respondents, Other: 3 respondents. Total: 210 respondents

HAVE YOU EVER ENCOUNTERED CHALLENGES IN OBTAINING INFORMATION ON AIR POLLUTION? (BASED ON AGE GROUPS)



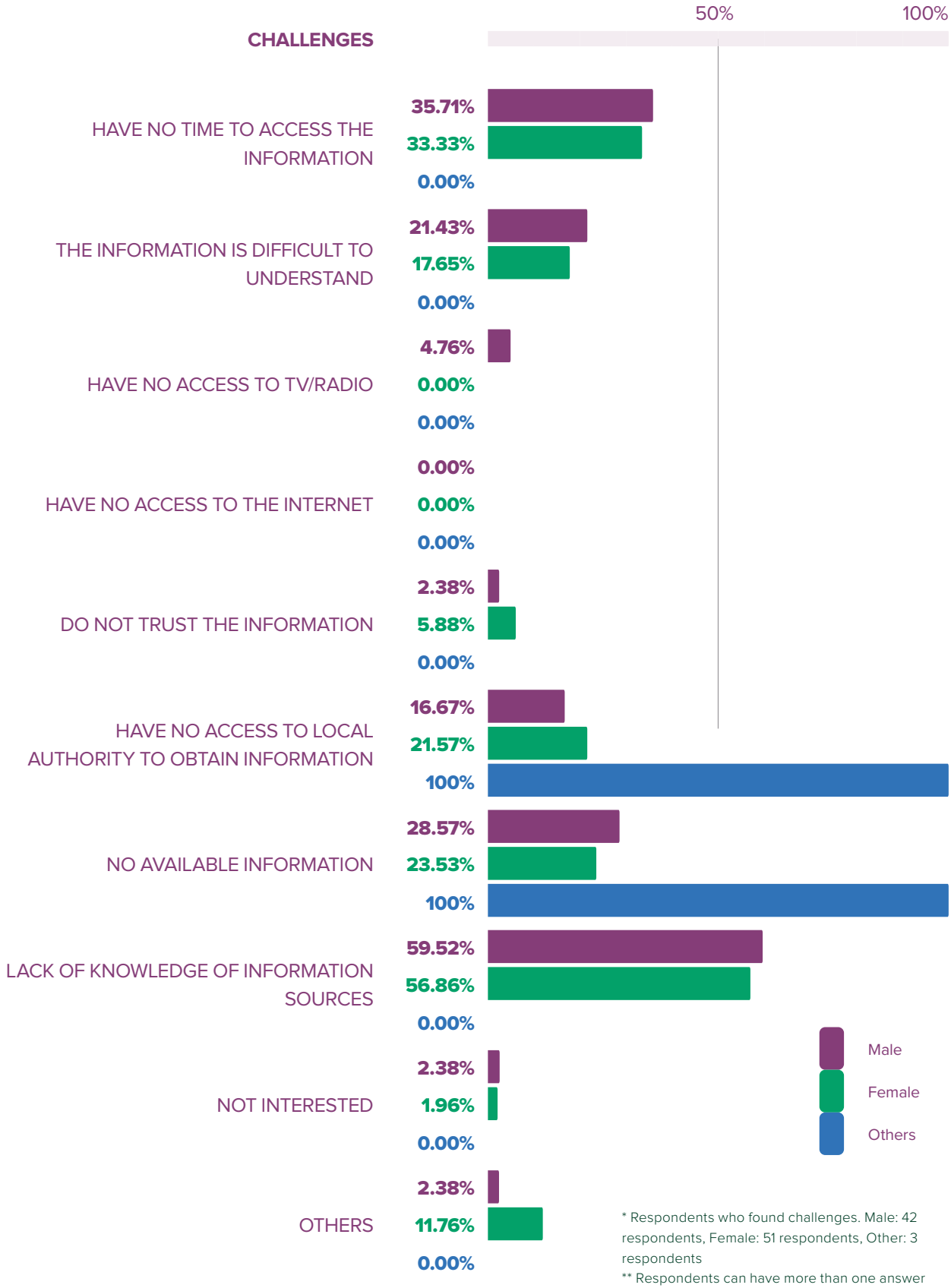
* Youth: 22 respondents, younger adult: 44 respondents, middle age: 9 respondents, older adult: 19 respondents. Total: 210 respondents.

WHAT ARE THE CHALLENGES YOU FACE IN OBTAINING INFORMATION ON AIR POLLUTION?



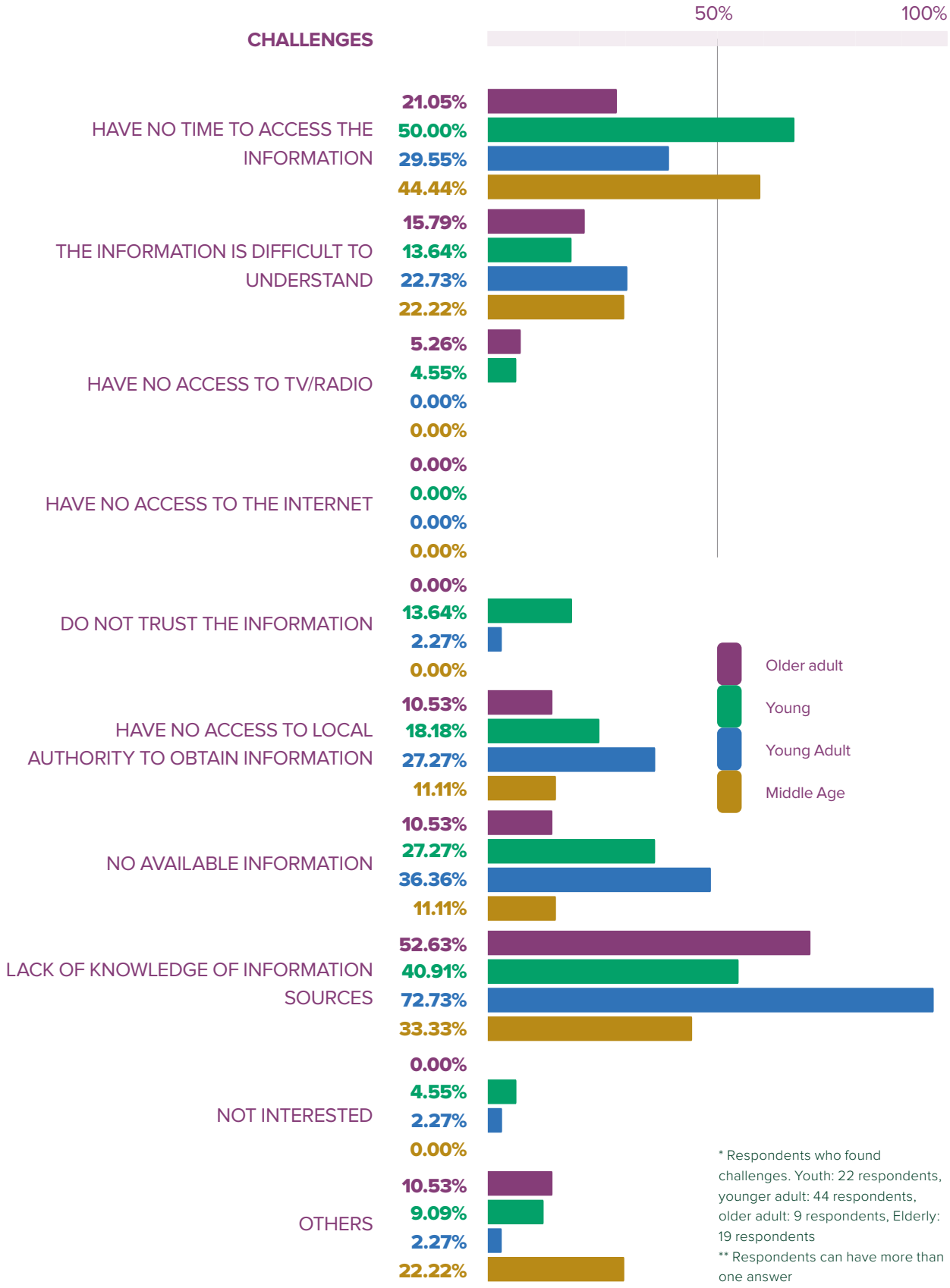
* Respondents who have challenges in accessing information on air pollution: 94 respondents
** Respondents can have more than one answer

CHALLENGES IN OBTAINING INFORMATION ON AIR POLLUTION, BASED ON GENDER



* Respondents who found challenges. Male: 42 respondents, Female: 51 respondents, Other: 3 respondents
** Respondents can have more than one answer

CHALLENGES IN OBTAINING INFORMATION ON AIR POLLUTION, BASED ON AGE GROUP



* Respondents who found challenges. Youth: 22 respondents, younger adult: 44 respondents, older adult: 9 respondents, Elderly: 19 respondents

** Respondents can have more than one answer

QUOTES 3

"The danger of pollution is that a lot of poor people are affected by this, because they can't have access to information. The information doesn't reach the grassroots. We must remember that not all poor people have cell phones or smartphones, which can access information and so on. There are still residents who don't have a TV so they can't access news about the dangers of air pollution."

—Housewife, 52 years old—

Middle- to lower-income respondents have more basic challenges, namely the availability of equipment and access. One of the FGD participants stated, for example, that her neighbor only has one cell phone that is used interchangeably by the entire family. Some participants stated that their access is limited by internet data quotas, and that this becomes a bigger problem if all the available information is presented through video formats that require large internet data. During FGD with communities from middle-to lower-income, they expressed concerns on their access to information.

QUOTES 4

"There are some so-called vulnerable people, such as people with disabilities or the elderly. They don't have access to cellphones, so they must be given information directly, in my opinion, besides social media, YouTube, and so on. YouTube also uses up a large quota."

—Housewife, 52 years old—

One participant with a visual disability pointed out that most of the information is inaccessible for people with disabilities. He has difficulty when the information is presented in a graphic form that cannot be "read" by a screen reader.

QUOTES 5

"Personally I often found barriers when reading websites. There are no inclusive websites that allow me to use screen readers. Website accessibility is a huge issue for us disabled persons."

—Male, 19 years old, university student—

For people from lower-middle income backgrounds, they mentioned that they do not receive information regarding air pollution or air quality and usually rely on their own network for information. Possibly because of their limited access to information and limited capabilities, they expect the government to provide information to them directly instead of them having to find the information themselves. They often use the phrase "we don't receive any information about this" or "the information is not provided to us" to exhibit their challenges in accessing information relating to air pollution.

These communities usually rely on their own community network for information and further shares as well as cross checks information on their WhatsApp group.

4.5. Trust Factors

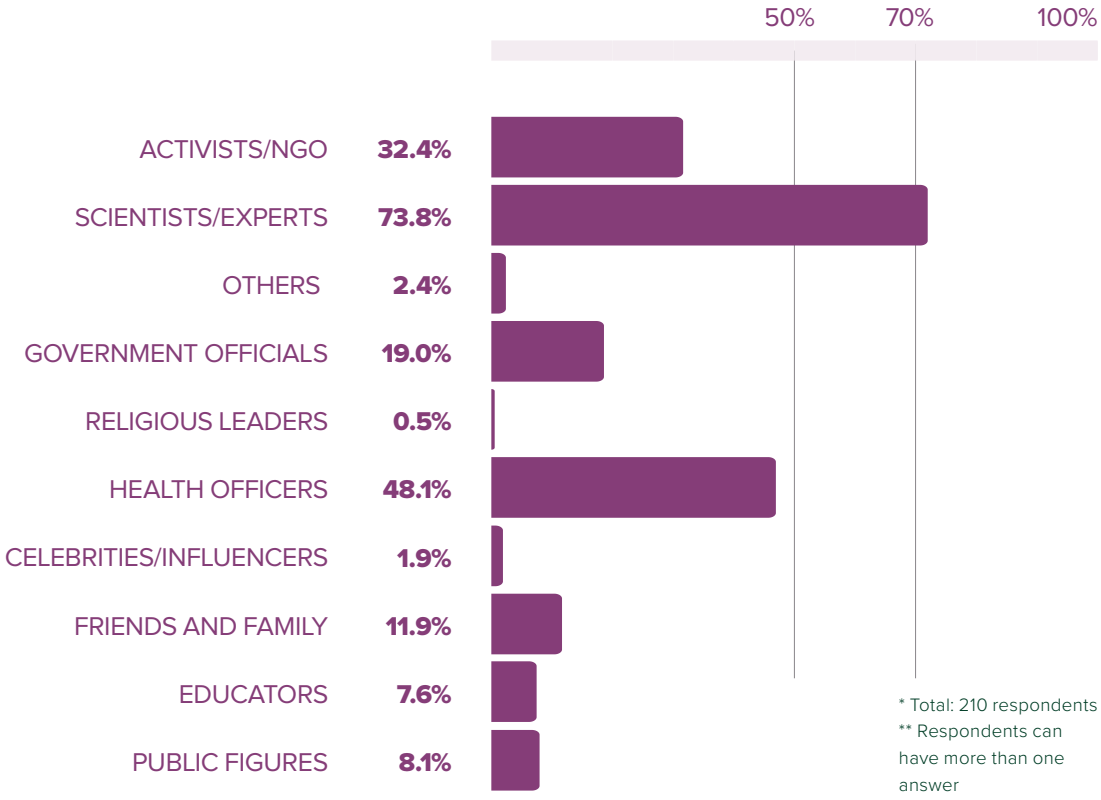
Our survey finds that scientists/experts (73.8%) and health workers (48.1%) are the most trusted sources on air quality. Interestingly, more respondents trusted NGO activists (32.4%) than government officials (19%). The survey also shows that very low trust is placed with religious leaders (0.5%) and celebrities/influencers (1.9%).

In Indonesian society, majority of people do not have access to higher-level of education. Therefore, people with degrees and expertise such as scientists are highly respected by the general Indonesian public and they are seen as a trusted source of information. Scientists and experts are often featured in the news to share their opinions on a particular issue or they use social media to share their expertise and opinions.

As for why people have low trust in religious leaders is because even though they are usually seen as expert and respected by the public, in recent years there are many cases in Indonesia where religious leaders are politicized and share biased information for political reasons, therefore public perception on religious leaders had shifted and they are not seen as a trustworthy source of information anymore. Similarly, for celebrities or influencers, the level of trust from the general public varied according to which celebrities or influencers. Celebrities or influencers are often seen as people

who only look for sensations and publicities and therefore cannot be trusted as a source of information, especially in a field in which they are not an expert.

