

# DENGUE MORTALITY IN MALAYSIA

## A 10-YEAR STUDY



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### INTRODUCTION

Dengue fever, a mosquito-borne viral disease, is prevalent in Malaysia due to high incidences of outbreaks. The number of dengue cases has significantly increased, rising by almost 185% from 13,650 cases between January and May in 2022 to 25,283 cases during the same period in 2023. This alarming trend is accompanied by a concerning toll, with 24 deaths reported as a result of dengue infection compared to 7 deaths in the same period in 2022 (Ministry of Health Malaysia 2023).

Studying dengue mortality provides researchers with valuable insights into the social determinants of health, which encompassing individual, social and health system factors, as well as virus infection and host conditions (Carabali et al. 2015). Additionally, understanding the epidemiological characteristics of dengue is crucial for developing effective strategies to prevent its spread and minimize its impact on public health (Mohd-Zaki et al. 2014). However, there is a limited number of systematic and large-scale studies that have specifically focused on investigating dengue mortality in Malaysia (Liew et al. 2016; Woon et al. 2016; AbuBakar et al. 2022).

### OBJECTIVE

To investigate the mortality rate of dengue in Malaysia from 2012 to 2021 and determine the factors associated with these mortality rates.

### METHODS

- Study design: cross-sectional study
- Data source: Mortality data obtained from the Department of Statistics Malaysia
- Variables included: Cause of death, age, sex, and place of death
- Inclusion criteria: Deaths between 2012 and 2021 with dengue as the underlying cause (ICD codes for dengue: A90-A91)
- Data analysis: The data were compiled in Excel and analysed using IBM SPSS version 26. Crude, age-adjusted mortality rates, and mortality rate ratios by age, sex and state were calculated. The map of age-adjusted mortality rates was created using ArcGIS 10.8.

$$\text{Crude mortality rate} = \frac{(\text{Number of dengue-related deaths})}{\text{Population}} \times 100,000$$

$$\text{Age-adjusted mortality rate} = \text{Age-specific mortality rate} \times \text{Weight in standard population}$$

### DISCUSSION

- Dengue mortality rates in Malaysia are a significant concern, with an average annual age-adjusted mortality rate of 0.56 deaths per 100,000 population. There is evidence that dengue incidence is influenced by climate factors, such as temperature, humidity, and rainfall, which can lead to an increase in fatality rate (Mohd-Zaki et al. 2014; AbuBakar et al. 2022). Therefore, public education about dengue and encouraging early treatment-seeking behaviour are crucial in reducing mortality.
- Central and South Malaysia experience higher dengue mortality rates compared to other regions. Factors such as population density, urbanization, and healthcare accessibility contribute to this variation (Mohd-Zaki et al. 2014). Therefore, it is important to allocate time and resources to those at the highest risk. Targeted interventions, such as vector control measures, public awareness campaigns, and strengthening healthcare infrastructure, are needed in high-risk areas to effectively address these differences.
- The elderly, especially those aged 75 and above, are most vulnerable to dengue, with higher mortality rates, possible due to weakened immune systems and underlying health conditions (Woon et al. 2016). Early diagnosis, prompt treatment, and supportive care are vital in addressing their specific needs.
- The mortality rates for dengue were slightly higher in males compared to females. This finding is consistent with a previous study (Liew et al. 2016). The disparity in mortality rates may be attributed to psychological factors and variations in care-seeking behaviours between genders (Woon et al. 2016).

### CONCLUSION

- In conclusion, dengue remains a significant public health challenge in Malaysia. It is crucial to prioritize the elderly population and urban areas, particularly Kuala Lumpur, in addressing this issue. The implementation of strong interventions for vector control, enhancement of healthcare infrastructure, and promotion of community engagement are essential for effectively combating dengue.

### RESULTS

Figure 1. Age-adjusted mortality rates (line graph) with numbers of deaths (bar graph) of dengue in Malaysia, 2012–2021.

