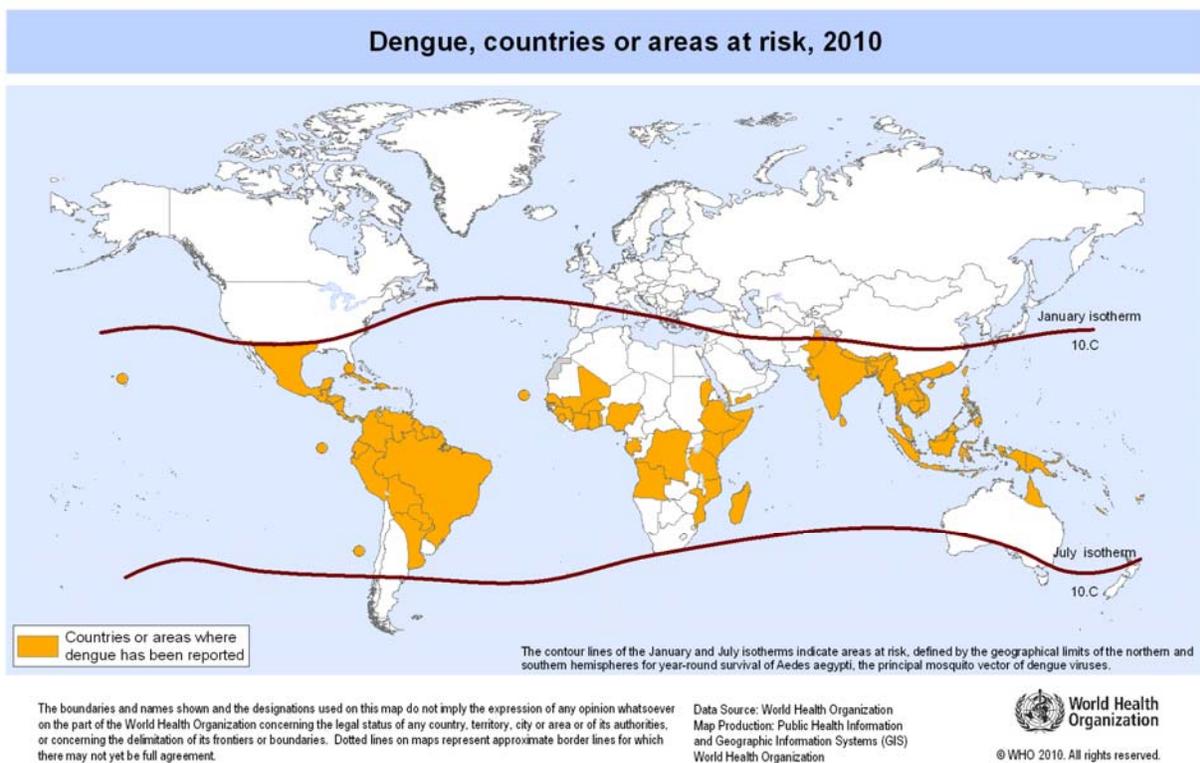
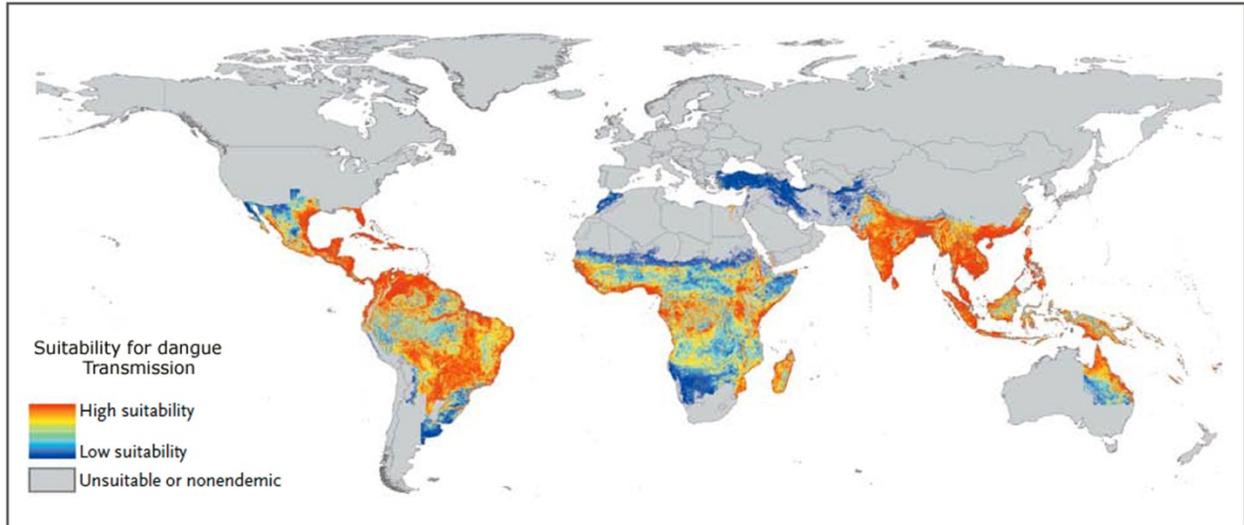


