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Original Research

Why participation matters for air quality studies: risk perceptions, understandings of air pollution and mobilization in a poor neighborhood in Nairobi, Kenya

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ARTICLE INFO

Article history:

Received 2 February 2015

Received in revised form

15 May 2015

Accepted 13 July 2015

Available online 19 August 2015

Keywords:

Air pollution

Participatory methodologies

Risk perceptions

Capacity building

Local knowledge

Sub-Saharan Africa

ABSTRACT

Objectives: With high urbanization rates, Sub-Saharan Africa is facing growing problems of poor air quality in its cities. We make a case for participatory approaches in air quality studies especially including those living in poor neighborhoods who may be particularly at risk from this trend.

Study design: We used collaboration with a community based organization, interviews, focus group discussions and a community forum.

Methods: We conducted a pilot study to assess health risk perceptions of air pollution for civic-minded residents in Mathare, an informal settlement in Nairobi, Kenya. Simultaneously, we involved Mathare residents in measuring levels of PM_{2.5} and later presented these data at a community forum with the participants of the monitoring study and the focus group discussions.

Results: We found that participation in conducting and interpreting air quality studies helped residents improve their understanding of air pollution and also helped them develop responses to it. Initially, participants associated air pollution with a bad odor or discomfort rather than their health, but once the connection to health was made through participation, they sought more information about air quality data and its hazards. Some residents also came up with strategies for coping with their environment and its risks.

Conclusions: These results point to the potential of including participation in air quality monitoring as a way to increase awareness and support local action to address it. Discussion and sharing of results at the local level as well as at a wider policy level will be critical for advocacy to improve air quality.

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<http://dx.doi.org/10.1016/j.puhe.2015.07.014>

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Introduction

In 2014, the World Health Organization estimated that air pollution contributed to seven million premature deaths a year globally, making poor air quality one of the most severe environmental risks to human well-being.¹ In response, the United Nations Environmental Program (UNEP) has made promoting improved air quality through capacity building for better regulation, monitoring and action a new priority. Clearly, a strong need exists for increasing support for local monitoring systems, science, regulation and action plans to address this growing public health concern. This is especially the case for many cities in Asia and Africa where rapid urbanization is increasing this public health risk but adequate scientific understanding, capacity to build and maintain monitoring systems as well as the public awareness needed to address the issue do not yet exist.

In this article, we argue that to do more effective air quality work, both the science and the advocacy must incorporate thoughtful participation of affected populations into its methodology. We illustrate this point through a reflection on air quality work (both risk perception and actual air quality sampling) in a poor community in Nairobi, Kenya. Such poor communities are at risk for a myriad of serious public health problems linked to poor services and location in the city, including respiratory infections from exposure to cook smoke or diarrhoea due to improper drinking water.^{2–8}

Overall, recent air quality studies in burgeoning urban areas in Sub-Saharan Africa (SSA) suggest in addition to indoor air pollution, outdoor air pollution is a serious, growing and understudied problem poised to grow worse.^{9–17} Vehicle emissions are one growing source contributing to as much as 90% of urban air pollution in developing countries.¹⁸ Further, this is an acute problem for the urban poor who comprise a large and growing portion of the urban population. The urban poor are already vulnerable as they also face indoor air pollution and live in close proximity to more pollution sources like highways, open burning of waste or industry.^{15,19,20} Inadequate planning and service provision in African cities also means that poor pedestrians who cannot afford motorized transport are often forced to walk near streets full of traffic and vehicle emissions.²¹

Long term air quality monitoring is rare in SSA. However, a growing number of urban air quality measurements are showing pollution levels often exceeding World Health Organization guidelines.^{11,14} The few studies within poor neighborhoods suggest a particularly severe problem.^{19,20,22} One air quality study showed that women living in Mathare slum in Nairobi experienced similar high levels of PM_{2.5} (particulate matter [PM] with an aerodynamic diameter <2.5 μm)³⁴ as roadside mechanics and street vendors, populations already considered at-risk since they spend their workday in close proximity to roadway emissions.²³ Dionisio et al.²⁰ in Accra, Ghana found PM emissions in low-income, densely populated neighborhoods were almost double that of high-income, less densely populated areas. Socio-economic differences in exposure to poor air quality require further study.

