

Global Health Cast - Summary

Three short lessons on Dengue



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Part 1: General Overview

Part 2: Clinical aspects

Part 3: Epidemiology

Dengue-Definition

Dengue is an

- **acute, systemic flavivirus disease;**
- caused by 4 closely related but antigenically distinct Dengue Viruses (DENV), i.e. **serotypes 1, 2, 3, and 4;**
- transmitted to humans primarily by ***Aedes aegypti* mosquitoes** (rarely *Ae. albopictus*).
- Clinically
 - **~75%** of infections are asymptomatic,
 - **~20%** result in mild unspecific flu-like disease (Dengue fever, DF),
 - **~5%** are severe (dengue hemorrhagic fever, **DHF**), usually second or later infection (**ADE**) (case fatality rate (**CFR**): **2.5% globally**).
- Today, half of the world's population is at risk for infection; there are **100-400 million cases annually**
- **No specific therapy** is available, vaccine prevention is of utmost importance
- Today **two vaccines** are licensed in some countries
 - see: [Global Health Cast – Dengue Vaccines – Global Health Press \(id-ea.org\)](https://www.id-ea.org/global-health-cast-dengue-vaccines)

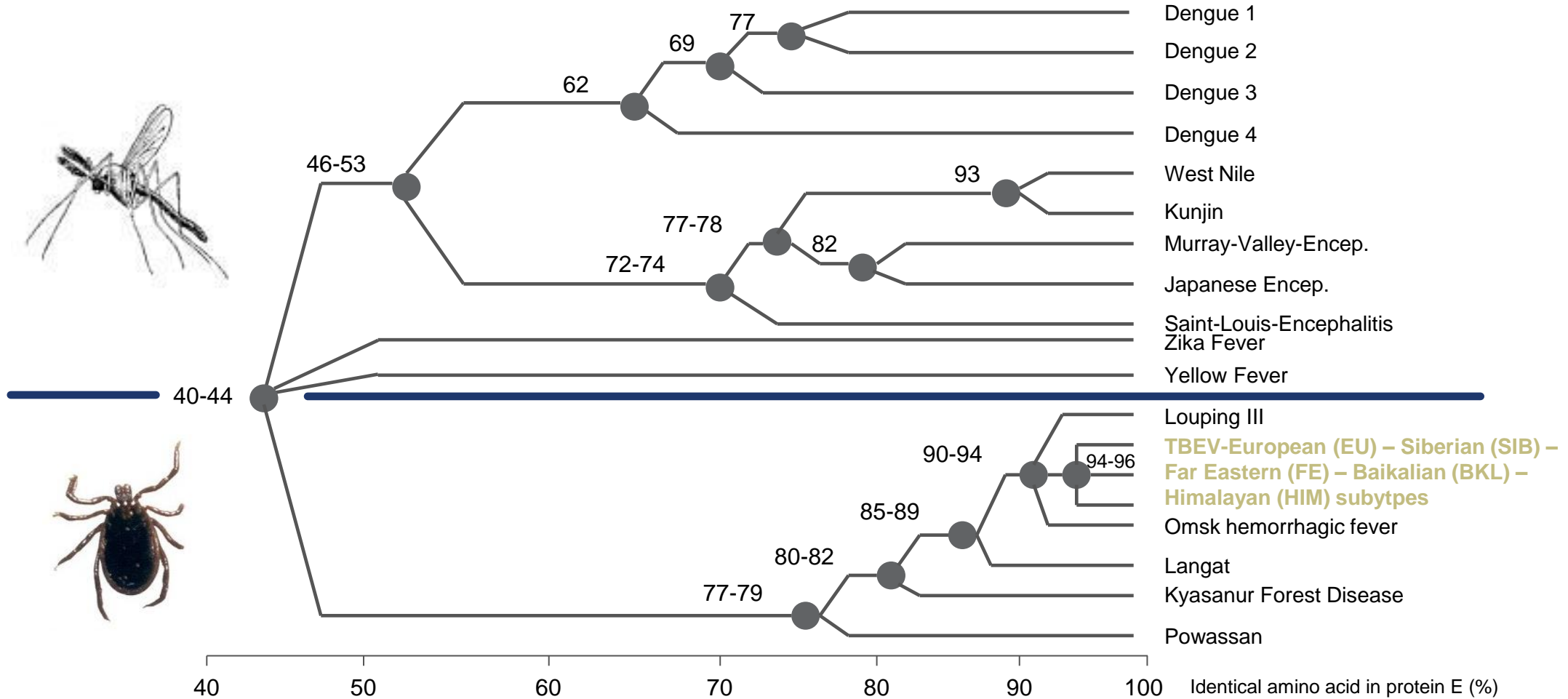
Very Brief History

- ▶ **1780: Benjamin Rush** first described “break-bone fever” (Philadelphia)
- ▶ Early decades **20th century: outbreaks** in continental United States;
 - ▶ last large epidemics in Florida in 1934; New Orleans 1945.
- ▶ **Descriptions of hemorrhage**, shock, death in outbreaks
 - ▶ Australia 1897, Greece 1928, Taiwan 1931.
- ▶ 1903: Transmission by *A. aegypti* mosquitos demonstrated
- ▶ 1906: **Viral** etiology proven
- ▶ 1944: **Sabin: 2 DENV strains** established. 1956 Hammon: 2 more types
- ▶ After 1945: **Pandemics**, intensified transmission, multiple DENV types, SE-Asia (DHF).
- ▶ Recently: **increasing DENV transmission and BoD, including temperate climates.**
 - ▶ Fueled by population growth, urbanization, increasingly favorable ecologic and environmental habitats for *Aedes* mosquitoes compounded by poor vector control, and international travel.

