

# Dengue Fever

## Epidemiology

ICDC



# Burden and Importance

- Dengue is an acute, transmissible (mosquito-borne) infectious disease caused by the dengue virus
- The World Health Organization declared dengue one of the “top ten threats to global health in 2019”
- The most prevalent arthropod-borne viral disease worldwide
- About ~400 million infections occurring per year, of which ~100 million (25%) cause clinical illness
- Dengue is endemic in more than 100 countries, mainly in tropical and subtropical areas

- About 40% of the world's population (3.6 billion people) is at risk of dengue fever
- The highest number of dengue cases was recorded in 2023
- In 2023 a historic high of over 6.5 million cases and more than 7300 dengue-related deaths reported
- The *Aedes albopictus* mosquito is spreading north, east and west in Europe, and now has self-sustaining populations across 13 EU/EEA countries
- Year round transmission of dengue viruses 1–4 occurs between latitudes 35°N and 35°S

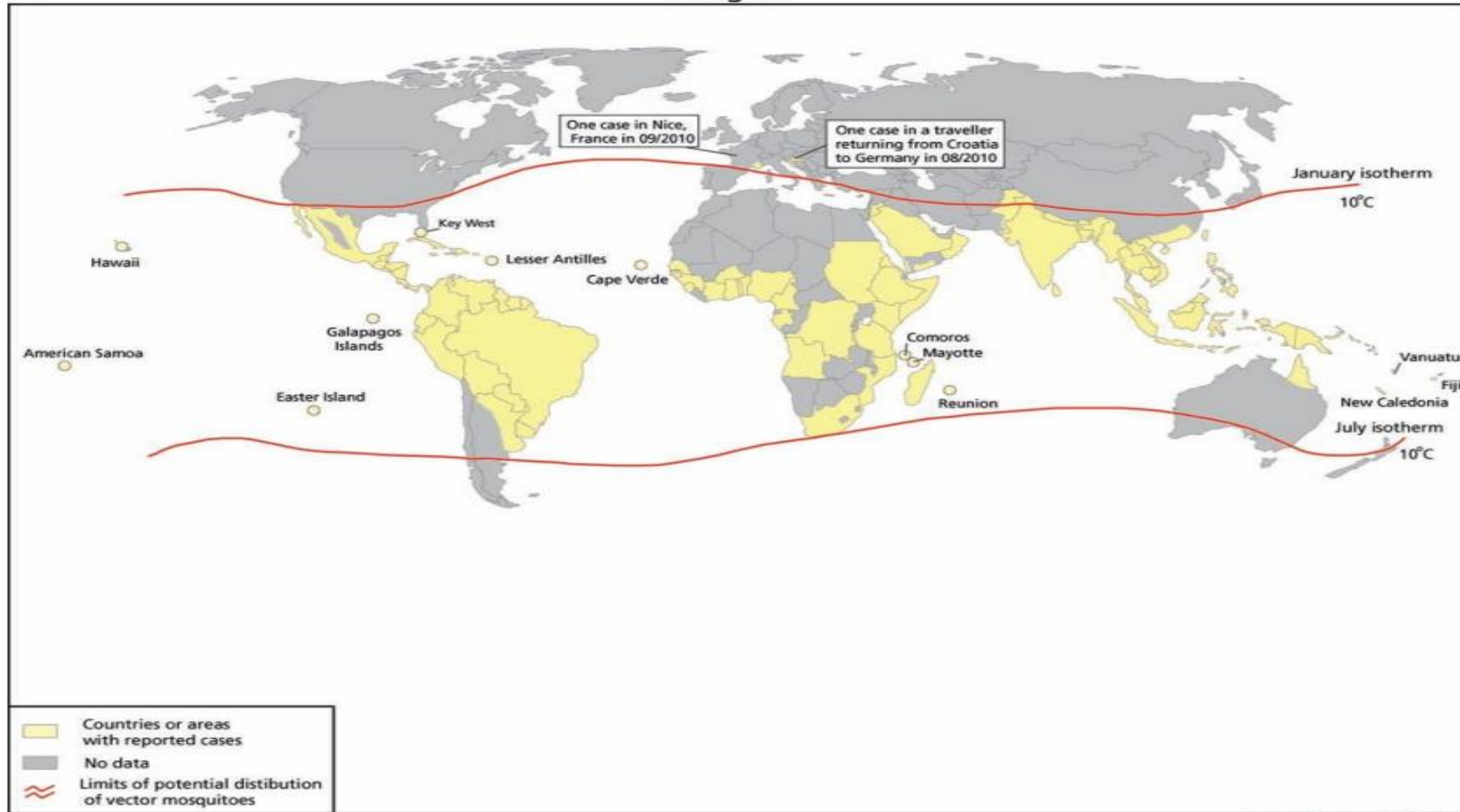
A high number of cases occurs in Asia (70%), mainly during the rainy seasons in countries such as Indonesia, Bangladesh, and India