In this pilot study in Mathare, an informal settlement in Nairobi, we explored how to involve the urban poor in

learning about air pollution and its risks. We were interested in the possibility of incorporating participatory methodologies into research design even for something as technical as air quality monitoring. Participation can involve many levels including informing, consulting and collaborating with the highest level and ultimate goal being citizen control and empowerment. In this work we incorporate consulting and informing local activists on air quality and risk, collaboration with a local community based NGO on this study and incorporation of local citizens into measurement taking with the aim of ultimately supporting more informed citizen action and pressures on government to improve conditions.

Nairobi provides an interesting setting for this study because its population is growing at an annual rate of 4% and reflects the rapid urbanization facing many parts of SSA.²⁴ Approximately 3.1 million people live in Nairobi and sources estimate that as much as 30%–70% of Nairobi's residents reside in informal settlements, and that at least 70% of the adult population lives on less than \$42/month.^{25,26} Evidence of a serious air quality problem is growing.^{9–11,13,16,27} While few epidemiological studies on air pollution exist for Kenya, studies show that diseases strongly associated with exposure to air pollution, like respiratory tract infections, pneumonia, or asthma and some cardiovascular diseases are serious public health concerns in this region.^{22,26}

In this study we conducted a preliminary assessment of health risk perceptions of air pollution for a group of residents in Mathare. Risk perceptions are subjective judgments not based on scientific experiments, but influenced by a combination of individual factors, like sensory experiences (e.g. odor produced from pollution), and institutional, societal, and cultural factors, like social networks.^{28–31} Thus far, with a few notable exceptions,^{32,33} most of the literature on this subject has focused on Europe or the US; little, if any work, has addressed this question in SSA. Yet risk perception matters in terms of advocacy and mobilization for improving conditions and hence deserves more attention.²⁸

In this work, we sought to understand how residents defined air pollution and what they considered important pollution sources. We also examined the potential of using air quality data collected via participatory monitoring as a form of health risk communication and explored how risk perceptions might change through the participation of three residents in data collection and a follow-up discussion of this air quality data and monitoring with residents. We took preliminary measurements of personal exposure levels to PM_{2.5}, which is typically used as a measure of urban air pollution, for three women living in Mathare who carried pumps as they went about their daily activities (results are reported elsewhere²³). We focus on women in the air quality pilot study for a number of reasons. First, indoor air pollution from cook stoves is serious problem in low-income neighborhoods, particularly for women who do most of the cooking while watching the children, making them especially vulnerable. Second, women tend to be organized and more involved in community based organizations, and many are important activists and opinion leaders in their neighborhoods. We discussed these results in a community forum as a way to learn how the participants in the air quality and focus group discussions would react to a discussion of the data.

Methods

Interviews and focus group discussions

This pilot study began in August 2011 in Mathare, one of the largest and oldest informal settlements in Nairobi, consisting of a number of interlocking villages located approximately 3 km from the Central Business District. According to the census in 2009, it had a population of 87,203 and 31,426 households.²⁴ We conducted individual prefocus group discussion interviews and focus group discussions to understand how residents currently view air pollution and if they see it as a problem. Participants were recruited by local community workers of Reality Tested Youth Program (RYP), most of whom are residents of Mathare or neighboring informal settlements. RYP is a community-based organization that aims to build the capacities of partner community groups to generate and influence social change in the poor neighborhoods of Huruma, Kiamaiko and Mathare in Starehe Constituency, Nairobi.

Collaborating with RYP was a key part of the strategy for a number of reasons. First, the organization is well known and respected in the area which meant that residents were more likely to engage seriously with our work. Second, RYP helped interpret responses and explain local cultural context. Finally, the work helped build knowledge of air quality within a strong local organization which was able to follow-up and support the local actions that came out of greater awareness of the problem of poor air quality.

