DENGUE EPIDEMICS IN LATE 20TH CENTURY PUERTO RICO: A COMPARISON OF DISEASE PREVALENCE, INSTITUTIONAL RESPONSE, AND MEDIA COVERAGE

Roger W. Samuels, MSII
Medical Student Research Day
Johns Hopkins University School of Medicine, Baltimore, Maryland, USA

ABSTRACT

The Dengue virus has had a presence on mainland Puerto Rico since the early 20th century, but perhaps no era exemplifies the island’s collective struggle against the disease better than the period from 1977–1994, a time in which at least three major Dengue epidemics occurred and upwards of 450,000 individuals on the island were affected. During this time, millions of dollars were spent on vector eradication programs, the appearance of Dengue Hemorrhagic Fever (DHF) resulted in the first Dengue-related deaths on the island, and the disease became a national concern. In this paper, it describes how the cultural and political responses to this disease have changed over time, and why (despite the development of many innovative vector control, treatment, and educational programs) Dengue still persists as such a problem on the island today.

BACKGROUND

A 20-year time period on the island marked by three major epidemics (1977–1978, 1985–1986, and 1990–1994) examined for trends and shifts in Dengue prevention strategy over time. Hopefully, such a comparison will contribute to a better understanding of why the net contribution of all of these programs has still fallen short of ridding the island of Dengue. Most importantly, these lessons will ideally be able to be applied to future Dengue prevention initiatives, both in Puerto Rico and other nations facing the threat of the disease, most notably of which being the continental U.S.

METHODS & SOURCES

This examination not only considers the pertinent epidemiological data, and Dengue-related secondary publications, but also primary press sources, transcripts from historical interviews with public health officials, and selected audio-visual promotional materials from two decades worth of anti-Dengue campaigns. My overall conclusions about Dengue control in Puerto Rico represent a fusion of these materials. Events and prevalence statistics cited in my oral interviews or the secondary literature were cross-referenced with the newspaper clippings from the same time period in order to both verify accuracy and obtain contrary viewpoints on the subject. Such contrasting perspectives were absolutely imperative in attempting to paint a broad picture of the changing political and cultural response to Dengue over time.

1977 Epidemic:

1977 was a year of political and economic transition on the island. After having suffered a record recession from 1974–1975 with the GDP falling to less than 3.0 percent (down from over 7.0 percent during the 1960’s), Puerto Rico was in a period of growing unemployment. This was set against the background of rising wage and afﬁliations utilized such as the Federal Food Stamp Program (FFS). This, in combination with a growing urban population and a number of labor strikes by the Sanitary Workers Union, meant that there was a proportional diminution of Aedes Aegypti breeding sites such as discarded tires and appliances. Additionally, heavy rains added even more risk of vector overpopulation on the island.

Overall, the 1977 epidemic affected more than 350,000 individuals on the island and resulted in a net economic burden of over $103 million. Interestingly, however, this magnitude of the disease’s burden was not fully recognized by researchers or the public until much later. This was due to both the technological limitations of serological Dengue surveillance at the time, and the relatively limited presence of Dengue in the press.

1986-87 Epidemic:

The early to mid 1980’s were marked by a changing paradigm within the CDC’s San Juan Laboratories and the Department of Health. Partially due to the efforts made by Dengue researchers such as Dr. Duane Globser, more and more emphasis was being placed on community education campaigns as a primary measure for improving disease prevalence (as opposed to traditional fumigation programs). The 1981 outbreak of Dengue Hemorrhagic Fever in Cuba, as well as a smaller outbreak in Puerto Rico in 1982 has raised concerns about the disease on the island to unprecedented heights. This concern peaked after the first publicly confirmed death due to DHF in 1985. Civic groups such as the San Juan Rotary Club and Catholic Charities were mobilized to improve the degree of Dengue-related knowledge and practices on the island. Furthermore, the CDC began employing the use of medical anthropologists as well as the US Public Health Service for the development of educational materials and PSAs, while the PRDH began collaborating with the Department of Education to create youth-directed anti-Dengue mini organizations such as the Association of Student Environmentalists. Shortly thereafter, the first nationwide anti-Dengue poster campaign, “Echale le al Dengue” was launched. By 1986, the prevalence of anti-Dengue publicity in the media was peaking. Increasingly, the traditional technique of educating citizens and citizens via panel discussions was being left in favor of mass marketing campaigns. Huge, dramatized photographs of the Aedes Aegypti began appearing on the side of city buses. Public Service Announcements on the television and the radio become more frequent and decidedly more theatrical. Indeed, perhaps also due in part to the concurrent AIDS scare, the public was becoming more and more aware of infectious diseases and Dengue was increasingly finding its way into the mainstream. By early April 1987, at least 2,400 possible cases of predominately Type 2 Dengue infection had been confirmed; a number that even without serological confirmation was considerably higher than that of previous years. By May, the PRDH had once again initiated aerial fumigation programs, this time utilizing a pesticide called Dibrom 14 in the place of Malathion.

1994 Epidemic:

The early 90’s were marked by the increasing role of technology in the fight against Dengue. First, the recent discovery of an IgM serotype test for Dengue antibodies had replaced the now antiquated paired-serum hemagglutination inhibition (HI) tests of the prior decade. This IgM method utilized a more user-friendly ELISA immunoassay, and was both more sensitive and much less resource/time-intensive than previous methods, therefore facilitating higher volumes of serum testing and improved overall accuracy of Dengue prevalence forecasts. Also, computerized databases for monitoring epidemiologies such as DBASE IV, though still being optimized, were increasingly becoming a critical tool in the weekly Dengue surveillance reports compiled by the PRDH and the CDC Dengue Branch. As usual, Dengue incidence in 1994 first became apparent during the Puerto Rico’s rainy season in early September. By this point in the year, 6,529 suspected cases had already been identified, compared with only 6,125 in the entirety of the previous year. By the first week of December an estimated $150,000 in emergency funds had already been used on the PRDH’s ongoing truck-mounted Malathion campaigns. Additionally, individual municipalities such as Bayamón (led by mayor Ramón Luis Rivera) had started to develop and implement their own community-based fumigation programs. Bayamón’s campaign, for instance, consisted of over 50,000 educational leaflets and direct home visits from health education volunteers. The cost of such programming was high, however, with Bayamón’s expenses exceeding $10,000,000. At the close of the year the total number of Dengue cases approached 9,000 and eight total Dengue-related deaths had been confirmed. By the beginning of 1995 the situation began to wane, but new infections continued until early April, when Secretary of Health Feliciano was finally able to declare an end to the epidemic. Revised surveillance data from the CDC subsequently totaled the number of new cases during the epidemic at over 24,700.

RESULTS

Overall, the evolving public health response to Dengue epidemics on the island revolved around a number of key factors:

• The growing evidence that island-wide fumigation programs (both truck-mounted and aerial) were ineffective as public health measure.
• The changing role of the CDC’s San Juan Labs to a Dengue-only facility.
• The growing AIDS scare in the 1980’s and the first public deaths due to Dengue Hemorrhagic Fever as factors that contributed to growing public concern about infectious diseases.
• The CDC funding shift from Dengue to AIDS initiatives as a force that resulted in the recruitment of civic organizations such as the Rotary Club for financial support in anti-Dengue programming.
• The growing use of print and television media as a tool for public health education during the late 1980’s.
• The development of serum IgM testing and database technology as a contributing factor to improving Dengue surveillance.
• The ongoing political ramifications faced by officials within the Department of Health as to the timing of an “epidemic” announcement.

CONCLUSIONS

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