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DENGUE DANGER: THE SILENT TREAT AMONG US

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Dengue fever, a climate-sensitive infectious disease transmitted by mosquitoes, has emerged as a significant global health concern, according to the World Health Organization (WHO). Originating from dengue virus serotypes transmitted by Aedes mosquitoes, the disease has plagued over 100 countries, with Asia bearing the brunt of its impact. In 2022 alone, WHO

reported a staggering 2,809,818 cases of dengue worldwide, marking a concerning 55% increase from the previous year. Malaysia, in particular, has seen a drastic rise in dengue cases, reaching an alarming 48,712 cases in 2023, with a staggering 158% increase from 2022. As the battle against dengue fever continues, recent data from epidemiological week 6 of 2024

2024 brings a glimmer of hope. From February 4th to February 10th, a notable decrease of 338 cases, amounting to 8.5%, was reported compared to the previous week. This decline paints a picture of progress in the fight against this mosquito-borne disease. Despite this positive shift, the cumulative number of dengue cases reported up to week 6 of 2024 stands at 22,058 cases. While this figure represents a significant increase of 68.5% compared to the same period in 2023, the slowdown in new cases signals a potential turning point in the battle against dengue. Tragically, 10 dengue-related deaths were reported up to week 6 of 2024, compared to 9 deaths during the same period in 2023. While the decrease in case numbers is promising, the loss of lives

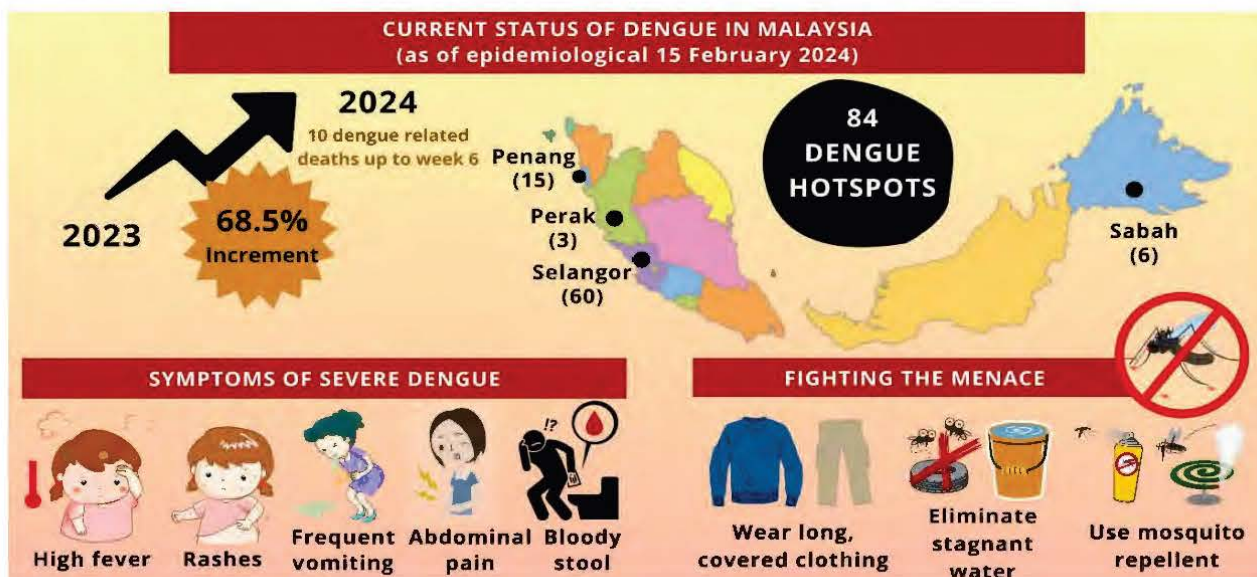


Figure 1: Overview of the current dengue status in Malaysia, highlighting the increasing incidence rates and the urgent need for intervention. It also outlines common symptoms of dengue fever, including high fever, rashes, frequent vomiting, abdominal pain and bloody stool, to aid in early detection and prompt medical attention. Additionally, the figure offers strategies to combat the spread of dengue, emphasizing preventive measures such as mosquito control, the use of repellents, and community awareness campaigns. (Source : MOH DCD, 2024)