RYP recruited 40 adult participants (ages 24–58 years) for this pilot study, many of whom ran environmental projects or women's groups. Summary statistics of participants are in [Table 1](#). As a result, responses to the individual prefocus group discussion interviews and focus group discussions pertain to a specific group of people who could be considered more engaged in community activism relative to the general population residing in informal settlements. These activists are already concerned about the environment and health and serve as role models who can support a wider diffusion of awareness and action. Despite the biased sample, this work is useful for a preliminary understanding of how local grassroots civic activists, who are most likely to take up these issues in poor communities, think and feel about local air quality. We were also able to compare the responses from this select population to two other separate studies that looked at risk perception on air pollution in two other Nairobi slums, Viwandani and Korogocho, but use a randomized sample of respondents.^{32,33}

Interviews and focus group discussions were translated into Kiswahili, a more widely spoken language than English among the poor. We conducted prefocus group discussion interviews with each participant separately at their homes or at RYP. Interview questions were asked in Kiswahili, then participants' answers were written or marked in English. Questions in the interviews ranged from survey questions that included asking participants to use a rating scale to more open-ended questions about what air pollution is, what causes it and perceptions of the link to health. (Sample questions are found in the [Appendix](#).) Then, over the next two weeks, the same participants attended focus group discussions in groups of ten. All focus group discussions were held at community centers or offices in Mathare settlement and were facilitated by two community workers from RYP.

Air quality pilot study and community forum in Mathare

We separately held a community forum at RYP and through RYP, we invited the same participants who were interviewed and attended the focus group discussions along with the women who carried the pumps in the air quality pilot study. The air quality study examined occupational exposure levels for vulnerable groups in Nairobi and also included bus drivers, street vendors, and mechanics. During the forum we discussed results from the study. The air quality pilot study occurred at the same time as the interviews and focus group discussions. We only describe the part of the study that took place in Mathare here since it is the focus of this study, but more information on the air quality pilot study can be found in [Ngo et al.](#)²³ The group in Mathare included three women who lived and worked near Kosovo, a village within Mathare. Each woman carried the pump for 8-h from 7:30am to 4:30pm for one week on Tuesday, Wednesday, and Thursday, and the study lasted three weeks. We chose these days since they were most convenient for the air quality pilot study participants. During week 1, the first woman who carried the pump was a tailor who mostly worked outdoors, the second woman in week 2 was a women leader who helped with tasks in the village, and the third woman in week 3 worked in the Nairobi City Council located in a nearby slum of Korogocho. The results were thus tied to real people that the participants knew.

The community forum took place in March 2012, six months after the air quality pilot study, and the three women from Mathare who participated in the air quality pilot study also attended ($N = 41$). The community forum was held six months later because the filters collecting the pollution data in Nairobi were sent to Columbia University in New York City for analysis. Our partner at the University of Nairobi, as is common across Africa, did not have adequate facilities for analysis. The analysis itself lasted a few weeks in addition to the statistical analyses and write-up of results.

The following week, we also conducted a forum involving relevant government officials, civil society and some residents from Mathare. This was to ensure that government officials were informed of the results and could hear feedback and concerns directly from residents. We asked Mathare participants in this research to advise or recommend actions or steps to be communicated to government officials.

Table 1 – Summary statistics of sample population.

Female	85%
Mean age	36 years
Completed primary school	38%
Occupation as own accountant	40%
Occupation inside settlement	70%
Main mode of travel: walk	95%
Mean years of residency in Mathare settlement	19 years
Income: \$60-\$12 a month	55%

Results

Interviews and focus group discussions

To understand potential sources of exposure, we first asked individuals how much time they allocated to different activities. We found that up to half of participants spent 6–9 h outside each day while a small minority spent more than 9 h outside each day. A large portion of this time was allocated for work, although it was not unusual for individuals to spend 1–3 h commuting. This is unsurprising since almost all participants walked as their main mode of transportation.

