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New premises for sanitation in arbovirus infections control in Brazil

Novos pressupostos para o saneamento no controle de arboviroses no Brasil

Nuevas presuposiciones para el saneamiento en el control de arbovirosis en Brasil

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Arbovirus infections such as dengue, Zika, and chikungunya cause pain and suffering in the population and overload the health systems. Recent outbreaks have exposed the vulnerability of prevention and control measures for these arbovirus infections. Thus, the complexity of arboviruses has increased as susceptible population groups emerge in different geographic areas [1,2,3,4,5].

In 2019, a total of 1,544,987 cases of dengue, 132,205 of chikungunya, and 10,768 of Zika were reported in Brazil. There were 782 confirmed deaths from dengue, 92 from chikungunya, and three from Zika [6]. The high incidence rates of arbovirus infections transmitted by *Aedes* mosquitoes in recent years in Brazil may be associated with deficiencies in the water supply [7], whether caused by extreme droughts, inadequate management of water utilities, or deficient public policies, and probably by the combination of these factors. The high rates may also be related to inadequate access to other components of sanitation, such as sewage disposal, solid waste disposal, and storm drainage.

Although Brazil has legislation on processes providing for universalization of sanitation services, notably the National Plan for Basic Sanitation (PLANSAB), coverage of running water supply and sewage disposal is still incipient. If planning takes the premises of the Human Right to Water and Sanitation (HRWS) into account in the elaboration and implementation of public policies, such policies become more egalitarian and contribute to the promotion of health for vulnerable populations.

Importantly, the way the territory is organized defines relations with the environment and thus influences the emergence of diseases. It is thus necessary to observe each territory with its specificities and to locate, as precisely as possible, where and how the diseases are occurring, which services the population needs, the areas of potential health and environmental risks, and the areas where the vulnerable social situations are located [8]. In this context, sanitation services can be an important determinant of the incidence and prevalence of arbovirus infections, while such services have been neglected in disease control strategies. The implementation of services has not been oriented from the HRWS perspective, which provides for important instruments to analyze the territory's real situation, pointing to guidelines for planning.

We thus present three premises for debate on the relationship between arbovirus infections and the supply of sanitation services, considering the inclusion of HRWS premises as an important element for the control of these diseases.

Sanitation measures and neglect of the dimensions in arboviruses control

Knowledge of the relationship between access to sanitation services and arbovirus infections has been consolidated by research published in Brazil and elsewhere. Such studies have found that deficiencies in the supply of sanitation services bears a relationship to the incidence and prevalence of these diseases, to varying degrees in different contexts. Studies indicate that dengue incidence and prevalence reflect a territory's social structure with its risk factors and socioenvironmental vulnerability. Infestation with the mosquito vector is present in various locations, but the morbidity is higher in the most economically vulnerable populations, with precarious coverages rates for basic sanitation services [9,10,11,12,13,14,15,16,17,18,19,20,21,22,23]. Importantly, although sanitation factors are essential for explaining the occurrence of arbovirus infections, they alone do not explain the heterogeneity of diseases, in which there are multiple determinants of various aspects and factors [24,25].

In addition to knowledge on the issues affecting the population's health, using the territory as the analytical unit allows identifying possibilities for intervention. In relation to sanitation, understanding cultural and social practices allows identifying the best technologies for use. Intervention measures developed at the territorial level allow active community participation in the decision-making process, building a new form of governance. Sanitation policies generally fail to consider the local health situation and its relationship to different types of interventions and technological concepts to be implemented. Technocentric and economicist biases still predominate, and similar solutions are often applied to diverse contexts. Thus, sanitation measures may not achieve the best public health results. For example, the management and maintenance of equipment may be difficult for more traditional communities. Economicist approaches that fail to take cultural and social differences into account may not be effective [26,27].

An alternative approach values endogenous participatory and democratic development. Tackling arbovirus infections will certainly be more effective if policymakers understand the importance of sanitation services in promoting public health and taking interdisciplinary analysis of the territory into account.

Access to water supply and sewage disposal and the premises of HRWS

Access to water was recognized as a human right in 2010 by the U.N. General Assembly, and in 2015 sewage disposal was recognized as an independent right, although integrated with the right to water. These rights derive from other rights, such as the right to physical and mental health and the right to life and dignity, and are thus backed by international human rights laws [28,29].

Thus, the theoretical frame of reference for HRWS was explicitly acknowledged internationally and back by resolutions published annually. These resolutions assume legal obligations for the States parties, which should respect, promote, and protect these rights based on premises and principles such as nondiscrimination/equity, sustainability, social and democratic participation, information, transparency, and accountability [30,31,32]. Water should be physically, geographically, and financially accessible, and it should be safe, acceptable, and available in sufficient amounts for personal and household use. In relation to sewage disposal, in addition to the premises on access to water, countries should ensure privacy of access and guarantee dignity and safety and be culturally acceptable.