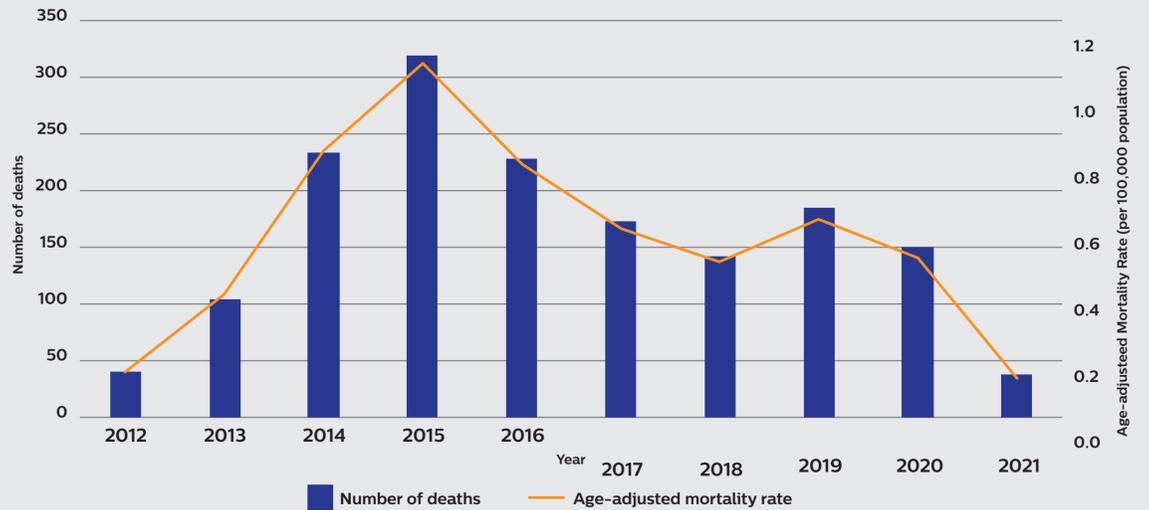


Figure 2. Annual average age-adjusted mortality rates of dengue by states in Malaysia, 2012–2021



Table 1. Characteristics of mortality rates of dengue in Malaysia, 2012–2021

| Characteristic   | Number of deaths (%) | Crude mortality per 100,000 population per year (95% CI) | Age-adjusted mortality rate per 100,000 population per year (95% CI) | Rate ratio* (95% CI) |
|------------------|----------------------|--|--|----------------------|
| <b>Sex</b>       |                      |  |  |                      |
| Male             | 823 (50.2)           | 0.50 (0.31–0.70)   | 0.55 (0.36–0.74)   | 1.00                 |
| Female           | 818 (49.8)           | 0.54 (0.32–0.76)   | 0.56 (0.33–0.79)   | 1.10 (0.96–1.25)     |
| <b>Age group</b> |                      |  |  |                      |
| 0–14             | 150 (9.1)            | 0.19 (0.11–0.27)   | 0.19 (0.11–0.27)   | 1.00                 |
| 15–29            | 288 (17.6)           | 0.31 (0.17–0.46)   | 0.31 (0.17–0.45)   | 1.84 (1.10–2.58)     |
| 30–44            | 379 (23.1)           | 0.55 (0.27–0.82)   | 0.55 (0.27–0.84)   | 2.82 (1.95–3.69)     |
| 45–59            | 412 (25.1)           | 0.88 (0.53–1.24)   | 0.88 (0.53–1.24)   | 5.21 (3.50–6.92)     |
| 60–74            | 308 (18.8)           | 1.29 (0.83–1.75)   | 1.30 (0.83–1.77)   | 7.80 (4.94–10.65)    |
| ≥75              | 104 (6.3)            | 1.63 (1.03–2.23)   | 1.64 (1.04–2.25)   | 10.17 (4.65–15.69)   |
| <b>All</b>       | <b>1641</b>          | <b>0.52 (0.32–0.72)</b>                                  | <b>0.56 (0.36–0.76)</b>  |                      |

CI= Confidence interval. \* Based on crude mortality rates.

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