

Review of: "Knowledge of Risk Associated with Exposure to Per- and Polyfluoroalkyl Substances in Abuja, Nigeria"

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Potential competing interests: No potential competing interests to declare.

This project is relevant, and may prove important, in relation to exploring what the perception of the people in Abuja, the capital city of Nigeria, is about this subject, since limited data is available due to limited capacity to monitor PFASs in Africa¹.

To make this publication more robust, it needs some more work and improvement, especially in two areas: the background of information about the problem intended for study, and the way the paper is written.

Ssebugere, P. et al¹, suggest that policy makers need to prioritize resources for research on PFASs in African hotspot areas. Then, the researchers should provide strong information and analyze the data in such a way that the results are a baseline for the decisions to be taken in Nigeria.

The paper needs a little more information from the chemical point of view. A short description of what these substances are and of their chemistry, including diagrams 1 and 2, would prove appropriate in the Introduction so people can understand better why they are of concern. At the same time, one would ask what kinds of products are used in Nigeria that contain PFAS.

The researchers mention, "There are reports indicating that some of these products are being phased out in America and Europe", but they do not make a reference to these reports, which can be relevant later in the discussion.

A quick review of what the environmental laws in Nigeria say about chemical substances, and whether the country has any national implementation plan (NIP) derived from the Stockholm Convention, will set the motion for learning what the results of the project are. Maybe the regulations on the Federal Solid and Hazardous Waste Management identify the risks of these substances on public health and need to be highlighted to understand the possible problems in the population.

If not, the researchers should reconsider the literature review done to reflect, in a more organized way, what is known, and at the same time they should be more clear about how it relates to the local population, in what products they are found, and how they are used. For example, the effects of these substances mentioned can be rearranged (combining paragraphs 6 and 7 of the Introduction) and elaborate on them. After this, saying that "people in Nigeria and Abuja do not know what PFAS is and the risks they carry" will be better understood and may avoid the readers questioning how the

researchers know this.

A closing paragraph of the Introduction contains the objective(s) of the research, and a description of what they would like to learn and the purpose of it, so the readers – policy makers, scientists, and others - understand the context of the effort done. Such a paragraph is missing.

Formatting suggestions

Materials and Methods

Why did you choose Abuja to conduct the project? Besides being the capital city, is there any particularity in the city that makes it the best site to conduct a survey to detect perceptions on the subject of interest? Moving the very last sentence of the Discussion to Methods will help in supporting any reasoning. Consider having a map to show where Abuja is located, along with other important information of interest to the project and the problem it studies, instead of giving the coordinates in the text.

In relation to the application of the surveys, being Abuja such a large city, with a large population, is 400 questionnaires a good sample size? What areas of the city were included in the survey (industrial, commercial, urban, other)? How did you choose them?

Is the questionnaire included as an appendix? What type of questions were included? How did you decide on the questions? How did you apply the survey (on the streets, offices, by phone, sent by snail mail or by e-mail, other)? Why did you not get all the surveys back?

Results

Table 1 includes a graphic description of the respondents. Including it in the Methods may be more appropriate as they are your primary source of information. Also, besides the table, consider including a short text describing the respondents.

What cohort(s) of respondents had more knowledge about PFAS? A sociological analysis of the data from the surveys would include looking at the answers in relation to the variables of Table 1. Since this is a diagnosis of the perceptions, and you are discovering several important issues with the answers you gathered, think on elaborating the text a little more, and point to what people may not see directly.

Discussion

While 91% of the respondents of Q #1 said they did not have knowledge of PFAS and their risks, almost 93% of the responses to Q#2 are affirmative, saying they have used products containing PFAS. Then, how do the respondents know the products contain PFAS?

Did the respondents say all of the statements mentioned in paragraph #5 of the Discussion? If so, is there other information that you can gather from the responses they provided? Did you learn the first sentence in paragraph #8 from

the answers to the survey?

Do you know if any public discussion on the risk of exposure occurs in Nigeria? How is this done?

Any data from other African countries on PFAS or any related matter? If so, you could use them for comparison, or as a reference. What about other parts of the world?

Recommendation

Since the recommendations given in the paper seem to be generated from outside the methodology or objectives of this project, you may, instead, consider proposing a strategy, based on the results and the discussion, on ways through which the population can learn about these substances and their risks. You can incorporate the fact that more research and funding is needed, as well as the need for technology and knowledge transfer.

The lines of research that should be funded include social studies on the population, scientific (chemical and biological) studies in the environment, and health studies to determine any health problems in the population associated with these substances, and establish a permanent monitoring program, not only in Abuja but also in other important cities of the country.

Maybe the NAFDAC and the Ministry of Health can support a larger-scale research project on the uses of these chemicals that will produce a better understanding of how hazardous they are and implement some, already existing or new, policies to regulate them.

Other departments of the university working on environmental research and technology may be good partners for a follow-up research project on this matter. Furthermore, researching what the state of knowledge is in other African countries, looking for any similar projects or work done, as well as finding if social and scientific researchers in other African universities are concerned about these substances and their risks, will produce a network of concerned parties and stakeholders that can be of impact for the needed changes.

Networks have been especially useful for translating global-scale issues to national or regional settings² and vice versa. If a network of researchers and concerned people is established in Africa, interested in the control of the substances and their use, the flow of information and funding could be reached more effectively.

References

Some citations are not included in the References (ATSDR 2005, USEPA 2016c, USEPA 2016de)

The references should be in alphabetical order and, in the case of repeated sources, the oldest first and the newer later. At least one of the references is not in alphabetical order due to mistakes in the names (USEPA 2009b, USEPA 2016b, USEPA 2017)

Some references are not mentioned in the text (CRCCARE 2014, UNEP 2006, USEPA 2016e)

One reference seems to have incomplete bibliographical information (ATSDR 2015)

Some of the references, particularly the ones from USEPA, have some letters after the year, meaning that several publications from that source were made during the same year. In those cases, the oldest of the publications from the same year will have the letter “a,” and the following letters after that for as many publications from the same year. So, your USEPA references will end up in the following order: 2009, 2015, 2016a, 2016b, 2016c, 2016d, 2017

Formatting

There are many typos (missing letters, concordances, plurals, non-required capitalized letters, etc.), which should be reviewed.

Do not use informal language, such as “don’t,” and the like.

Consider modifying the following sentence (in the middle of the Abstract), from

“A total of 400 questionnaires were distributed and only 365 were collected” to “A total of 365 questionnaires were used.”

The sentence before diagrams 1 and 2 appears to be incomplete.

(1) Ssebugere, P. et al, 2020. Environmental levels and human body burdens of per- and poly-fluoroalkyl substances in Africa: A critical review. *Science of the Total Environment*, 739. <https://doi.org/10.1016/j.scitotenv.2020.139913>.

(2) Editorial overview: Networks and networking: collaborative work, innovation and far-reaching approaches to multiple sustainability challenges. *Current Opinion in Environmental Sustainability* 2019, 39:A1–A2.
<https://doi.org/10.1016/j.cosust.2019.12.001>