Since the topic of air pollution had not been discussed thoroughly in Mathare before, we first told participants the US Environmental Protection Agency's definition of air pollution, which is 'any substance in the air that can cause harm to humans or the environment.' We then asked participants how they defined air pollution prior to knowing this definition; less than half explicitly considered health in their definition of air quality (N = 16). Examples of definitions of air pollution included: 'dirty material in the air that usually doesn't have smell, but disrupts people (e.g. bags in the air)' or 'Smoke and dust that mixes with the air that we breathe.' When asked what they considered very important characteristics associated with air pollution, many participants associated it with a 'bad smell,' which may explain why problems of 'sewage' or 'dirty water' were commonly brought up during both the interviews and focus group discussions. A little over half of participants considered coughing and poor breathing an important characteristic of air pollution.

Next, we asked individuals to list possible sources of pollution to further assess how they perceived air pollution. Many participants discussed cigarette smoke and often referred to 'cleanliness' as being an important determinant of air pollution. The latter suggests participants do not see air pollution as a problem separate from other environmental problems, like overflowing sewers. A few discussed the brewing of a local alcohol, *chang'aa*, along Mathare River when tires are sometimes burned to brew the beer, a factory that burns animal bones, a large dumpsite in an adjacent settlement, and industrial sources from Nairobi's second largest industrial area, Baba Dogo.

We then inquired which pollution sources they considered a potential health risk and most participants discussed dust from roads, industrial areas and burning trash as major health risks. Though, only half of participants considered smoke from cook stoves (N = 21) or traffic (N = 26) as a large and significant health risk. Consequently, though indoor air pollution is considered a top priority by many large organizations, like the UN and the World Health Organization, it remains a more complex issue for residents of low-income neighborhoods with little options for alternatives for cook stoves. This latter point arose during the focus group discussions, where participants considered smoke from cook stoves a sensitive issue since most acknowledge it was a problem, but not an important pollution source since there was little they could do to change their exposure to indoor smoke. The lack of feasible alternatives for cook stoves, also referred to as a *jikos*, was a major barrier. Though, after further discussion,

some women discussed possible ways of minimizing exposure, including using *jikos* outside and increasing ventilation in the household, such as opening a door. Another topic that arose from our discussion on pollution sources was the difficulty in avoiding them since participants emphasized that air pollution was 'everywhere.' Overall, these results dovetail with the studies that used a randomized sample and find similar results, where most poor residents associate air pollution with bad smell and do not have adequate access to high quality information on the risks they face.^{32,33} However, a focus on activists likely to lead mobilization showed more local agency in addressing these issues than a random sample.

Prior to our discussion, only a few had heard about air pollution from the television, but they had trouble relating it to themselves. For example, one woman heard about the ozone layer, but did not understand its importance since she could not see where it was located. However, almost all participants during the focus group discussions were interested in learning more about air pollution and its health impacts. We asked individuals about any previous research studies conducted in their communities. Many said that the community rarely, if ever, received feedback from any academic work.³⁵ In fact, when we asked participants to rank various sources of information, scientists ranked fairly low. These results reinforce the need for further discussions between the scientific and local communities to co-produce or transfer knowledge between each other, even for more technical projects, such as air quality monitoring. Meaningful participation of residents is one way to increase trust and facilitate this needed communication. We explore this last point further in the next section, where we discuss results from our community forum.

Community forum on air quality study in Mathare

In March 2012, six months after the air quality pilot study in Mathare, we returned to Mathare to discuss results from this air quality study. Based off statistical analyses, results showed that women experienced similar high levels of air pollution as street vendors and mechanics, which are groups we expect to have high exposure levels since they work along or by busy roadways.²³ During the discussion, we distributed flyers in Kiswahili (in the [Appendix](#)) briefly describing the health impacts of air pollution, air pollution sources in Nairobi, and finally the main results, shown as graphs from the air quality pilot study. One of the co-directors of RYP facilitated the discussion and a nurse and local community health worker discussed some of the health risks posed by air pollution using smoking as an example. We included them because it was clear that they commanded the most respect on health matters in the area. It concluded with questions and a review of a graph showing the results specifically in Mathare, then another graph showing the air quality results from the other groups involved in the study.

