

WHO Warns of Post-SARS Threats, Lack of Public Health Defenses

by Marcia Merry Baker

At the annual World Health Organization meeting in Geneva on May 19-28, besides the attention to severe acute respiratory syndrome (SARS), many officials joined in warning that *new infectious disease outbreaks* lie ahead, and public health defenses are not in place to cope with them. Dr. David Heymann, head of the WHO communicable diseases unit, said on May 19, "There will be more outbreaks like SARS; there's bound to be more. . . . The big concern is influenza." Officials considered it "good news" that SARS was not influenza, because the flu has a capacity to spread much faster than the SARS infection.

In addition to the virology questions presented by the behavior of the flu virus, the obvious point is that vulnerability to sickness and death arises from the lack of in-depth health-care infrastructure, and the lack of official "will to fight disease" that has characterized recent decades of "market-based" health-care policy.

The infrastructure crisis was addressed in a medical survey report issued in March, by the Washington, D.C.-based, Institute of Medicine, titled, "Microbial Threats to Health—Emergence, Detection, and Response." This 400-page document is a ten-year follow-on to the institute's 1992 report, "Emerging Infections: Microbial Threats to Health in the United States," which already gave fair warning of the crisis just ahead. Now, even the sub-sections of the new report indicate the crisis evaluation from the medical community: "Breakdown of Public Health Measures," "Lost Windows of Opportunity," and "Lack of Political Will."

In line with the recent WHO warning, one section of the report is titled, "A Case in Point: Influenza—We Are Unprepared." Besides summarizing the scientific issues of the virus, and stressing that influenza, because of its very nature, is not an eradicable disease, the report warns: "The disturbing reality is that despite the certainty of a pandemic, even the developed countries of the world are quite unprepared for such an event. The public health structure is inadequate. Hospitals lack the capacity to accommodate a surge of patients. Vaccine manufacturers had severe problems in meeting the demand in 2001 and 2002, the mildest influenza years in two decades, and the repertoire of antiviral drugs is completely inadequate. . . . If a country cannot cope with inter-pandemic influenza, it is likely that the pandemic, when it does occur, will cause massive societal disruption."

'The Breakdown of Vector Control'

SARS and influenza are diseases in the category of human-to-human transmission. But the lack of preparedness to deal with these kinds of illnesses, is also dramatically evident in the way disease-bearing vectors of all kinds (rodents, mosquitoes, lice, ticks, etc.), have been allowed to re-infest vast parts of once-sanitized areas. The Institute of Medicine reports on this under the heading, "The Breakdown of Vector Control." The result is the needless resurgence of old diseases, and spread of new arrivals.

The maps in **Figure 1** give a striking and dangerous example in the case of the Western Hemisphere, which makes the point for any part of the world. The maps show the areas of infestation in the Americas, for three time periods, of the *Aedes aegypti* mosquito, a leading carrier of many diseases. Over a 70-year period, the infested area was severely beaten back—as shown in the 1970 map; but then, the mosquito was allowed to reclaim all its territory, and is now spreading even farther afield.

The original, principal motivation for targeting this species of mosquito, was to combat yellow fever. As of the 1930s, large areas in South America, Central America, the Caribbean, and the Gulf states of North America were infested. Some of the earliest mass quarantine efforts of the U.S. Public Health Service, were to try to contain epidemics of yellow fever in Louisiana, Georgia, and Florida, from the 1860s onwards.

In the 1950s and '60s, the Pan American Health Organization (part of the WHO), and cooperating nations, conducted an aggressive program to eradicate *Ae. aegypti*. DDT, developed around the time of World War II, was a leading part of the arsenal used, and the campaign was remarkably effective, as the 1970s map shows. Also part of the battle against yellow fever, was the successful development of a vaccine.

But then, with the scientifically incompetent and politically motivated banning of DDT in the 1970s, and the pull-back from mosquito eradication campaigns, not only has yellow fever needlessly persisted in the Hemisphere—even though there is a vaccine—but new mosquito-borne diseases have entered the Americas and spread, in particular, dengue fever in new forms.

