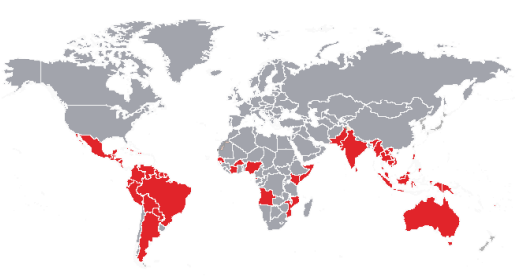
Dengue in Endemic Countries

About Dengue

- Dengue fever is a mosquito-borne viral disease that **has spread rapidly around the world.**[1] Global incidence rates have increased about ten-fold from 2000 to 2019, and more countries are reporting their first outbreaks of the disease.[1]
- Most dengue infections are asymptomatic or lead to mild illness with flu-like symptoms, but occasionally severe dengue can lead to potentially deadly complications.[1]
  - Most dengue cases are either asymptomatic or subclinical; approximately 25% lead to clinically apparent disease, and around 5% of these may be severe cases.[2,3]
- Dengue is caused by four distinct, but closely related, dengue virus serotypes (DENV-1, 2, 3 and 4).[4]
  - Recovery from infection with one serotype is thought to provide long lasting protection against that serotype, but not against other serotypes.[5] Individuals who are infected for a second time with a different serotype are at greater risk of severe dengue.[1]
- Dengue is found mostly in urban and semi-urban areas in tropical and sub-tropical climates where Aedes aegypti and Aedes albopictus mosquitoes are most common.[6]
  - Climate conditions, such as rainy season in endemic countries, can lead to increased mosquito breeding.[7]

Dengue is a Top Ten Threat to Global Health[8]

- About 50% of the world's population lives under the threat of dengue, which is responsible for an **estimated 390 million infections** globally per year and people in more than 125 countries are at risk of infection.[1,9]
- The global economic burden of dengue is substantial and has been estimated to cost **$12 billion per year.**[10]
- Since 1970, dengue has spread from nine countries to being **endemic in more than 100 countries.**[1,11]
  - The Americas, South-East Asia and Western Pacific regions are the most seriously affected, with Asia representing ~70% of the global burden of disease.[1]
  - More than six billion people could be at risk for dengue by 2080 due to population growth in endemic areas based on one projection.[6]



- A vast majority of dengue cases are asymptomatic or mild and self-managed, resulting in the actual numbers of dengue cases being under-reported and making it difficult to estimate the true extent of the disease and incidence rates.[1,12]

Dengue Can Have a Negative Impact on Endemic Regions and Put Significant Burdens on Communities

Epidemics are unpredictable and are becoming increasingly frequent.

- Severe dengue is a **leading cause of hospitalization and death** in children in Southeast Asia.[13]

- Hospitals can struggle with high numbers of cases. During an outbreak, affected areas can see a massive spike in cases and admitted patients.[14,15]
  - Healthcare facilities may face difficulties in finding the necessary space to care for the significant rapid influx of patients, resulting in overwhelmed health care systems.
  - Staff on call may not always be sufficient to meet patient demand, leading to stress, fatigue, and unexpected lack of attendance.[14]

The Economic Impact of Dengue is Broad

Individuals

The average cost range per hospitalized person in endemic countries can vary anywhere from **$36-$2,000**[10] and families may spend **up to a quarter of monthly household income** for hospitalizations due to dengue fever, or more, depending on socioeconomic factors.[16,17]

Local Governments

Local governments in dengue endemic regions face the expenses of additional personnel, equipment and supplies needed for vector control and surveillance; and monitoring and communication of information about cases, outbreaks and death.[18]

Countries

Countries experiencing dengue outbreaks may see loss in tourism, business travel and in foreign and local investment.[18]

Dengue can also significantly impact a region's productivity, with some persisting dengue symptoms including long-term fatigue affecting educational levels and labor supply.[18]

Controlling Dengue

- Current efforts for dengue control are directed at reducing infection rate through vector control methods, such as personal protection, biological control, chemical control and environmental management of mosquitoes[19,20]:
  - **Preventing breeding:** Removing or applying insecticide to outdoor water storage containers;
  - **Personal protection measures:** Use of window screens, repellents, or wearing clothing that minimizes skin exposure;
  - **Community engagement:** Educate the community on mosquito-borne diseases and mobilize together for vector control;
  - **Active mosquito and virus surveillance:** Build surveillance measures to monitor mosquito population.

- An integrated dengue prevention and control strategy is important to combating dengue, as recommended by the Center for Disease Control and Prevention (CDC).[19, 20]

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