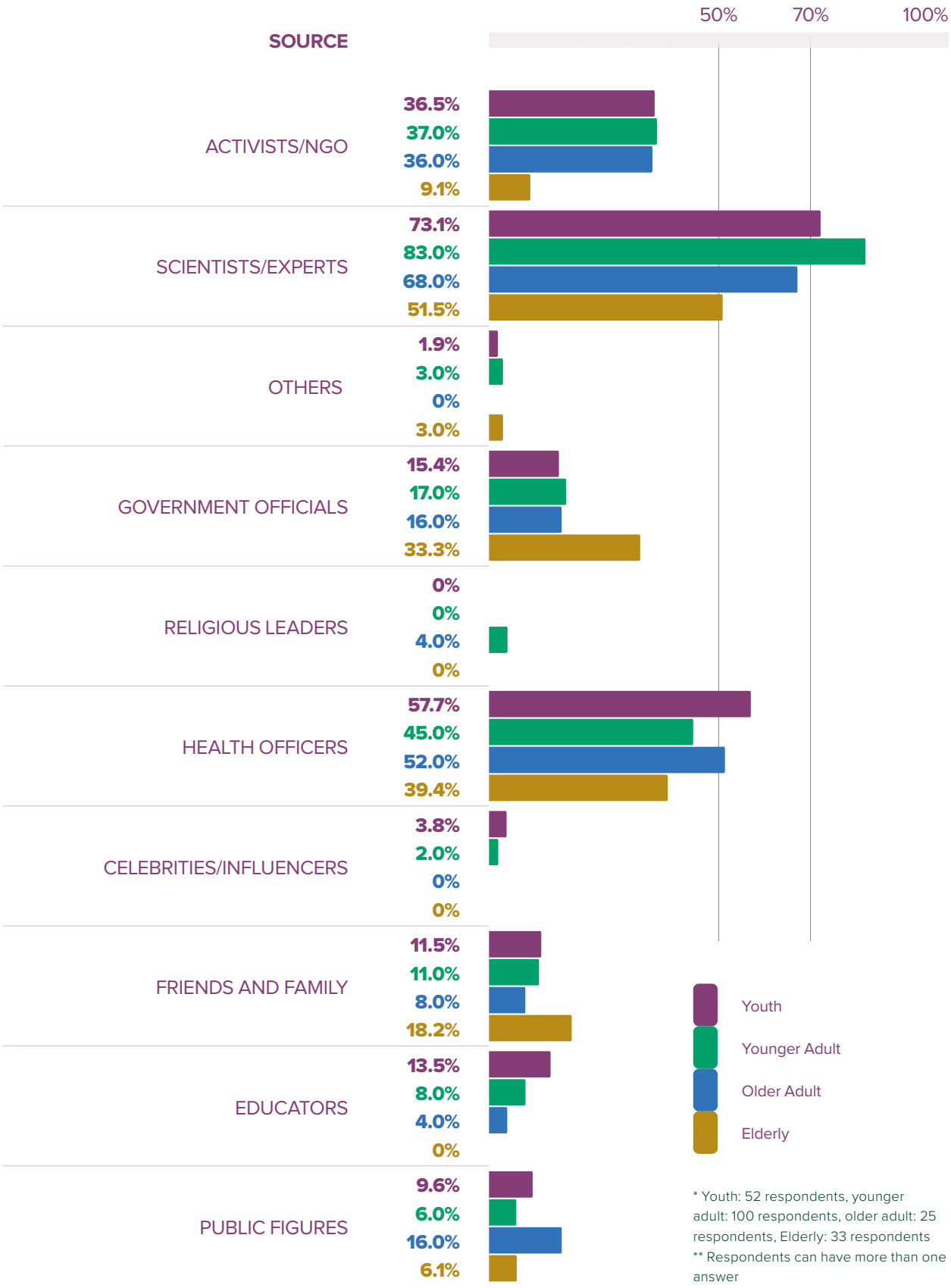
WHICH SOURCES DO YOU TRUST THE MOST IN OBTAINING INFORMATION ON AIR QUALITY?



While gender variables do not predict the respondents' trust, there is significant variation in age variables. There are more older adults who trust government officials, friends, and family than any other age group. In contrast, the older adult age group places less trust on NGO activists than other age groups.

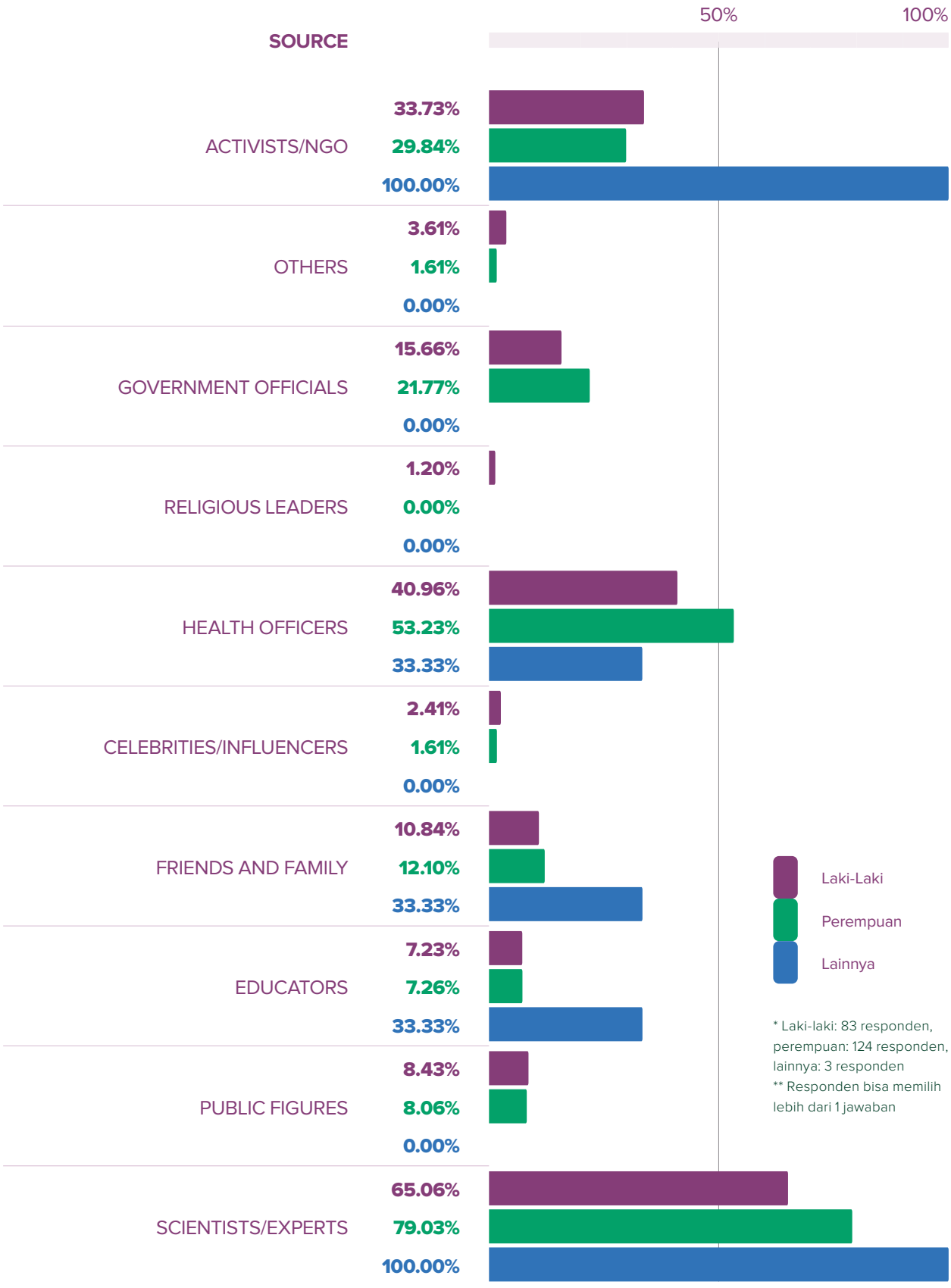
In terms of mediums of information, most respondents put their trust in sites or applications dedicated to presenting information on air quality, such as AirVisual (63.3%). Although social media and online media are effective mediums for disseminating air pollution information—see table "What Platform Do You Think Most Effective to Distribute Information on Air Quality?" on page 37—the number of respondents who trust both mediums is relatively moderate: 20% for social media, and 23.3% for online media.

MOST TRUSTED INFORMATION SOURCES ON AIR QUALITY, BASED ON AGE GROUPS

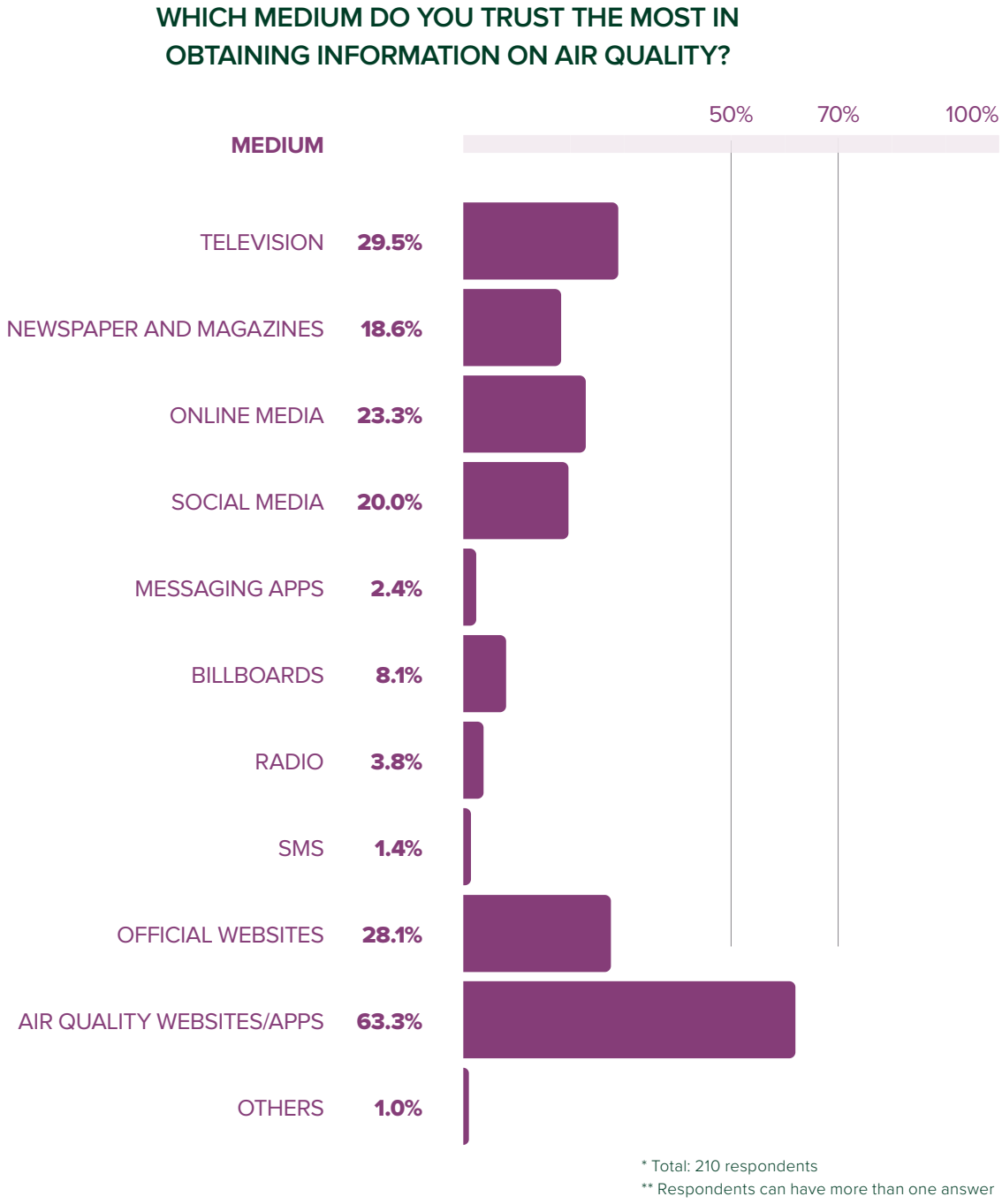


* Youth: 52 respondents, younger adult: 100 respondents, older adult: 25 respondents, Elderly: 33 respondents
** Respondents can have more than one answer

MOST TRUSTED INFORMATION SOURCES ON AIR QUALITY, BASED ON GENDER

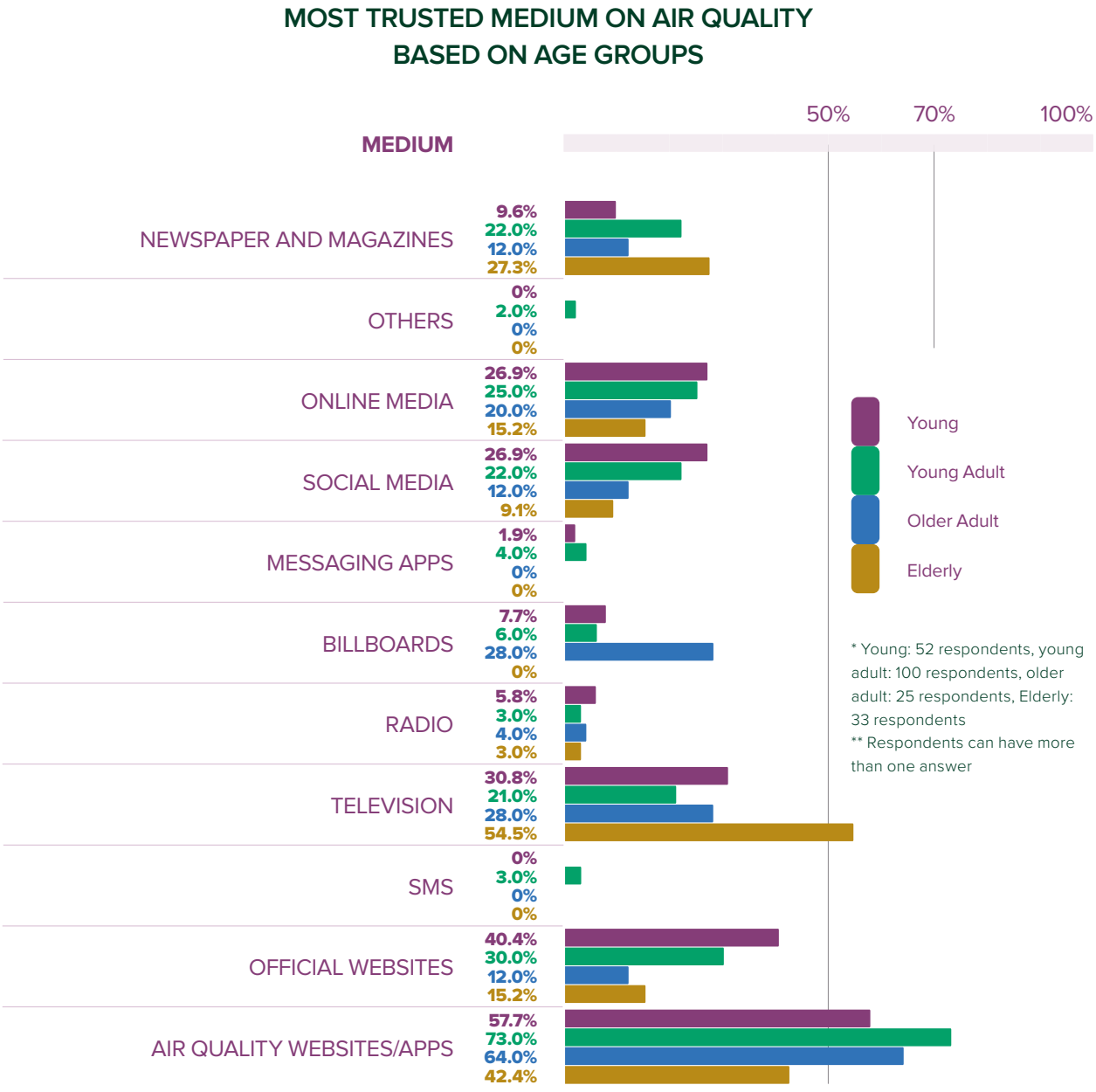


* Laki-laki: 83 responden, perempuan: 124 responden, lainnya: 3 responden
** Responden bisa memilih lebih dari 1 jawaban