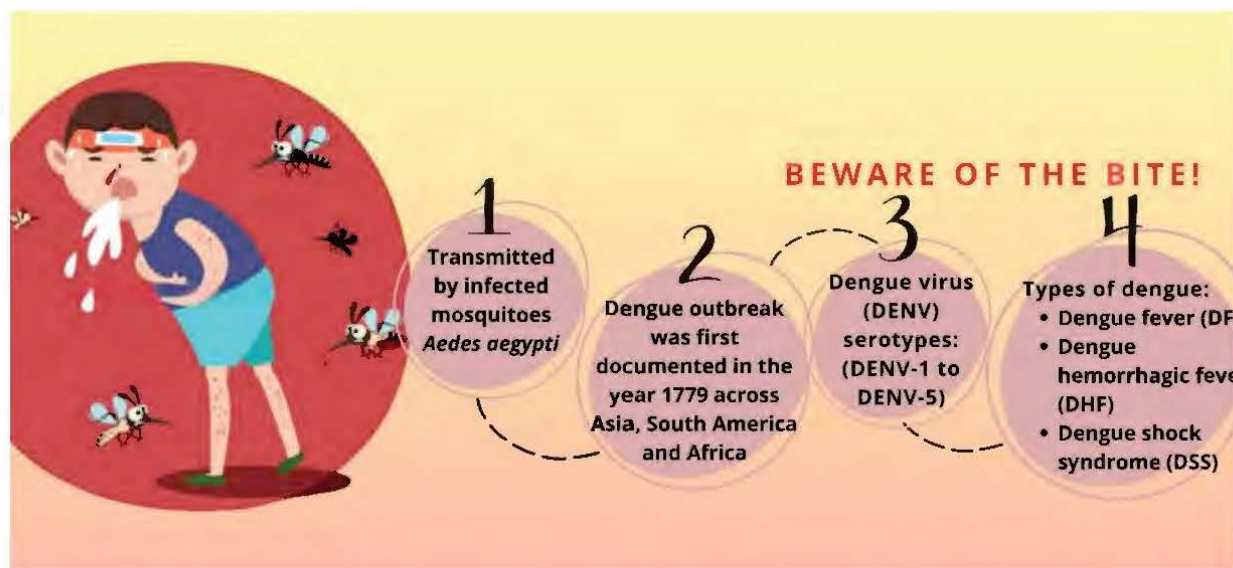


Figure 2: General overview of dengue serotype and transmission (Source: MOH DCD,2024)

underscores the continued severity of this disease and the urgent need for effective interventions.

Dengue fever symptoms often resemble the flu, but severe muscle and joint pain set it apart. Complications like dengue hemorrhagic fever or dengue shock syndrome can arise, causing internal bleeding, low platelets, and organ problems. Diagnosis involves clinical assessment and tests like rapid dengue combo tests and viral RNA detection. Low platelet and white cell counts are common indicators. The infection progresses through fever, circulatory issues, and recovery stages. Climate factors like temperature and rainfall affect mosquito breeding, so using repellents, installing nets, and eliminating stagnant water are vital preventive steps. With dengue cases rising, awareness and action are crucial. Recognizing symptoms, seeking medical

help, and taking preventive measures like wearing long sleeves and keeping surroundings clean can help curb dengue's spread and impact on communities.

Despite the severity of dengue, progress in vaccine development has been marred by challenges. While candidates like CYD-TDV (Dengvaxia) and TAK-004 have shown promise, their efficacy remains uncertain, leading to health complications. However, in phase III trials, the Butantan-DV (TV003/TV005) vaccine candidate has exhibited a promising 79% efficacy against specific dengue serotypes. In the quest for effective therapies, researchers have turned to traditional medicinal plants, uncovering potential antiviral properties that offer hope in the fight against dengue. Leading the charge in this battle is the Malaysian Genome and Virology Institute-National Institute of

Biotechnology Malaysia (MGVI-NIBM), collaborating with public and private partners to develop antiviral drug candidates. By targeting the dengue virus protease, researchers aim to inhibit virus replication and infectivity, paving the way for innovative treatment strategies.

Researchers in our institutions are dedicated to finding effective treatments for dengue fever, a serious illness caused by the dengue virus. One crucial target in this quest is the NS2B/NS3 protease, which plays a vital role in the virus's ability to replicate and spread in the body. By focusing on this protease, we hope to contribute towards the development of new drugs to fight dengue. In our institutions, scientists worked on expressing and purifying the NS2B/NS3 protease in the lab.

Recombinant techniques were used to ensure the production of the protease are sufficient for the studies. DNA encoding dengue's protease was

inserted into *E. coli* XL1-Blue MRF's as host cells. The expression and purification of the protease, which came next, were made possible using an Immobilised Metal Affinity Chromatography (IMAC) technique to capture the NS2B/NS3 protease. Subsequently, buffer with increased imidazole concentration were employed to elute the targeted protease from the column. Following purification, the protease was examined using a method known as SDS-PAGE gel analysis, to verify the authenticity and purity of the purified protease.

The dedication of researchers in expressing and purifying the NS2B/NS3 protease underscores the importance of

collaboration among research institutions and industry partners.

Together, we are working towards the shared goal of developing effective treatments for dengue fever. With each step forward, they bring us closer to a future where dengue is no longer a threat, offering hope to communities worldwide. In light of escalating dengue cases and the urgent need for effective interventions, a collaborative approach offers hope for a brighter, healthier future. By raising awareness, investing in research, and implementing preventive measures, we can collectively combat the threat of dengue fever and safeguard our communities from its devastating impact.

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