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Neglected lessons from the 2009 dengue epidemic in Argentina

ABSTRACT

The article reflects on the impact of the 2009 dengue epidemic in Argentina, with 26,000 infected and six deaths. The impact could have been greatly reduced through dialogue between epidemiology and public health policy. Lack of preparation, poor coordination of the response and the impact on the population confirm the gap between scientific evidence and decision-making. Epidemiology and health policy have different priorities, different times and different values scales. The lessons of the 2009 epidemic should serve to improve collaboration between these two pillars of public health for the benefit of the community, which is ultimately the shared objective.

DESCRIPTORS: Dengue, epidemiology. Disease Outbreaks, prevention & control. Epidemiologic Surveillance, organization & administration. Health Policy.

INTRODUCTION

Dengue is one of the biggest emergent tropical diseases. In 2007, more than 1 million cases were reported in the Americas.⁷

During the first half of the last century, the *Aedes aegypti* mosquito, the dengue vector in the Americas, was present in the Northern and Central Argentina. Around 1960, the mosquito was eradicated due to the yellow fever campaign led by the Pan American Health Organization.¹ Nonetheless, it was once again documented in 1987 in the north of the country and a year later in central provinces.⁵

Specifically, the province of Buenos Aires was re-infested in 1991 and the Federal District in 1995. High dispersion levels of mosquitoes were found in both areas (35% and 18% respectively).² In subsequent years, dengue circulated in various regions of the country: in 1998, the DEN-2 virus was detected in Northwest Argentina; in 2000, there was an outbreak of DEN-1 in the Northeast;³ between December 1999 and March 2000, 38 cases were detected and treated in Buenos Aires, which were imported from Paraguay where 42,000 cases were reported during the period;⁴ and later in 2004, a new outbreak occurred in Tartagal, Salta Province, with a total of 487 suspected dengue cases.^{9,12}

The most recent dengue cases in Argentina occurred in 2007 and 2008 in the provinces of Salta, Corrientes and Formosa, with 53 confirmed cases of DEN 1, 2 and 3.

In 1999 concern grew over the reestablishment of dengue in Argentina, due to the high vector density, low levels of immunity in the population, the presence of endemic virus in neighboring countries and deteriorating health conditions, combined with the subtropical climate of the Northern and Central regions that favors conditions for the reemergence of the disease.

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The degree of vector infestation in Buenos Aires is greater than registered before eradication of the mosquito. The humidity and temperature, as well as the density of the human population and the availability of water reservoirs for egg-laying are factors that help the proliferation of *Ae. aegypti*.

Buenos Aires was especially favorable to the establishment of the mosquito: more than 12 million inhabitants, a population density of 3,230 people per square kilometer, an average annual temperature of 17 degrees and humidity usually between 65% and 70%.

In the north of the country, the greatest rate of mosquito egg-laying is correlated with the rainy season from October to December. Close to 87% of the population of Argentina live in an urban environment in places where the mosquito has favorable conditions for development. From a temporal point of view, the risk is greatest between January and March, with medium risk in the following months and almost no risk between June and September, the coldest months.^{13,14} In addition, the months of highest infestation coincide with the period of vacations, when tourists return with the virus in their blood and increase the likelihood of epidemic outbreaks.⁶

To understand the relationships between environmental conditions and health outcomes, it is critical to apply the data to population level interventions rather than individual consultations.

In the final months of 2008, an epidemic of outbreak occurred in Bolivia, which in March 2009 was considered the country's worst by the World Health Organization. In April the first cases were detected in Buenos Aires, and on May 15, the Minister of Health confirmed more than 24,000 autochthonous cases and five deaths from dengue. In the middle of June the Ministry of Health declared the epidemic over, with more than 26,000 infections and six official deaths, while unofficial estimates were of almost 50,000 infections.

LESSONS AND FUTURE PERSPECTIVES

Argentina is a fragmented society with impoverished living conditions, especially since the economic crisis of 2001. A recent report by the World Bank warned that "without appropriate interventions the deterioration in the socioeconomic conditions of the population, the country may also experience an increase in seasonal diseases". We now know that worse living standards are reflected in poorer health conditions. In addition, the large amount of data and warnings about dengue contributed very little to the implementation of prevention and mitigation measures against the epidemic.

The epidemiologic analysis of these conditions demonstrated that the combination of individuals and risk factors resulted in a high-risk situation. The population and other determinants had an important impact on the epidemic. There was also extensive improvisation and lack of coordination among the different actors involved, despite the availability of descriptive epidemiologic data (health measures), surveillance data (trends and patterns) and health mapping. On the other hand, geographic health mapping is the most effective on the ground when needing to convince politicians.

The findings generated by epidemiologists has the added value of being useful at different stages in responding to health situations and has the advantage of facilitating prioritization. Therefore, why did the epidemiologic information predicting the epidemic have such a small impact on public health policy measures to attenuate and prevent the impact of a potential epidemic?

A possible answer is the lack of communication between epidemiology and public policy.

Epidemiology and politics have different technical foundations, time scales and values placed on qualitative and quantitative information, and they do not collaborate well. In other words, there are serious problems with their coexistence. Until recently, epidemiology viewed almost everything in terms of risk factors, and currently, it focuses on social determinants. The change in perspective and priorities is not a trivial detail; it is almost a change in paradigm.

Improved guidance and ample collaboration between epidemiology and health policy decision-makers is required, through improved communication and more developed capacity to receive information. Scientific evidence and its application in public policy allows for projections of community impact.

In considering this dengue phenomenon and public health in Argentina, the most important thing is that the first large-scale epidemic occurred. The epidemic did not only affect periphery or interior cities. It affected the largest urban center, and one of the largest cities in the region experienced deaths of people that developed the disease indigenously.

On the other hand, failures were identified that should be corrected in the near future to prevent new epidemics. Actions implemented in the early 1990s, after the first dengue epidemics, were ineffective. Control schemes during the eradication stage were based on vertical strategies, developed at central administrative levels without community participation, and did not have the expected impact. The actions had limited impact because they were not technically appropriate or lacked the necessary support and buy-in by

management, including technical and policy staff, to implement the potentially important interventions.¹¹

Communication is a decisive but insufficient factor. Information, awareness and perceived risk are a continuous network – partially within a process that attempts to modify practices, habits and behavior – that informs health promotion and prevention.¹⁰

Another point for analysis and reflection was the reevaluation of the role of primary health in an urban setting. We analyzed the case of Brazil, the country with the greatest number of cases reported annually. The majority of recent dengue outbreaks have been concentrated in Rio de Janeiro city, Southeastern Brazil, which has 12 million residents and a population density of 4,800 people per square kilometer, less than Buenos Aires. Nonetheless, the neighboring city of Niteroi has the same population characteristics but different rates of infection (1,038/100,000), when compared to Rio

de Janeiro (2,036 per 100,000). What can explain the difference?

In the last 20 years, primary health care coverage for the population of Niteroi has increased from 1% to 77%, a change that occurred in parallel to the decrease in dengue cases in the city. Only 7.2% of Rio de Janeiro is covered by the primary health care system, which is the lowest level of all state capitals in Brazil.⁸

Medical treatment of dengue illness is a basic practice in any public health system, meaning that high quality care is of primary importance. The progression of the disease has been impossible to control, a reason that returning to eradication programs would be utopian. Therefore, efforts should be directed to capacity strengthening of primary care.

Consideration of regional best practices could be an effective way to reduce the gap that still exists between what is and should be, in public health and health policy.

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