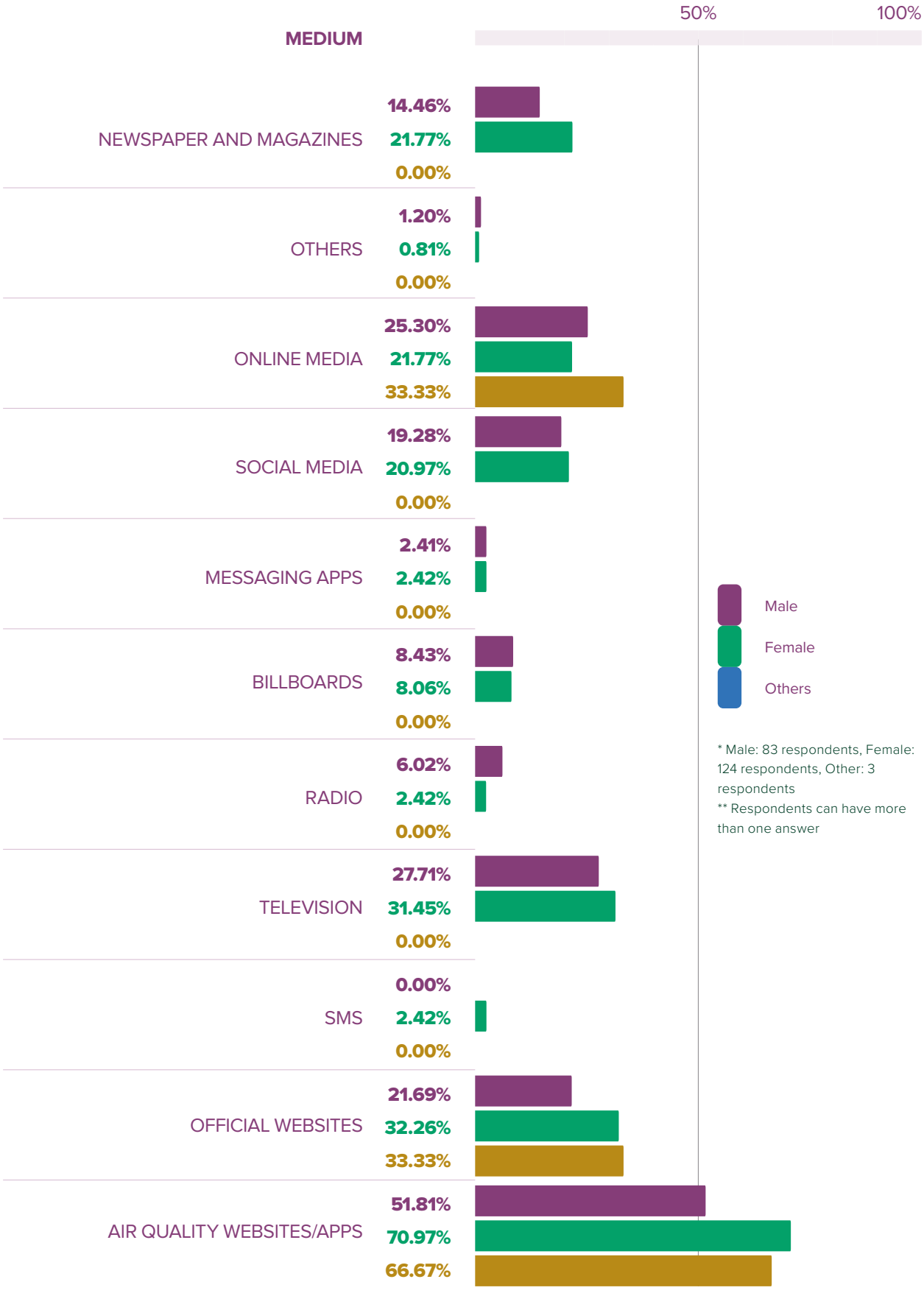


The older adults tended to place trust on newspapers/magazines (27.3%) and television (54.5%), while trust on government websites was more prevalent among the youth. Older adults have significantly higher trust in billboards than other age groups. These findings show that each age group has a unique trusted medium, and that any air quality campaigns need to consider different approaches for specific age groups.

Trust on official websites (32.26%) and air quality websites/apps (70.97%) is significantly more prevalent among females than males (21.69% and 51.81% respectively).



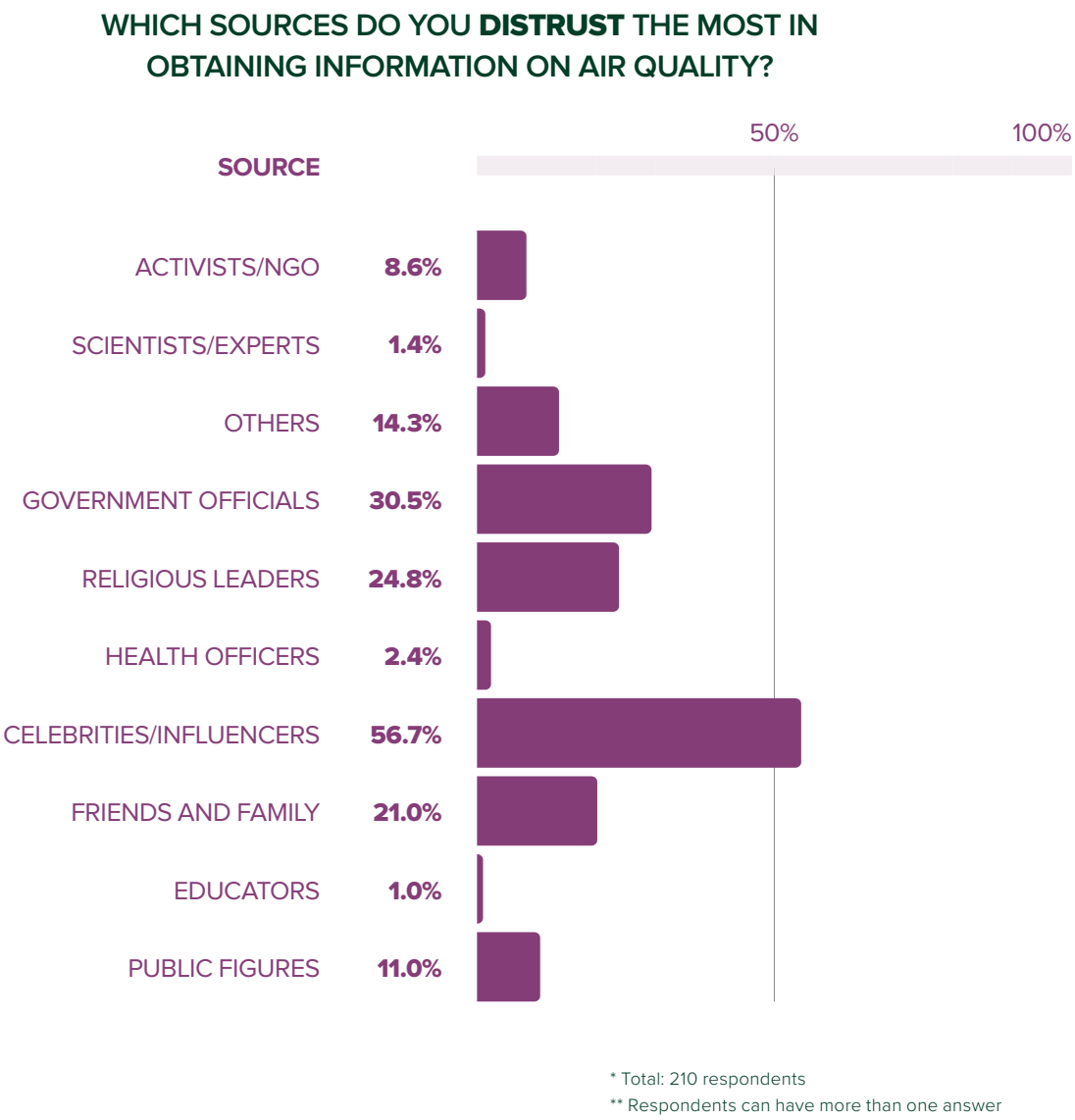
MOST TRUSTED MEDIUM ON AIR QUALITY BASED ON GENDER



* Male: 83 respondents, Female: 124 respondents, Other: 3 respondents
** Respondents can have more than one answer

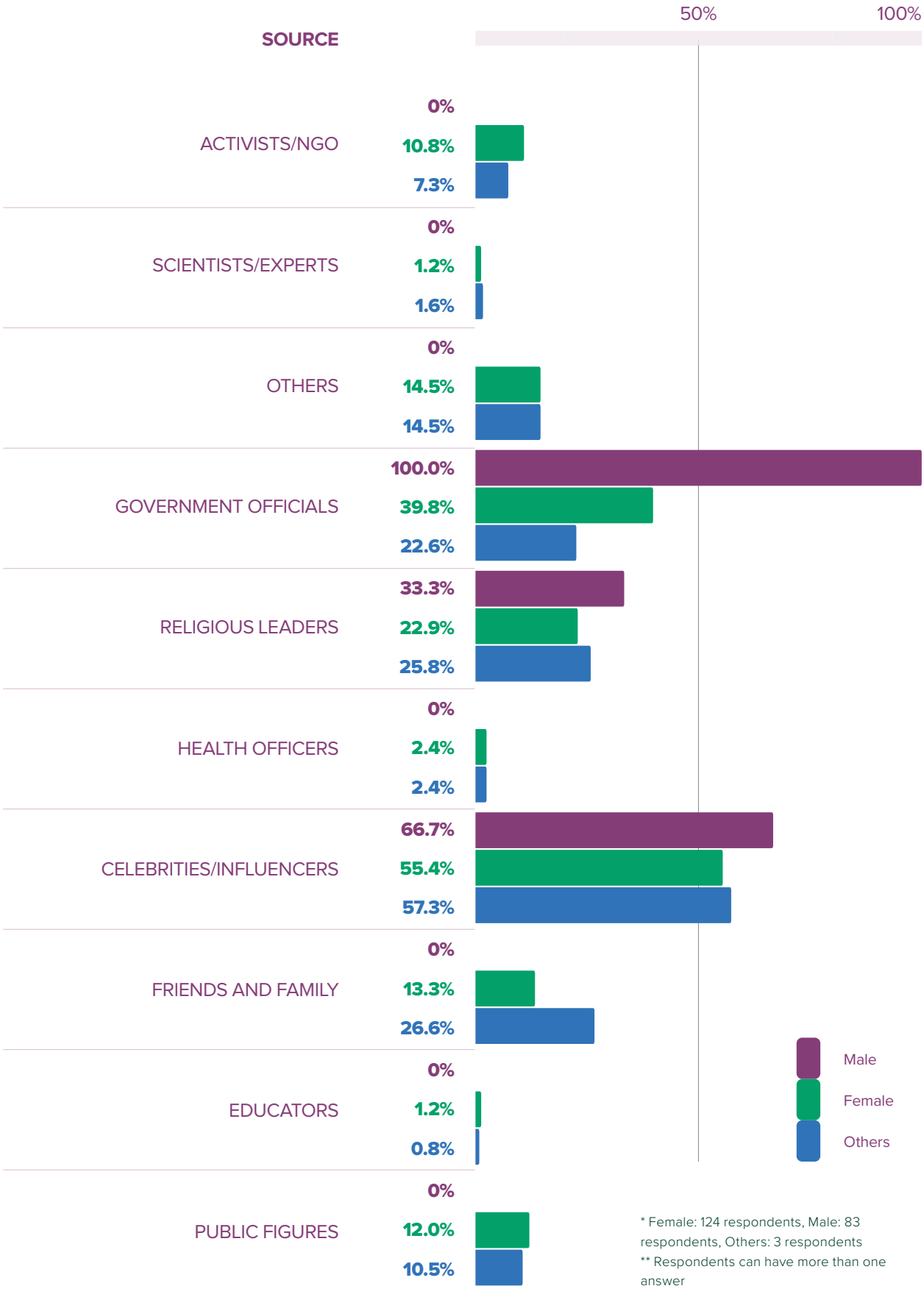
Our findings on the factors of *dis*trust are consistent with the factors of trust. In terms of sources, the prevalence of distrust for celebrities/influencers (56.7%), government officials (30.5%) and religious leaders (24.8%) is high. More female respondents (26.6%) tended to distrust friends/relatives compared to male respondents (13.3%), while men (39.8%) were more likely to distrust government officials than women (22.6%).

Age variables have no visible correlation of distrust on information sources.

