Research and research capacity strengthening in the context of an emerging epidemic: Zika virus in Latin America

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The Zika virus epidemic was declared an international public health emergency in 2016 following reports of a suspected association between pregnant women infected with Zika virus and microcephaly as well as other fetal malformations.¹ The World Health Organization (WHO) Headquarters and the Pan American Health Organization (PAHO) worked together to coordinate a research agenda to identify key evidence gaps that would inform interventions to limit the impact of the Zika virus epidemic.²

In response to the call for more research, the UNDP/UNFPA/UNICEF/WHO/World Bank Special Programme of Research, Development and Research Training in Human Reproduction (HRP) and the UNICEF/UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases (TDR) with the support of PAHO joined, to issue a call for research proposals. The aim was to combine support for research capacity strengthening in the context of an emerging epidemic, with investigations into the multifaceted but largely unknown nature of the Zika virus outbreak. Researchers based in the countries most affected by the epidemic were encouraged to apply for funding that prioritized implementation research projects to support an evidence-based, comprehensive public health response.³

In many of the Zika-affected countries in Latin America, socioeconomic inequities and legislation limit access to sexual and reproductive health services such as modern contraceptives and safe abortion.⁴ The Zika epidemic exposed this vulnerability further, given its dire consequences for pregnant women. Viral characteristics, such as sexual transmission of the virus caused by it persisting in semen several months after infection⁵ and the highly contextualized varying incidence rates of microcephaly following Zika infection during pregnancy, highlighted how inequities in and unmet access to sexual and reproductive health services determine the epidemic’s impact.

The combined effort between the WHO-hosted special research programs and the WHO regional office—focusing on infectious diseases of poverty and sexual and reproductive health and rights—enabled WHO to address the need for cross-cutting efforts between research areas and disciplines, in response to a complex emergency like the Zika epidemic. Ranging from studies on the spatial distribution of the virus and its relative risk, to articles on understanding how the virus impacts women’s reproductive choices in communities without access to safe abortion, the papers in this Supplement illustrate the broad variety of perspectives necessary to ensure an understanding of the Zika virus context and to tailor the necessary response.

The articles included in this Supplement come from Brazil, Colombia, and Peru. Colleagues implementing a study in Colombia (Forero et al.⁶)
and in Peru (Igúñiz-Romero et al.) qualitatively assessed women’s and healthcare workers’ experiences with the epidemic; their findings point toward poorly coordinated health system responses to the Zika virus in both countries, especially with regard to necessary collaboration with other sectors (such as education, vector/infection control). Gomez and Ocampo further highlight women’s dissatisfaction with the healthcare system, delayed access to care due to socioeconomic inequities, and high out-of-pocket expenses. Freitas et al., Salvador Mocelin et al., and Tirado et al. found, through their separate qualitative assessments of affected women in Brazil and Colombia, that the combined social and medical impact of Zika virus infection disproportionately affects women and is closely linked to poverty—confirming the findings of others—and stressing the inequitable impact of the epidemic. Using a Bayesian model, Florez et al. identified high-risk Zika virus areas in Colombia that can help inform surveillance systems for a better health system response in future outbreaks. Ocampo et al. showed that newborns of Zika-infected women were mostly born at full term and with normal birthweight, while de Siqueira et al. emphasized the need for continuous screening of newborns, even among those not exhibiting any symptoms of Zika virus, to ensure timely access to services. In addition, Angelo et al. provide evidence that arbovirus epidemics, frequent in the region (i.e. dengue, chikungunya, Zika), are associated with increases in the incidence of neurological disorders.

An additional objective of this call was to foster capacity in community-based research in low- and middle-income countries. Research capacity strengthening is at the core of HRP’s and TDR’s mandates and aims to develop a critical mass of researchers who can conduct research and knowledge transfer and lead in ensuring that local research agendas are developed and met. The unknown nature of the Zika virus disease and the rapid spread of the epidemic have provided an important experience of what needs to be in place to support research in the context of unanticipated and unpredictable disease outbreaks.

Added to the inherent need to act fast in a public health emergency to ensure timely provision of information for public health action, the Zika outbreak changed rapidly over time. Some of the research teams had to adjust or adapt their research protocols to fit evolving situations, while others had to abandon their plans owing to a lack of cases at the later stage of the epidemic.

Not all of the studies are published in this Supplement. Some of the research teams are functioning in settings undergoing critical social and public health challenges, hindering their ability to respond in a timely manner. Others experienced unforeseen delays with data collection and analysis, while others faced challenges with writing research results for a peer-reviewed journal. Additionally, although researchers participating in this call were encouraged to write in their native languages (mostly Spanish or Portuguese), several experienced the existing and persisting challenges that non-English speakers face, both in accessing and disseminating research internationally. These shortcomings highlight the need for continuous support for national research capacity strengthening to ensure that teams are fully prepared and able to respond to other emerging health issues. We believe our lessons learned from this process could help others to plan and rapidly implement a small grant research program in disease outbreak and other health emergencies in the future.

The evidence obtained through these projects offers helpful guidance to the national health system responses, as well as useful insights to research capacity strengthening initiatives. Outbreaks and health emergencies create the need to act fast; they are also a reminder that high-quality evidence springing from these situations is critical for shaping the real-time public health response. By building research capacity that can be available both nationally and regionally, we further contribute to a sustained focus on research related to the interplay between emerging infectious diseases of poverty, like Zika virus, and sexual and reproductive health and rights, ultimately to support a contextualized and effective epidemiologic response.