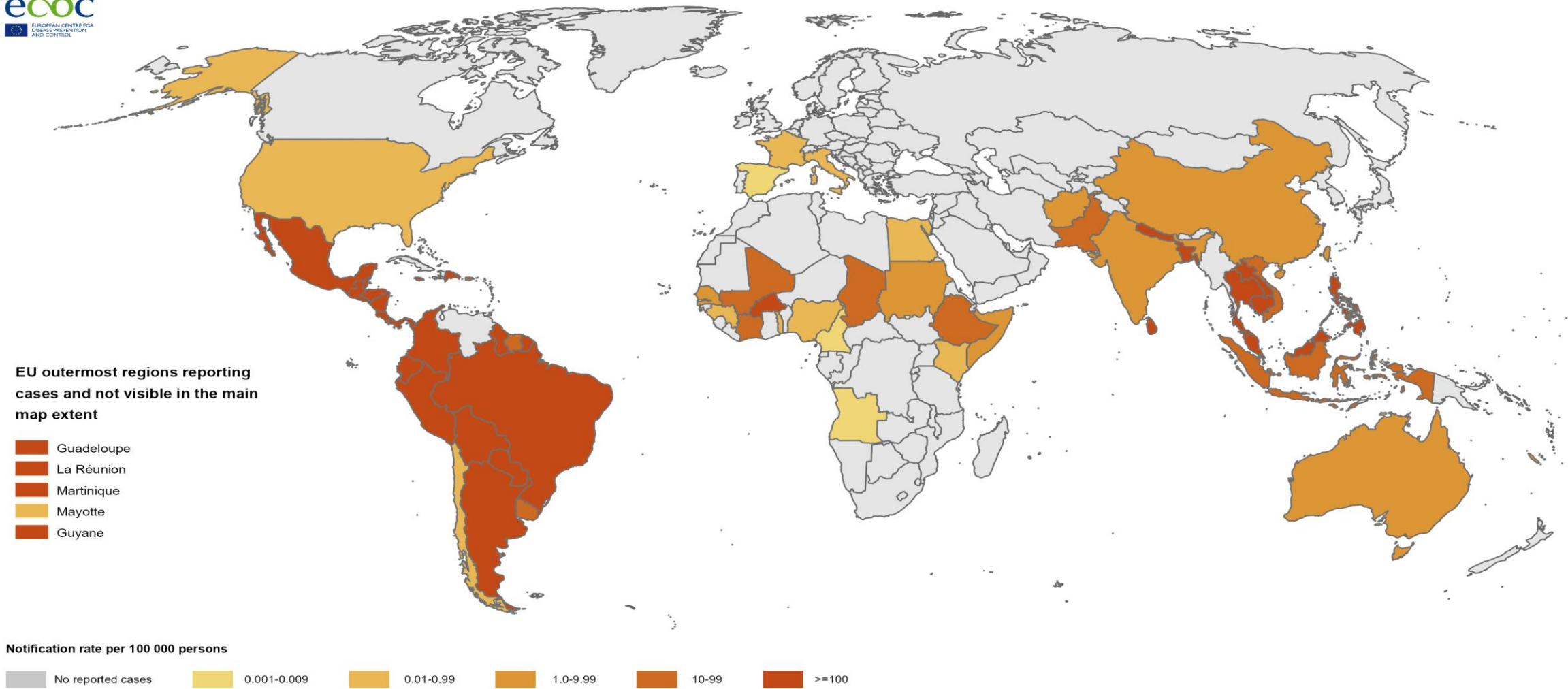
Recent outbreaks of dengue in Pakistan, Brazil, Indonesia, and Peru are among the largest



- People of all ages who are exposed to infected mosquitoes are at risk of developing dengue
- The risk for infection may be as high as 79% in naïve hosts, and clinical disease may develop in up to 20%
- In endemic areas (primarily South-East Asia), dengue occurs mainly in children, with dengue hemorrhagic fever being the major cause of death - with a case fatality rate of 3 to 10 percent

