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Editorial: One Health and preparedness for Disease X in the Tropics: spillover prevention, surveillance, vaccines, and drugs

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Editorial on the Research Topic

One Health and preparedness for Disease X in the Tropics: spillover prevention, surveillance, vaccines, and drugs

Pandemic preparedness for a future Disease X has been defined by WHO, international agencies, and governments as a critical global priority. Nevertheless, dealing with complex eco-social conditions in underserved tropical regions remains a major challenge. The lack of resources for implementing effective knowledge governance has undermined local efforts to provide timely and reliable access to diagnosis and preventive and therapeutic strategies. In this book, we review and discuss the current challenges to reverse this scenario, integrating surveillance, prevention, treatment, and response from a transdisciplinary perspective and accelerating vaccine and drug development and access. The nine chapters are presented in six thematic groups, as indicated in [Figure 1](#): (1) Conceptual framework spillover prevention, surveillance, vaccines, and drugs; (2) epidemiological surveillance; (3) vaccine development and coverage; (4) capacity building; (5) knowledge, attitudes, and practices; and (6) remote methods and digitalization.

Possas et al. provide a conceptual framework from an integrated eco-social One Health perspective. The authors alert the risk of a future highly lethal zoonotic pandemic with no vaccines and call for accelerating integrated spillover prevention, surveillance, and prototype vaccine development, aiming for massive global vaccine production based on Coalition for Epidemic Preparedness Innovations (CEPI)'s 100 Days Mission initiative. These interventions, supported by innovative artificial intelligence systems and quality data, would support data sharing and response across human, animal, and environmental health fields. Finally, technological transfer and local capacity building are identified as critical steps for equitable vaccine distribution, reducing dependence on imports.

From an innovative methodological approach, [Ribas Freitas et al.](#) alert that their study results highlight a serious underestimation of Chikungunya mortality by traditional



epidemiological surveillance in southeast Brazil. The excess mortality rate was surprisingly high and significantly 60 times higher than the deaths reported by surveillance. These results evidence the concerning fragility of traditional surveillance systems in assessing the impact of mortality in epidemics and pandemics and the urgent need for complementary tools to better assess their impacts on morbidity and mortality.

Possas et al. provide evidence of a worrisome global situation regarding the development of new dengue vaccine candidates. The results from the Cortellis Drug Discovery Intelligence and the Derwent Innovation database indicate that 65% of dengue vaccines are still in phase 1 of development. The few current dengue vaccines that have reached phase 3 (1 vaccine) and have been launched (2 vaccines) have shown limited levels of individual protection for one or more dengue serotypes, evidencing an anemic pipeline for the next generation of more effective tetravalent dengue vaccines. The authors highlight an urgent need to implement new governance strategies and funding for innovative dengue vaccine development.

Possas et al. discuss the global decline in immunization coverage, with the resurgence of vaccine-preventable diseases like measles. The reasons for this decline that affected particularly tropical developing countries, go far beyond the simplistic generalization of the “vaccine hesitancy” assumption and are related to complex programmatic and socioeconomic issues at the local level. Brazil is now among the countries with the lowest vaccination coverage worldwide. The country organized its internationally recognized National Immunization Program (NIP) in 1973 and experienced a sharp decline in immunization rates starting in 2012. Lessons from the Brazilian experience can contribute to changing the global immunization scenario, preparing for a possible Disease X pandemic, and helping achieve the sustainable development goals of the UN’s 2030 Agenda.

From an innovative perspective, Magalhaes et al. describe the challenges and successful strategies to integrate a One Health (OH) course into an established graduate program at a public university in Brazil. The authors provide a detailed description of this implementation process and conclude that for its success, an OH course should be adequately tailored for its effective integration into the program where it is being taught, adjusting the content and format as needed.

Hamed aims to identify predictors influencing knowledge, attitudes, and practices in this region related to dengue fever (DF). There is a lack of studies addressing the importance of health education regarding DF in Saudi Arabia, and this cross-sectional study succeeded in overcoming an important gap in the literature. The study results indicated that good participants’ knowledge and attitudes toward DF were observed. An important conclusion is that knowledge, attitudes, and practices toward DF among adults in Saudi Arabia can be predicted by specific sociodemographic characteristics. Thus, implementing interferences that focus on improving public practices toward DF is imperative.

Togan et al. provide an innovative strategy to overcome the lack of health statistics on dengue in the country despite viral circulation. This study aimed to assess the knowledge, attitudes, and practices (KAP) of health professionals in the Kara health region in Togo. The results indicate that out of 256 professionals who had encountered a case of dengue fever in their practice, only 24 (9.4%) had appropriate practices for diagnosing and treating dengue fever. The conclusion is that strengthening healthcare professionals’ dengue-related skills through ongoing training and the provision of dengue diagnostic tests could help improve early detection practices and the management of dengue fever in Togo.

Grant emphasizes the urgent need for transdisciplinary remote methods in epidemic and pandemic preparedness and response in

Sub-Saharan Africa. During pandemics, it can be difficult to continue with traditional research methods, as movement restrictions stop social interactions, altering normal behavior patterns and the ability to conduct research with people. From this perspective, she indicates how remote social science methods can be critical in gathering data and understanding the different contexts and narratives. Thus, building partnerships with local communities and stakeholders will be key. This innovative methodological strategy, based on anthropology and social sciences, should be effectively implemented in a way that when pandemics and crises emerge, existing relationships can be utilized to allow remote methods to be more successful.

Chuchu et al. examine complex issues related to antimicrobial resistance (AMR) as a major threat to global public health in Kenya, affecting human and animal health, agriculture, food safety, and the environment. To develop evidence-based control policies for AMR, an electronic information system that integrates AMR data from various sectors, in a One Health approach, has proven critical. They conclude that digitalizing AMR surveillance through a One Health lens is pivotal in understanding AMR prevalence and patterns across various sectors. Digital tools such as The European partnership on One Health AMR (OHAMRS) are vital in facilitating the availability of data and actionable information on AMR required to address the AMR crisis in Kenya.

All the articles in this Research Topic provide innovative knowledge governance contributions to overcome the current gaps in pandemic preparedness in the Tropics.

Author contributions

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Conflict of interest

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