Update on chikungunya and chikungunya vaccines

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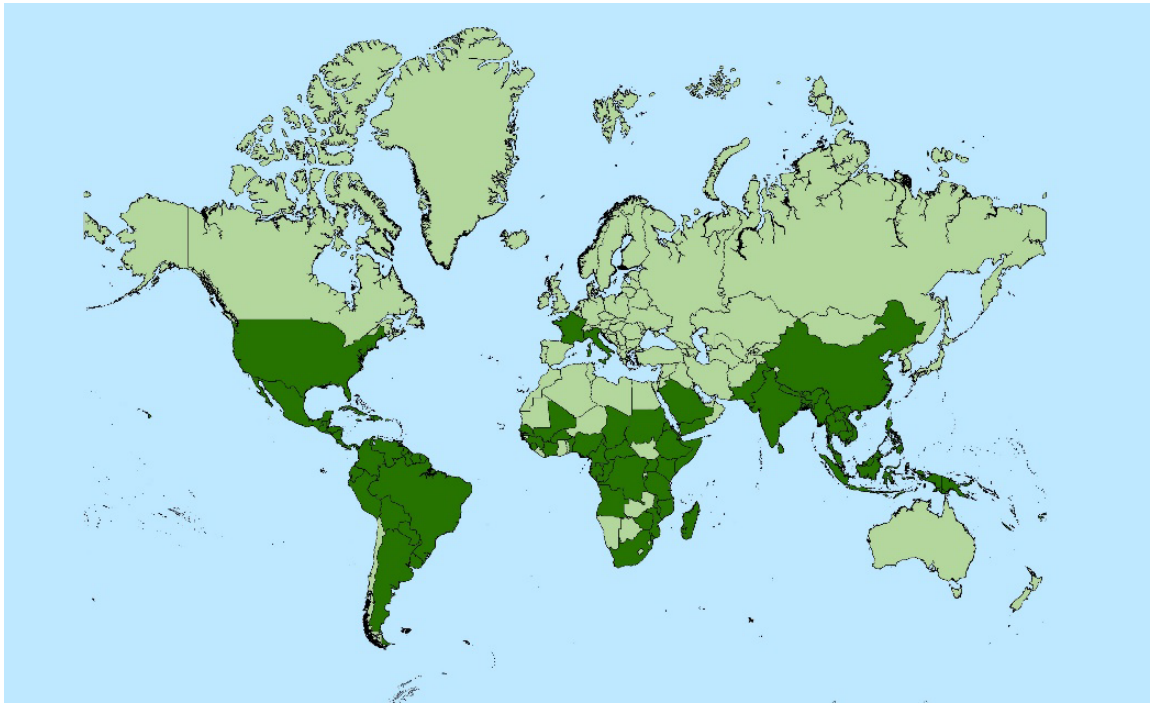
Chikungunya

- Mosquito-borne disease
- Key vectors are *Aedes aegypti* and *Aedes albopictus* mosquitoes

Distribution and virus transmission

- Typically tropical and subtropical regions
- Periodically causes large outbreaks, often with high attack rates



Countries and territories with current or past transmission of chikungunya virus

Key features of acute chikungunya virus disease

- Febrile illness with typically severe arthralgia, can be debilitating
- Other symptoms include headache, rash, myalgia, anorexia
- No anti-viral treatment available and management is supportive

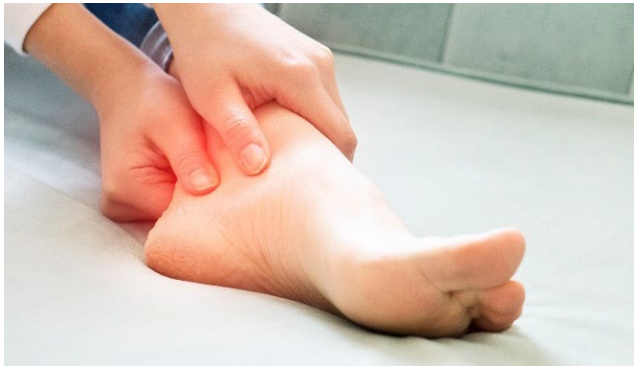


Image above from : https://www.paho.org/en/topics/chikungunya

Complications of chikungunya

- Rare serious complications (e.g., myocarditis, hepatitis, neurologic illness)
- Deaths rare and reported mostly in
  - Older adults, particularly those with comorbidities
  - Young infants infected perinatally or by mosquito bites

