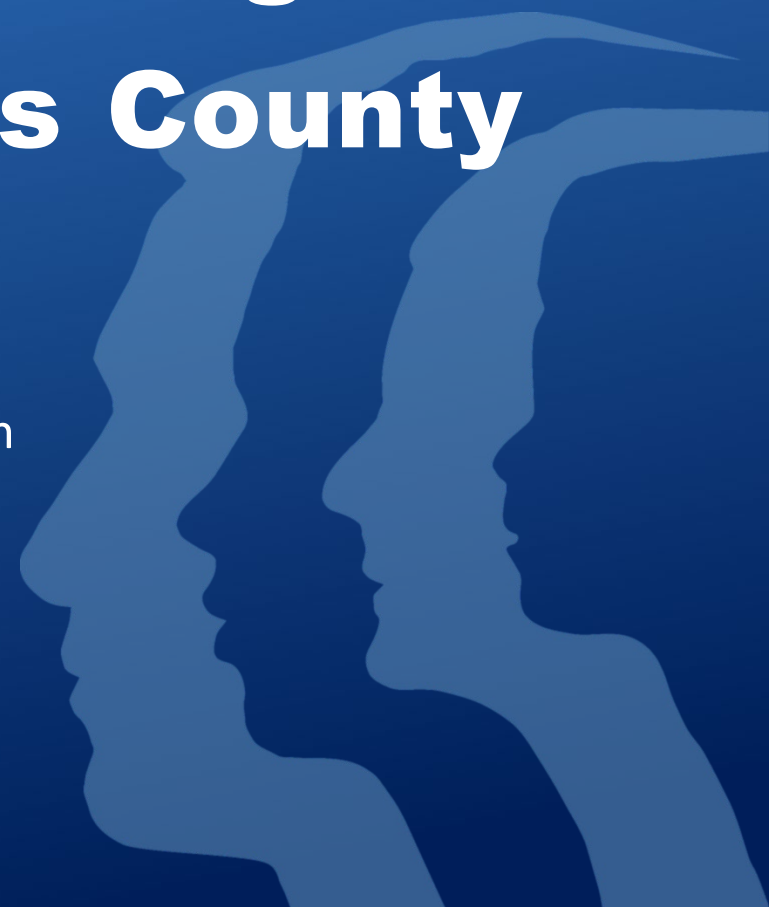




What Clinicians Need to Know about Dengue in Los Angeles County

Acute Communicable Disease Control Program
Los Angeles County Department of Public Health

Centers for Disease Control and Prevention





What Clinicians Need to Know about Dengue in LA County

None of the planners or presenters for this activity have disclosed relevant financial relationships with ineligible companies.

There is no commercial support for today's activity

Ineligible companies are companies whose primary business is producing, marketing, selling, re-selling, or distributing healthcare products used by or on patients.



Educational Objectives

At the completion of this activity, the learner will feel more confident in their ability to:

- Understand the risk of travel associated and locally acquired dengue in Los Angeles County.
- Recognize clinical presentation of dengue and order appropriate diagnostic tests.
- Assess disease severity and provide recommended management.
- Understand the public health response to reported dengue cases.



Aiman Halai, MD, MPH
Medical Epidemiologist,
Acute Communicable
Disease Control Program,
Los Angeles County
Department of Public Health



**Alfonso C Hernandez-
Romieu, MD, MPH**
Medical Officer,
Dengue Branch, Division of
Vector-Borne Diseases,
National Center for Emerging
and Zoonotic Infectious
Diseases, CDC

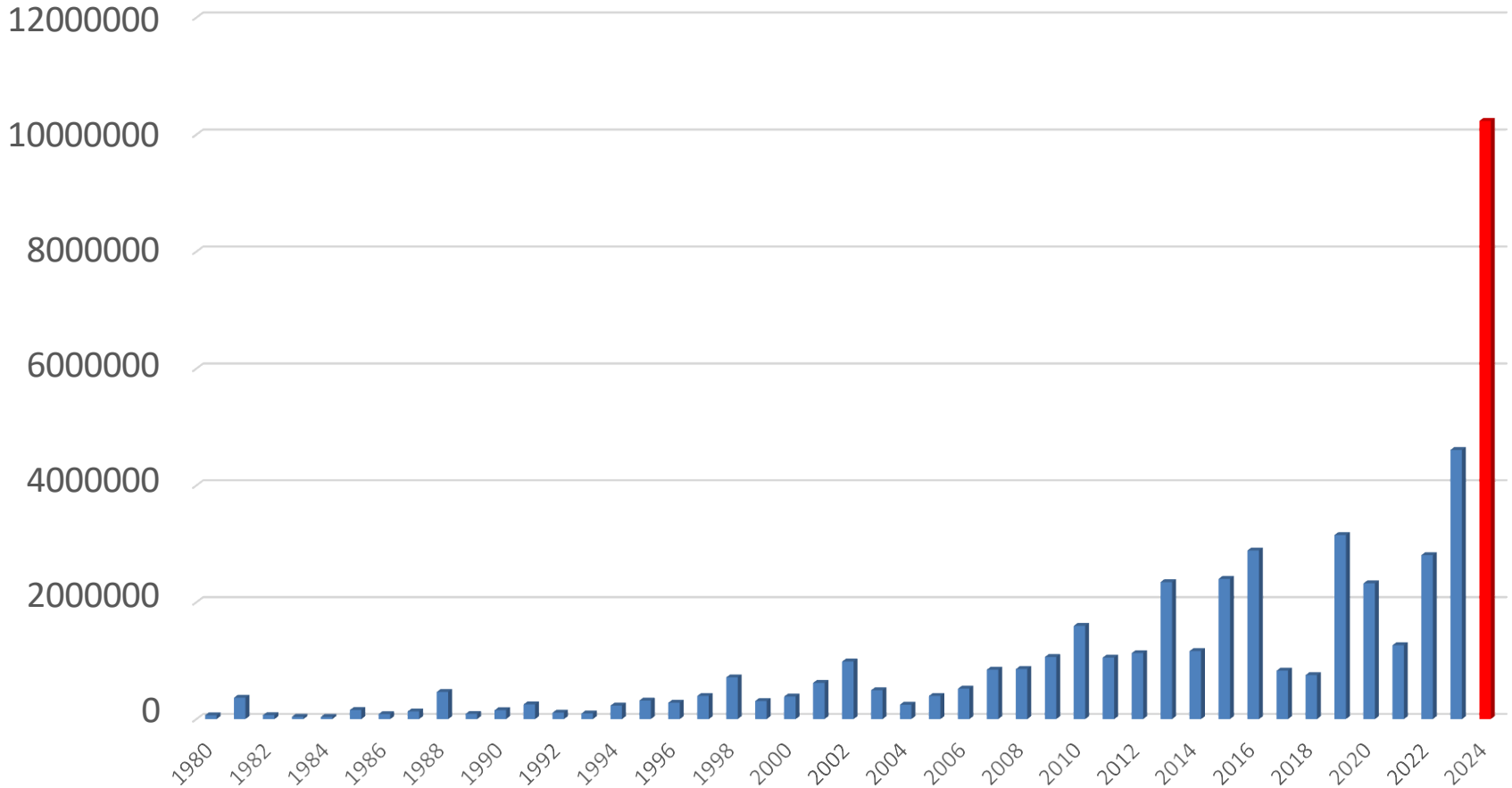


Source: Deadly Dengue Fever Outbreak in Bangladesh Strains Scarce Resources, NY Times, Sept 25, 2023



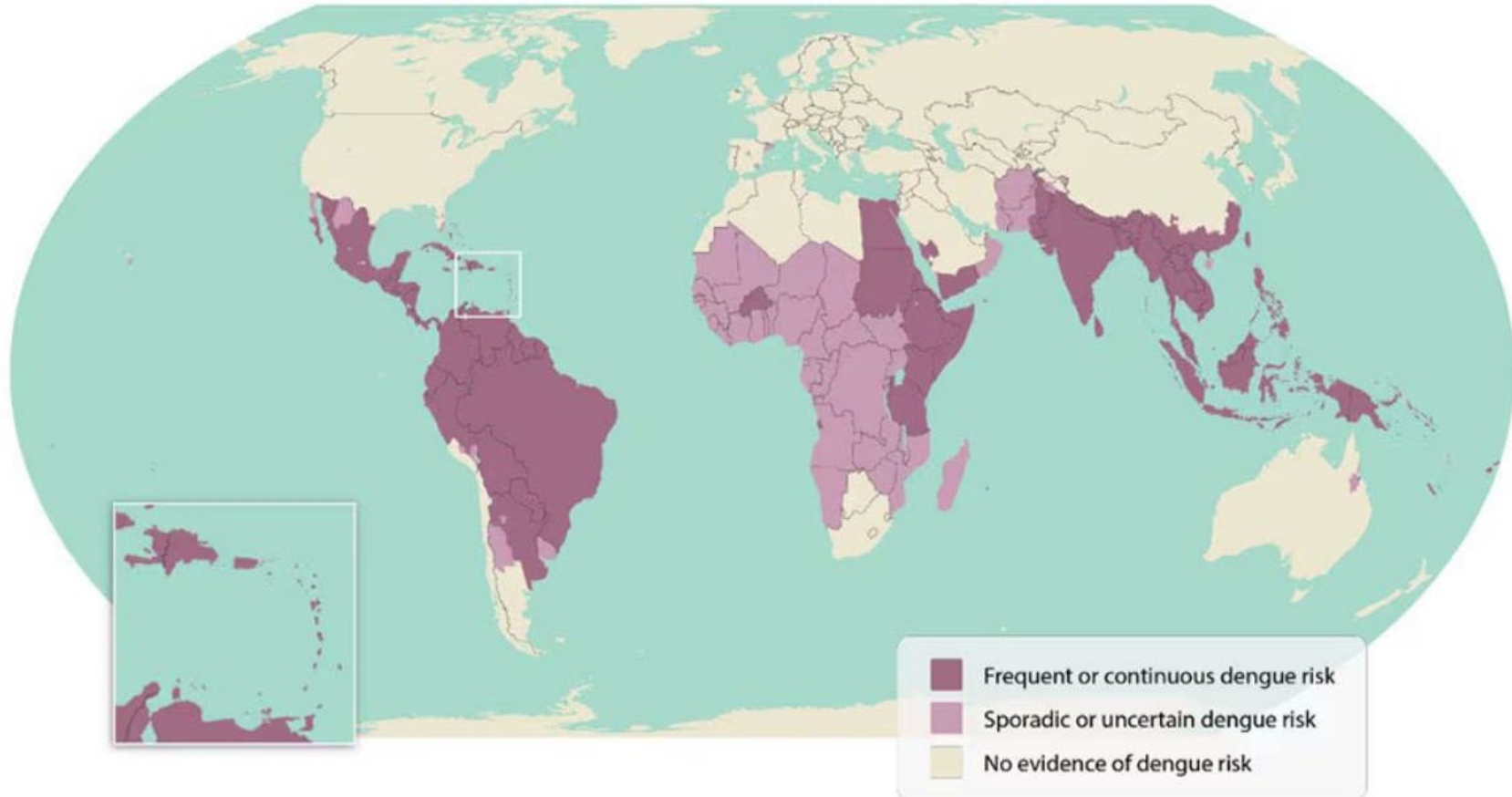
Dengue Cases in the Americas 1980-2024*

More than **10 million** cases reported this year as of July 3, 2024



*Data from PAHO PLISA Health Information Platform for the Americas

Dengue epidemiology worldwide



Source: CDC (<https://www.cdc.gov/dengue/areaswithrisk/around-the-world.html>, <https://wwwnc.cdc.gov/travel/yellowbook/2024/infections-diseases/dengue#epi>)



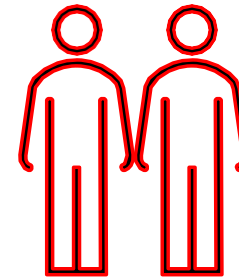
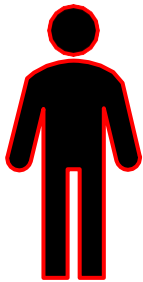
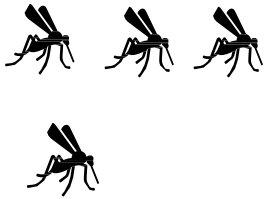
What does this mean for us?



Travel-associated cases

Risk of local transmission

What is Local Transmission





Locally Transmitted Cases

In Fall 2023 there were 2 cases of locally-transmitted dengue

CITY OF
LONG BEACH PRESS RELEASE

11/1/2023

FOR IMMEDIATE RELEASE

Subject: Long Beach Health Department Confirms

Contact: Jennifer Rice Epstein
562.441.3590
Jennifer.RiceEpstein@longbeach.gov
Public Affairs Officer
Department of Health and Human Services

The City of Long Beach Department of Health and Human Services (Health Department) has confirmed a case of dengue in a resident who has not traveled outside of the U.S. This is the first case of dengue in Long Beach not related to travel and only the second in California, the first of which was identified earlier this month in Pasadena. The risk of local exposure remains low, and the Health Department is taking steps to prevent further spread of the virus that causes dengue. The person who was infected has recovered at home and no other suspected cases have been identified. The Health Department is carefully monitoring the situation and has educated healthcare providers on the symptoms of dengue.

