Dengue fever continues to challenge and to puzzle

Contemporary society tends to believe that scientific knowledge is virtually unlimited for establishing measures to control health problems produced by infectious agents. This may explain the widespread bewilderment vis-a-vis the limited effectiveness of the global struggle against the current dengue epidemics. Yet we are facing a disease whose etiological agent displays tremendous velocity and transmission force. With more than six million cases of dengue fever per year distributed across some 100 countries and more than a half million cases evolving to dengue hemorrhagic fever and thus at risk of dying, society now views dengue as a modern "urban curse".

In Brazil, despite progress by the Unified National Health System in the surveillance and prevention of infectious diseases and tireless efforts by numerous health system administrators to control the problem, the situation has been further aggravated by the introduction of the DENV4 in 2010, since the Brazilian population is completely susceptible to infection with this dengue virus serotype. Brazilians are exposed to the real threat of a new and serious epidemic wave of dengue. The demand on health services may become so heavy that it will seriously hinder timely and adequate care to all who need it, although such care is the only way to avert deaths. Previous experiences, including the epidemic in 2008 in Rio de Janeiro, tend to corroborate this daunting forecast.

It is no coincidence that at the first sign of a dengue epidemic the population feels bewildered, vulnerable, and powerless. Such disempowerment underscores the limits to our understanding of the biological, social, and behavioral dimensions of dengue virus transmission and its pathogenesis.

An on-going challenge is to obtain a vaccine capable of simultaneously protecting against the four serotypes and that maintains the delicate balance between the immunogen's immunogenicity and pathogenicity. Clinical trials with some candidate vaccines are already in the advanced stages, with prospects (but still no guarantees) that some will be licensed for mass use in the coming years. Still, even with the advent of an effective vaccine, issues will remain to be solved, such as the mismatch between the number of doses needed to immunize millions of people at risk and the manufacturer's production capacity, the number of intervals between doses needed to confer immunity, costs, and others. Epidemiological studies are thus urgently needed to produce information capable of backing the definition of sustainable vaccination strategies and help reduce the transmission force of the virus in Brazil's urban areas.

Meanwhile, we are left with the control measures for *Aedes aegypti*, which must be implemented by society as whole. However, the development of clean technologies that reduce the vector population requires support from research agencies. In addition, health professionals and services must continue their efforts to provide timely and appropriate care for persons that fall ill to dengue, in the final effort to reduce case-fatality to a minimum.

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