During the community forum, we were primarily interested in ascertaining how academic studies in partnership with the local community can assist in producing action to address real air quality risks. We asked participants who were involved in the original focus groups and some who

participated in the actual air quality study what the flyer and graphs evoked and for their opinions and suggestions on the scientific study. The overall reaction was a recognition of the problem and concern. Participants articulated some resignation at the situation but nevertheless despite this, also displayed a willingness to use their own agency to mitigate and address risks as best they could.

They strongly asked for more information with which to act in very practical ways to protect themselves. They articulated a need for more information to explicitly link the health impacts of air pollution from different sources. For example, our air quality study showed that bus drivers experienced the highest amount of exposure relative to the other groups studied, which also included street vendors and mechanics. When participants from Mathare saw this, they discussed whether it was worse to take a bus into town or walk along a busy roadway. In addition, there are few alternatives for avoiding pollution sources, like open burning of waste, cook stoves, dust, etc., so although smelling smoke is uncomfortable, many said they are used to it. Without alternatives, they may have downplayed the risks. The residents also discussed the possibility of planting trees in their neighborhoods to reduce the pollution.

This forum displayed the interest of some more civic-minded residents in participating in discussions and studies of air quality and its impacts on their local community and showed a demand for information from trusted sources like health care practitioners although as we have shown researchers could also have a more active role in these kinds of discussions by working with community based organizations and engaged residents. Finally, in preparation for a meeting to discuss the results with government, we asked participants what actions they would like their officials to take to improve air quality. Participants suggested addressing problems like overcrowding, the production of *chang'aa* along Mathare River which involved burning tires, ways to minimize dust, and removing older vehicles that have not been maintained from the road, many sensible interventions that they crafted after being exposed to more information and an open dialogue. However, in private many were skeptical of the government's ability to address these issues and sought to find self-help approaches such as avoiding the worst sources (if they could get the information) or planting trees.

Discussion

Policy implications

Urban air pollution is a problem affecting all city dwellers, and it will continue to be a growing problem in SSA unless regulations are implemented and enforced and urban planning and social services are improved for all citizens. Some policymakers are beginning to acknowledge poor air quality as an issue and draft regulations exist, but it is unlikely they will pass these draft or other regulations unless there is public concern, civil society mobilization and pressure from local experts, along with data to show the implications on health of inaction.

It is important to note that citizens, including those in the most adversely impacted areas, must have access to this information and understand the health implications in order to increase their capacity to advocate for themselves. We found that involving local people and discussing the scientific data, as opposed to simply reporting measurements done by academics alone, helped generate trust and facilitate needed discussions on air quality and health risks among the most vulnerable. It also showed potential for more conscious incorporation of participation into air quality studies to facilitate better sharing of local and scientific knowledge across a wide range of actors needed for advocacy.

When provided with data, civic-minded residents of informal settlements recognized air pollution as a problem and sought more information concerning what could be taken to improve their situation. Some also devised strategies for addressing poor air quality including avoiding clear sources as best as possible and planting trees. They also were more empowered by the information to make specific demands on their government that aligned better with risks. Proper health education and risk communication along with community and policy meetings focused on scientific results could thus increase awareness and mobilization in these areas, as well as for residents living in middle- and high-income neighborhoods who also suffer from pollution exposure from vehicles and industries, though less so compared to poor communities, but may be more influential in increasing pressure to implement air quality regulations.

Finally, this paper also demonstrates the potential to improve collaborations with urban poor groups.³⁶ RYP was a central partner in this work. RYP staff input helped facilitate knowledge transfers including the production of this paper. The organization and participants in this work serve as a repository of information anchored locally. Future research in the area of air quality and public health should include participatory methodologies as a way to contribute to air quality monitoring and health education and could become one more important avenue for revealing the conditions of life in informal settlements. This, in turn, might help in strengthening advocacy for improving not only informal settlements, but also the environment and quality of the city as a whole including its air.

