

ZIKA IN THE CONTEXT OF EMERGING INFECTIONS

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As has been noted, Zika is in many ways a prototypical emerging infection. “Emerging infections” are those that appear suddenly or are rapidly increasing in incidence or geographic range. They are often zoonotic pathogens that acquire new opportunities to come in contact with humans and spread, frequently as a result of such anthropogenic factors as ecological and land use changes, increasing urbanization, human movement, and globalization of people and goods. Strikingly, despite progress in identifying these underlying factors (or “drivers”) and improving early warning capabilities, no human emerging infection or pandemic has actually been predicted before its appearance in humans. The expansion of Zika to the Western Hemisphere is an example. Centuries earlier, yellow fever (together with its principal vector in much of the world, the *Aedes aegypti* mosquito) was introduced to the New World and became entrenched. The presence of *Aedes aegypti*, also an excellent vector for many other infections, later provided the conditions for dengue to invade the Western Hemisphere in the 1980’s, but the introductions of Chikungunya and Zika were not foreseen. Zika, which came to Brazil from the Pacific Islands only a few years ago and had been circulating in Africa (and then Asia) far longer, spread rapidly but was considered a mild disease and little cause for concern. The first outbreaks of Zika were initially discounted before reports of serious neurological effects in the developing fetus drastically changed our views.

Such surprises should serve to warn against complacency. However, epidemiologic data essential for appropriate decision making are sparse. There are serious data gaps in the population prevalence of Zika, proportion of asymptomatic infections, and risk of congenital Zika syndrome. Such effective public health measures as mosquito control are also crucial. Largely because of yellow fever, *Aedes aegypti* was substantially eliminated in South and Central America in the mid-20th century. Control efforts lapsed after the 1970’s, allowing resurgence of the mosquito populations. This lapse allowed the sequential introduction of the several dengue viruses and later Zika (as well as Chikungunya). Probably neither dengue nor Zika could have gained a foothold in the Western Hemisphere now if vigorous mosquito control had been maintained. As urbanization and mobility increase worldwide, effective early warning and response, and sustained public health prevention measures, remain ever more essential to prevent tragic surprises.