

## EPIDEMIC FEATURES OF SOME REGIONS IN EAST AFRICA

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**Introduction.** Dengue infection is caused by any one of four distinct but closely related dengue virus (DENV) serotypes (called DENV-1, -2, -3, and -4). These dengue viruses are single-stranded RNA viruses that belong to the family Flaviviridae and the genus Flavivirus—a family which includes other medically important vector-borne viruses (e.g., West Nile virus, Yellow Fever virus, Japanese Encephalitis virus, St. Louis Encephalitis virus, etc.). Dengue viruses are arboviruses (arthropod-borne virus) that are transmitted primarily to humans through the bite of an infected *Aedes* species mosquito.

**Results and discussion.** The origins of the Spanish word dengue are not certain, but it is possibly derived from dinga in the Swahili phrase Ka-dinga pepo, which describes the disease as being caused by an evil spirit. Slaves in the West Indies having contracted dengue were said to have the posture and gait of a dandy, and the disease was known as "dandy fever". Dengue is of the infectious disease that can cause death if not treated, Tanzania is one where the disease became epidemic especially in the year 2014, dengue fever outbreak notified to the World Health Organization by the Ministry of Health and Social Welfare (MOH&SW) on 4 February 2014. As at 30 May 2014, the dengue fever outbreak has spread to seven (7) regions on the mainland and two (2) regions in Zanzibar. The geographical distribution of cases and deaths is as follows: mainland (1,017 confirmed cases out of a total of 2121 suspected cases including 4 deaths) and Zanzibar (1 confirmed case out of 8 suspected cases, and no deaths). Ninety-nine (99%) of the cases of the mainland were reported from the following three districts of Dar es Salaam: Kinondoni, Temeke, and Ilala. Of the four (4) deceased cases, 1 had presented with Dengue Haemorrhagic Fever (DHF) and 1 with multiple organ failure.

Dengue virus is primarily transmitted by *Aedes* mosquitoes, particularly *A. aegypti*. These mosquitoes usually live between the latitudes of 35° North and 35° South below an elevation of 1,000 metres (3,300 ft). They typically bite during the day, particularly in the early morning and in the evening, but they are able to bite and thus spread infection at any time of day all during the year. Other *Aedes* species that transmit the disease include *A. albopictus*, *A. polynesiensis* and *A. scutellaris*. Humans are the primary host of the virus, but it also circulates in nonhuman primates. An infection can be acquired via a single bite. A female mosquito that takes a blood meal from a person infected with dengue fever, during the initial 2–10 day febrile period, becomes itself infected with the virus in the cells lining its gut. *Aedes aegypti* is

particularly involved, as it prefers to lay its eggs in artificial water containers, to live in close proximity to humans, and to feed on people rather than other vertebrates.

Dengue can also be transmitted via infected blood products and through organ donation. In countries such as Singapore, where dengue is endemic, the risk is estimated to be between 1.6 and 6 per 10,000 transfusions. Vertical transmission (from mother to child) during pregnancy or at birth has been reported. Other person-to-person modes of transmission have also been reported, but are very unusual. The genetic variation in dengue viruses is region specific, suggestive that establishment into new territories is relatively infrequent, despite dengue emerging in new regions in recent decades.

The World Health Organization's 2009 classification divides dengue fever into two groups: uncomplicated and severe. This replaces the 1997 WHO classification, which needed to be simplified as it had been found to be too restrictive, though the older classification is still widely used included by the World Health Organization's Regional Office for South-East Asia as of 2011. Severe dengue is defined as that associated with severe bleeding, severe organ dysfunction, or severe plasma leakage while all other cases are uncomplicated. The 1997 classification divided dengue into undifferentiated fever, dengue fever, and dengue hemorrhagic fever. Dengue hemorrhagic fever was subdivided further into grades I–IV. Grade I is the presence only of easy bruising or a positive tourniquet test in someone with fever, grade II is the presence of spontaneous bleeding into the skin and elsewhere, grade III is the clinical evidence of shock, and grade IV is shock so severe that blood pressure and pulse cannot be detected. Grades III and IV are referred to as "dengue shock syndrome.

In December 2015, the first dengue fever vaccine received approval in Mexico and should be available in 2016.<sup>1</sup> The vaccine is produced by Sanofi and goes by the brand name Dengvaxia. It is based on a weakened combination of the yellow fever virus and each of the four dengue serotypes. Two studies of a vaccine found it was 60% effective and prevented more than 80 to 90% of severe cases. This is less than wished for by some.

**Conclusions.** There are ongoing programs working on a dengue vaccine to cover all four serotypes. Now that there is a fifth serotype this will need to be factored in. One of the concerns is that a vaccine could increase the risk of severe disease through antibody-dependent enhancement (ADE). The ideal vaccine is safe, effective after one or two injections, covers all serotypes, does not contribute to ADE, is easily transported and stored, and is both affordable and cost-effective.

Pain relievers such as aspirin and nonsteroidal anti-inflammatory drugs (NSAIDs) should only be taken under a doctor's supervision because of the possibility of worsening bleeding complications. Acetaminophen (Tylenol) and codeine may be given for severe headache and for joint and muscle pain (myalgia).