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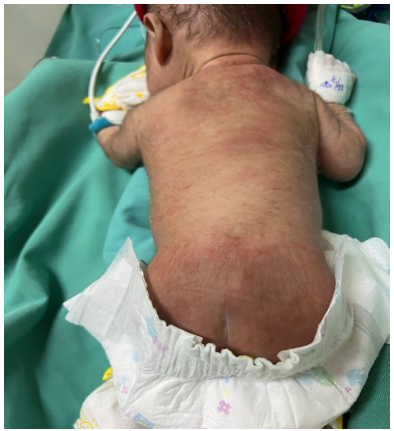


Bin S et al, Clin Case Rep 2023

Chronic arthralgia following chikungunya

- Acute symptoms usually resolve in 7–10 days
- Some patients have continuation or relapse of symptoms
- Ongoing arthralgia of variable severity might be present in up to ~50% at 3 months and ~30% at 12 months[1]

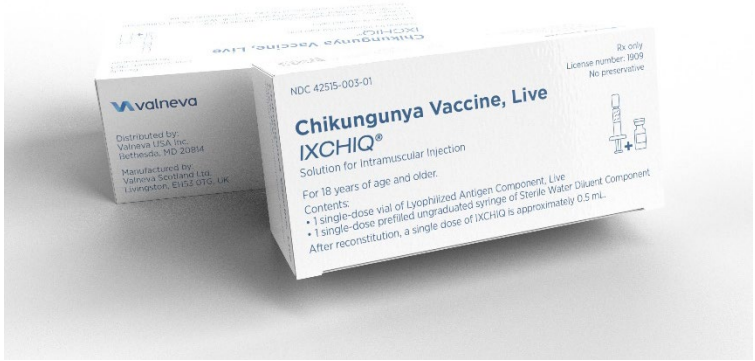
[1]Based on recent meta-analysis (Lindsey N. Chronic arthralgia after chikungunya. US Advisory Committee on Immunization Practices meeting, June 2023)

Chikungunya among U.S. travelers

- Approximately 100–200 reported cases annually
- Infection most commonly acquired in locations in Asia and Americas
- Greatest risk factor for travelers is traveling to area with outbreak

Chikungunya vaccines

Live attenuated chikungunya vaccine



- Manufactured by Valneva as IXCHIQ
- Licensed November 9, 2023
- Age group currently adults ≥18 years
- Single dose schedule

Recommendations for travelers approved February 2024

- ACIP **recommends** the live attenuated chikungunya vaccine for persons aged ≥18 years traveling to a country or territory where there is a chikungunya outbreak

- In addition, the vaccine **may be considered** for the following persons traveling to a country or territory without an outbreak but with evidence of chikungunya virus transmission among humans within the last 5 years
  - Persons aged >65 years, particularly those with underlying medical conditions, who are likely to have at least moderate exposure* to mosquitoes, OR
  - Persons staying for a cumulative period of 6 months or more

*Moderate exposure could include travelers who might have at least 2 weeks (cumulative) of exposure to mosquitoes in indoor or outdoor settings

Recommendations for use among laboratory workers approved February 2024

- ACIP recommends live attenuated chikungunya vaccine for laboratory workers with potential for exposure to chikungunya virus

Updates on live attenuated chikungunya vaccine

- Adolescents aged 12–17 years: expected submission to FDA in 2024
- Children aged 1–11 years: clinical trial began December 2023
- Long term persistence trial ongoing
  - High seroresponse rate (97%) at 2 years
  - Monitoring continuing through 10 years to determine if booster dose needed in future

Virus-like particle chikungunya vaccine

- Manufactured by Bavarian Nordic
- Licensure possible February 2025
- Intended age group is adolescents and adults aged ≥12 years
- Single dose schedule

Licensure through accelerated approval pathway

- Traditional approval challenging and clinical development would likely have been delayed
  - Efficacy trial with disease endpoint difficult as outbreaks unpredictable and duration can be relatively short
  - No established immunologic correlate of protection
- Accelerated approval pathway endorsed at FDA VRBAC* meeting, 2019
  - FDA can grant for products for serious conditions that fill unmet medical need
  - Effectiveness demonstrated by controlled trials showing vaccine has effect on surrogate endpoint reasonably likely to predict clinical benefit
  - Marker of protection for virus-like particle vaccine based on neutralizing antibody titer estimated from validated non-human primate model
  - Post-licensure requirement for controlled trials to confirm clinical benefit

*Vaccines and Related Biological Products Advisory Committee

ACIP recommendations for use of chikungunya vaccines

Population	Live attenuated vaccine	Virus-like particle vaccine
Travelers	Completed*	*Pending*†
Laboratory workers	Completed	*Pending*
Residents of U.S. territories with transmission risk	*Pending*	*Pending*
Residents of U.S. states with transmission risk	*Pending*	*Pending*

*Adults aged ≥18 years †Adolescents and adults aged ≥12 years

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.