PASADENA
OFFICE OF THE CITY MANAGER

ABOUT ▾ PUBLIC AFFAIRS ▾ ECONOMIC DEVELOPMENT

Home · News

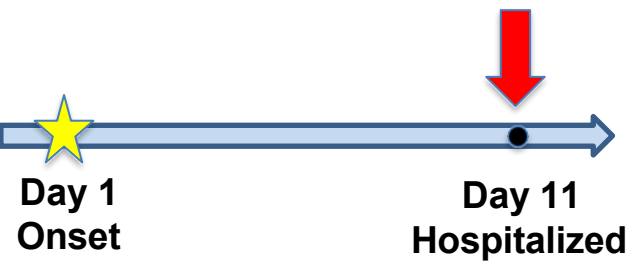
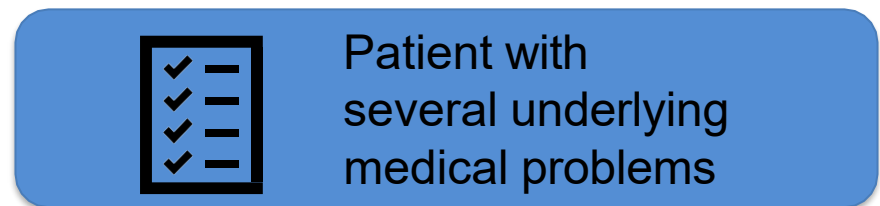
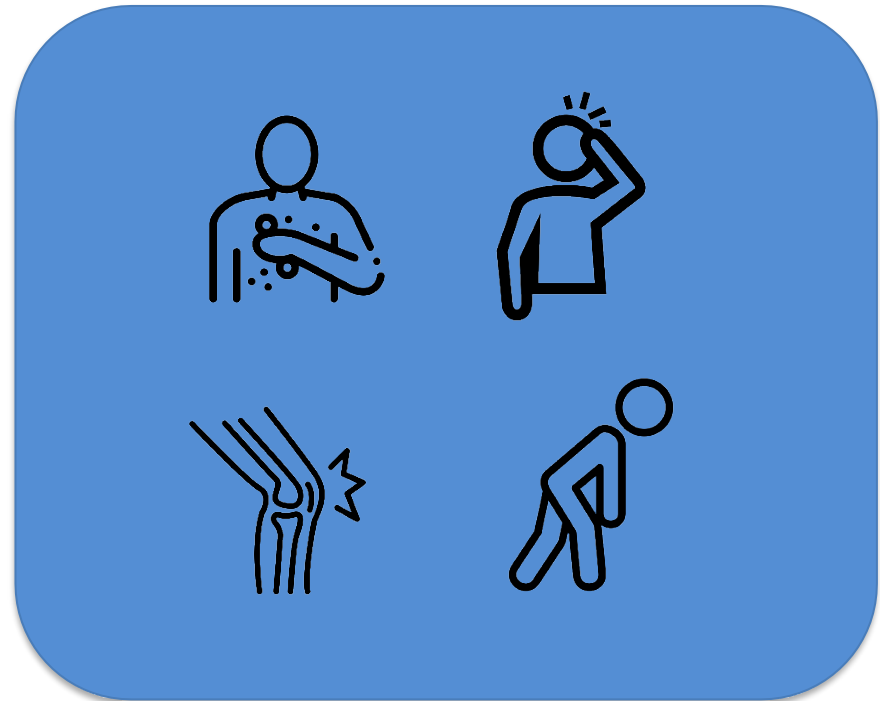
· Pasadena Reports Extremely Rare Case of Locally-Acquired Dengue; Exposure Risk to Local Residents Remains Very Low

Pasadena Reports Extremely Rare Case of Locally-Acquired Dengue; Exposure Risk to Local Residents Remains Very Low

📅 October 20, 2023 📌 News

PASADENA, Calif.— [Pasadena Public Health Department](#) (PPHD) reports a case of dengue in a Pasadena resident who did not travel outside the United States. This is the first confirmed case of dengue in California not associated with travel and is instead an extremely rare case of local transmission in the continental United States. The risk of exposure to dengue for residents is very low and standard precautions are effective at preventing all mosquito-borne illnesses, including dengue.

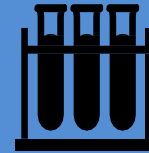
Pasadena Case Presentation



↓
White Blood Cells
2.5 (4.4-10.8x10³)/mcL

↓
Platelets
116 (150-400x10³)/mcL

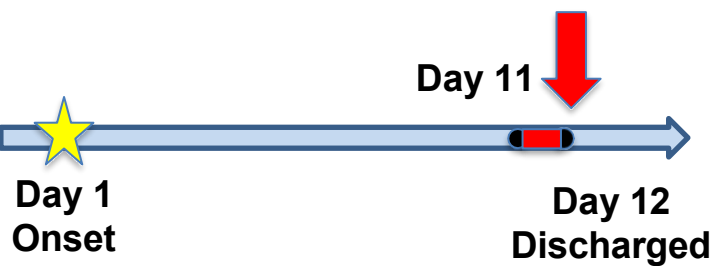
↑
Hematocrit
46.2 (36.0-45.0%)

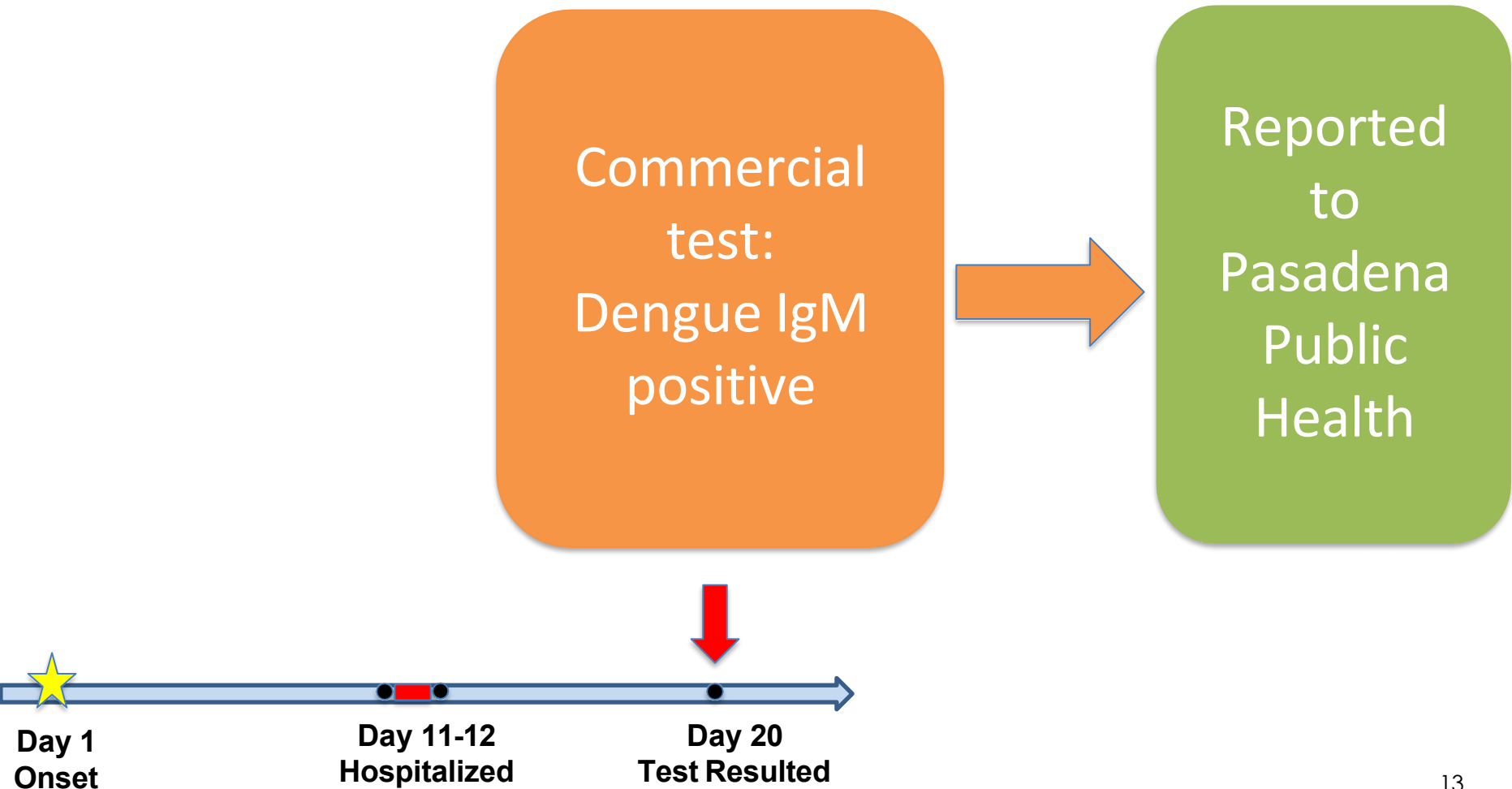


Diagnostic test ordered
✓ Dengue IgM/IgG

**No West Nile virus
ordered**

Patient discharged with doxycycline





Public Health Investigation



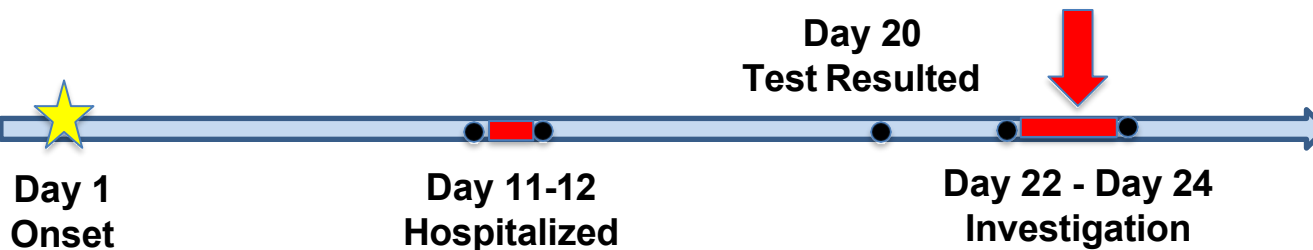
No travel away from neighborhood

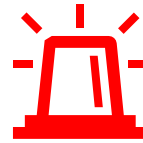


Many mosquitoes on property

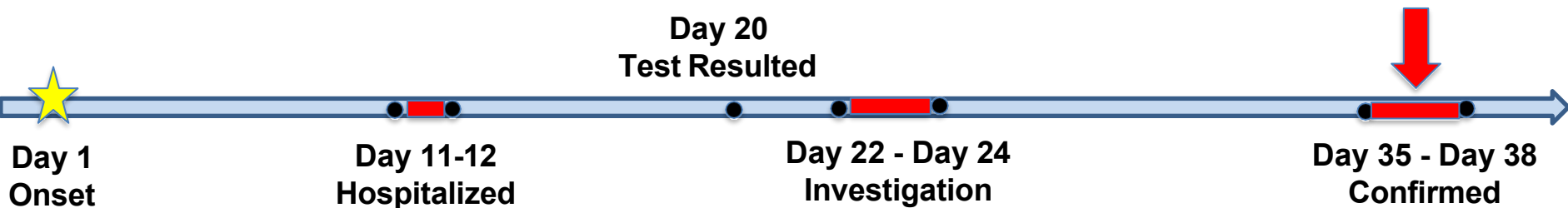


Additional testing ordered at Public Health laboratories

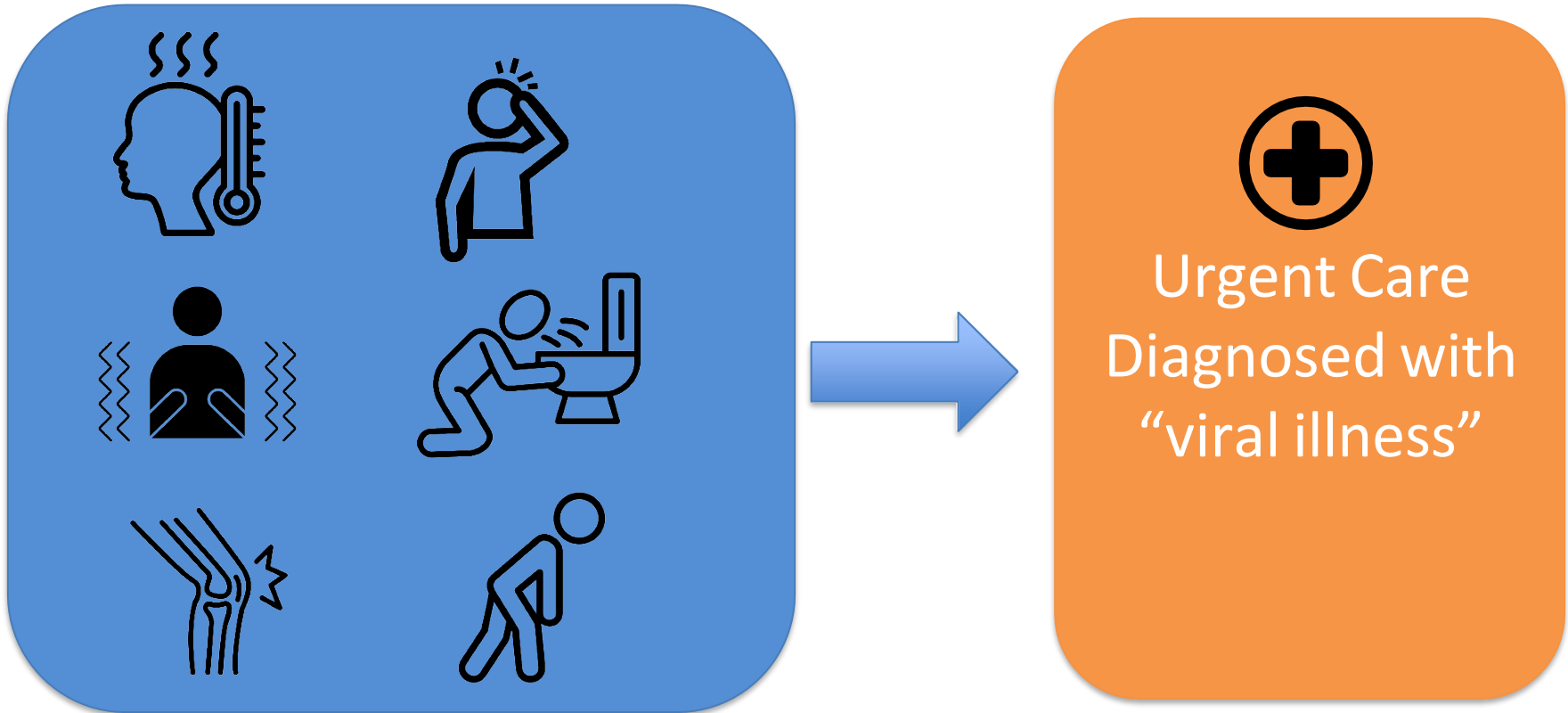





Public Health test results:
Dengue PCR positive (DENV-1)
Dengue IgM positive
West Nile virus IgM negative
Dengue/Zika PRNT negative



