Environment and Health in Nigeria: Capacity and Research Development

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In Africa, population growth, urbanization, and climate change are environmental health challenges of emerging concern. These challenges intersect in Nigeria, Africa’s most populous country. Nigeria’s coastal location makes it vulnerable to climate change–related weather extremes that may influence the health of its residents (Elias & Omojola, 2015; Serdeczny et al., 2016). However, there is a paucity of data on the health impacts of extreme weather in coastal Nigeria because of critical gaps in research capacity, data collection, and research funding.

This brief describes a project to promote collaborative capacity and research development in environmental epidemiology in Nigeria. The project will develop and evaluate a short course on environmental epidemiology for Nigerian researchers. The effort will also produce new knowledge on the physical and mental-health impacts of weather extremes among residents of Nigeria’s coastal cities, including Lagos, Africa’s most populous city. The project is designed to improve public health by advancing knowledge about the nature and magnitude of environmental health hazards in Nigeria.

Environmental and Health Concerns

In Africa, environmental risks account for approximately 23% of the burden of disease (Pruss-Üstün et al., 2006). This environmental burden has been attributed to unsafe water, sanitation, and hygiene (WASH), air pollution from ambient particulate matter, and indoor air pollution from household use of solid fuels and traditional cooking methods (GBD 2019 Risk Factors Collaborators, 2020; Mustapha et al., 2011; Shaffer et al., 2019). While WASH and air pollution are well-established environmental hazards, 21st century hazards, such as population growth, urbanization, and climate change, interact to present new public health challenges (Koné et al., 2019; Nweke & Sanders, 2009).

Research in both low- and high-income settings has documented extreme weather’s associations with adverse physical and mental health (Lane et al., 2013; Mason et al.,...
2020; O’Neill & Ebi, 2009), but evidence from Nigeria has been shaped by the noted gaps (Koné et al., 2019; Kula et al., 2013). Environmental monitoring is not robust, there are no central repositories of environment health data, and expertise in environmental epidemiology is limited. These gaps complicate environmental epidemiology research and the translation of findings to inform public health efforts (Koné et al., 2019). The work described here is designed to address the gaps through collaborative development of capacity and research.

**Task 1: Develop and Evaluate an Environmental Epidemiology Short Course for Nigerian Researchers**

In 2021, we developed a 3-day online short course in environmental epidemiology. The purpose of the course was to strengthen the ability of Nigerian researchers to conduct environmental health research and, thereby, to fill data gaps. The course consisted of weekly 2-hour synchronous sessions, with independent learning activities between sessions. The course was extensively advertised to all parts of Nigeria through social media and professional societies. Eligible applicants included Nigerian graduate students and scientists with degrees in environment, health, and related disciplines. We received over 200 applications and enrolled 30 participants.

**Task 2: Explore the Health Impacts of Weather Extremes in Nigeria**

With a protocol modified for Nigerian study participants, this task will involve collection of survey data from a sample of Nigerian residents of varying socioeconomic and environmental parameters. Participants will complete a self-administered questionnaire on health impacts encountered during extreme weather events. The questionnaire will also solicit information on respondents’ demographic characteristics, socioeconomic status, household composition, health status, and adaptive behaviors, as well as health-related quality of life. This exploratory work will address research gaps through novel data collection that will allow the project’s researchers to develop standards, protocols, and methodologies for future replication.

**Significance and Impact**

This work will advance new knowledge about the nature and magnitude of environmental health risks in Nigeria. As climate change–related weather extremes become more frequent and severe, research and capacity development of the sort undertaken in this project will be vital for improving environmental public health there. The research in this work will innovate by gathering data on everyday health impacts, including understudied mental-health impacts.

**Plans for Next-Stage Funding**

The project has fostered meaningful collaborations between scholars at Emory University, the University of Denver, the Nigerian Institute of Medical Research, and Washington University in St. Louis. This partnership will provide a strong foundation for the research enterprise and scholarly endeavors within Nigeria. The project supports the strategic plan of the National Institute of Environmental Health Sciences (2018) in the National Institutes of Health by promoting improvement in global environmental health. As such, the work will inform the development of large-scale studies to fill data gaps and ultimately inform interventions to reduce the health burden of environmental health hazards in Nigeria.

**References**


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