Limitations and looking forward

There are a few limitations to this study. First, our sample size is small and unrepresentative. It would be important to replicate this work in other communities and socio-economic groups in other parts of the city. Many more air quality monitoring and health impact studies need to be conducted in different neighborhoods and in other African cities. We also need to pay attention to the dynamics of social segregation and exclusion. Poor neighborhoods are often blamed as sources of air pollution, rather than being perceived as carrying an inordinate and unfair risk. This work, especially if conducted in a participatory way, will facilitate greater understanding of air quality and its sources and support advocacy for addressing this growing public health problem in Africa. Finally, we did not explore the potential of using new low cost monitoring devices, sensors and cellphones, but

these technological developments have clear potential, if used thoughtfully, to support participation in air quality monitoring. Given the magnitude of the public health problem posed by poor urban air quality in Africa and the dearth of current resources applied to it, it is critically important that we explore the most impactful approaches to further badly needed air quality and health impact studies.

Author statements

Acknowledgments

We would like to especially thank all the people in Mathare who contributed their time and effort in supporting this project, including the wonderful staff at Reality Tested Youth Programme. Special thanks to Dr. Michael Gitari and Dr. Patrick Kinney for their support of this work and to the two anonymous reviewers also provided very valuable comments.

Ethical approval

Ethical approval for this work was obtained by Columbia University's Institutional Review board.

Funding

This work was supported through a grant from the Institute for Social and Economic Research Policy and the Center for International Business Education and Research Doctoral Research Grant at Columbia University and the Volvo Research and Education Foundations.

Competing interest

We have no competing interests.

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Appendix

Part A: Summary of quantitative findings from interviews

Table A1 – How important is air pollution in relation to the following problems?

	% Very important
Bad smell	69
Coughing/poor breathing	56
General health	41
Irritable eyes	41
Poor visibility	34
Noise pollution	26

Table A2 – How would you define air pollution PRIOR to the definition given to you just now?

Definition	% Of individuals
Dirty material in the air that usually has a bad smell	29%
Gases or solids in the air that can affect my health and the environment around me (U.S. EPA definition)	42%
Black smoke that can harm the environment, but has no effect on my health	5%
Other	24%

Table A3 – What do you consider the top 5 most important sources of air pollution?

Source	% Who considered it important
Burning trash	68
Sewage/dirty water	65
Garbage	58
Exhaust from vehicles	45
Dust	40
Cook stoves (in general)	28

Table A4 – How much of a health risk do you think you are exposed to while in the following areas?

Source	% Large health risk
Dust from roads	84
Industrial areas	74
Burning trash	69
Smoke from jikos	53
Smoke from stoves (kerosene)	53
Traffic	54

Table A5 – How important do you consider the following sources of information about air pollution?

Source	% Very important
Local community workers	68
NGOs	56
Radio	56
TV	56
Government agency	46
Friends	39
Scientists/academics	39
Newspaper	28

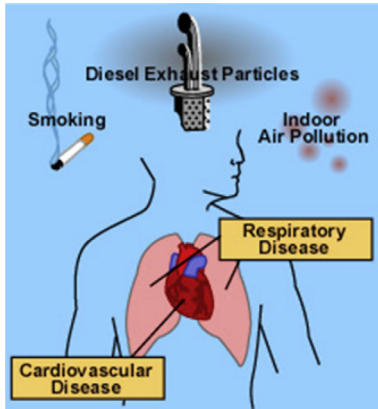
Part B: Flyer handed to participants of the community forum

Uchafuaji wa hewa katika Mathare na Nairobi

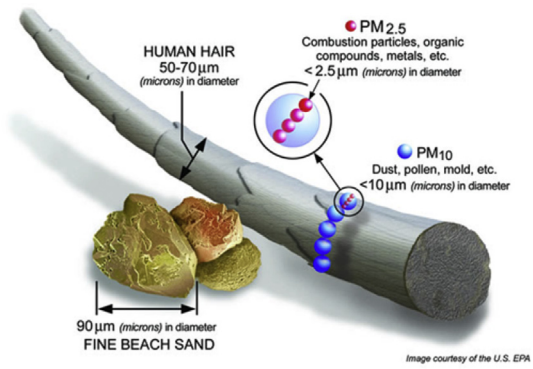
Kwa nini tulichungua uchafuwaji wa hewa katika Mathare?