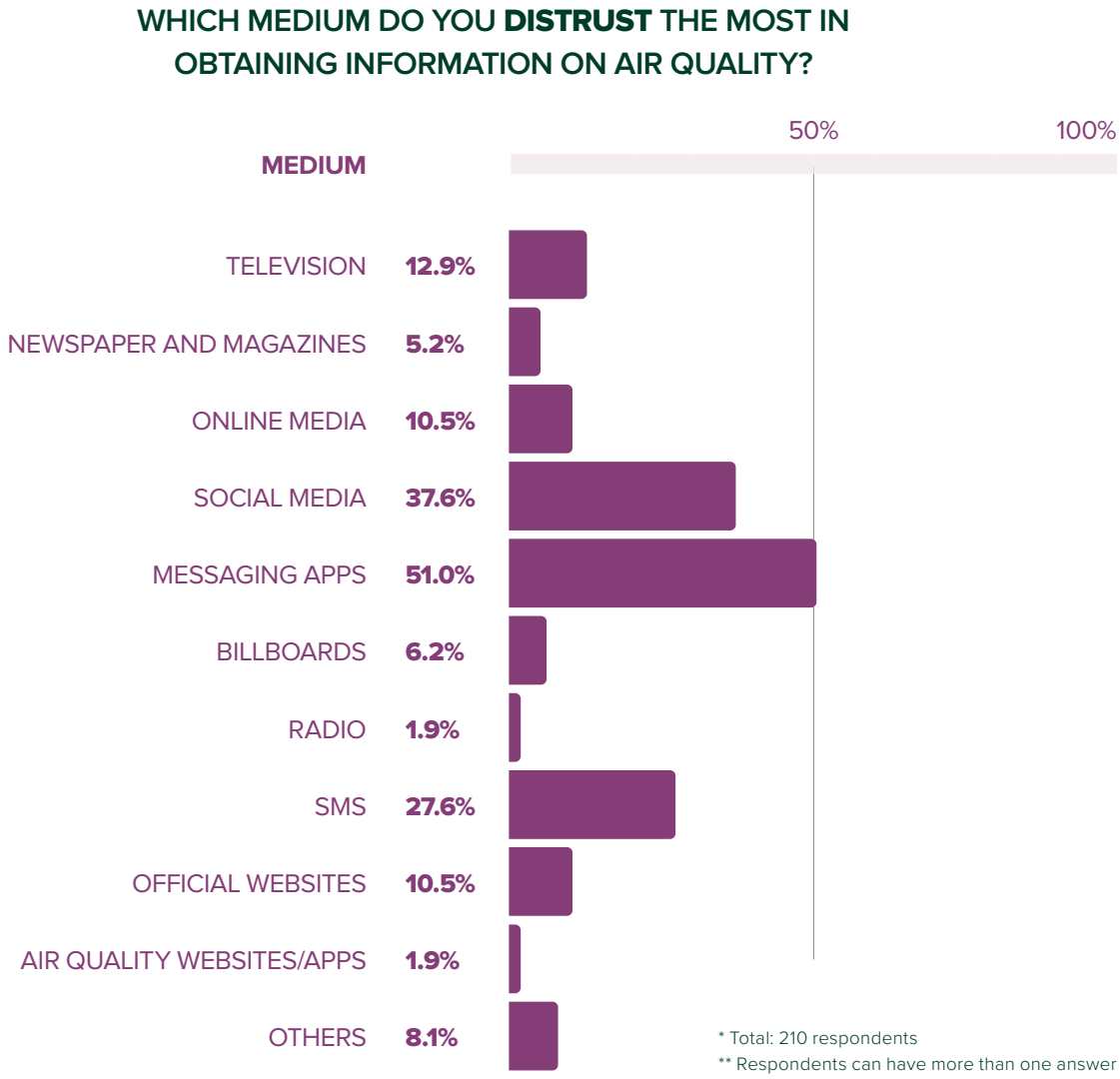


* Total: 210 respondents
** Respondents can have more than one answer

MOST **UNTRUSTED** INFORMATION SOURCES BASED ON GENDER



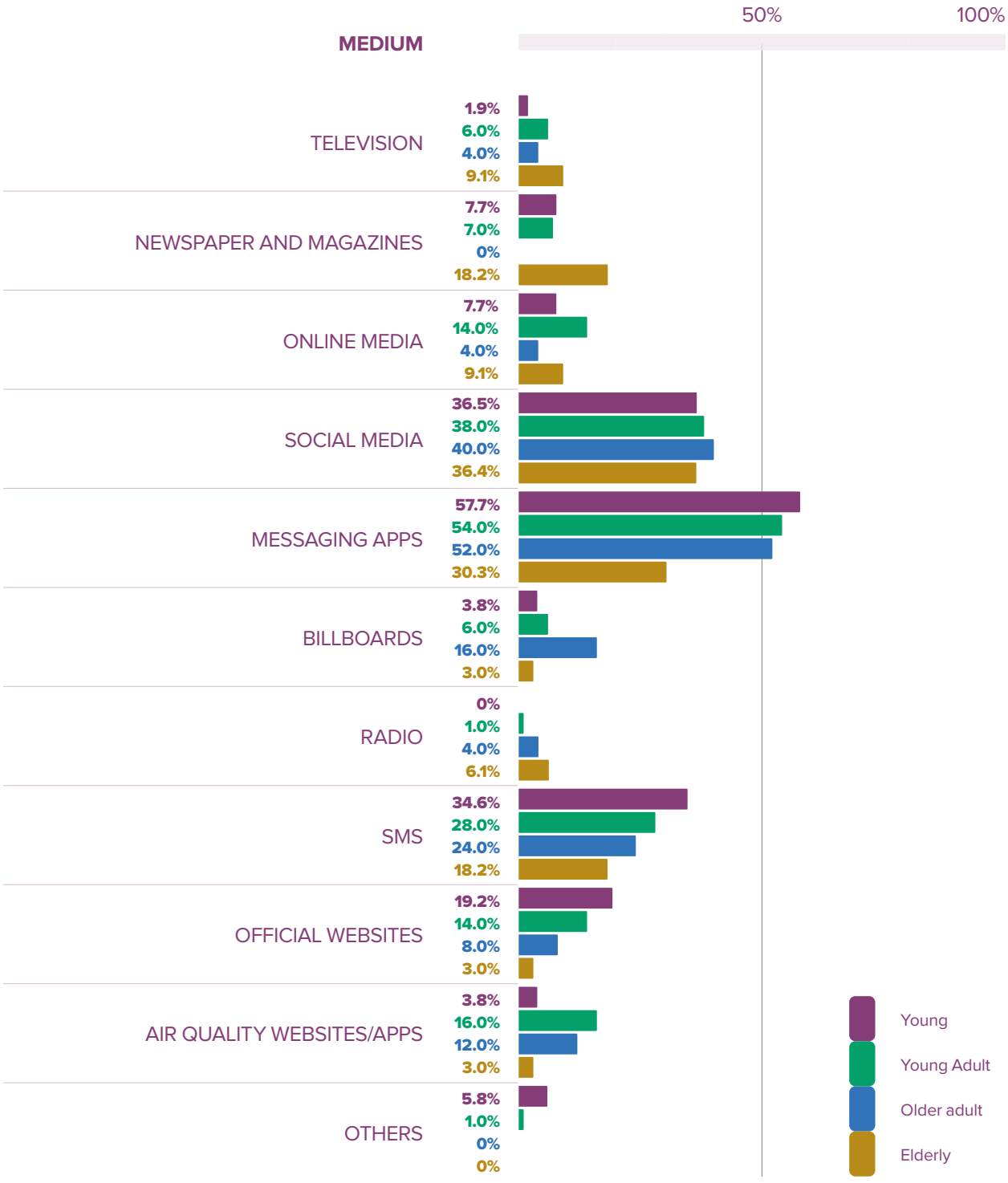
* Female: 124 respondents, Male: 83 respondents, Others: 3 respondents
** Respondents can have more than one answer



Messaging apps (51%), and social media (37.6%) are the two most distrusted mediums in obtaining information on air quality. The number of respondents who trust SMS progressively decreases with age. In other words, the younger the age group, the more distrust is placed on SMS. Elderly respondents tended to have less distrust towards messaging apps compared to other age categories, although it is still relatively large (22.20%). The prevalence of distrust on government websites is higher among younger and middle ages compared to other age categories.

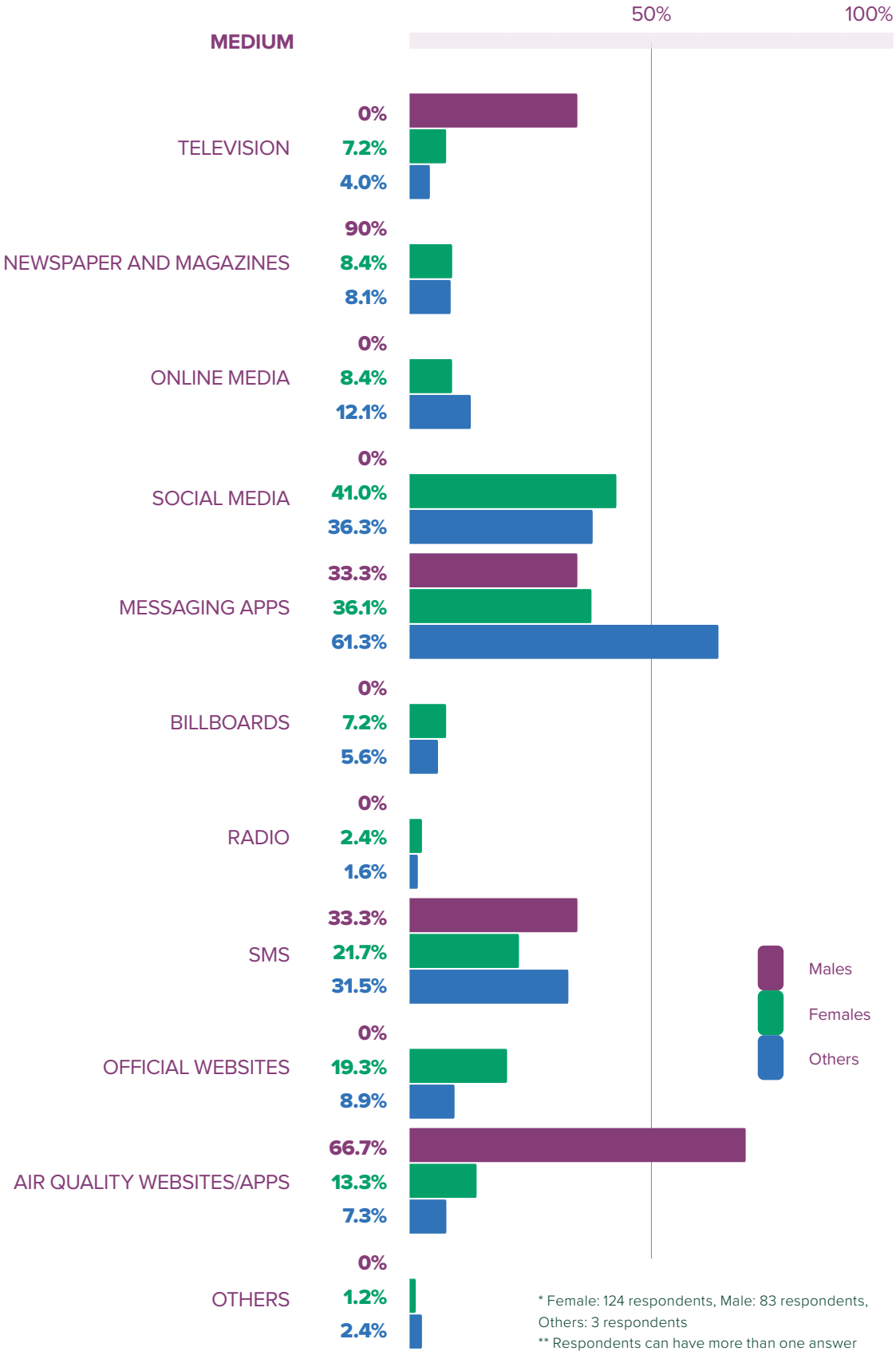
Meanwhile, a significant variation across genders is found in distrust towards messaging apps, with a higher prevalence of distrust among women compared to men, which is inversely proportional to the greater tendency of men to distrust SMS.

MEDIUM YANG TIDAK DIPERCAYA BERDASARKAN USIA



* Youth: 52 respondents, young adult: 100 respondents, older adult: 25 respondents, Elderly: 33 respondents
** Respondents can have more than one answer

MOST **UNTRUSTED** INFORMATION SOURCES BASED ON GENDER



* Female: 124 respondents, Male: 83 respondents, Others: 3 respondents
** Respondents can have more than one answer

Based on these findings, the following points are important to note: 1) scientists/experts and healthcare professionals are the most trusted sources of information on air quality; 2) websites or applications on air quality are the most trusted information source mediums; 3) a person's age and gender affect the factors that determine trust, so it is important to adjust the communication strategy accordingly; and 4) there is a polarization of trust in social media and government officials, with the prevalence of trust and distrust being equally large. Further research is required to understand this polarization.

4.6. Information Impact

To what extent does the information a person receives change their perception and behavior? The answer to this is—of course—diverse, considering the myriad factors that contribute to it. More in-depth study needs to be taken to be able to provide a definitive answer, something that is outside the scope of this study. However, this study collects qualitative and anecdotal portraits of our research subjects' experience to illustrate this impact.

In general, many FGD participants admit that the information on air quality that they obtained did not drastically change their behavior. A respondent from the cycling community stated that he would not stop cycling despite knowing how bad Jakarta's air quality is, "Because cycling is fun, so I will keep doing it." Even so, he believes that information might influence someone to change their behavior, especially adaptive behavior such as finding a smaller road with fewer vehicles or wearing a mask.

Such sentiment represents the opinions of many other FGD participants who believe that information only influences minor changes. Some cyclists, for example, choose not to cycle for a while, while others choose to come home late at night when there are fewer vehicles on the road. Those who have sinusitis, for example, would wash their noses after being on the road. They realize that their attention to air quality issues is short-term and easily replaced by more pressing or trending issues.

Most respondents were aware of how their lifestyles contribute to the poor air quality in Jakarta. They noted, for example, that they are also guilty due to their

choice to use private vehicles instead of public transportation due to convenience and to avoid air pollution. Some of the participants from communities mentioned that they try to grow trees to improve air quality and reduce air pollution in the area where they live.

QUOTES 6

"I think immediate change in behavior is rare. Changes in mindset are more prevalent. I think, awareness comes first, until we experience the impact firsthand, and by then we will finally change our behavior."

—Female, 33 years old, lecturer—

4.7. Information Behavior and Practices

The practice of verifying and sharing a piece of information is commonly found (and advisable) in the digital ecosystem. The FGD session found that this was also the norm among the participants.

In the online *ojek* (motorcycle taxi) community for example, WhatsApp groups are often used as a platform to find and confirm the accuracy of information. They should "attach evidence by sending photos and sharing loc[ation]," said a female driver who responded to our question about what they usually do to verify information. The availability of visual materials such as photos is regarded as a crucial factor in deciding whether to trust information. In other words, *seeing is believing*.

A journalist states that she often observes air quality information when passing the AQMS in Gambir. She is curious about the published data which, after she compared it with the data from AirVisual, turned out to be different. "Not that I trust AirVisual more," she said. "It is just that I see dust and pollution everywhere in Jakarta. It is clearly visible, but the display [on AQMS billboards] claims that the air is 'healthy?'" This quote indicates that verification is taken if there is a discrepancy between information and their sensory prescription or experiences.

Another journalist shares the same sentiment towards AQMS in another area because the AQMS is not placed facing the road but facing a cemetery in the area, thus making him doubt the accuracy of information displayed on the AQMS and the accuracy of official information from the government. The respondents from the journalist community are the ones who voiced their lack of trust in information from the government. They also mentioned that back in 2019 when people shared information from AirVisual, the government kept denying the poor air quality in Jakarta.

On a different note, the respondents correlate the practice of information sharing with the usefulness of the information. One participant stated that he tends to consume information privately. However, if the information affects his community—the weather forecast, for example—he will share the information via WhatsApp groups.

Another opinion came from a student who believes that social media culture encourages him to share information through the story feature on Instagram. The student seemed to trust Greenpeace, stating that he would re-share information on air pollution if it came from that organization. "That's for sure," he said. "I will share it on the [Instagram] story or the feed." He is aware that what he shares does not reach many people, but he hopes that at least his circle of friends will know that the air quality in Jakarta is deteriorating. In this case, the credibility and reputation of the informant was the determining factor for someone to share information.