Long Beach Case Presentation



Day 1
Onset



Urgent Care
(Healthcare
encounter #2)



Alanine aminotransferase
92 (0-40 IU/L)



Aspartate aminotransferase
117 (0-44 IU/L)

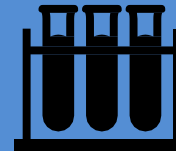




Primary Care
Provider
(Healthcare
encounter #3)



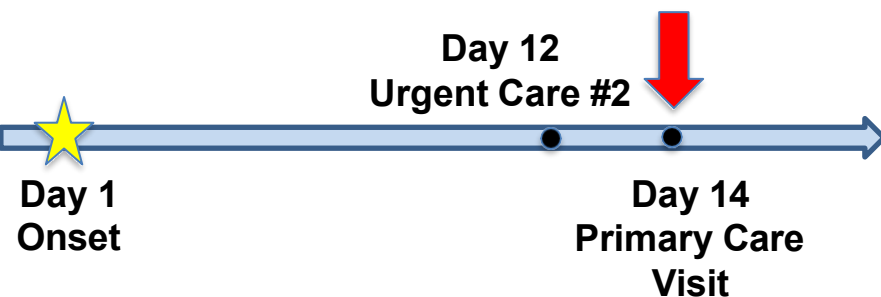
Reports mosquito bites

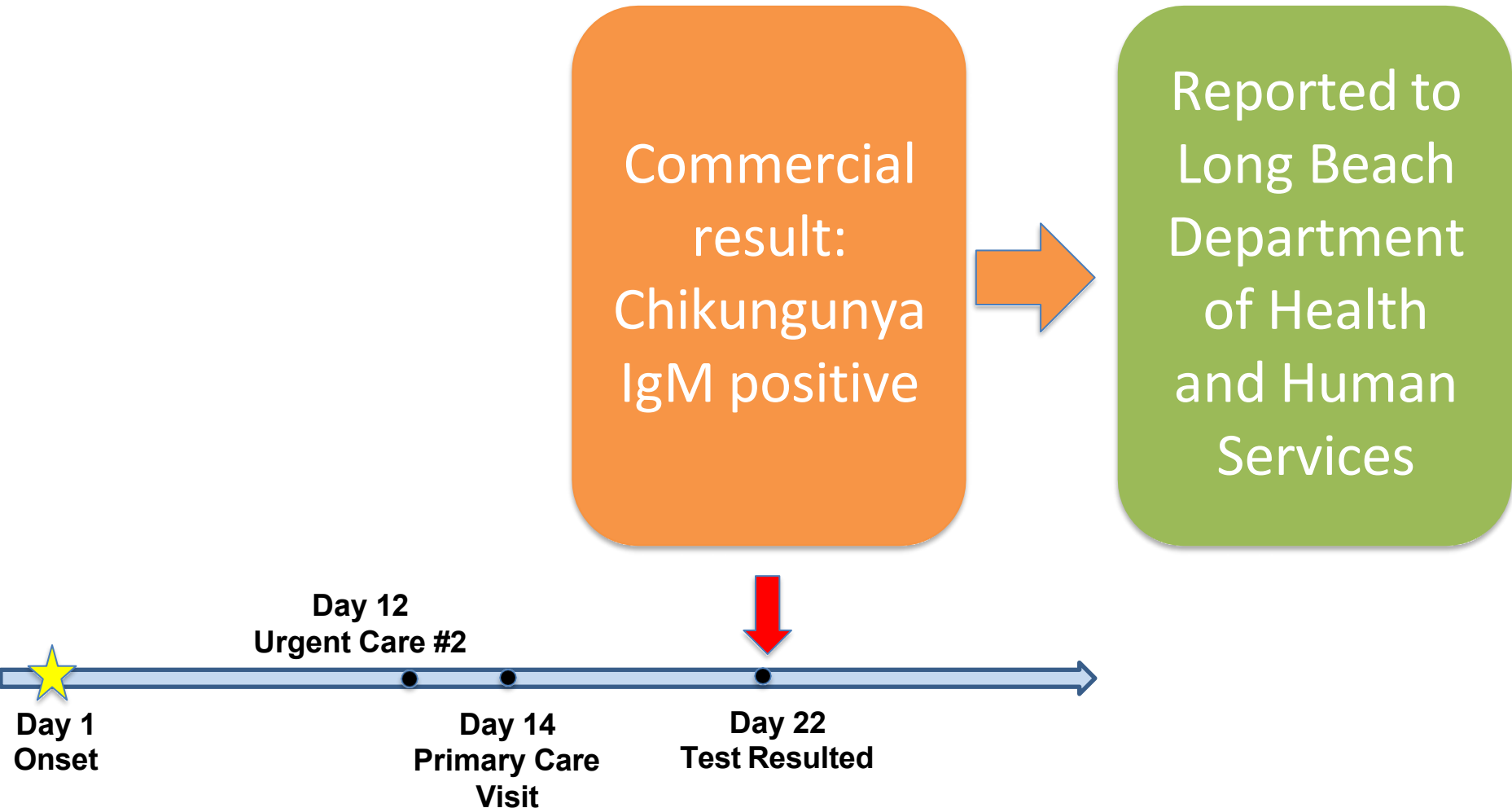


Diagnostic tests ordered

- ✓ West Nile virus IgM/IgG
- ✓ Chikungunya IgM/IgG
- ✓ Zika IgM

No dengue ordered





Public Health Investigation



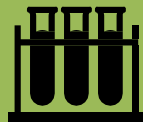
No travel



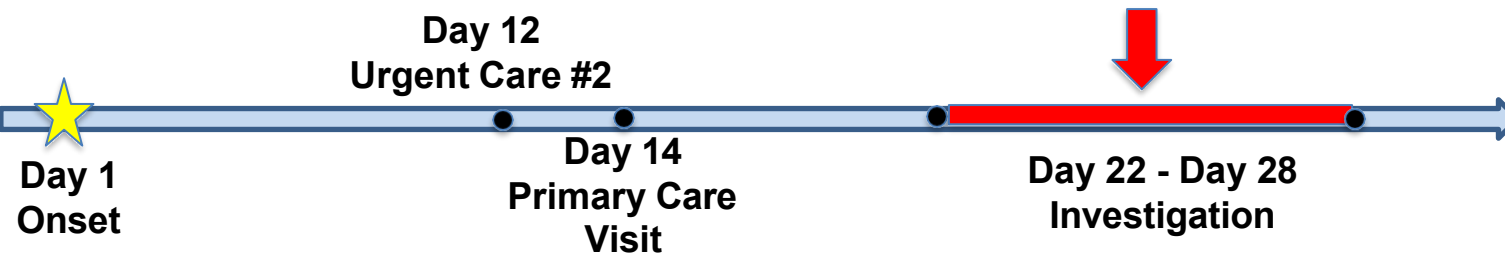
Works from home

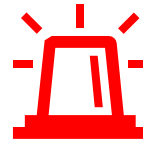


Many mosquitoes on property

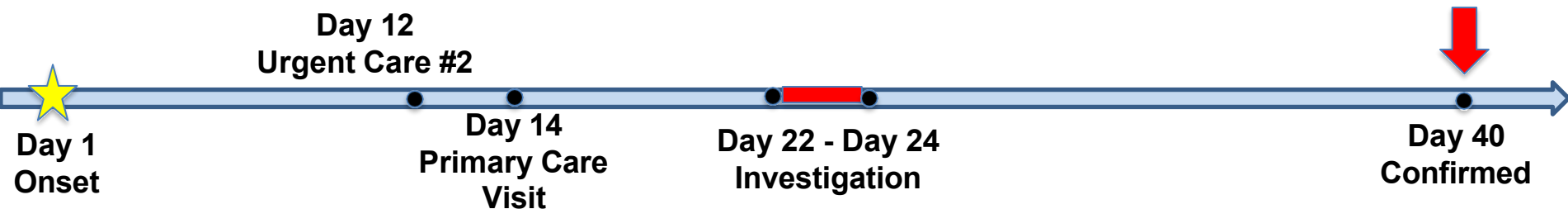


Additional testing ordered
at Public Health laboratory

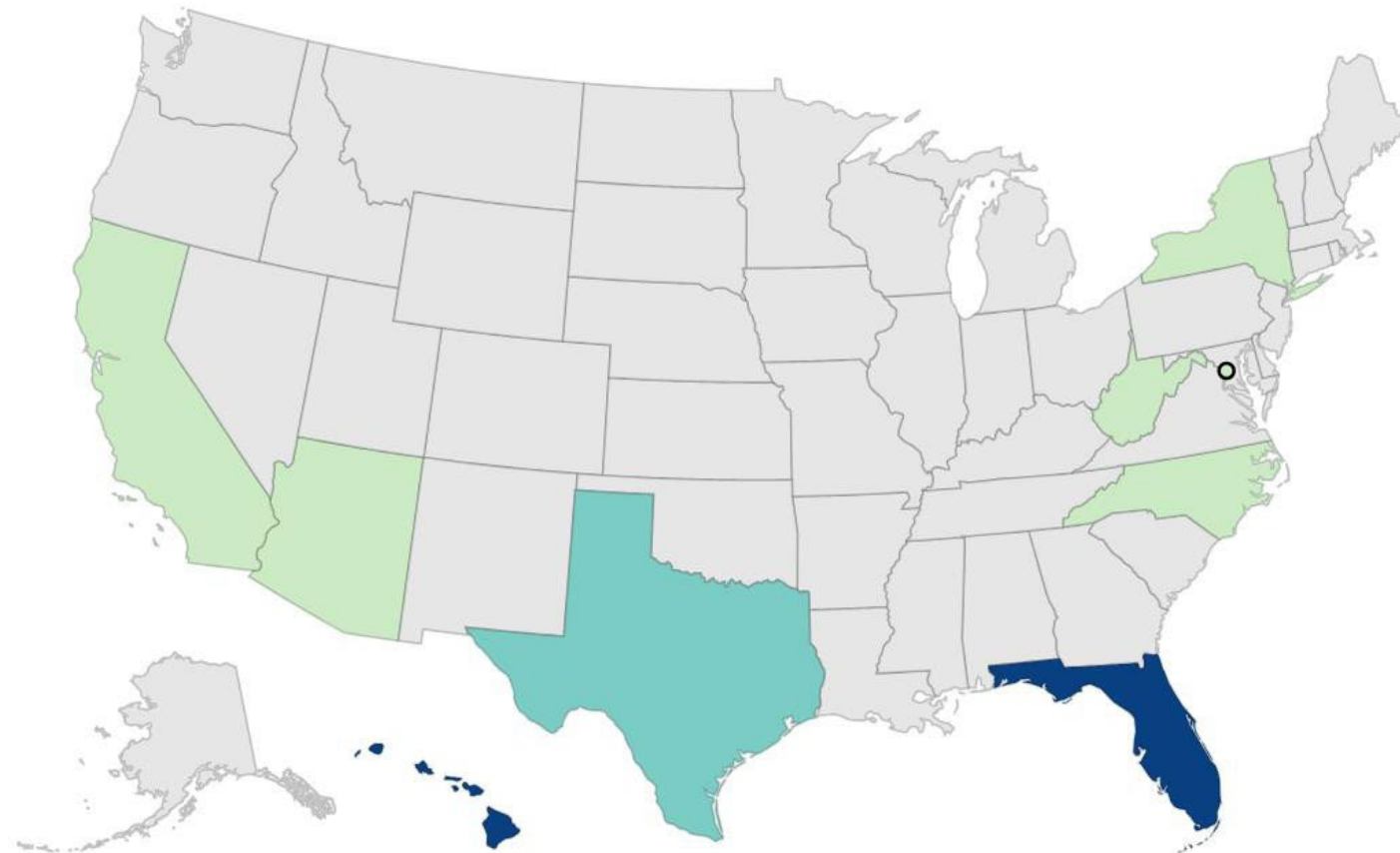




Public Health result:
Dengue PCR positive (DENV-3)
Dengue IgM positive
WNV IgM negative
Chikungunya PCR negative
Chikungunya PRNT negative