- Uchafuaji wa hewa unaathiri afya zetu kwa sababu unaathiri hewa tunayotumia kwa kupumua
 - Unaathiri macho, pua, koo na sehemu za mwili za kupumua (Mchoro 1)
 - Pia inatatiza matata ya afya kwa watoto na wazee

Kuna uchunguzi mdogo kuhusu hewa chafu katika sehemu za wakazi wa tabaka la chini katika Afrika kwa hivyo hatajui kama uchafuaji wa hewa una wasiwasi wa afya.



Mchoro 1. Uchafuaji wa hewa na sehemu za mwili za kupumua (U.S. EPA 2012).



Mchoro 4. Ukubwa wa PM_{2.5} ni mdogo zaidi kuliko nywele.



Mchoro 2. Moshi wa kuchoma takataka (CARB 2012).



Mchoro 3. Uchafuaji wa hewa kutoka barabara (kwa mfano vumbi na moshi ya gari).

Tulivyofanya:

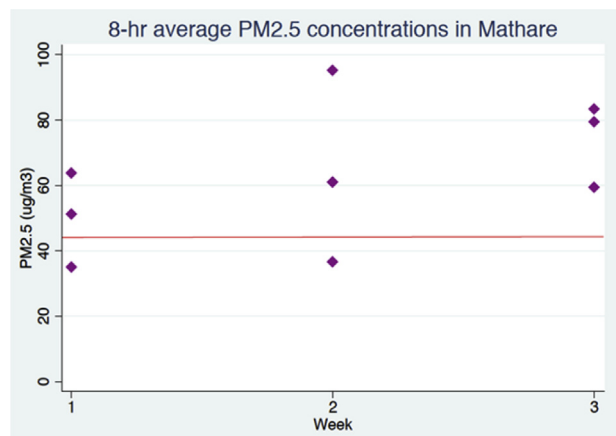
- Kuna vichafisho vingi? Vianzo vyake vinategemea
 - Kwa mfano moshi wa magari (Mchoro 3), moshi wa kuchoma takataka (Mchoro 2), vumbi (Mchoro 3), moshi kutoka majikoni na viwandani.

- Lakina kuna vianzo vingine hatuvifahamu, kama harufu, hasa harufu kutoka kwenye maji machafu
- Tunapima **fine particulate matter (PM_{2.5})** kwa sababu Shirika la Dunia la Afya limeamua kwamba kiwango salama cha PM_{2.5} kwa afya zetu
- United Nations inasema kwamba asilimia tisini za uchafuwaji wa hewa katika miji unatoka barabara, kwa hivyo tulipima PM_{2.5} kwenye hizi: Madereva wa matatu ('Matatu driver'), wachuzi wa barabarani ('Hawker'), makanika wa magari ('Mechanic'), wanawake kutoka Kosovo ('Mathare')

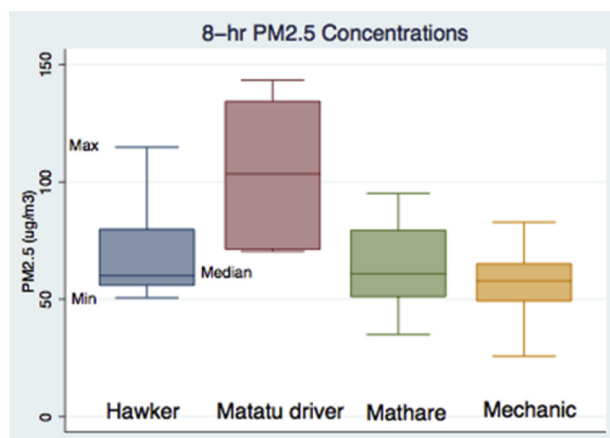
Matokeo makuu ya uchunguzi huu unaonsha kwamba:

- Wanawake katika Mathare waliathiriwa kwa kiwango cha PM_{2.5} kama wachuzi wa barabarani na makanika.
- Inaonekana kwamba kiwango cha PM_{2.5} kilikuwa mara mbili zaidi kuliko tunaona katika nchi za maandeleo

Huu ni mchoro:



Mchoro 1 (kushoto). Viwango kutoka uchunguzi wetu katika Mathare ("Week" ni wiki). Mstari ni kiwango cha uchafuaji wa hewa na watu karibu barabara jijini New York.