1. EPIDEMIOLOGY

Dengue has emerged as one of the most important mosquito-borne viral diseases of the humans. If improperly managed; it can carry a significant morbidity and mortality. It is predominantly a disease of urban and semi urban area in the tropics and sub-tropics. Because of the vector's sensitivity to the temperature, a January isotherm of 10 °C in the northern hemisphere is considered to be the vector limiting range. Changing weather pattern associated with the global warming, mosquito vector is likely to extend its range from the tropical regions, deeper into the subtropical zones, of which Pakistan is a part. Lately, as a result of Lahore epidemic-2011, dengue has become an important public health issue in Pakistan.



Spread of dengue fever, therefore, illustrates how global trade (allowing the transport of the mosquito vectors in the used tires), increasing travel within and between countries (thereby allowing the movement of viremic people), urban crowding (which is conducive to multiple infections from a single infected mosquito), and ineffective vector-control strategies have supported a pandemic in the modern era. ¹



Picture modified from - *Dengue: Review article: Simmons CP, Jeremy J. Farrar JJ, Vinh Chau NV, Wills B, N Engl. J Med: April, 2012: 366:pp-1427*

The number of reported dengue fever (DF) and dengue hemorrhagic fever (DHF) are increasing all around the world. For example cases reported in Malaysia show an upward trend from 44.3 cases/100,000 population in 1999 to 181 cases/100,000 population in 2007 (Figure 1). But this increase in reported cases may be biased as all the febrile ailments (without dengue confirmation) are reported and included in the analysis.