The approach to HRWS thus allows assessing important aspects involved in guaranteeing such rights, such as those related to gender, minority and vulnerable people's rights, management models, and the population's cultural characteristics, dimensions that extend beyond infrastructure conditions such as coverage of water and sewage pipes [28].

According to Neves-Silva & Heller [29], the use of HRWS as a public policymaking tool can favor the population's health promotion through recognition of individuals as subjects of rights, and the understanding that access to safe water and sewage disposal should be treated as a right and not merely as a favor.

HRWS and SDG 6 as promoters of public health protection

In 2015, nearly all countries of the world agreed on the 17 Sustainable Development Goals (SDGs) and their 169 targets, with the purpose of eradicating poverty, protecting the planet, and ensuring the prosperity of all as the motto: *No One Left Behind* [31]. As for achievement of the HRWS, it is considered SDG 6: ensure availability and sustainable management of water and sanitation for all by 2030, eliminate inequality in access to drinking water, without discrimination, having access to safe water with quality, and guaranteeing adequate access to sewage disposal aimed at eliminating the practice of defecating in the open, with special attention to the needs of women and those in situations of vulnerability. Thus, SDG 6 incorporates new elements into the discussion on the concept of access with equity and nondiscrimination, as well as the importance of having access outside the household, as in schools and health centers [8].

SDG 6 provides for eight targets addressing access to safe water and sewage disposal and management of water resources from an integrated perspective. The concern with drinking water supply is the focus of target 6.1. Target 6.2 addresses sewage disposal, and it is interconnected with other targets, since it is known that inadequate sewage disposal and treatment can lead to contamination of the soil, seas, and water sources for supply, jeopardizing public health.

Water supply rates in Brazil have improved in recent decades, despite caveats by researchers and government agencies on quantity, quality, availability, and access. The Brazilian National Water Agency (ANA) cited a coverage rate of 97.2% in 2017. However, the agency emphasizes the distribution of the percentage deficit across income brackets, with the population earning up to three times the official monthly wage, or about USD 675.00 a month, as the most affected by the lack of indoor running water supply. The indicator of sewage disposal coverage in Brazil, including both public sewage disposal and septic tanks, was 63.5% in 2017, with several caveats on the data's reliability. Universal access to proper sewage disposal in Brazil would require investments of approximately 100 billion BRL (USD 21 billion) by 2035, and proper treatment of the sewage would require another 47.6 billion BRL (USD 10 billion). The indicators for the period in question showed progress, with the largest persistent deficiencies in the sewage disposal rates, emphasizing the need for urgent measures. This also touches on guidelines and recommendations, with the year 2035 as the planning time horizon [33].

The PLANSAB sets different regional targets for water supply and sewage disposal by the year 2033, seeking to reach universal coverage of services. According to the document, in 2010, 59.4% of Brazilian households had what was considered adequate water supply, while for sewage disposal the figure was only 39.7% [34].

To meet the targets set in SDG 6, it is necessary to understand the complex changes taking placing in various spheres of people's lives, stemming from serious issues related to on-going processes of urbanization, socio-spatial segregation, economic crises, incentives, and political action. The situation, especially in Brazil's complex metropolitan areas, reveals a burden of social exclusion or precarious inclusion.

More effective disease control can be achieved through policies aimed at minimizing exposure to arbovirus vectors and providing healthy environments for the population by taking the premises of HRWS into account and the territory as the locus of action and seeking equity and nondiscrimination in access to sanitation for vulnerable populations.

Final remarks

Arbovirus infections have public health impacts due to various factors, ranging from the diversity of infectious agents to the difficulty in implementing and maintaining vector control measures and activities. This highlights the importance of sanitation as a way of controlling the incidence and prevalence of arbovirus infections, considering the inclusion of the premises of HRWS when planning the activities.

The article emphasizes the recognition of HRWS as a relevant milestone for the sanitation sector's agenda, presenting important and urgent issues that aim to guarantee other conditions

beyond merely the economicist view. If included in public policies, such issues can reach other parts of the population.

The article thus values the elaboration of integrated policies and action, organized jointly with society, considering the unique characteristics of various territories and prioritizing other models beyond the top-down approaches that hinder effective participation by the population and thus the fight against arbovirus diseases.

Contributors

J. T. M. Queiroz and P. N. Silva conceived the article and wrote and revised the manuscript. L. Heller wrote and revised the manuscript.

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Additional informations

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