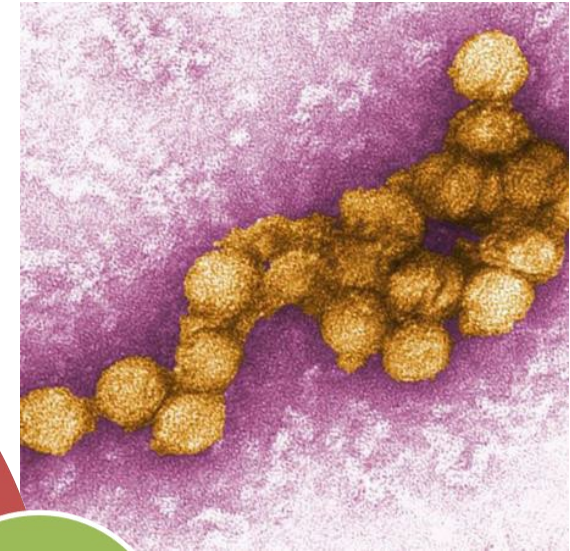
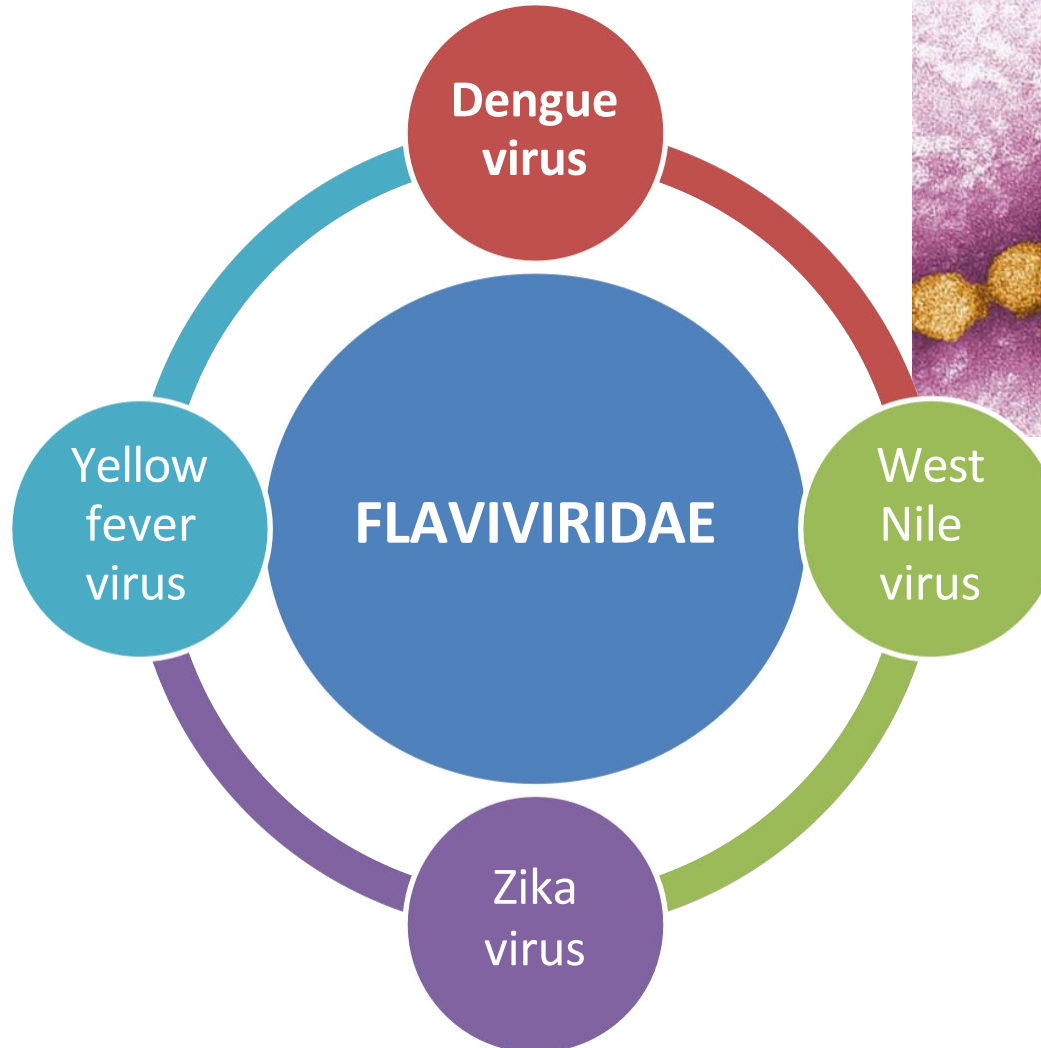
Local dengue transmission occasionally occurs in the continental United States.



Locally acquired dengue cases in the US 2010-2023

○ No reported cases ● 1 to 4 ● 5 to 49 ● 50 to 249 ● 250+

Dengue is a viral illness



Aedes aegypti

Aedes albopictus



Less common routes:



Serotypes and Immunity



DENV-1



DENV-2



DENV-3



DENV-4

Lifelong type-specific immunity

Short-term cross-immunity
against other DENV types



Clinical characteristics and management of Dengue

LCDR Alfonso C Hernandez, MD MPH

**Medical Officer, Dengue Branch, Division of Vector Borne Diseases, NCEZID, CDC
United States Public Health Service**

July 11, 2024

Why should you care about dengue?

GOATS AND SODA

With a million cases of dengue so far this year, Brazil is in a state of emergency

MARCH 4, 2024 · 4:00 PM ET

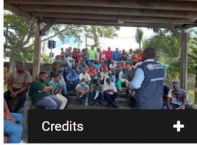
By Jill Langlois



WHO supports Mauritius as it grapples with first dengue outbreak

21 March 2024

Dengue fever is having a moment. According to WHO data, cases increased significantly in 2023, following a small decline during the three previous years. A potent cocktail of ongoing transmissions and a surge in new cases saw the worldwide number of dengue cases exceed five million, a near record high. And although the lion's share of the new cases has been reported in the Region of the Americas (almost 80%),



REUTERS® World Business Markets Sustainability Legal More

Dengue outbreak in Argentina on track to break records

By Horacio Soria, Miguel Lo Bianco and Javier Corbalan

March 21, 2024 9:20 AM GMT-4 · Updated 4 days ago

A photograph of a hospital admission area with a sign that says "Admisión".

**How can we prepare for
increasing dengue cases?**

Vaccination to prevent dengue

- Dengue vaccines
 - **Dengvaxia**: recommended in US (children 9-16 years old with previous DENV infection and living in endemic areas)
 - **TAK-003**: licensed in several countries
 - **Butantan-DV**: high efficacy in early phase 3 results
- No dengue vaccines are currently recommended for use in US travelers.



How can we prepare for increasing dengue cases?

- **Recognize** dengue
- **Know the warning signs** for progression to severe dengue
- **Manage** dengue patients appropriately
- **Test** appropriately for dengue

How can we prepare for increasing dengue cases?

- Recognize dengue



When should you suspect dengue?

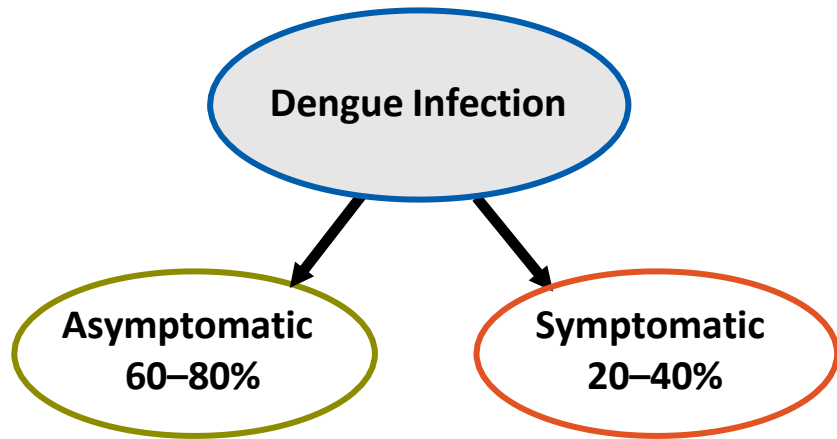
When should you suspect dengue?

- **All febrile travelers** coming from endemic areas or areas with ongoing local transmission within 14 days.
 - Ask about a **history of travel among household members**

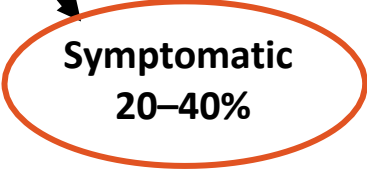
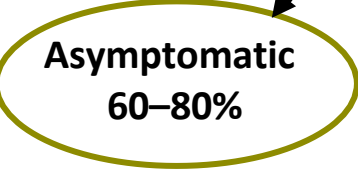
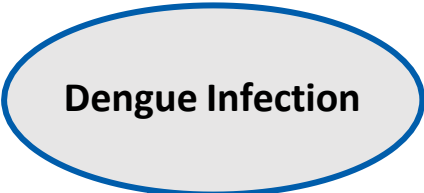
When should you suspect dengue?

- **All febrile travelers** coming from endemic areas or areas with ongoing local transmission within 14 days.
 - Ask about a **history of travel among household members**
- Think dengue in patients without recent travel **presenting with consistent symptoms after excluding more common causes of febrile illness.**

Dengue Outcomes

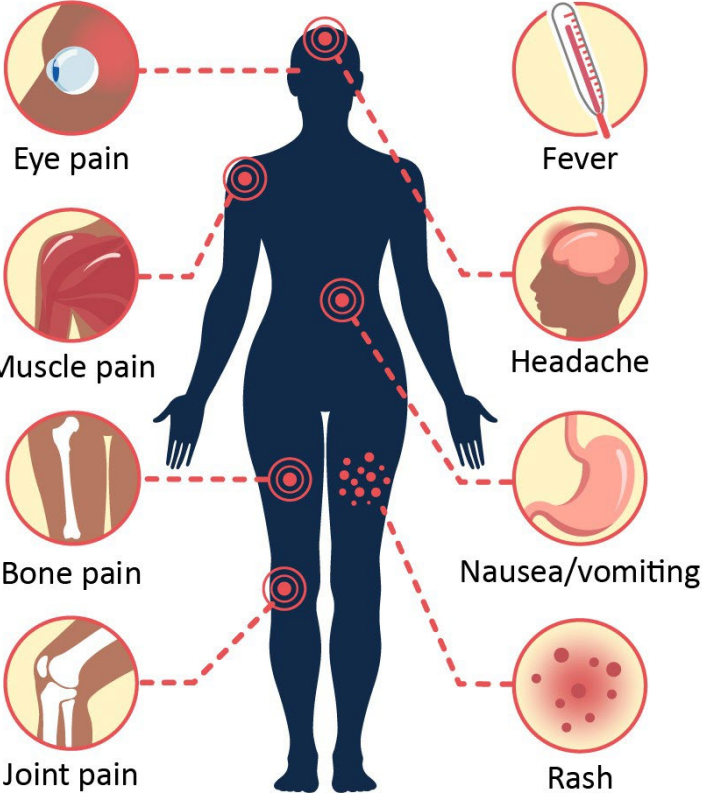


Dengue Outcomes

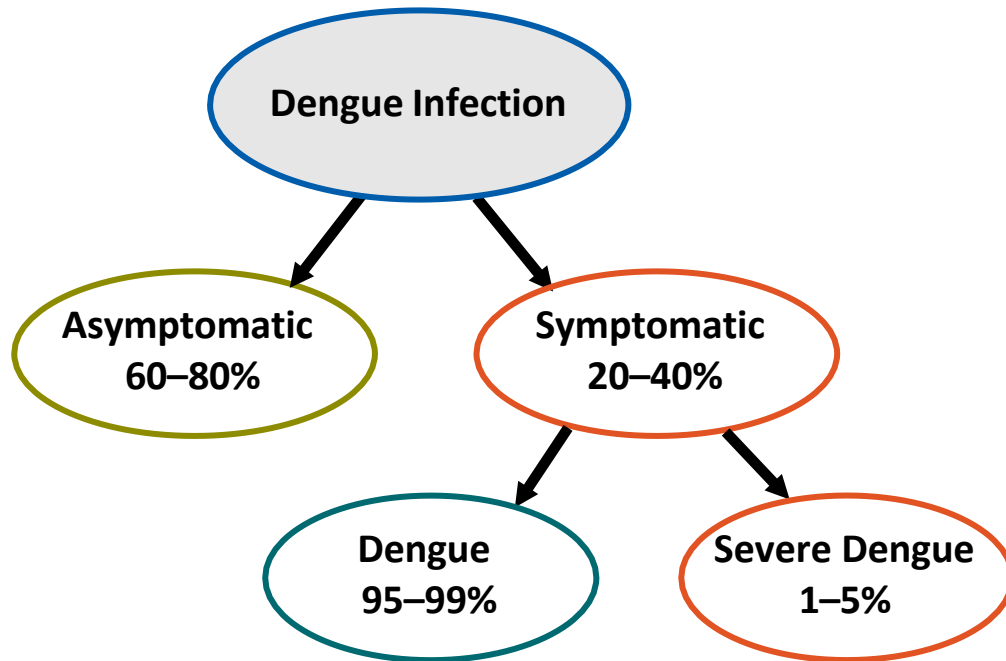


Dengue Symptoms

Fever with any of the following



Dengue Outcomes

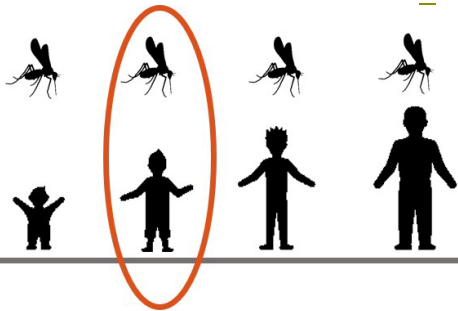


Risk factors for severe dengue



■ Age

- Infants born to seropositive mothers
- Elderly



■ Morbidities

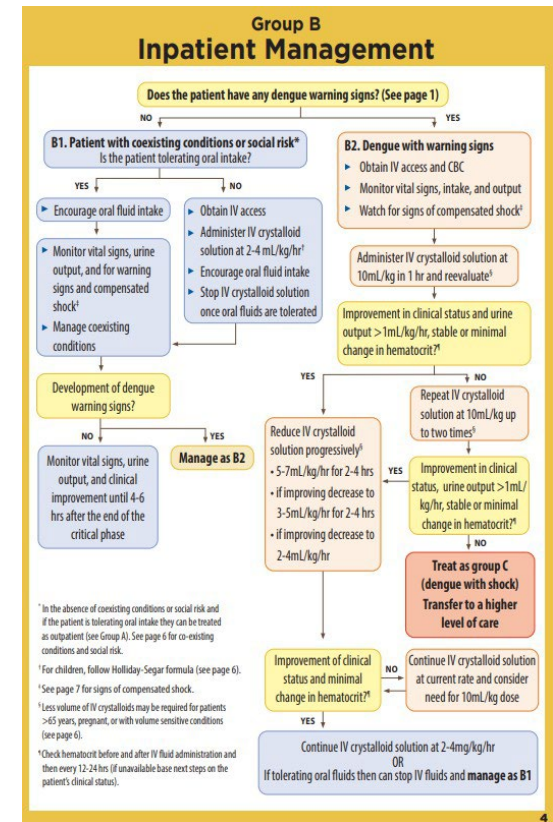
asthma, diabetes, obesity, hypertension, sickle cell disease, kidney disease, hypertension, or on anticoagulant therapy

■ Number of dengue infections

- 2nd >> 1st, 3rd, 4th infection

Early recognition and appropriate treatment of dengue saves lives.