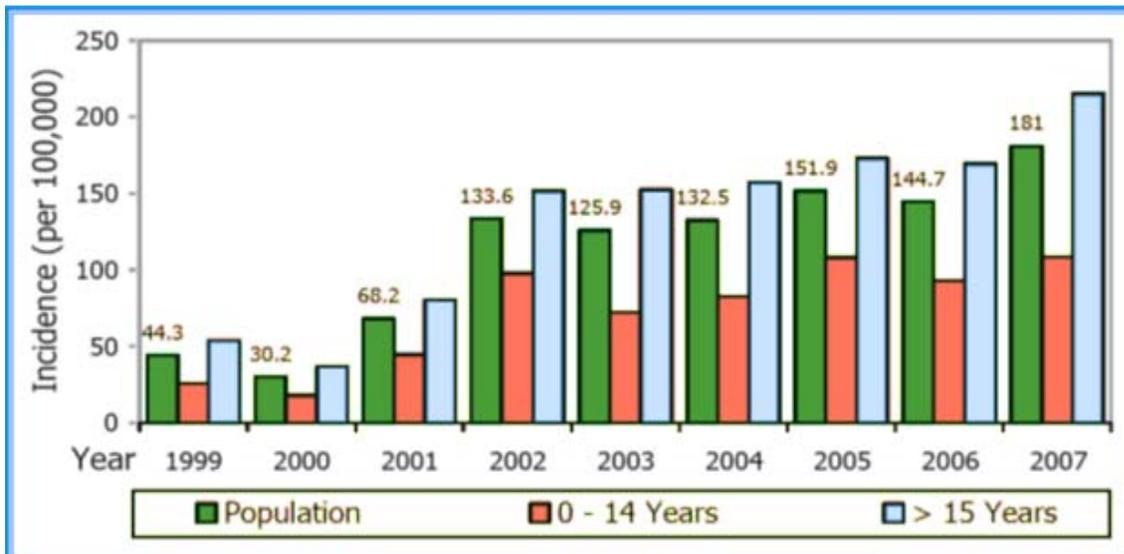


Figure 1: Dengue Incidence Rate by Age Group in Malaysia, 1999-2007²

Most of the Dengue related morbidity is related to Dengue fever; DHF accounts for less than 5% of all reported cases in S.E. Asia. (Figure 2)

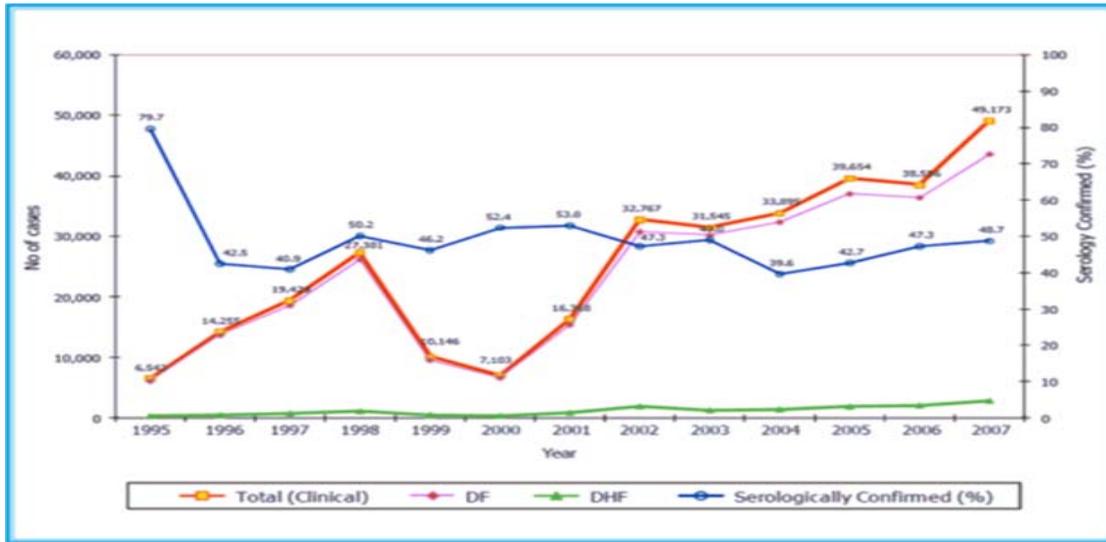


Figure 2: Number of Dengue Cases DF & DHF, 1995-2007³

Only 40-50% of the reported cases in the region are serologically confirmed at the time of notification (Figure 2). This relatively low percentage of seropositivity is often due to lack of availability of convalescent samples (second blood specimen) for confirmation. As discussed before, this low threshold for epidemiological reporting of dengue – without serological or viral confirmation - may have resulted in exaggerated number of cases reported from some of the SE Asian countries.

In Cambodia DF is mostly the disease of the younger age group (Figure 3). It might well be speculated that most of the adults, there, have acquired some degree of immunity to the virus because of their earlier exposures.

