

## About Dengue



- Dengue fever is a mosquito-borne viral disease that **has spread rapidly around the world.**<sup>1</sup> Global incidence rates have increased about ten-fold from 2000 to 2019, and more countries are reporting their first outbreaks of the disease.<sup>1</sup>
- Most dengue infections are asymptomatic or lead to mild illness with flu-like symptoms, but occasionally severe dengue can lead to potentially life-threatening complications.<sup>1</sup>
  - Most dengue cases are either asymptomatic or subclinical; approximately 25% lead to clinically apparent disease, and around 5% of these may develop into severe cases.<sup>2,3</sup>
- Dengue is caused by four distinct, but closely related, dengue virus serotypes (DENV-1, 2, 3 and 4).<sup>4</sup>
  - Recovery from infection with one serotype is thought to provide long lasting protection against that serotype, but not against other serotypes.<sup>5</sup> Individuals who are infected for a second time with a different serotype are at greater risk of severe dengue.<sup>1</sup>

- 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.<sup>6</sup>

- Climate conditions, such as rainy season in endemic countries, can lead to increased mosquito breeding.<sup>7,8</sup>

## Dengue is a Top Ten Threat to Global Health<sup>9</sup>

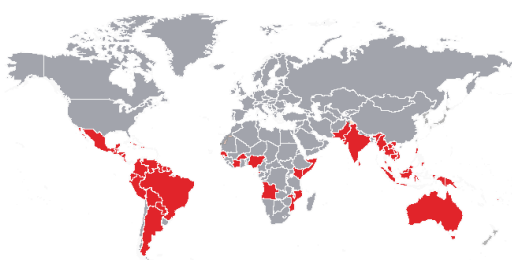
- About 50% of the world's population lives under the threat of dengue, which is responsible for an **estimated 390 million infections** globally per year and people in more than 125 countries are at risk of infection.<sup>1,6,10</sup>

- The global economic burden of dengue is substantial and has been estimated to cost **\$8.9 billion per year.**<sup>11</sup>

- Since 1970, dengue has spread from nine countries to being **endemic in more than 100 countries.**<sup>1,12</sup>

- The Americas, South-East Asia and Western Pacific regions are the most seriously affected, with Asia representing ~70% of the global burden of disease.<sup>1</sup>

- More than six billion people could be at risk for dengue by 2080 due to population growth in endemic areas based on one projection.<sup>6</sup>



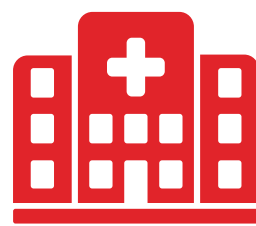
- A vast majority of dengue cases are asymptomatic or mild and self-managed, resulting in the actual numbers of dengue cases being under-reported and making it difficult to estimate the true extent of the disease and incidence rates.<sup>1,13</sup>

## 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.<sup>14</sup>

- Hospitals can struggle with high numbers of cases. During an outbreak, affected areas can see a massive spike in cases and admitted patients.<sup>15,16</sup>



- Healthcare facilities may face difficulties in finding the necessary space to care for the significant influx of patients, resulting in overwhelmed health care systems.<sup>15</sup>

- Staff on call may not always be sufficient to meet patient demand, leading to stress, fatigue, and unexpected lack of attendance.<sup>15</sup>

### The Economic Impact of Dengue is Broad



#### Individuals

The average cost per hospitalized person in endemic countries can range from **\$30-\$2,000** and families may spend **up to a quarter of monthly household income** for hospitalizations due to dengue fever, or more, depending on socioeconomic factors.<sup>17,18</sup>



#### Local Governments

Local governments in dengue endemic regions face the expenses of personnel, equipment and supplies needed for vector control and surveillance; and monitoring and communication of information about cases, outbreaks and death.<sup>19</sup>



#### Countries

Countries experiencing dengue outbreaks may see loss in tourism, business travel and in foreign and local investment.<sup>19</sup>

Dengue can also significantly impact a region's productivity, with some persisting dengue symptoms including long-term fatigue affecting educational levels and labor supply.<sup>19</sup>

## Controlling Dengue

- Current efforts for dengue control are directed at reducing the infection rate through vector control methods, such as personal protection, biological control, chemical control and environmental management of mosquitoes<sup>1,20,21</sup> :

- **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 international organizations such as the World Health Organization (WHO) and Pan American Health Organization (PAHO).<sup>20,21</sup>

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