ANNEX 5:
Perception and Knowledge of Air Pollution

5.1. Perception of Air Quality

In general, the respondents consider air quality as important in their day-to-day life. This applies, for example, to those who have respiratory disease, use certain types of vehicles like motorcycles and bicycles, or people like journalists and motorcycle taxi drivers who work mostly outdoors. This kind of attitude is found in almost all age groups, occupations, and genders.

But for those who are facing more basic problems—such as the threat of losing their homes in slums—air quality is not the main thing in life, which forces them to be "friendly" with dirty air. This attitude was repeatedly voiced by FGD participants from diverse backgrounds. An *ojek* (motorcycle taxi) driver, who lives in a densely populated residential area, told us that he would not stop working as a driver even though he knows that the air is dirty. "If I don't take a taxi, the plates will be flying at me," he said, using "flying plates" as a metaphor for an "angry wife."

In general, 44.3% of respondents rated Jakarta's air quality as "moderate." Meanwhile, 15.3% of respondents stated that air pollution had a "very low" and "low" impact on their lives. There were 31% of respondents who considered the impact of air pollution as "moderate." These figures are interesting, as well as worrying, given how poor Jakarta's air quality is. To quote Agus Dwi Susanto, Chairman of the Indonesian Lung Doctors Association: "Actually, people who have been exposed to

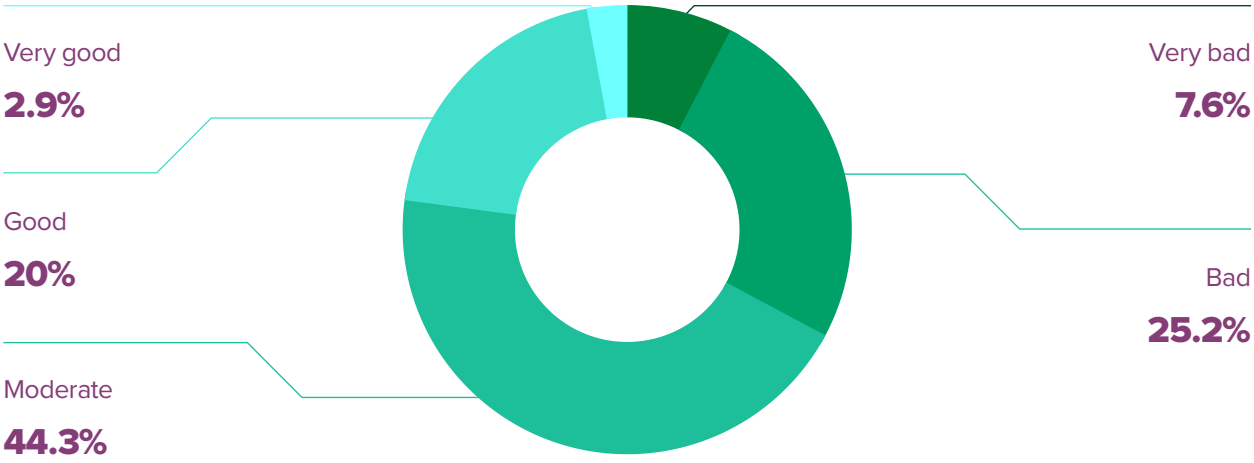
pollution often feel the impact, although sometimes they are ignored or not regarded as a serious matter" (Arumningtyas, 2020).

QUOTES 7

"For me personally, the impact (of air pollution) is pretty obvious after a trip from out of Jakarta. I always need to adjust myself; I always cough and have trouble breathing."

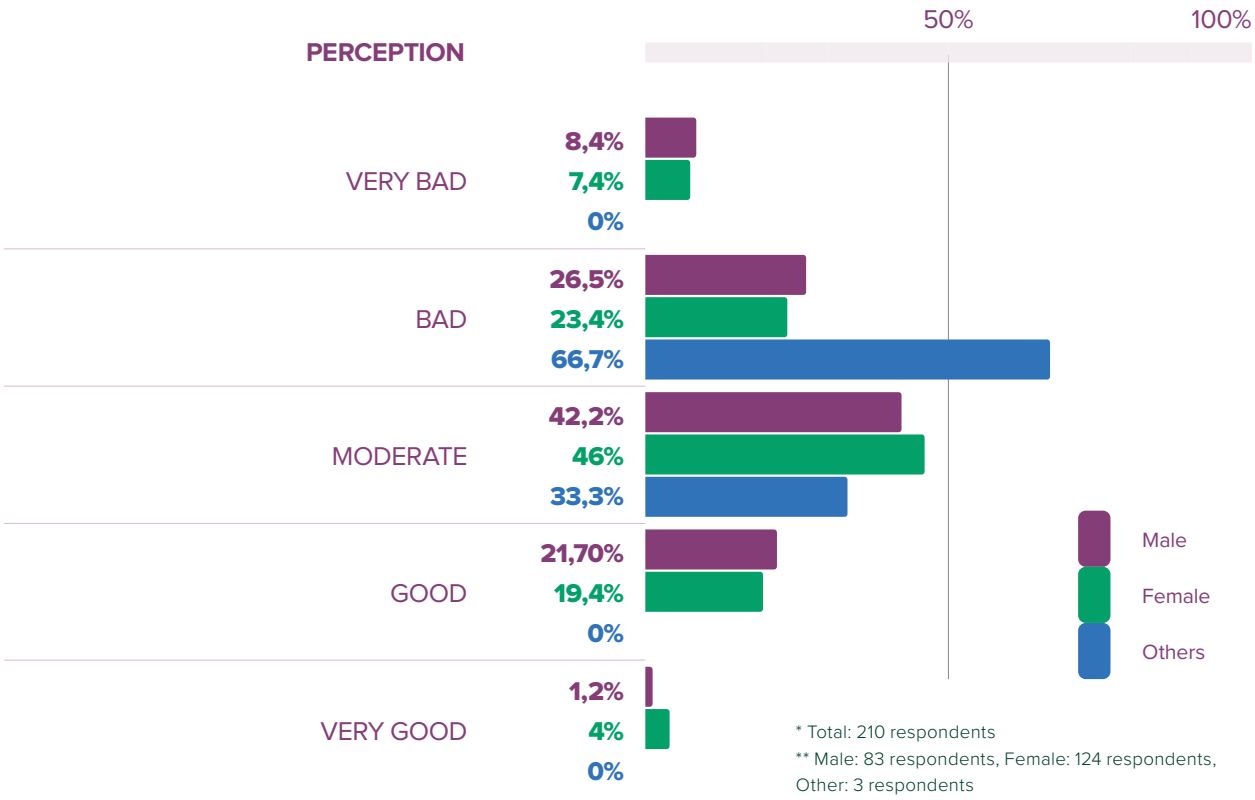
—Working women, 33 years old—

WHAT DO YOU THINK OF THE AIR QUALITY IN YOUR LIVING ENVIRONMENT?



* Total: 210 respondents

PERCEPTION OF AIR QUALITY, BASED ON GENDER

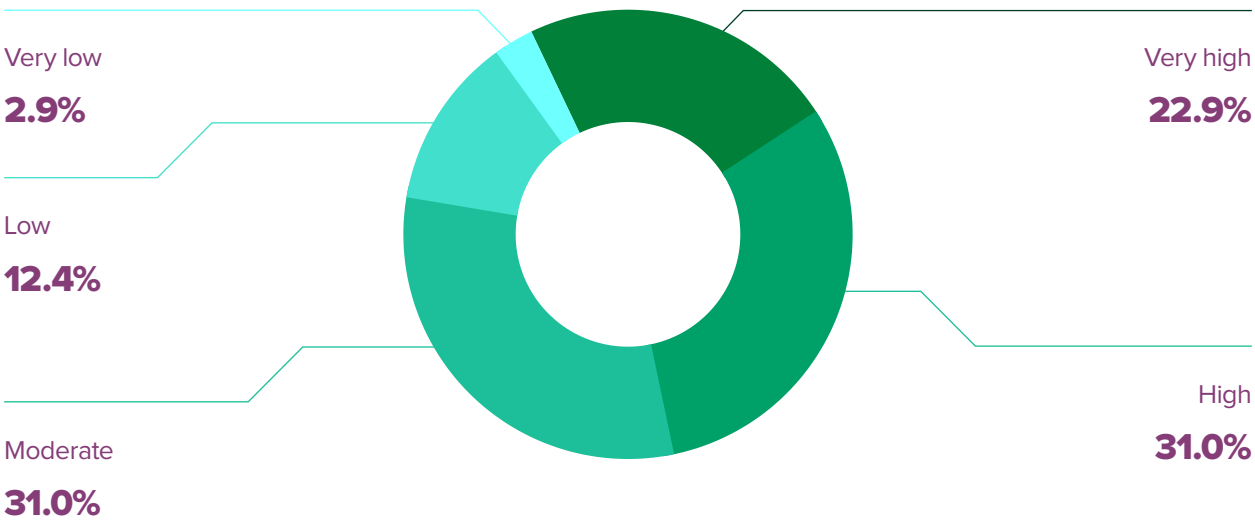


* Total: 210 respondents
** Male: 83 respondents, Female: 124 respondents, Other: 3 respondents

The respondents who live in North Jakarta tend to have negative sentiment towards air quality. According to the Ministry of Environment and Forestry, North Jakarta was indeed the most polluted city in Indonesia in 2015. This is because the area has been home to a stream of heavy traffic accessing the airport and the port. This finding indicates that respondents' perception of air quality might have a correlation with the area in which they live. There do not appear to be gender variations in the perception of air quality.

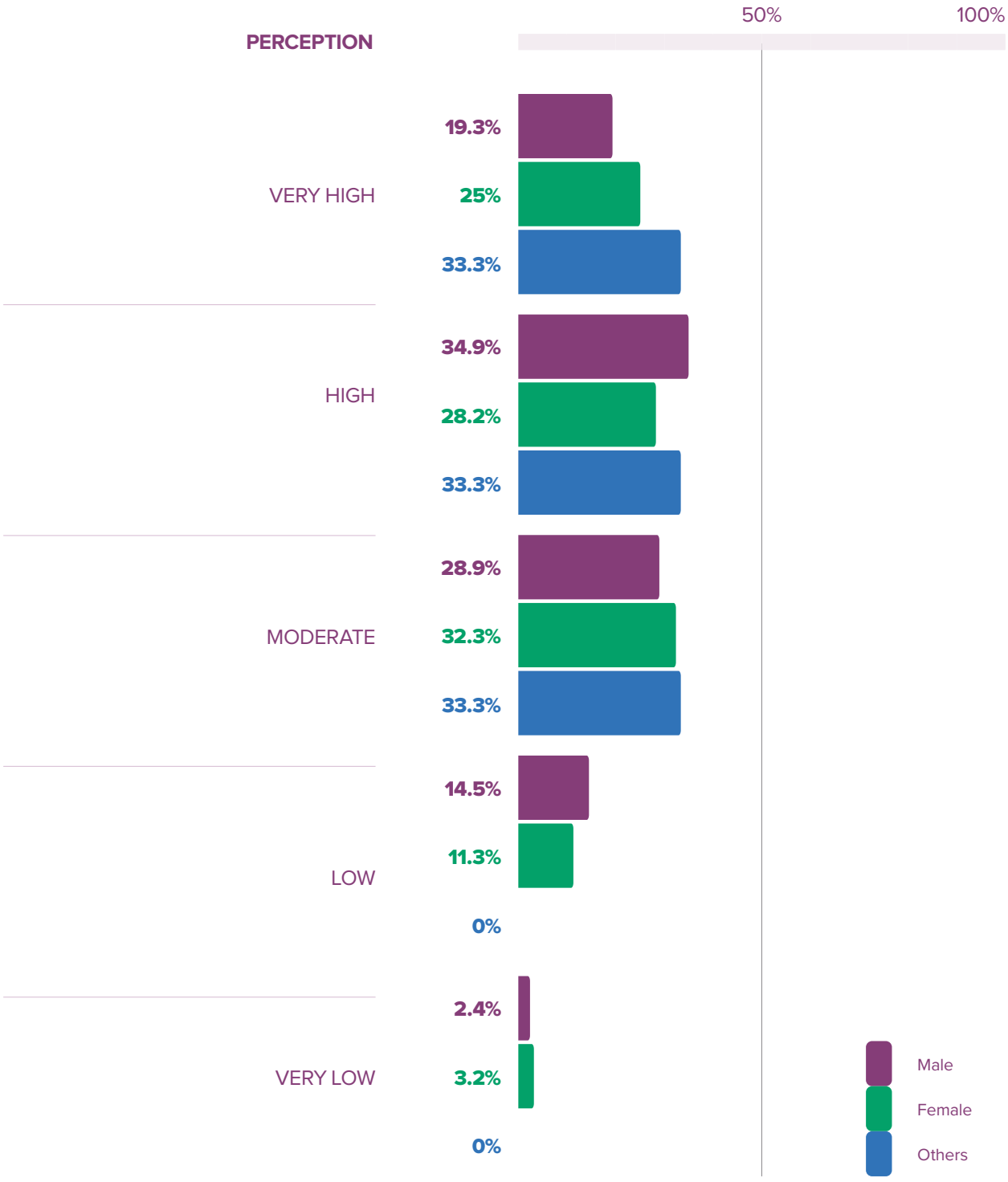
Several respondents stated that they give little attention to the poor air quality because they think the impacts are not visible and direct. Only those experiencing the direct impact of air pollution tend to have a negative attitude towards air quality in Jakarta. A respondent complained that the deteriorating air quality due to the construction of a toll road near her child's school might have caused the child to fall ill more frequently. In response, the school now urges students to wear masks to school. Similarly, a female motorcycle taxi driver explains the dirty air in Jakarta through her daily experience: "I went out with a clean [face], and I got home dirty," she said. "Even if you wear a mask, the inside of your nostrils still feels dirty and sore. If we don't wear glasses, our eyes will get dirty, red, irritated."

HOW MUCH IMPACT AIR POLLUTION HAS ON YOUR LIFE?