- No specific antiviral treatment available.
- Standard of care is protocolized IV fluid management, according to WHO guidelines.
- Up to 13% mortality if severe disease is untreated, but can be reduced to <0.05% mortality with appropriate management.



For further dengue training resources, visit: <https://www.cdc.gov/dengue/hcp/clinical-care/index.html>

All clinicians should be
asking:

**Could this patient
have dengue?**

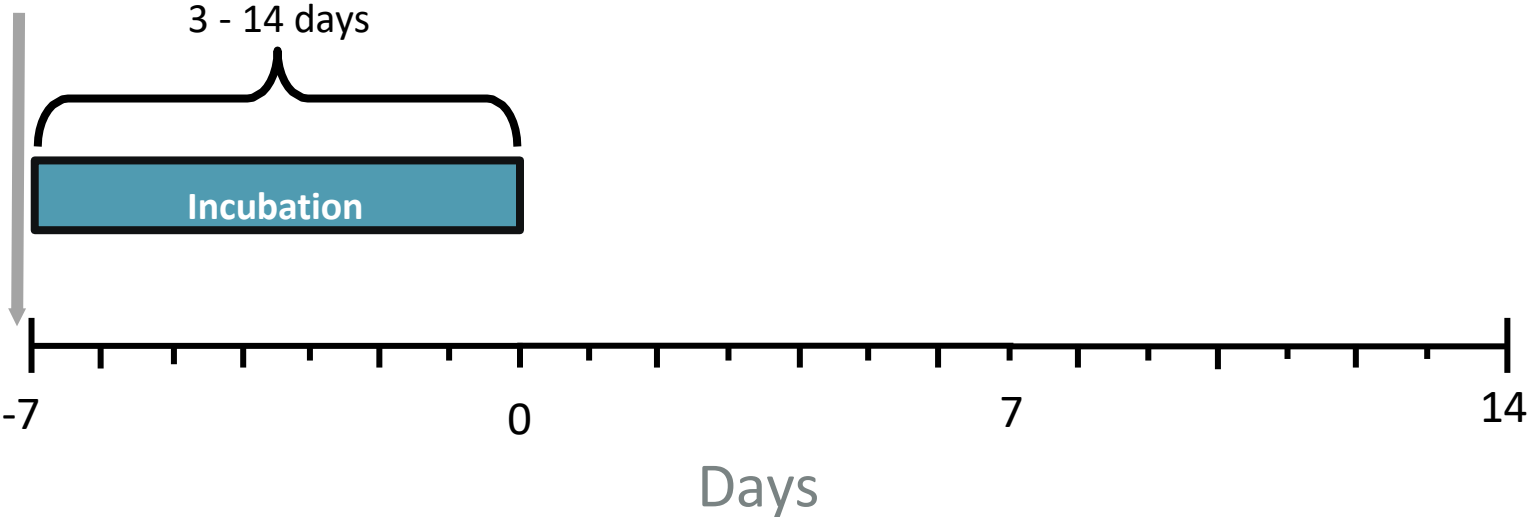
How can we prepare for increasing dengue cases?