AUTHOR CONTRIBUTIONS

AT initiated the editorial with support from VB and GA. All authors provided input and approved the final version.

ACKNOWLEDGMENTS

The authors would like to thank all the contributors to this Supplement, particularly José Guilherme Cecatti as Guest Editor, as well as the researchers whose projects did not make it to this publication, for their work and efforts in the Zika virus outbreak response. They also wish to thank the team at CEMICAMP in Brazil, particularly Luis Bahamondes, José Guilherme Cecatti, and Vilma Zotareli for the support provided to the research teams during manuscript preparation. The work in this Supplement was funded by the HRP Alliance, part of the UNDP/UNFPA/UNICEF/WHO/World Bank Special Programme of Research, Development and Research Training in Human Reproduction (HRP) and the UNICEF/UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases (TDR), both cosponsored programs hosted by WHO. Funding was also provided from WHO Headquarters, within the frame of the coordinated Zika research response. The Pan American Health Organization provided technical support throughout project implementation.

CONFLICTS OF INTEREST

The authors have no conflicts of interest.

REFERENCES

1. World Health Organization. Pregnancy management in the context of Zika virus infection. Interim guidance update. May 13, 2016. WHO/ZIKV/MOC/16.2 Rev.1. https://www.who.int/csr/resources/publications/zika/pregnancy-management/en/. Accessed August 20, 2019.
2. World Health Organization. Zika virus research agenda. WHO/ZIKV/PHR/16.1. October 2016. https://www.who.int/reproductivehealth/zika/zika-virus-research-agenda/en/. Accessed August 30, 2019.
3. TDR, HRP, PAHO, WHO Americas. Call for applications: HRP/TDR/PAHO Joint Small Grants Programme for research on the Zika virus outbreak in the Americas. http://www.who.int/tdr/grants/SGP-HRP-TDR-PAHO-EN.pdf. Accessed August 30, 2019.
4. Gómez Ponce de Leon R, Everling F, Serruya SJ, et al. Contraceptive use in Latin America and the Caribbean with a focus on long-acting reversible contraceptives: Prevalence and inequalities in 23 countries. Lancet Glob Health. 2019;7:e227–35.

5. Medina FA, Torres G, Acevedo J, et al. Duration of the presence of infectious Zika virus in semen and serum. J Infect Dis 2019;219:31–40.

6. Forero-Martinez LJ, Murad R, Calderón-Jaramillo M, Rivillas-Garcia JC. Zika and women’s sexual and reproductive health: Critical first steps to understand the role of gender in the Colombian epidemic. Int J Gynecol Obstet 2020;148(Suppl 2):15–19.

7. Iguiniz-Romero R, Guerra-Reyes L. On the front line: Health professionals and system preparedness for Zika virus in Peru. Int J Gynecol Obstet 2020;148(Suppl 2):45–54.

8. Gomez HM, Mejia Arbelaez C, Ocampo Cañas JA. A qualitative study of the experiences of pregnant women in accessing healthcare services during the Zika virus epidemic in Villavicencio, Colombia, 2015–2016. Int J Gynecol Obstet 2020;148(Suppl 2):29–35.

9. Freitas PSS, Soares GB, Mocelin HJS, et al. How do mothers feel? Life with children with congenital Zika syndrome Int J Gynecol Obstet 2020;148(Suppl 2):20–28.

10. Mocelin HJS, Catão RC, Freitas PSS, et al. Analysis of the spatial distribution of cases of Zika virus infection and congenital Zika virus syndrome in a state in the southeastern region of Brazil: Sociodemographic factors and implications for public health. Int J Gynecol Obstet 2020;148(Suppl 2):61–69.

11. Tirado V, Morales Mesa SA, Kinsman J, Ekström AM, Restrepo Jaramillo BN. Women’s reluctance for pregnancy; Experiences and perceptions of Zika virus in Medellin, Colombia. Int J Gynecol Obstet 2020;148(Suppl 2):36–44.

12. Souza WV, Albuquerque MFPM, Vazquez E, et al. Microcephaly epidemic related to the Zika virus and living conditions in Recife, Northeast Brazil. BMC Public Health 2018;18:130.

13. Flórez-Lozano K, Navarro-Lechuga E, Llínás-Solano H, et al. Spatial distribution of the relative risk of Zika virus disease in Colombia during the 2015–2016 epidemic from a Bayesian approach. Int J Gynecol Obstet 2020;148(Suppl 2):55–60.

14. Ocampo Cañas JA, Caviedes Combita D, Molina Leon HF, García Sierra AM, Hernández Florez LJ. Patient characteristics and pregnancy outcomes among Zika-infected pregnant women: Epidemiologic surveillance data from two cities in Colombia, 2015–2016. Int J Gynecol Obstet 2020;148(Suppl 2):4–8.

15. Oliveira JV, Carvalho TCX, Giovanetti M, et al. Neonatal surveillance for congenital Zika infection during the 2016 microcephaly outbreak in Salvador, Brazil: Zika virus detection in asymptomatic newborns. Int J Gynecol Obstet 2020;148(Suppl 2):9–14.

16. Angelo JR, Fuller TL, Leandro BBS, et al. Neurological complications associated with emerging viruses in Brazil. Int J Gynecol Obstet 2020;148(Suppl 2):70–75.