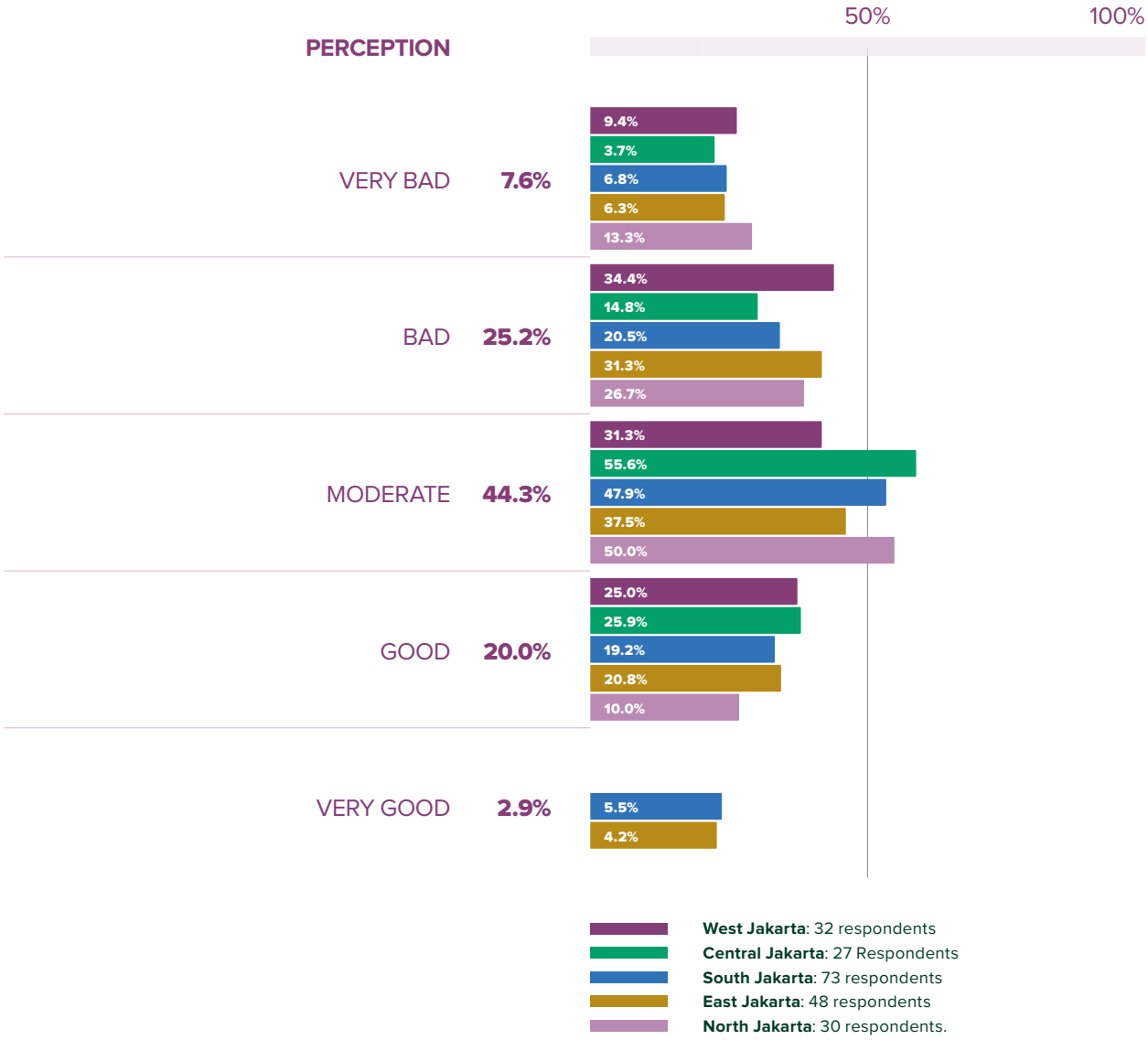
* Total: 210 respondents

PERCEPTION OF THE IMPACT OF AIR POLLUTION, BASED ON GENDER



* Total: 210 respondents
** Male: 83 respondents, Female: 124 respondents, Other: 3 respondents

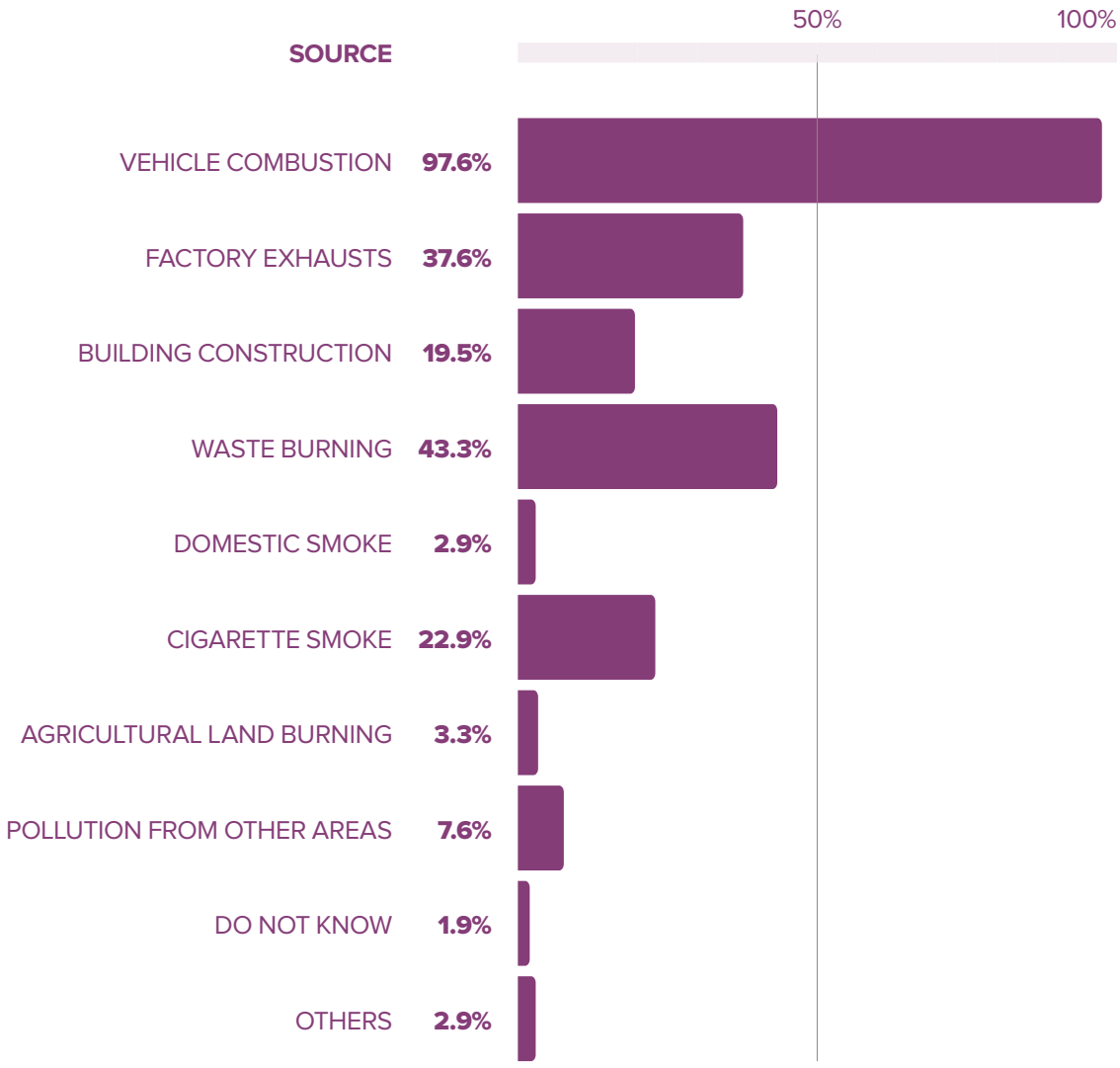
PERCEPTION ON AIR QUALITY BASED ON RESIDENCE



Nearly all—97.6%—of the respondents stated that "vehicle combustion" is the main contributor to air pollution. This perception is consistent with various scientific studies that show vehicle combustion to be the main source of pollution in Jakarta (Puji Lestari et al., 2020; Breathe Easy Jakarta, 2017). However, the number of respondents who identified "waste burning" (43.3%) and "cigarette smoke" (22.9%) as the main sources of pollution was high, in contrast to research findings that estimate the contribution of "waste burning" to air pollution to be only 5% (Breathe Easy Jakarta, 2017). The high number of respondents who perceive cigarette smoke

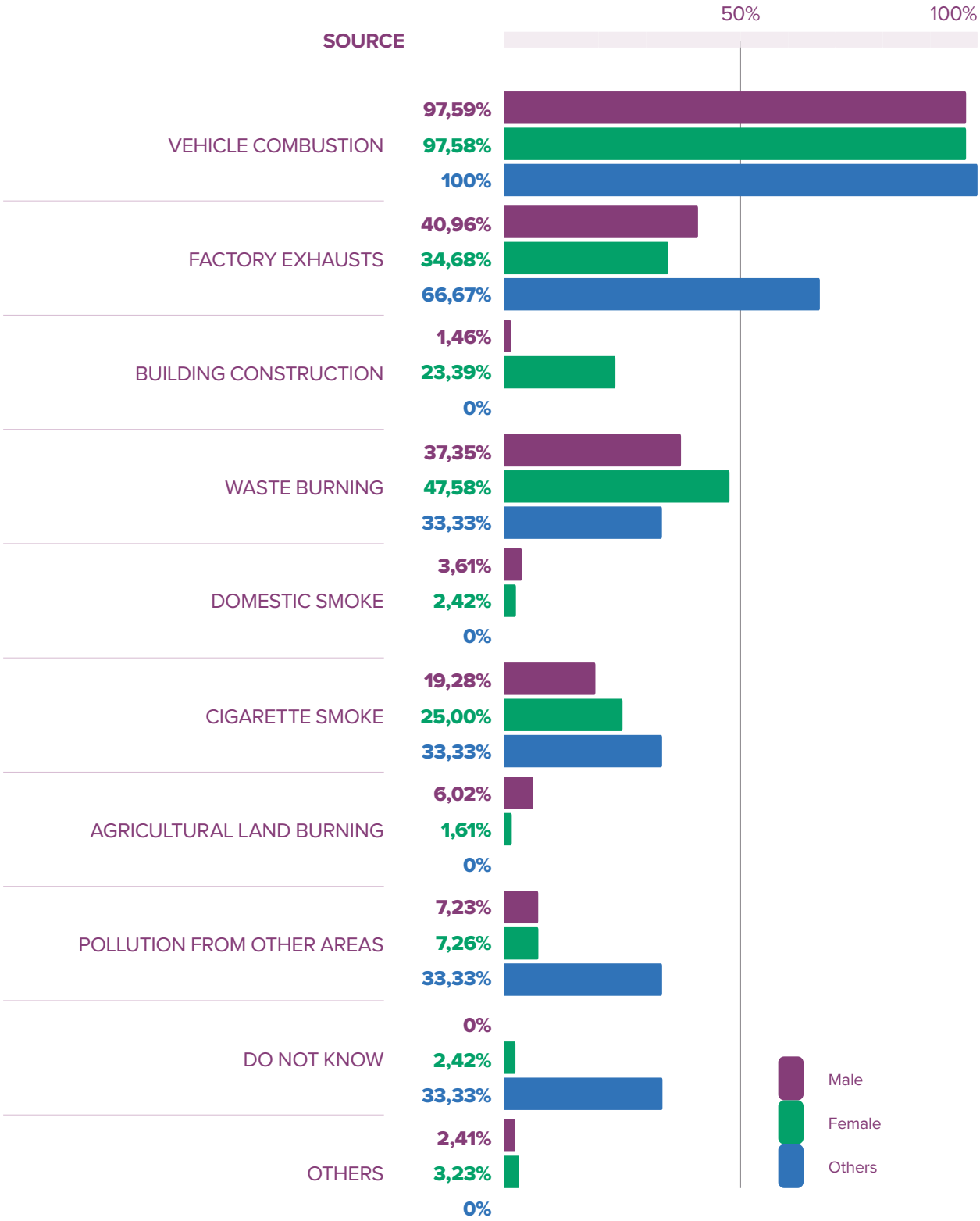
and waste burning as the main sources of pollution, we assume, is due to their visibility and proximity to daily life compared to factory smoke, which is not directly visible to or experienced by most people. This assumption also explains why fewer respondents perceive factory exhausts as a source of pollution (37.6%) compared to burning waste, despite it being the second largest contributor (28%) to air pollution in Jakarta (Breathe Easy Jakarta, 2017). This finding, in our opinion, is consistent with the respondents' attitudes towards air quality that are influenced by their direct experiences of its impacts on their lives.

WHAT ARE THE MAIN SOURCES OF AIR POLLUTION IN JAKARTA?



* Total: 210 respondents
** Respondents can give more than one answer

PERCEPTION OF POLLUTION SOURCE, BASED ON GENDER



* Male: 83 respondents, Female: 124 respondents, Other: 3 respondents
** Respondents can have more than one answer

5.2. Perception of Responsibility on Air Quality

Most of the participants in the FGD conducted with students and respondents from the areas of Sindikat, AIMI, and online motorcycle taxi drivers were aware of how their lifestyles contribute to the poor air quality in Jakarta. They noted, for example, that they are also guilty due to their choice to use private vehicles—although that choice is also taken to avoid air pollution. For residents living in slum areas, waste burning is repeatedly cited as a source of pollution. Realizing this, those who live in a more organized slum community—have created a biogas program so that kitchen waste is made into compost instead of burned. One such example is the community of JRMK (Jaringan Rakyat Miskin Kota).

QUOTES 8

"I always turn my waste to the landfill. However, I do not know whether they burn it or not."

—Perempuan, 47 tahun, Ibu rumah tangga—

In general, respondents think that the local government (46.7%) and the central government (17.6%) are the parties bearing the most responsibility for reducing air pollution in Jakarta. Interestingly, slightly more respondents attributed responsibility to individuals (19.5%) than to the central government. This finding requires further study to understand how far and in what context air pollution is seen by the public as an individual and a structural problem.

WHO HOLDS THE MOST RESPONSIBILITY TO REDUCE AIR POLLUTION IN JAKARTA?