- Recognize dengue
- **Know the warning signs** for progression to severe dengue



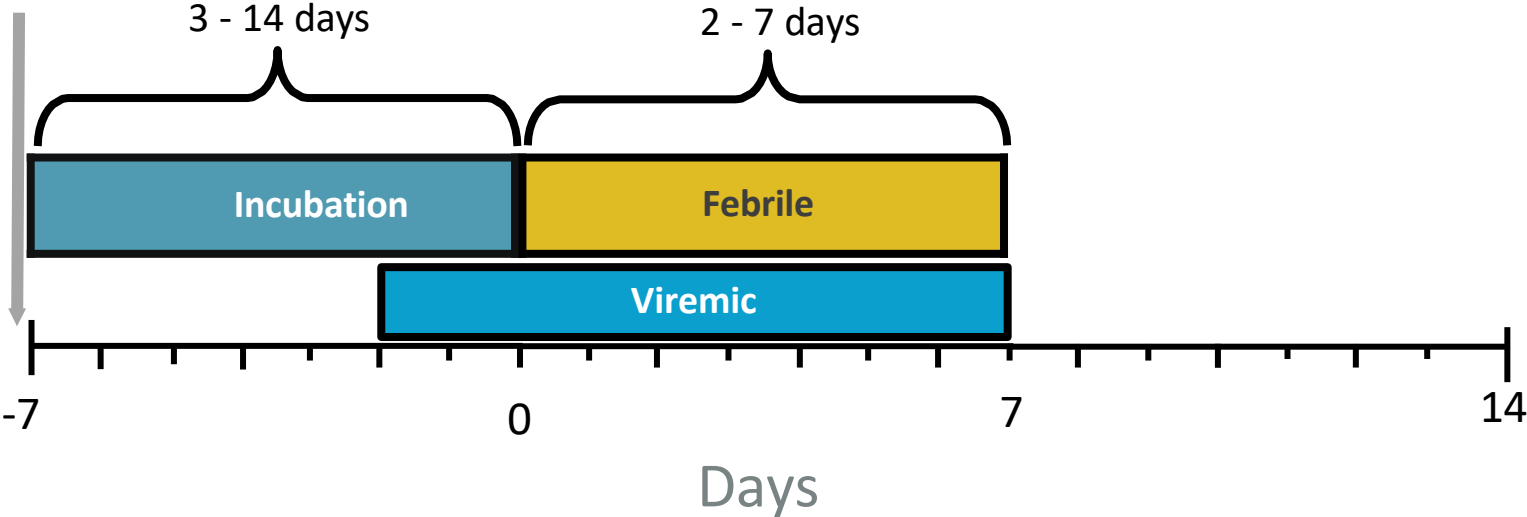
Dengue Clinical Course

Mosquito bite



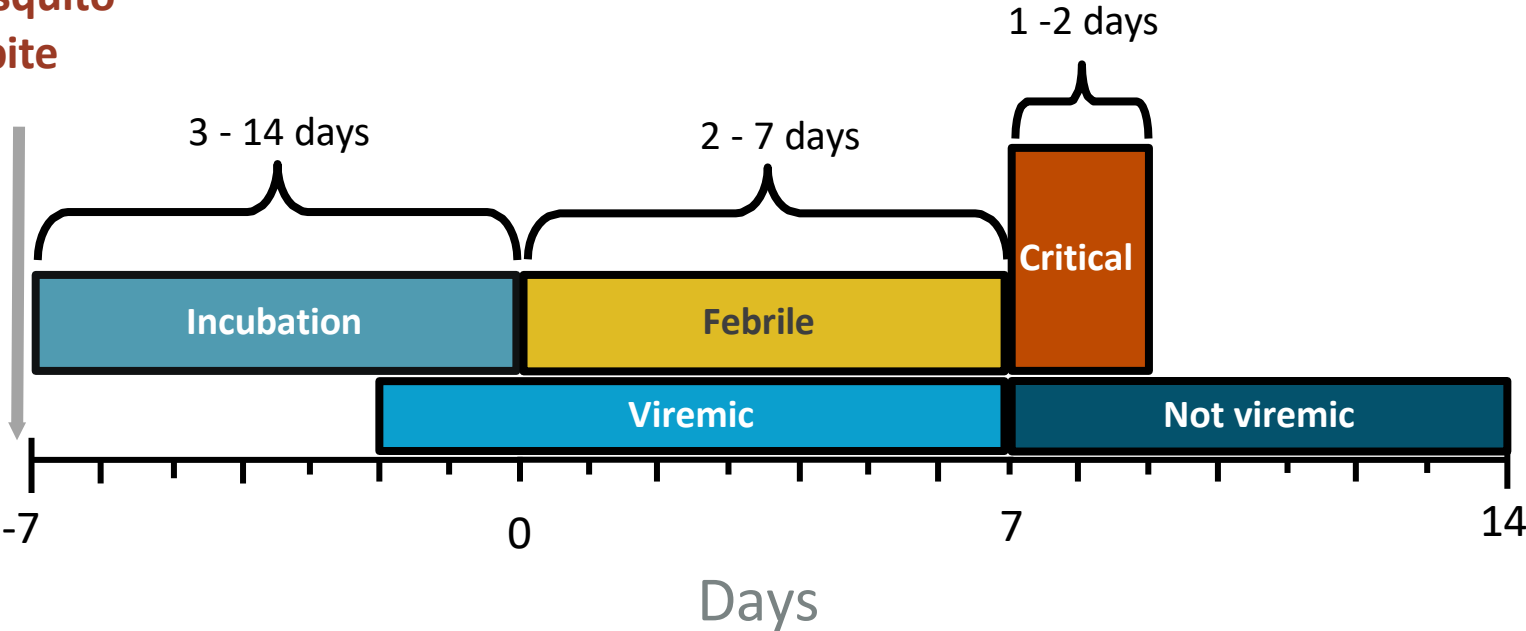
Febrile Phase

Mosquito bite



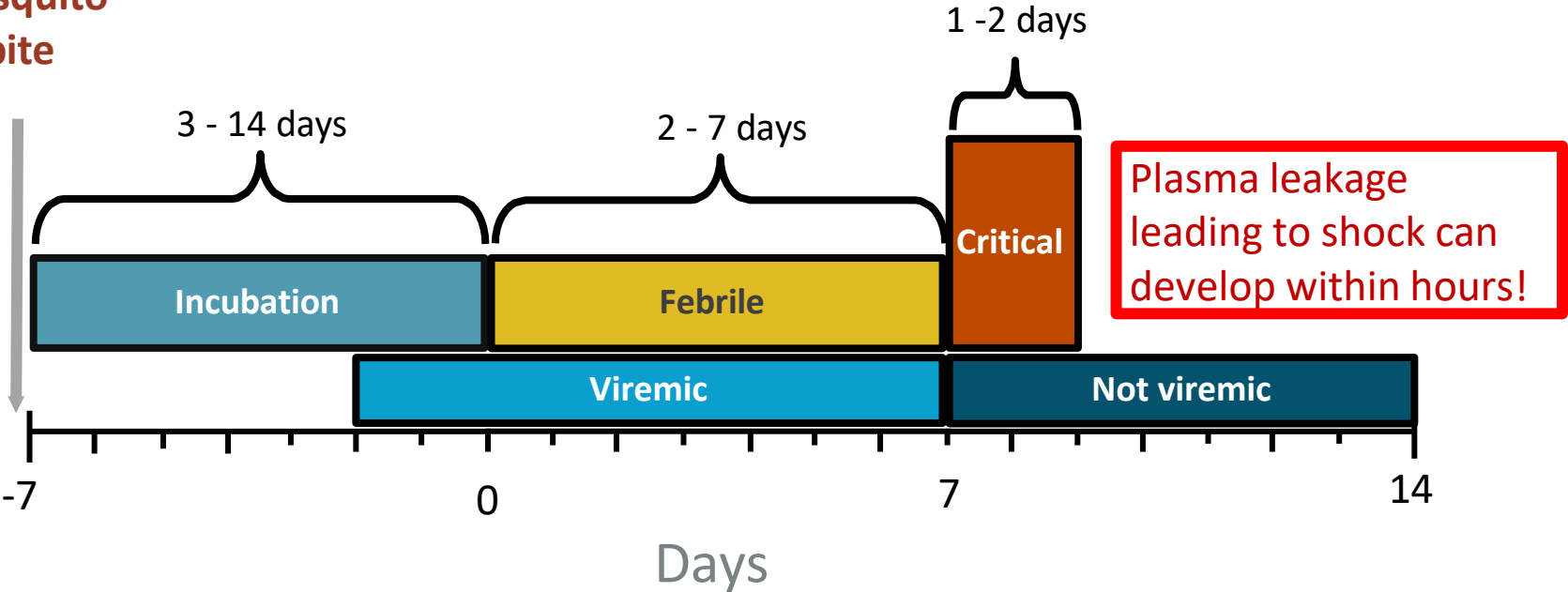
Critical Phase

Mosquito bite



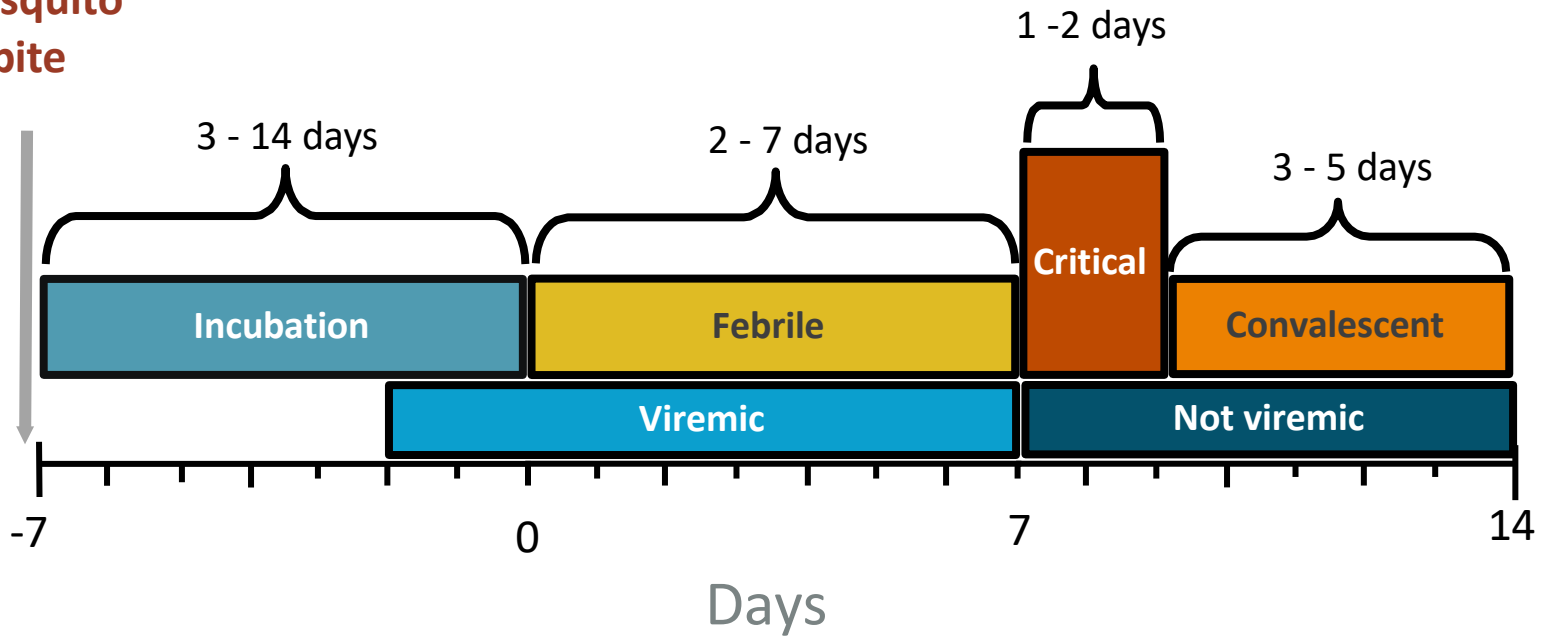
Critical Phase

Mosquito bite

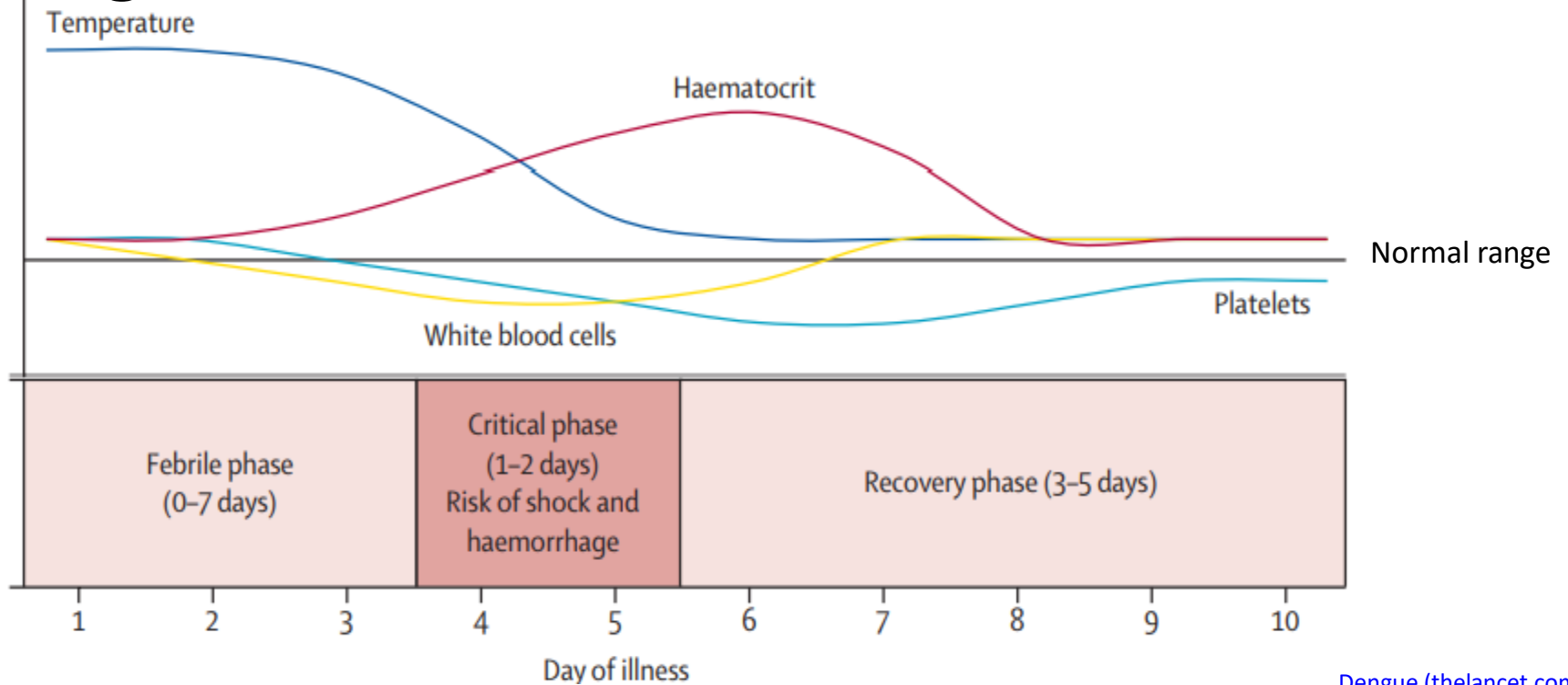


Convalescent Phase

Mosquito bite

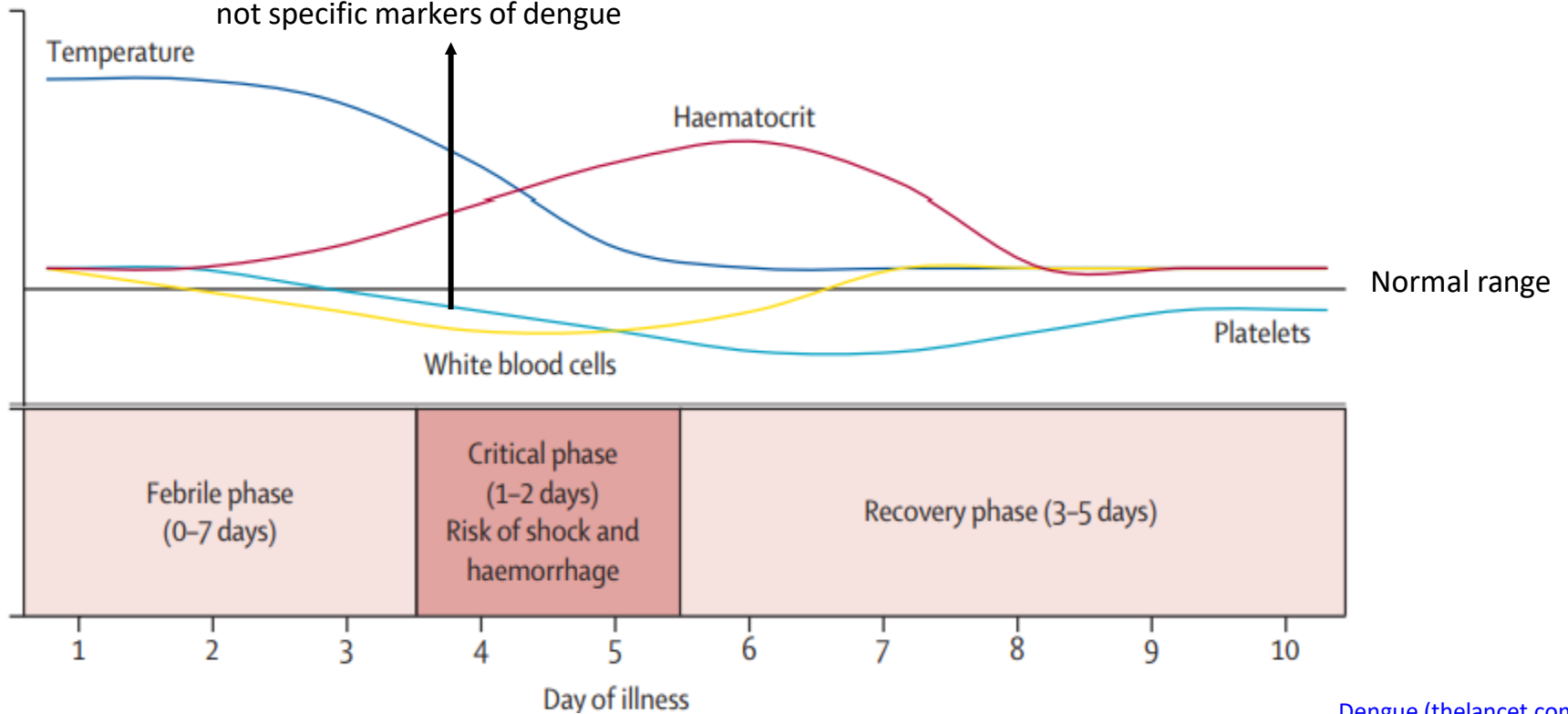


Laboratory characteristics of dengue



Laboratory characteristics of dengue

↓WBC and ↓Plt are sensitive but not specific markers of dengue

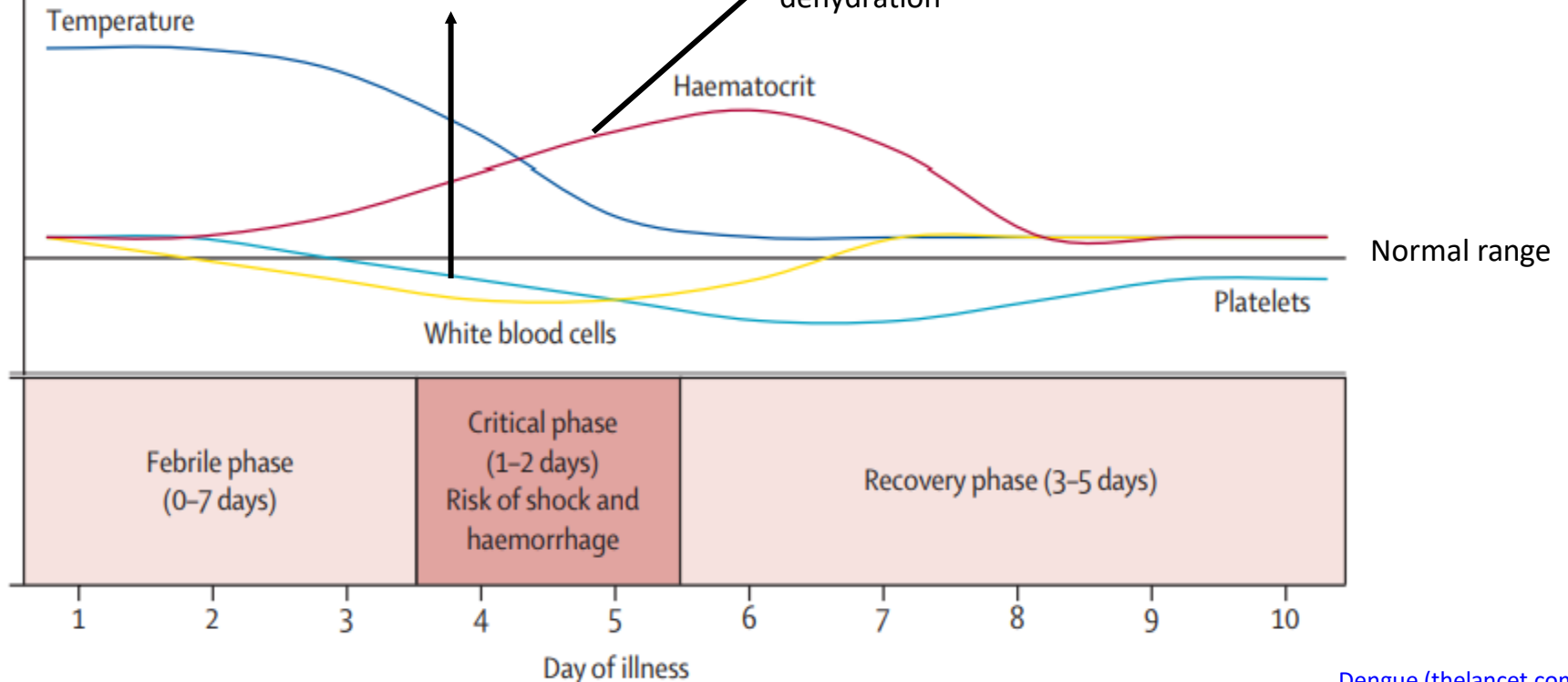


Laboratory characteristics of