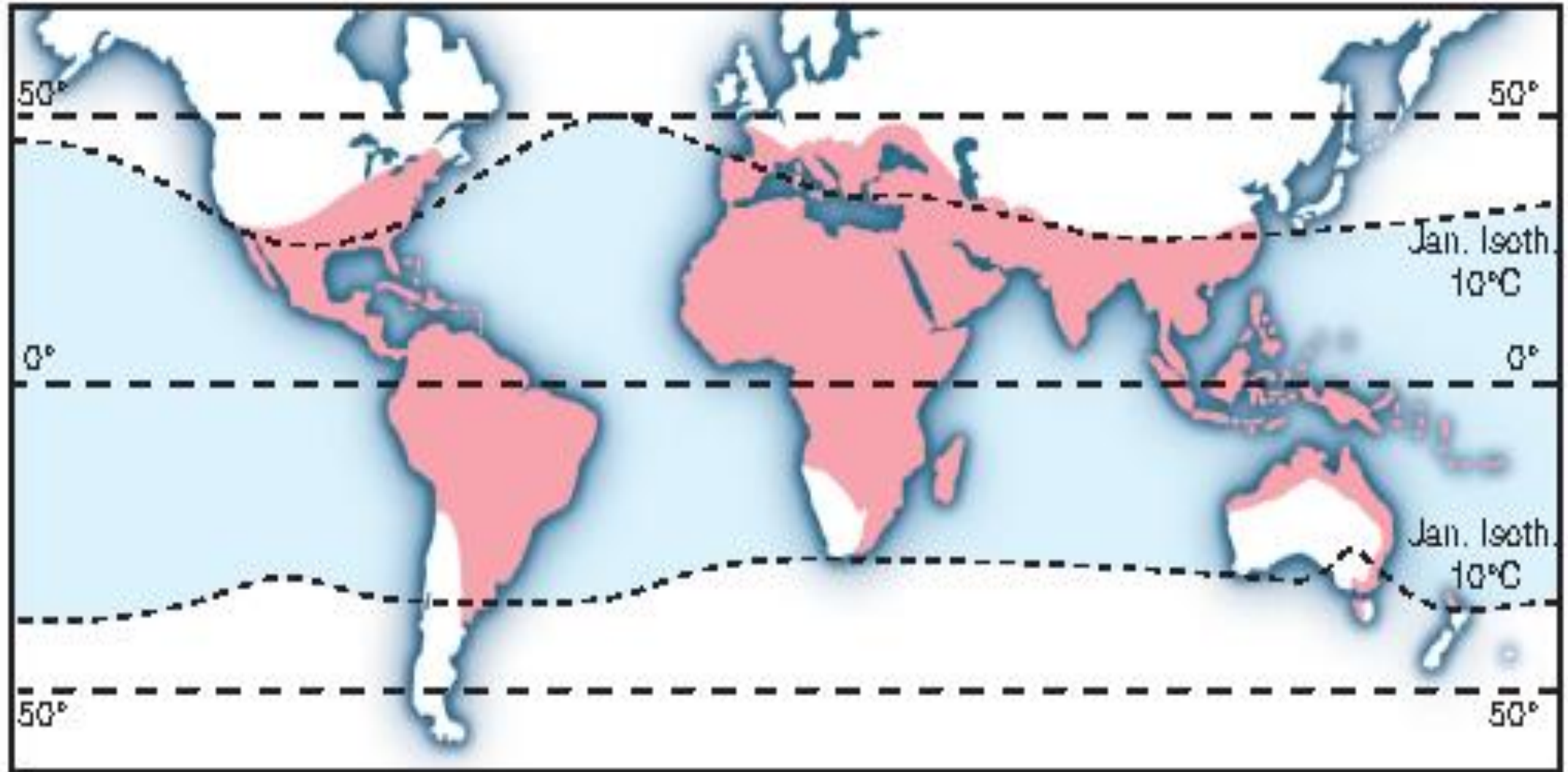
# Dengue





Note: Data refer to Dengue virus cases reported in the last 12 months (June 2023-May 2024) [Data collection: June 2024]. Case numbers are collected from both official public health authorities and non-official sources, such as news media, and depending on the source, autochthonous and non-autochthonous cases may be included. Administrative boundaries: © EuroGeographics. The boundaries and names shown on this map do not imply official endorsement or acceptance by the European Union. ECDC. Map produced on 26 June 2024

potential distribution of *Aedes aegypti*





# Virus

- There are four serotypes of dengue: DEN-1, DEN-2, DEN-3, and DEN-4.
- The sources and hosts of the virus are humans and African and Asian primates
- A person can be infected with the dengue virus several times during their life, either consecutively or simultaneously with two different serotypes
- Most people are viremic for about 4–5 days, but viremia can last as long as 12 days.