Public transportation corporations **4.3%**

Major corporations (automotive industries, electricity industries, etc.) **7.6%**

Factory owners **1.4%**

Central government **17.6%**

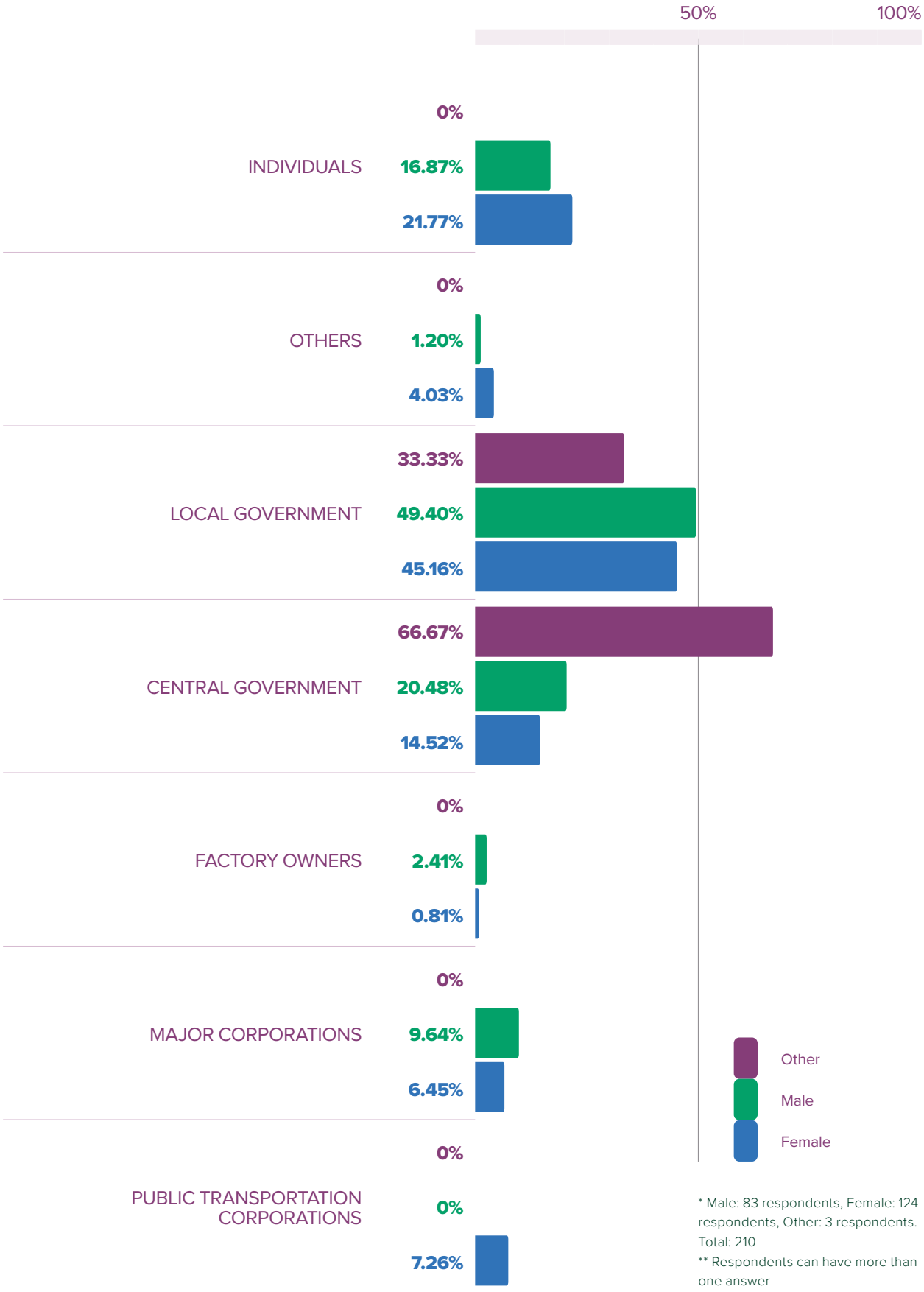
Individuals **19.5%**

Others **2.9%**

Local government **46.7%**

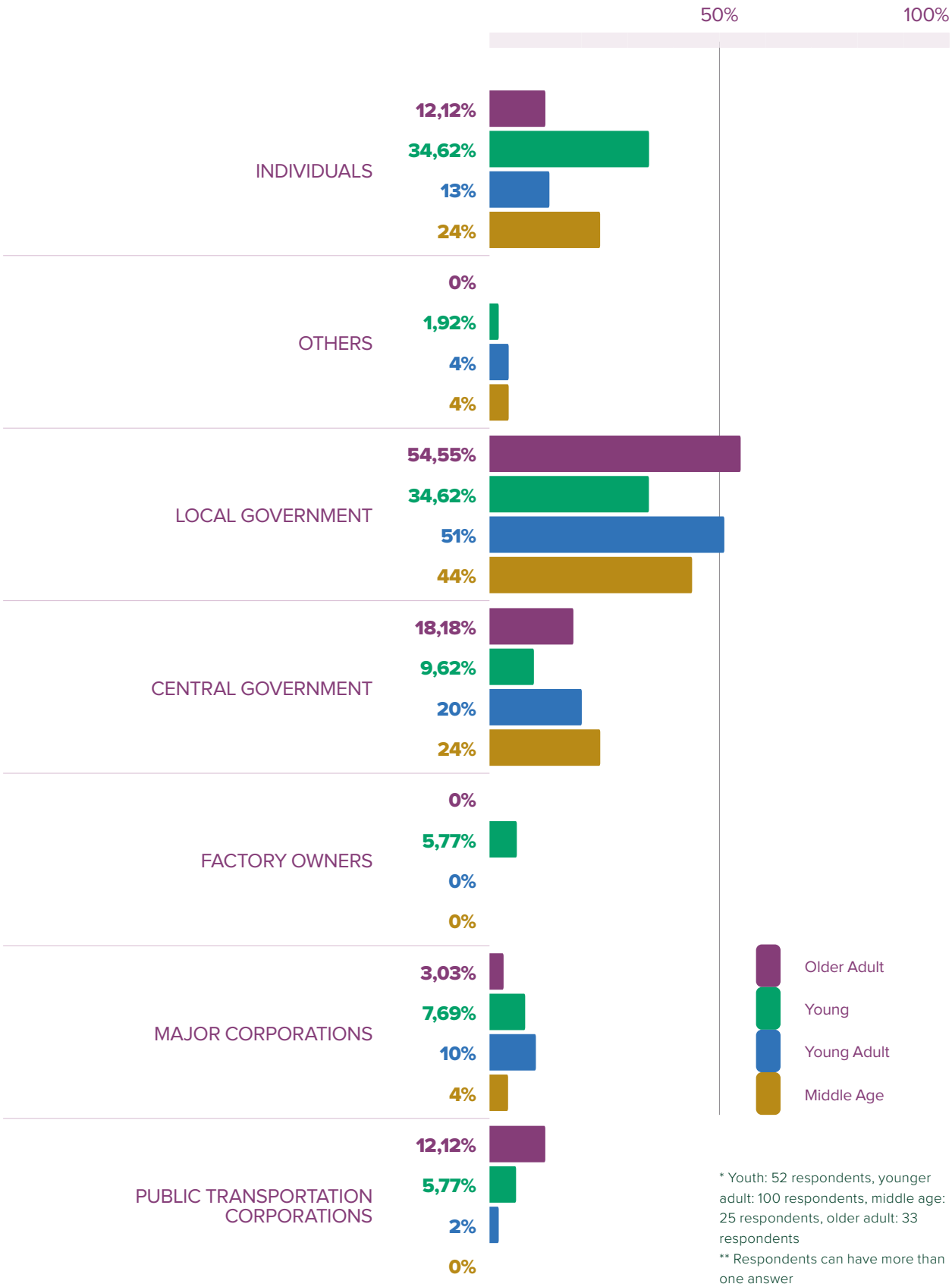
* Total: 210 responden

PERCEPTION OF RESPONSIBILITY BASED ON GENDER



* Male: 83 respondents, Female: 124 respondents, Other: 3 respondents. Total: 210
** Respondents can have more than one answer

PERCEPTION OF RESPONSIBILITY BASED ON AGE



* Youth: 52 respondents, younger adult: 100 respondents, middle age: 25 respondents, older adult: 33 respondents

** Respondents can have more than one answer

Nonetheless, in contrast to the perception of individual responsibility attribution, the government's regional and central role) is considered vital due to their political power. Although some respondents realize that individual efforts are needed, the government still plays the most key role. "Because if it is only the grassroot [having the initiative], we will be stuck," said one FGD participant from the cyclist community. A similar opinion is conveyed by respondents from the labor community who stated that the large contribution of industrial waste to air pollution is also caused by weak government supervision.

5.3. Basic Knowledge of Air Quality

This study also identified the level of public knowledge about air pollution, including information gaps about it.

For the purposes of this study, we used the following two categories of air pollution-related knowledge as a baseline to assess scientific understanding of air pollution in Jakarta: 1) knowledge of the content of polluted air, and 2) knowledge of the Air Quality Monitoring Station (AQMS) in Jakarta. To elaborate on the first aspect, we asked the respondents to name air pollutants. We considered their answers correct if they mentioned one of the following matters: $PM_{2.5}$, PM_{10}, CO_x, NO_x, SO_x, O_3, VOC_S, and/or heavy metals (Pb and As). To probe the second aspect, we asked the respondents to mention the location of AQMSs in Jakarta. Their answers were considered correct if they mentioned one of the following locations: Hotel Indonesia Roundabout, Kelapa Gading, Kebon Jeruk, Jagakarsa, Lubang Buaya, Gambir (United States Embassy), Gelora Bung Karno, Jakarta Environment Service, Ministry of Environment and Forestry, and/or Meteorology, Climatology and Geophysics Agency (BMKG).

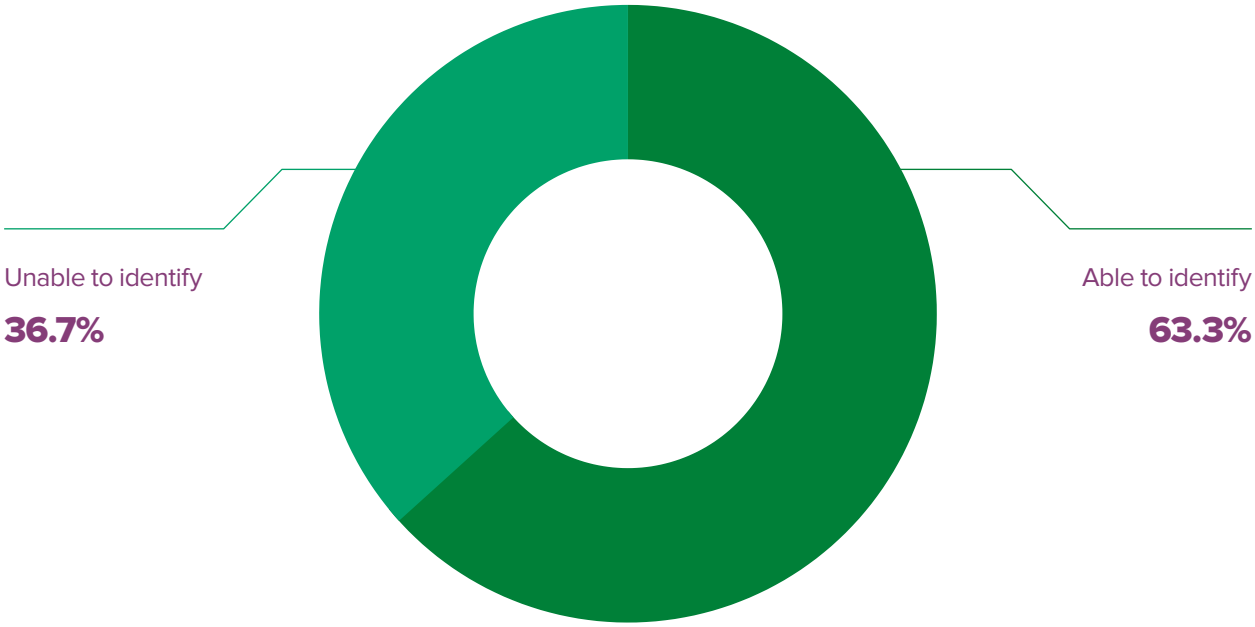
Survey data shows that 63.3% of respondents have some scientific air pollution knowledge about the content or substances contained in polluted air. In addition, 25.2% of respondents stated that they are aware of the existence of Air Quality Monitoring Station AQMS in Jakarta, and 17.6% were able to identify the exact location of the AQMS.

QUOTES 9

“If I know how dangerous pollution is, I will not ride motorcycles. I rode it anywhere I went. It is easy, fast, and cheap. I just do not know how dangerous it is.”

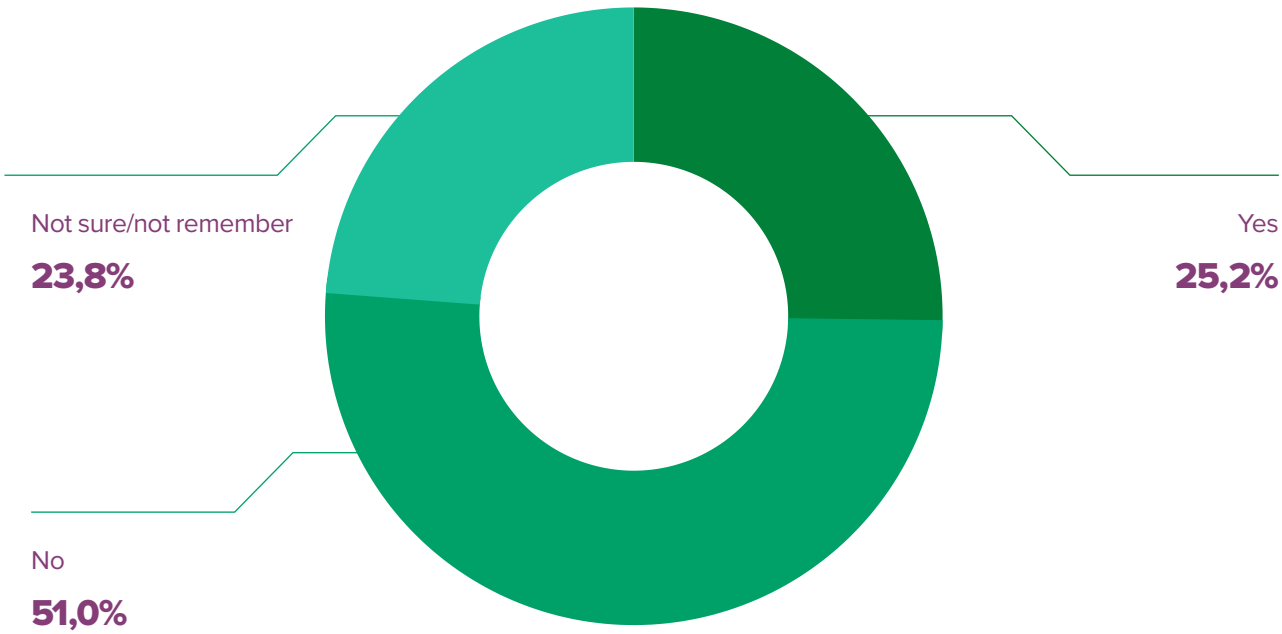
—Housewife, 47 years old—

ABILITY TO IDENTIFY AIR POLLUTANTS



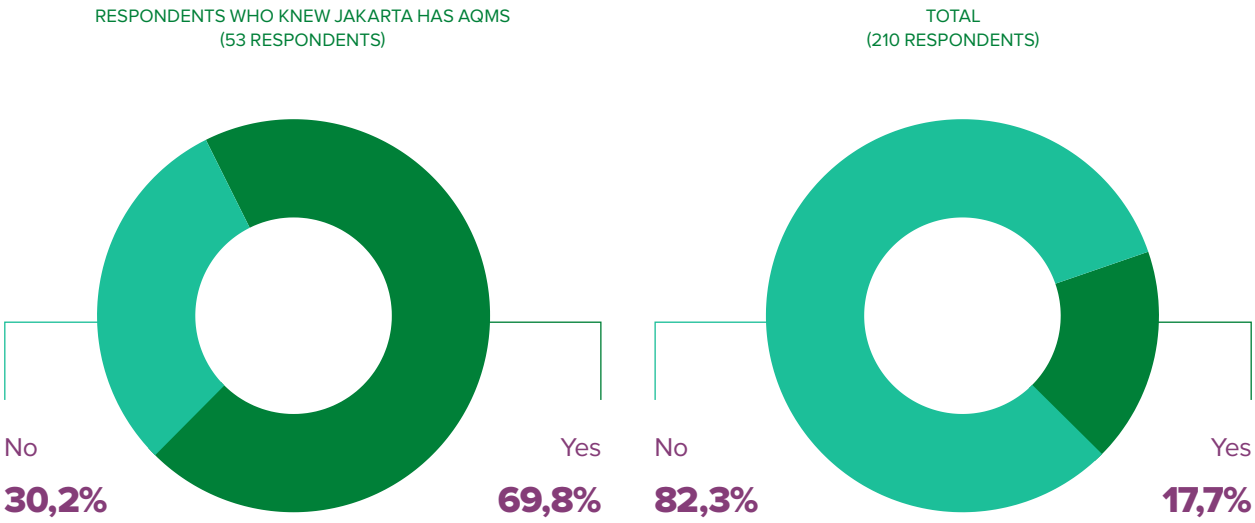
* Total: 210 respondents

DO YOU KNOW JAKARTA HAS AQMS?