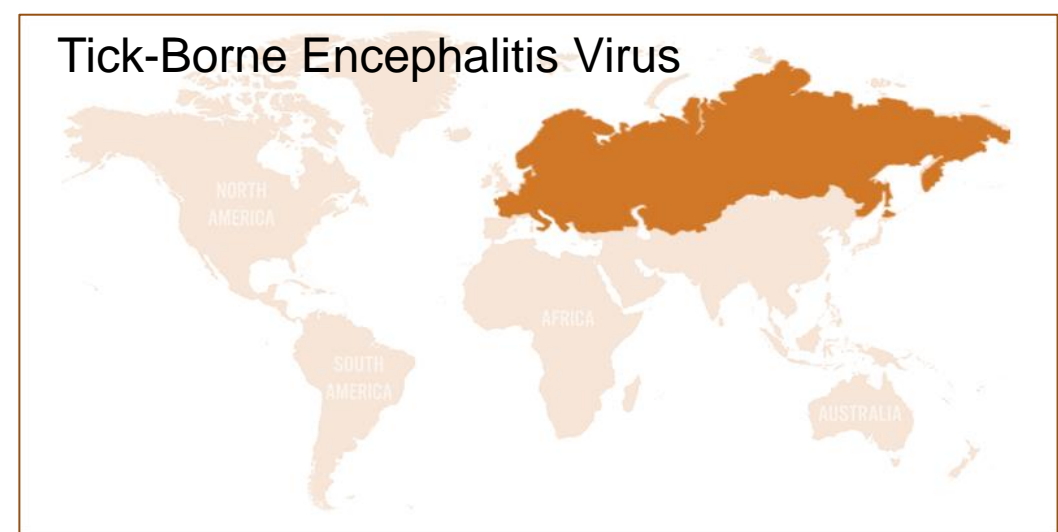
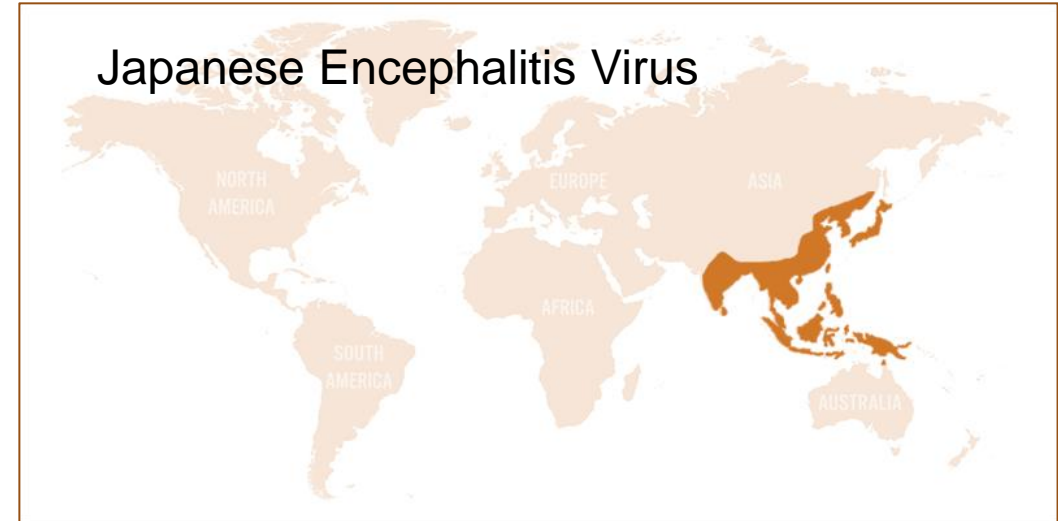
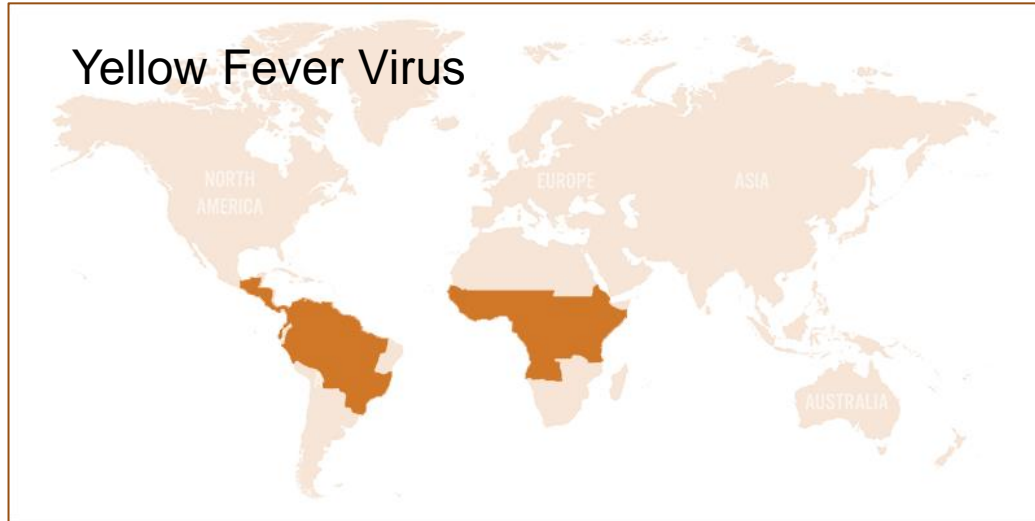
Phylogenetic Map of Selected Flaviviruses



Phylogenetic Map of Selected Flaviviruses



Global Distribution of 4 relevant Flaviviruses



Human Diseases Caused by Selected Flaviviruses

Virus	Vaccine ?	Severe manifestations
Dengue Virus	2 + pipeline	Febrile systemic disease, hemorrhagic fever
Yellow Fever Virus	1	Hepatitis
Japanese encephalitis virus	> 7	CNS diseases
West Nile Virus		CNS diseases; fevers, arthralgias, rash
Alkhurma Virus		Hemorrhagic fever
Kyasanur Forest Disease Virus	1 (India); TBE?	Hemorrhagic fever
Zika-Virus	Pipeline	Fever, arthralgias, rash, congenital disease
Tick-Borne Encephalitis Virus	2	CNS diseases, ARI, others
St. Louis Encephalitis Virus		CNS diseases
Powassan Virus		CNS disease, (CFR <10%), 50% of survivors suffer from long-term disability

Dengue Podcasts:

[Global Health Cast – Dengue Vaccines – Global Health Press \(id-ea.org\)](#)

[Global Health Cast – Dengue: Clinical Aspects – Global Health Press \(id-ea.org\)](#)

[Global Health Cast – Dengue: a complex disease – Global Health Press \(id-ea.org\)](#)