

Vector-Borne Diseases: Impact of Climate Change on Vectors and Rodent Reservoirs
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Yellow fever to Chikungunya – the globalization of vectors and vector borne diseases

I.P. Reiter, Institut Pasteur, Paris, France

Yellow fever epidemics were once a dreaded feature of life in many parts of the Americas, with devastating epidemics as far north as Boston. The vector, *Aedes aegypti*, and the virus were both introduced from Africa during the slave trade. *Ae. aegypti* is present, often common, in urban areas from South Carolina to Argentina, and responsible for endemic and epidemic transmission of another Old World virus, dengue. Yellow fever virus is now enzootic in the rainforests of South America, and may well cause devastating urban epidemics in the future. Another Old World pathogen, West Nile virus, appeared in New York in 1999, probably introduced in an infected bird imported from the Middle East. It is now enzootic from Canada to Venezuela. In addition to its public health and veterinary significance, it has caused a major wildlife catastrophe that will probably continue for centuries to come. The Asian mosquito, *Ae. albopictus*, has conquered the world in the past 30 years. Most infestations can be traced directly or indirectly to Japan, disseminated by a world-wide commerce in used tyres. The species is well adapted to cold climates, and can survive sub-zero winter temperatures. In Europe, it is now established as far north as Holland. Infestations are particularly high in Italy, predominantly in the northern half of the peninsula, where the species first appeared in the early 1990s. Its future range could well extend southward, to warmer climes, and northward into Scandinavia. Lastly, chikungunya, another African virus known for frequent pandemics throughout Asia, has now appeared in northern Italy, apparently introduced by an infected person who arrived from India. A small epidemic began in late June, 2007, in a village just south of the Po river, an area once notorious for malaria transmission. It is quite possible that further outbreaks will occur further north in Europe, as may dengue, which caused a massive epidemic in Greece in 1927-28 and is rampant throughout the tropics. It is clear that all these events are the result of human activities—transportation of goods and people—and will continue with increasing globalization of trade. Recent statements that they are the result of climate change are ill-informed, misleading and irresponsible.