* Total: 210 respondents

RESPONDENTS WHO KNOW THE EXACT LOCATION OF AQMS



The general lack of knowledge on the existence of AQMS can be interpreted in at least two ways: 1) information on air quality is not considered a priority, so the tools to measure it are irrelevant for many people, or 2) there is a lack of information or distribution and/or explanation of information provided by the government on the functions of the AQMS.

Most of the NGO, journalism, government, and scholar key informants share the common sentiment that there is a significant knowledge gap among the public. They highlight the absence of public knowledge regarding clean air as a right, and a lack of understanding when it comes to interpreting information on air pollution. Furthermore, there is also a significant gap in public awareness of the impact of pollution on health, as shown by several FGD participants.

QUOTES 10

“One of the public misperceptions of air pollution is that, if the air looks good, the quality is also good. But that is not the case. The appearance might look fine, but the level of ozone, NO2, or particulate matter is unsafe.”

—Kirana Nadhila, Kopernik—

MISPERSEPSI MENGENAI POLUSI UDARA

Polusi udara dianggap sebagai sesuatu yang wajar terjadi dan menjadi sebuah konsekuensi bersama.

Kualitas udara dianggap sama dengan suhu udara.

Udara yang tercemar dianggap bisa terlihat dengan jelas oleh mata telanjang. Selama tidak terlihat kotor, maka udara tersebut dianggap bersih.

Alat pengukuran kualitas udara dianggap kurang berguna untuk dihabiskan dalam anggaran belanja pemerintah.

Data prediktif dianggap sebagai data aktual yang sedang terjadi.

ANNEX 6:
Managing Information: Experiences from the Field

This section describes the experiences and views of individuals who have run and are currently running programs or activities related to air pollution in Jakarta. More specifically, it describes their experience in the field of information management.

The first thing that is important to note is that building public discourse on air quality requires creativity to find new perspectives or interesting strategies. Our informants often ran out of ideas on how to present the issue in ways that would attract and engage an audience.

Ayu Eza Tiara, a public lawyer who assisted the Koalisi Ibukota civil lawsuit case, shares her experience with air quality issues in the last two years. "Two years is a long time," she said. "We can't just talk about the air; people will be bored. We have to look for new ideas for the campaign, and it's not possible to only rely on press releases."

Bondan Andriyanu of Greenpeace experiences similar difficulties. He believes that any campaign needs public support. Despite the obstacles, however, campaigns on air quality have had some success. Greenpeace campaigns, according to Bondan, aim to encourage the public to express their concerns on social media. The end goal, of course, is for their voices to be heard by policy makers and drive policy changes. Bondan recounts a Greenpeace campaign that] succeeded in making a difference by exposing the government's air quality measurement method—which apparently did not measure the ambient concentration of $PM_{2.5.}$ This campaign stirred public discussion until finally the government installed a tool to measure PM2.5 in 2018.

Greenpeace is targeting urban communities as its communication targets. For air quality campaigns, Greenpeace is specifically targeting young mothers, who are very concerned for their children's health.

"I think that there is a trend in which people prefer how-to, practical, news," said Ahmad Arif, a *Kompas* journalist who specializes in environmental issues. "Instead of news about the impact of environmental damage, the public prefer news on, for example, 'how to live healthy,' 'how to [follow a] particular diet.'" What Ahmad

said correlates with Greenpeace's findings about people's interest in health issues.

Critical campaigns tend to receive less support. "When we talk about the government needing to take responsibility, many [people] were resigned. It is as if [the solution] must come from individuals," said Bondan. This symptom of individualization of responsibility is consistent with the survey findings that we presented in the previous section, which show that respondents impose more responsibilities on individuals than on the government.

6.1. Production of Information

Data is a vital material in the production of information. Unfortunately for academics, journalists, and activists, the rare availability of relevant, accurate, and open data presents a major obstacle in producing reliable information.

To illustrate this situation, University of Indonesia Professor of Public Health Budi Haryanto stated that official government data are oftentimes incomplete, difficult to access, and raw—requiring further processing to be meaningful. "To obtain [the governments'] unprocessed data requires a lot of effort," he said.

This sentiment is shared by Puji Lestari, a Professor from the Bandung Institute of Technology who focuses on the field of air and waste management. Although in Puji's experience the government has so far been cooperative, she believes that making the data available online would be beneficial to all stakeholders.

The availability of reliable data is also very much needed for the work of journalists. "Data and research are important to strengthen the stories we write," said Sapariah Saturi, senior editor at *Mongabay*. She also complained about the difficulty of obtaining data from the government: "If only the data has been published, it is easier. But [it is difficult to get] detailed data."

An academic from the Bandung Institute of Technology, Raden Driejana, has a different opinion. According to her, official data on air quality, although imperfect, has been available for a long time. "However, people do not take advantage of it, or don't really care," she said. This might correlate with what was mentioned above, that the poor attention given to air quality is caused by the invisible and indirect impact of air pollution. In a different context, Ahmad Arif agrees that public education is

a valuable tool to change the current pattern of media coverage, which often relies on what the readers like, not what they need.

Yusiono Supalal, head of the Environmental Impact Control Division of Jakarta's Provincial Environmental Service, states that data unavailability is largely caused by retribution policies that categorize data into several levels of transparency, therefore restricting direct access to some types of data. "So, it's not that we don't want to provide data," he said. He, however, admits that to achieve public information transparency, the regulation needs to be evaluated.

Apart from government agencies, data is also generated and managed by scientists. Ahmad Arif believes that scientific data from academia is an important control for governments' official data. He stated, however, that it was rare for Indonesian scientists to have the awareness to present their research in a more popular approach so that it could be more accessible to the wider public, "or at least inform them that they have just issued a [scientific] paper, for example."

Acknowledgement

Conducting the Information Ecosystem Assessment for the Clean Air Catalyst project was an important piece of work done in collaboration with many individuals and institutions.

We are grateful to all the partners of Catalyst for reviewing and making meaningful contributions throughout the research process. A big thank you to all the reviewers from partner organizations:

- The World Resource Institute (Beth Elliott, Jessica Seddon, Anindita Annisa, Marley Leitner, Belathea Chastine Hutauruk, Elizabeth Moses, Behruz Baizayee, Achmad R. Noviansyah, Muhammad Shidiq)
- Environmental Defense Fund (Reiner Romero, Sarah Vogel, Helen Joo)
- Vital Strategies (Ririn Radiawati)
- USAID experts—Katherine Swanson, Georgia Hartman and Hung Vo gave some very useful comments in the final draft of the report.

We are deeply grateful to our colleagues at Internews who provided guidance, advice, and administrative assistance to make this research work smoother: Stella Paul, Juthamas Sukitjanont, and Kok Eng Amy Sim. Amy reviewed the report and provided a lot of useful input.

Justin Auciello and Kenichi Serino of Internews contributed significantly by guiding us in understanding and implementing the Information Ecosystem Analysis method.

We would also like to extend our gratitude to Suchismita Goswami, who conducted similar research in Indore, India. In addition to being an inspiring discussion partner, Goswami, who started this research first, provided the initial foundation for the design of this study.

Finally, our greatest gratitude is to our research subjects, who have shared their views and stories so that this research could be presented in this final form.

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Appendix 1:
Survey Form

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 Jakarta.

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, 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!

Information Ecosystem Assessment Team
Internews Earth Journalism Network

Mobile phone number/email address: _____

1. **Age:**

2. **Gender:** Female/Male/Others

3. **Highest level of education completed:**

- o No formal school
- o Primary schooling (SD-SMP)
- o Secondary level/vocational schooling (SMA/SMK/STM)
- o Completed university (S1)
- o Master's degree (S2)
- o Doctorate degree (S3)

4. **Occupation:**

- o Unemployed
- o Government officer
- o Housewife
- o TNI/POLRI
- o Freelancer (pekerja paruh waktu)
- o Karyawan/buruh swasta
- o Entrepreneur
- o Retired
- o Serabutan
- o Student
- o Teacher/lecturer
- o Health workers
- o Other: _____

5. **Where do you live?**

Jakarta Pusat	Jakarta Barat	Jakarta Selatan	Jakarta Utara	Jakarta Timur	Kepulauan Seribu

6. **What type of residence do you currently live in?**

- o Landed house in densely populated area *(perkampungan/kampung)*
- o Landed house in old housing complex *(perumahan lama)*
- o Housing estate: townhouse/cluster house
- o Apartment/flat/*rumah susun*
- o Rented room *(kost)*
- o Ruko (house-shop building)
- o Homeless
- o Others_____

7. Between 1 to 5, 1 being very poor and 5 very good, how would you rate the overall outdoor air quality in your neighborhood

1	2	3	4	5

8. What do you believe are the major sources of air pollution in Jakarta? *(Chose at least 1, and at most 3)*

- o Emissions from transport
- o Emissions from factory
- o Construction Work
- o Waste Burning
- o Domestic emission (faulty furnace/ unvented gas stove, wood stove and kerosene heaters)
- o Cigarette Smoke
- o Agriculture stubble burning
- o Sources from outside of Jakarta
- o Not aware
- o Other_____

9. Between 1 to 5, 1 being very affected and 5 very unaffected, how affected are you by air pollution?

1	2	3	4	5

10. What chemical or substances that you know or believe are causing dangerous pollution in Jakarta? *(Please name the substance or answer "do not know")*

11. Have you ever come across any information relating to air quality in Jakarta?

Yes	No	Not Sure/Cannot remember

12. Between 1 to 5, 1 being very poor and 5 very good, how is the quality of air quality information you received?

13. Between 1 to 5, 1 being very low and 5 very high, how would you rate the quantity of information on air quality that you have received?

14. As far as you can remember, on which medium have you seen or sought information on air quality or pollution in Jakarta? *(Chose at least 1, and at most 3)*

- o Television: _____ (please name the TV station)
- o Newspapers and magazine: _____ (please name the publisher)
- o Radio: _____ (please name the station)
- o Billboards in public areas
- o Social media (Facebook, Instagram, Twitter, Tiktok)
- o Messaging apps (WhatsApp, Telegram)
- o Internet sources other than social media (governments or NGO's or any websites)
- o Online news media
- o Website/apps on air quality (AirVisual, JAKI, Nafas)
- o SMS
- o Others: _____ (please mention)
- o Not available or you do not seek that information

15. Who do you get information about air quality/pollution or who do you go to for that information? Please select the options below based on what you experience the most *(Choose at least 1, and at most 3)*

- o Government officials
- o Scientists/Experts
- o NGO activists
- o Religious leaders
- o Friends and relatives
- o Healthcare workers
- o Teachers
- o Celebrities/influencers
- o Community leaders/figures
- o Others: _____ (please mention)
- o Not available or don't look to anyone for this information

16. Which sources would you trust the most when receiving information about air quality? *(Chose at least 1, and at most 3 for each category)*

MEDIUM/CHANNEL	SOURCES
Television	Friends and relatives
Newspapers and magazine	Religious leaders
Radio	Healthcare workers
Billboards	Government officials
Social media (Facebook, Instagram, Twitter, Tiktok, etc.)	Teachers
Messaging apps (WhatsApp, Telegram, etc.)	NGO activists
Online news media	Celebrities/influencers
Website/apps providing information on air quality (AirVisual, JAKI, Nafas)	Scientists/Experts
Internet sources other than social media (governments or NGO's or any websites)	Community leaders/figures
SMS	Others: _____ *(please mention)*
Others: _____ *(please mention)*	

17. Which sources would you trust the least when receiving information about air quality? *(Chose at least 1, and at most 3 for each category)*

MEDIUM/CHANNEL	SOURCES
Television	Friends and relatives
Newspapers and magazine	Religious leaders
Radio	Healthcare workers

Billboards	Government officials
Social media (Facebook, Instagram, Twitter, Tiktok, etc.)	Teachers
Messaging apps (WhatsApp, Telegram, etc.)	NGO activists
Online news media	Celebrities/influencers
Website/apps providing information on air quality (AirVisual, JAKI, Nafas)	Scientists/Experts
Internet sources other than social media (governments or NGO's or any websites)	Community leaders/figures
SMS	Others: _____ *(please mention)*
Others: _____ *(please mention)*	

18. Do you know Jakarta has air quality monitoring stations (Stasiun Pemantau Kualitas Udara/SPKU)?

Yes	No	Not sure

19. f you know, where are they located? *(Please name the location)*

20. What kinds of information do you wish to receive about air pollution? *(Chose at least 1, and at most 3)*

- o Impacts on human health
- o Impacts on the environment
- o Impacts on the economy
- o Data on both Jakarta and national air pollution
- o Data on national air pollution
- o Notifications if pollution is high in the neighborhood
- o Things to do to prevent and combat air pollution
- o Initiatives and enforcement taken by local agencies to improve air quality
- o Information on causes or sources of pollution
- o Others: _____

21. What are the challenges you encountered in receiving information related to air pollution? *(Chose at least 1, and at most 3)*

No access to electricity	Unable to understand the information
I do not have time to access information	Information is difficult to comprehend
No access to TV/radio	Do not have access to phone
No access to the internet	Do not trust the information
No access to local authorities for seeking information	Information not available
Not interested	Do not know appropriate information sources
Other: _____(mention)	I have no obstacles

22. Between 1 to 5, 1 being very poor and 5 very good, how would you rate the quality of information on air quality you received?

23. Between 1 to 5, 1 being very low and 5 very high, how would you rate the quantity of information on air quality you received?

24. Who held the most responsibility for reducing air pollution in Jakarta?

- o Central Government
- o Local Government (Pemprov DKI Jakarta)
- o Big corporations (automotive industries, electricity companies, etc.)
- o Small businesses (satay/seafood stalls, etc.)
- o Public transportation companies
- o Factory owners
- o Individuals
- o Other_____

25. Why do you think these actors are responsible for air pollution?

26. What would be the most effective way to receive air quality information?

Hotline number	SMS/WhatsApp message
Online agency platforms	Email
Social Media	TV
Face to face meeting with government officials	Via Community Meeting
Participating in NGO activities	Via community leaders
Radio	Online news
Others	Newspapers

27. What kind of initiatives would you want to see in Jakarta to improve the air quality?


Clean Air
Catalyst
A partnership of:
USAID
EDF
Internews
openaq
Vital Strategies