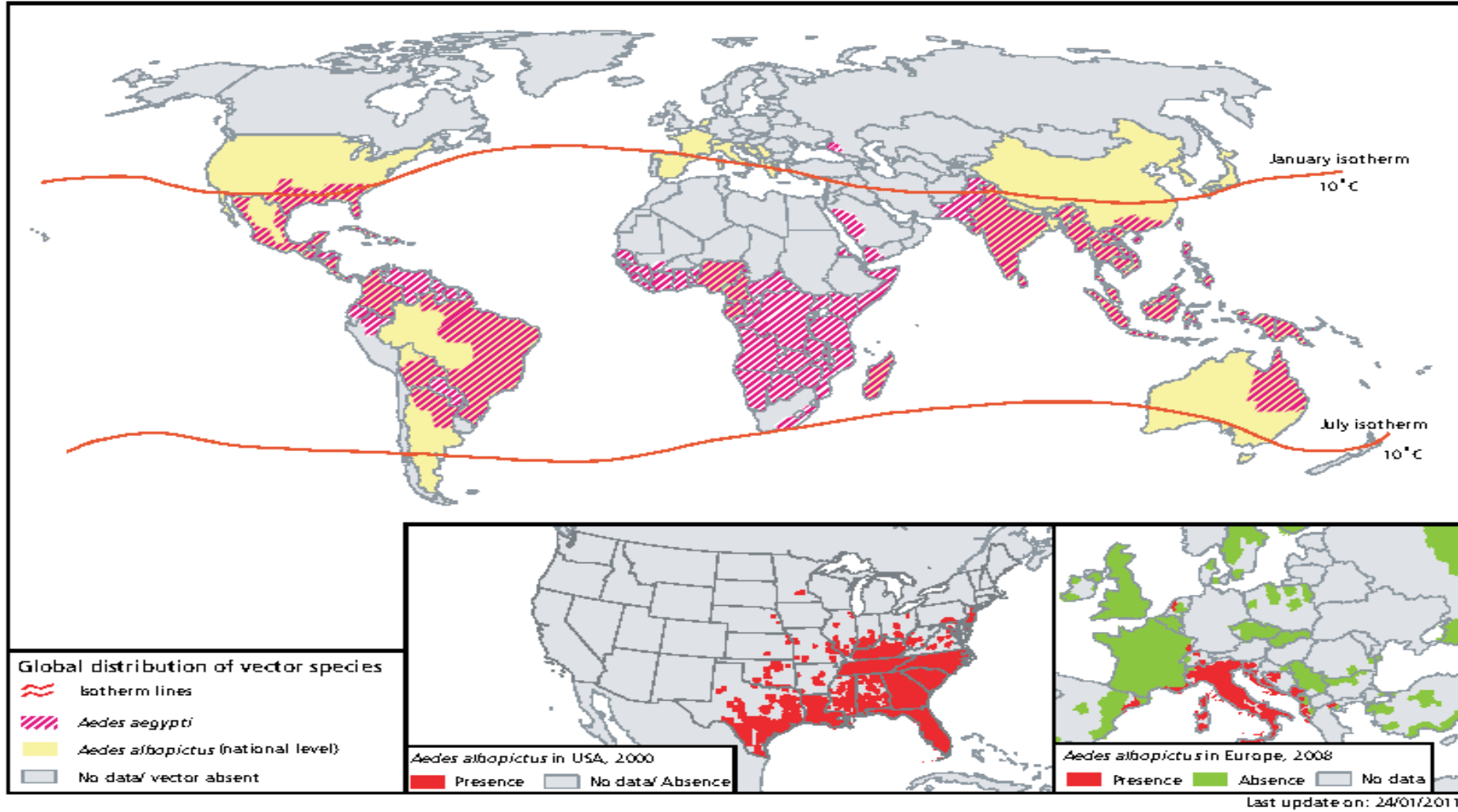


# Mosquito

- Dengue is transmitted to humans by the bite of female *Aedes aegypti* and *A. albopictus* mosquitoes.
- These mosquitoes usually bite during the day
- Transmission between humans and *Aedes* mosquitoes, as well as vertical transmission from mosquito to mosquito
- Human-to-mosquito transmission can occur up to 2 days before someone shows symptoms of the illness, and up to 2 days after the fever has resolved

- Feeding attempts may occur several times a day over the insect's lifetime of 1 to 4 weeks
- Adult mosquitoes shelter indoors and bite during 1- to 2-hour intervals in the morning and late afternoon.
- Temperatures  $<15^{\circ}\text{C}$  or  $>36^{\circ}\text{C}$  substantially reduce mosquito feeding.
- Viral replication can occur in as little as 7 days with temperatures of  $>32\text{--}35^{\circ}\text{C}$ ; at  $30^{\circ}\text{C}$ , replication takes  $\geq 12$  days; and replication does not reliably occur at  $26^{\circ}\text{C}$
- Peak transmission at  $\sim 32^{\circ}\text{C}$ , reflecting combined effects of a shorter extrinsic incubation period, a higher feeding frequency, and more rapid development of mosquitoes
- Within a range of 500 - 800 m rapidly spread the infection

### *Aedes aegypti* and *Aedes albopictus*



# IRAN

- GILAN
  - MAZANDARAN
  - GOLESTAN
  - HORMOZGAN
  - BUSHEHR
  - SISTAN & BALOCHESTAN
  - KHUZESTAN
- Until 02/26
  - 75 Cases
  - From 02/26
  - 146 Cases
  - 135 Imported
  - 1 Death
  - Serotype 2