The *Ae. aegypti* mosquito is a favored carrier of dengue. Moreover, a characteristic of this species of mosquito is that

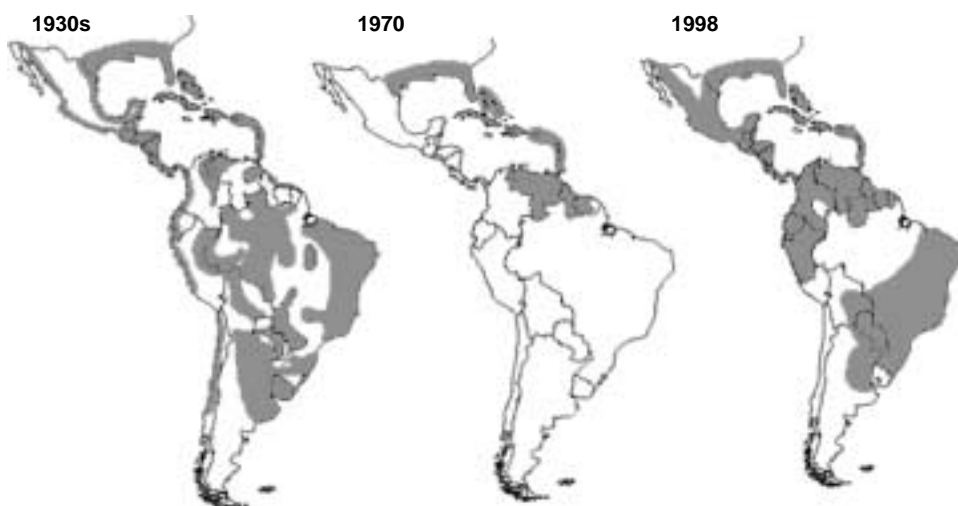
it thrives in urban settings, where it has breeding sites in pools of stagnant water in old tires, discarded cans, and other debris. These are exactly the conditions that became extensive over the past three decades, as national economies were undermined, and millions of dislocated people crowded into urban areas. Plus, *maquiladoras*, cheap-labor assembly plants, were

set up in Mexico and Central America—and with them shantytowns with little or no public health infrastructure.

The Institute of Medicine report summarizes the process shown in Figure 1: “The major impetus for this [original eradication] effort was the desire to preclude the emergence of sylvatic yellow fever into urban populations, which remains

FIGURE 1

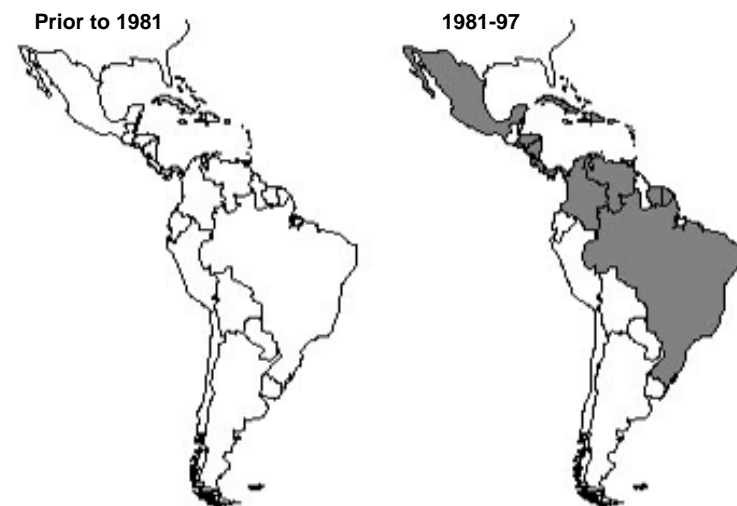
Areas Infested With the Mosquito *Aedes Aegypti*, Showing Large Re-Infestation Since 1970



Source: Centers for Disease Control.

FIGURE 2

Countries With Laboratory-Confirmed Hemorrhagic Fever



Source: Centers for Disease Control.

a major concern today. . . . Now *Ae. aegypti* is essentially hyperabundant throughout the Americas, and concomitantly, all four dengue virus serotypes (including the virulent Asian genotypes which are associated with DHF-SS—dengue hemorrhagic fever and shock syndrome) are co-circulating in the region.”

Before the 1980s, only one or two serotypes of dengue fever were known to be present in the Americas, and the deadly DHF-SS, then a problem in Asia, was absent. Though many factors of epidemiology may figure in DHF-SS taking hold outside of Asia, as the report stresses, “However, there is no doubt that one of the major factors contributing to the emergence of DHF-SS in the Americas was the resurgence of *Ae. aegypti* in

tropical and subtropical cities, concomitant with rampant and unplanned urbanization.”

Figure 2, from the Centers for Disease Control and Prevention (CDC), shows the location of dengue hemorrhagic fever today, as compared with its all but non-existence in 1980.

Enter, West Nile Virus

This is the backdrop from which to understand the rapid spread of West Nile fever in North America, now traveling southward through Mexico. Before August 1999, the West Nile virus had never been isolated in the Western Hemisphere. From the time it showed up in New York City in the late Summer of 1999, it spread to the point where by 2002, forty states had reported 4,000 human cases of West Nile encephalitis, and 254 people had died. In the transmission cycle, birds are the primary host for the virus, which is then spread to humans by mosquito. Vector control is paramount for public health, because as a CDC epidemiologist said last Winter, “West Nile never met a mosquito it doesn’t like.”