dengue

↓WBC and ↓Plt are sensitive but not specific markers of dengue

↑Hct suggests plasma leakage and dehydration



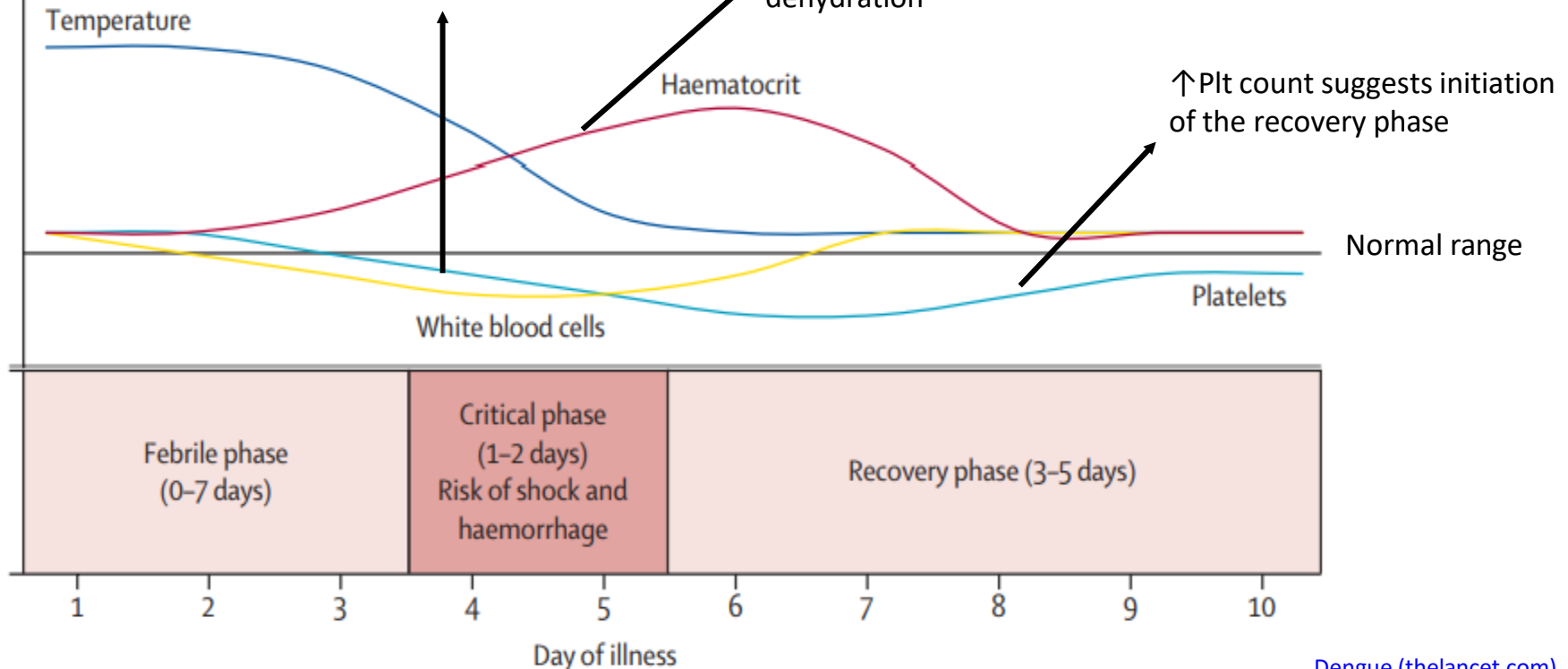
Laboratory characteristics of dengue

dengue

↓WBC and ↓Plt are sensitive but not specific markers of dengue

↑Hct suggests plasma leakage and dehydration

↑Plt count suggests initiation of the recovery phase





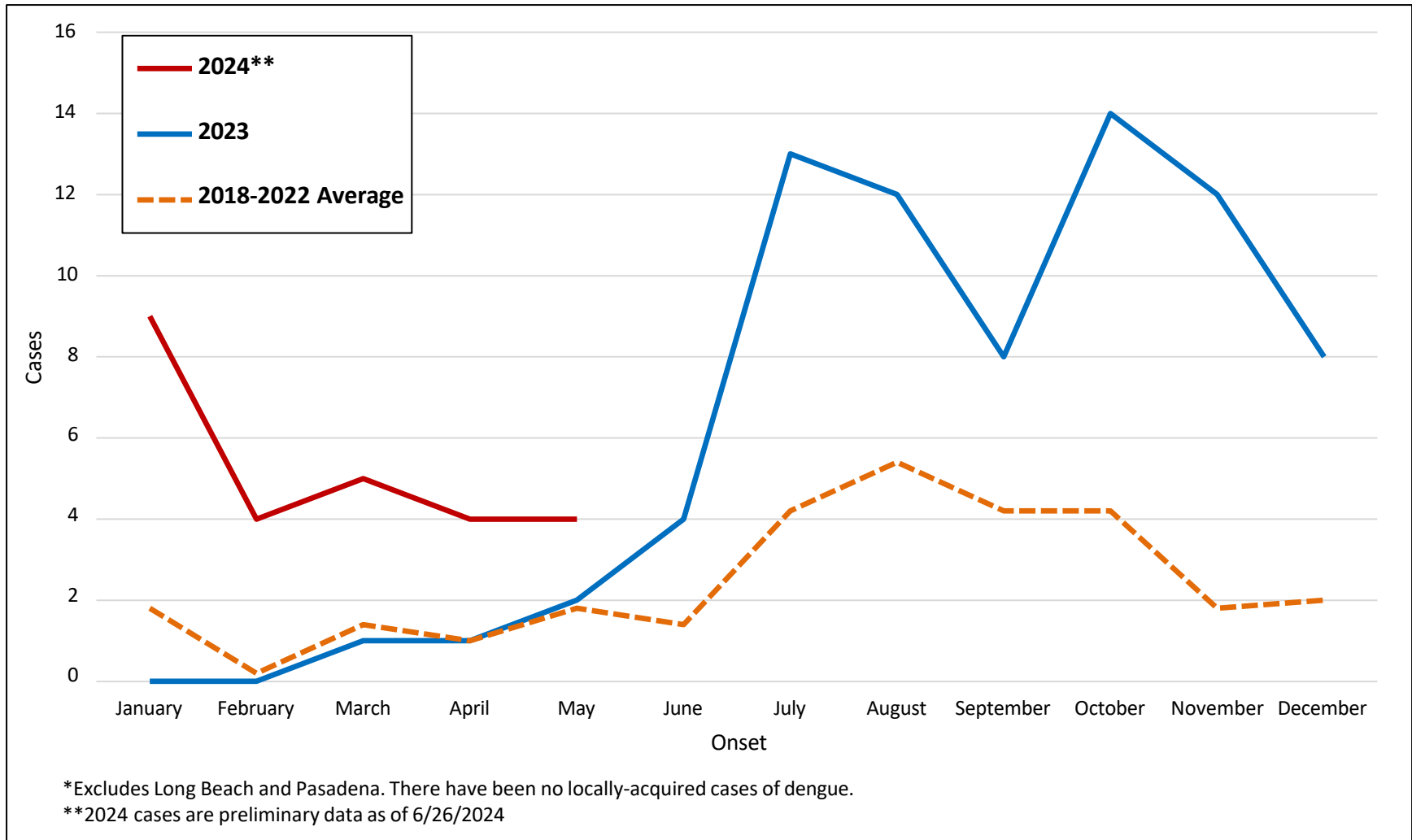
Los Angeles County

Local Situation

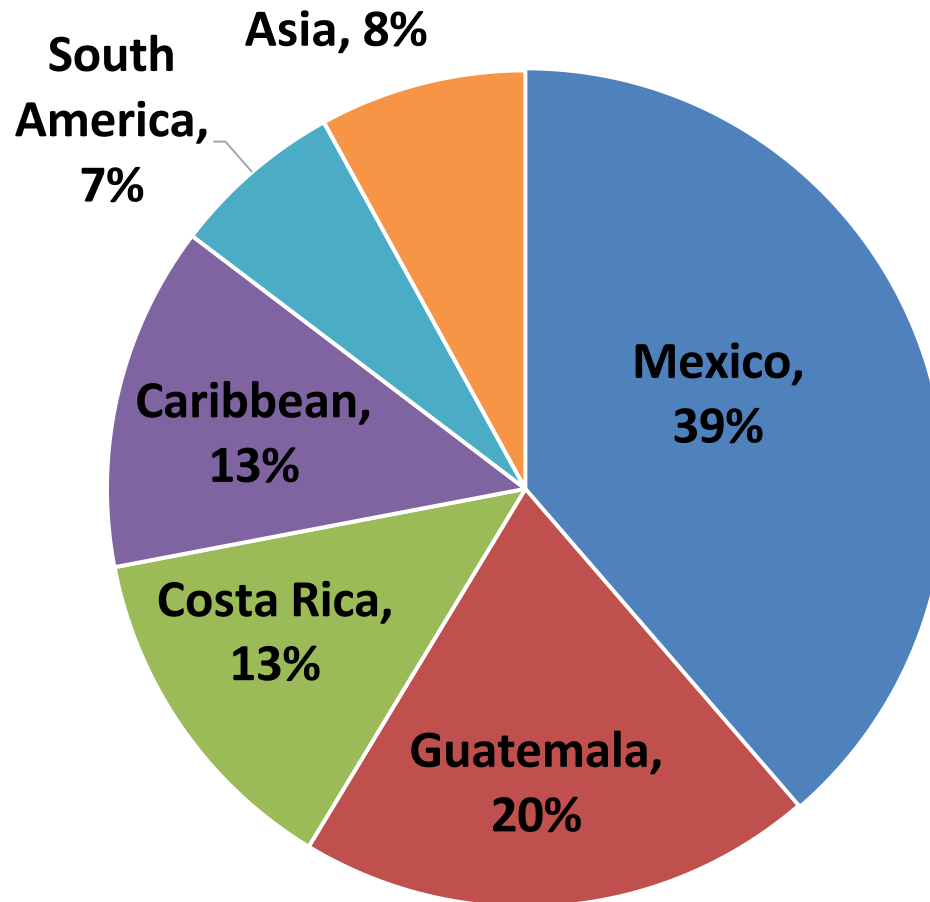




Travel-Associated Dengue by Month, LAC*



Travel Destinations of Aedes-borne Disease Cases (N=75) in 2023, LAC*

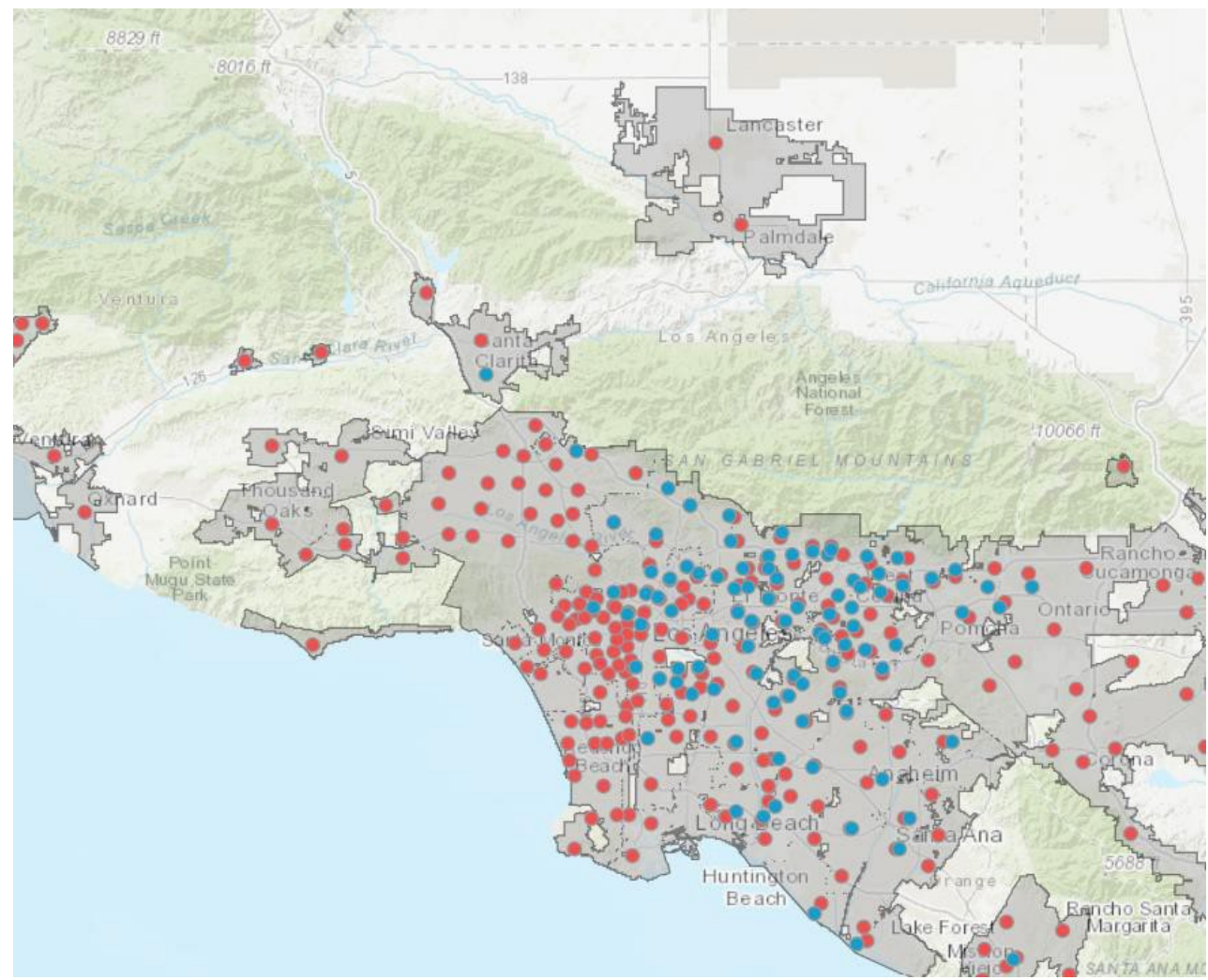
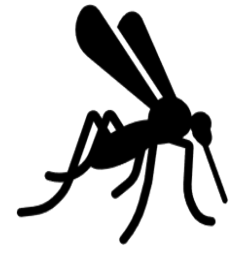