Mchoro 2 (kulia). Matokea jumla kutoka uchunguzi wetu. “Max” ni kima cha juu, “Min” ni kima cha chini, “Median” ni kima cha kati.

Kuna njia moja muhimu sana ambayo kila mtu anaweza kujitahidi kufanya: Kwepeni na msiende kwenye sehemu kulikuwa hewa chafu kama viwanda, barabara, na kadhalika.

Matokeo yanapendekeza kwamba hewa chafu ni wasiwasi wa afya katika Mathare na Nairobi. Hewa chafu ni shaka vigumu na kuna uchunguzi mdogo kuhusu hewa chafu katika sehemu za wakazi wa tabaka la chini katika Afrika. Lakini tunataka uchunguzi zaidi kuhusu hewa chafu katika Mathare, kama vianzo. Tafadhali twambie maoni zake: hewachafumathare@gmail.com.

Ukifanya hivyo utapunguza kima cha kupumua kwa kutumia hewa chafu na utayapa yako maisha bora!

Part C: Focus group discussion questions

Questions for focus group

We will have four 2-hr sessions with a maximum of 10 people in each session.

To the facilitator: Please make the following statement below stating the purpose of the project to participants.

Hi and thank you for offering to participate in this focus group. The purpose of the focus group is to assess how information from scientific studies on air quality in Nairobi could be useful for residents, like yourselves.

There is no right or wrong answer. We only want to better understand what people think. No information about individuals will be published.

Then offer the following definitions below of air pollution and air quality and see if people understand what it means.

Air pollution: Chemicals in the air that can affect human health or the physical environment. For example, black smoke from vehicles contains pollutants because chemicals from the smoke can enter your respiratory system and affect your breathing.

Air quality: Way to measure the quality of the air at a given location by measuring the local air pollution.

Give some examples: For example, when you see smoke from a fire or from a vehicle, that is ‘air pollution.’ Another example of air pollution is dust from roads floating in the air. ‘Air quality’ is a measure of how much of this pollution is in the air. This is similar to the notion of water quality. Water quality describes how ‘dirty’ the water is and air quality describes how ‘dirty’ the air is.

1. What types of problems, if any, do you associate with air pollution in Nairobi? (Probe: Tell me more about that) (Summarize: We seem to have present the following issues so far...)
2. Where in your neighborhood do you think air pollution is worse and from what source? (Probe: Tell me more about that. What source or where do you think it is coming from?)
3. Do you or anyone in your family currently practice any behavior to reduce your or your child's exposure to air pollution? If yes, what kind of behaviors do you practice? (Summarize: There seem to be the following points of view about this ...)
4. What is the possibility of avoiding areas of high air pollution in your settlement (for example, on your way to work or on your child's way to school, is it possible to avoid high traffic areas or areas of trash burning)? If you work or visit areas outside Nairobi, what is the possibility of avoiding areas of high air pollution in other parts of Nairobi (for example, in town or where you work)?
5. What, if any, information have you been getting about air quality in your neighborhood (Probe: How helpful is this information to you?)
6. In your opinion, what kind of information about air pollution in your neighborhood would be helpful (probe: For example, when you consider important lessons learned in the past, like about your health, what helped convince you to not only believe what you were hearing, but to change your behavior)? What is the best source for this information about air quality? (Probe: If participants seem unsure how to answer the first question, please cite the following examples: potential sources of pollution, information on health impacts, pollution levels in certain parts of Nairobi, pollution level standards set by the World Health Organization).(Summarize: If I understand, you feel this way about the situation...)
7. What do you think are the best ways to improve air quality in your settlement?
8. What role do you think you could play in helping to reduce air pollution? (Probe: Who or what agency is in the best position to help with these improvements and why?) (To facilitator: If participants seems unsure how to answer the first question, please cite the following examples: you and your neighbors, officials in your community, government officials like in NEMA, academics, private businesses, other residents)
9. (Optional): How do you think air quality has improved or worsened over the years? (Probe: Tell me more about that.)