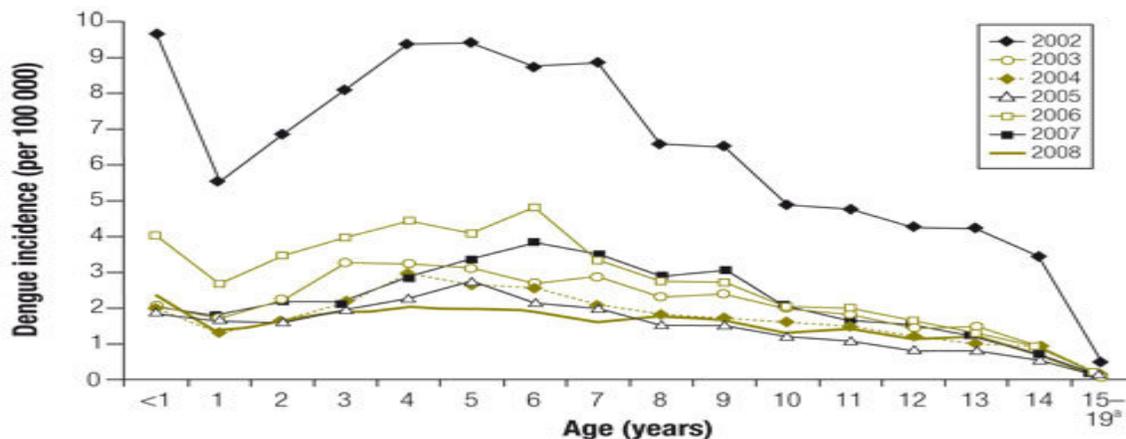


Figure 3: Age-specific incidence of dengue fever, Cambodia, 2002–2008

In Malaysia, however, the highest incidence of dengue is among the adults and adolescents above the age of 15 (Figure 1). An increase of dengue deaths in the adult population has been observed there since 2002 (Figure 4).

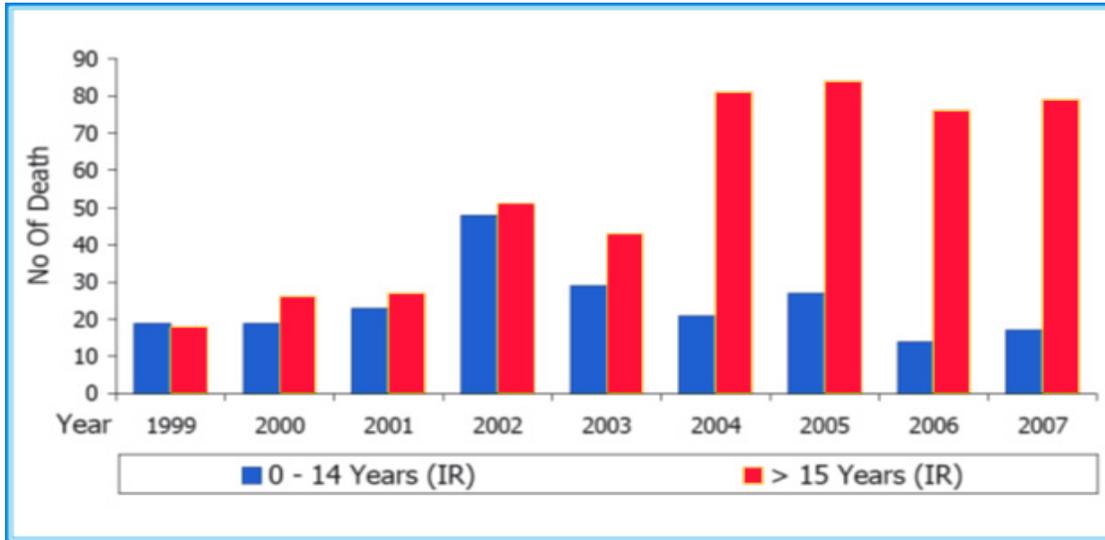


Figure 4: Dengue Deaths by Age Group in Malaysia, 1999-2007²

Seventy to eighty percent of the dengue cases are reported were from the urban areas. Here a high density of population and rapid development activities and poor sanitation favors the vector replication and dengue transmission. Countries of South East Asia in general and Thailand in particular have one the biggest disease burden and have contributed a great deal of knowledge and understanding of the disease.