*Excludes Long Beach and Pasadena

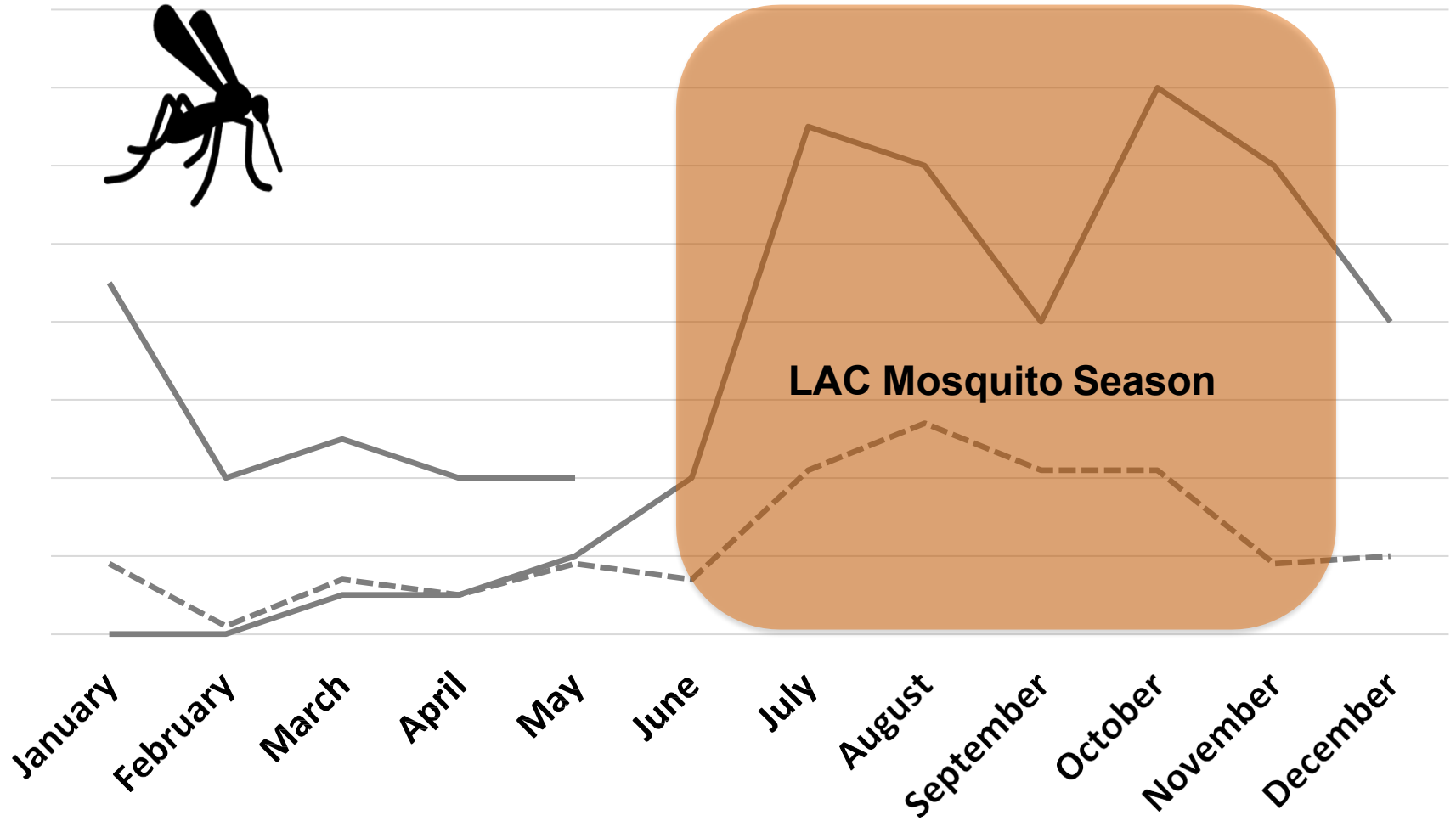
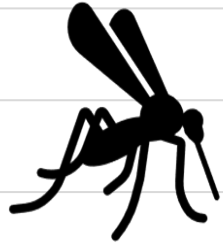
Cities with Current Aedes Detections

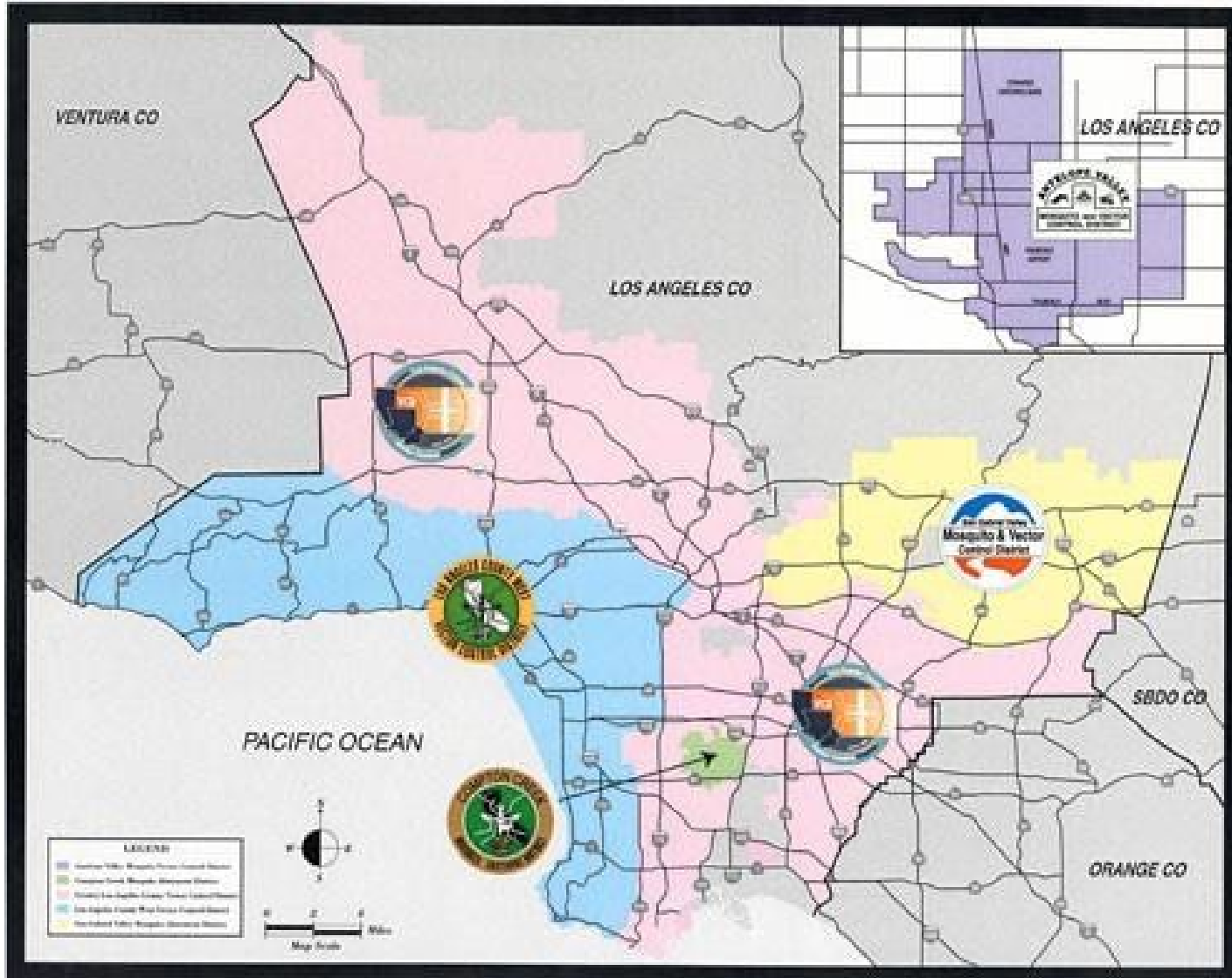
- *Aedes aegypti*
- *Aedes albopictus*

Approximate Aedes Infestation Area



Source: [Interactive Map of Invasive Aedes Mosquito Detections in California](#) – Updated January 11, 2024





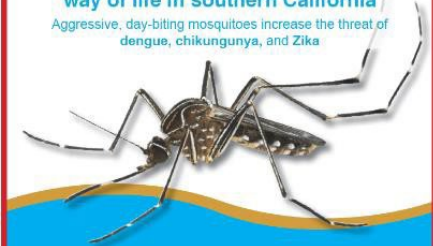
- *Antelope Valley Mosquito and Vector Control District*
- *Compton Creek Mosquito Abatement District*
- *Greater Los Angeles County Vector Control District*
- *San Gabriel Valley Mosquito and Vector Control District*
- *Los Angeles County West Vector Control District*



Public Health Alert Invasive Aedes Mosquitoes

New mosquitoes are changing our way of life in southern California

Aggressive, day-biting mosquitoes increase the threat of dengue, chikungunya, and Zika



Alerta de Salud al Público Zancudos Aedes Invasivos

Los zancudos están cambiando la manera de vivir en el sur de California

La picadura agresiva de un zancudo aumenta el riesgo de contraer dengue, fiebre amarilla, chikungunya, y Zika

Español pagina 3 y 4



Protecting the public from vector-borne disease since 1989
1145 N. Azusa Canyon Road, West Covina, CA 91790
(626) 814-9466 www.SGVmosquito.org

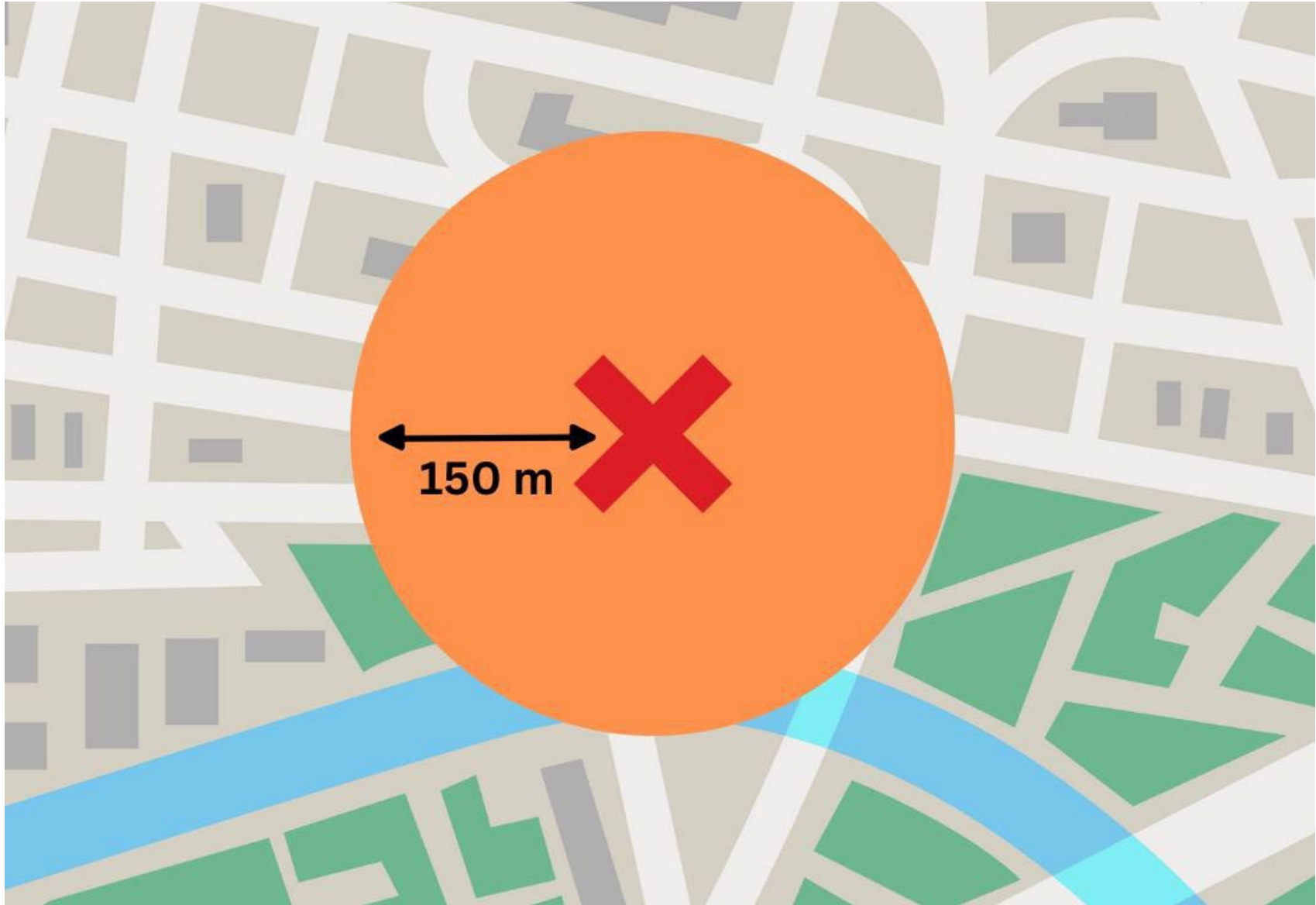




What We Do at Public Health

- Obtain and investigate case-patient reports from laboratories and providers, review medical data, interview patients and coordinate confirmatory testing.
- Work closely with the Vector Control Districts for environmental response
- Compile and share data with clinicians, public health partners, stakeholders and residents
- General county-wide outreach and communication

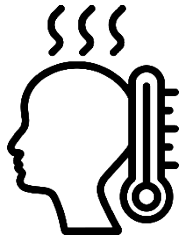






Actions Requested of Providers

1. Suspect Dengue



Returning travelers with fever who have been in areas with dengue transmission



Any patient with compatible illness, regardless of travel history

A thorough travel history is very helpful when considering travel-associated illnesses



Include countries patient travelled through to get to their destinations



Don't overlook short day trips across the border



Obtain specific locations (state or city) and dates (departure and return) of travel

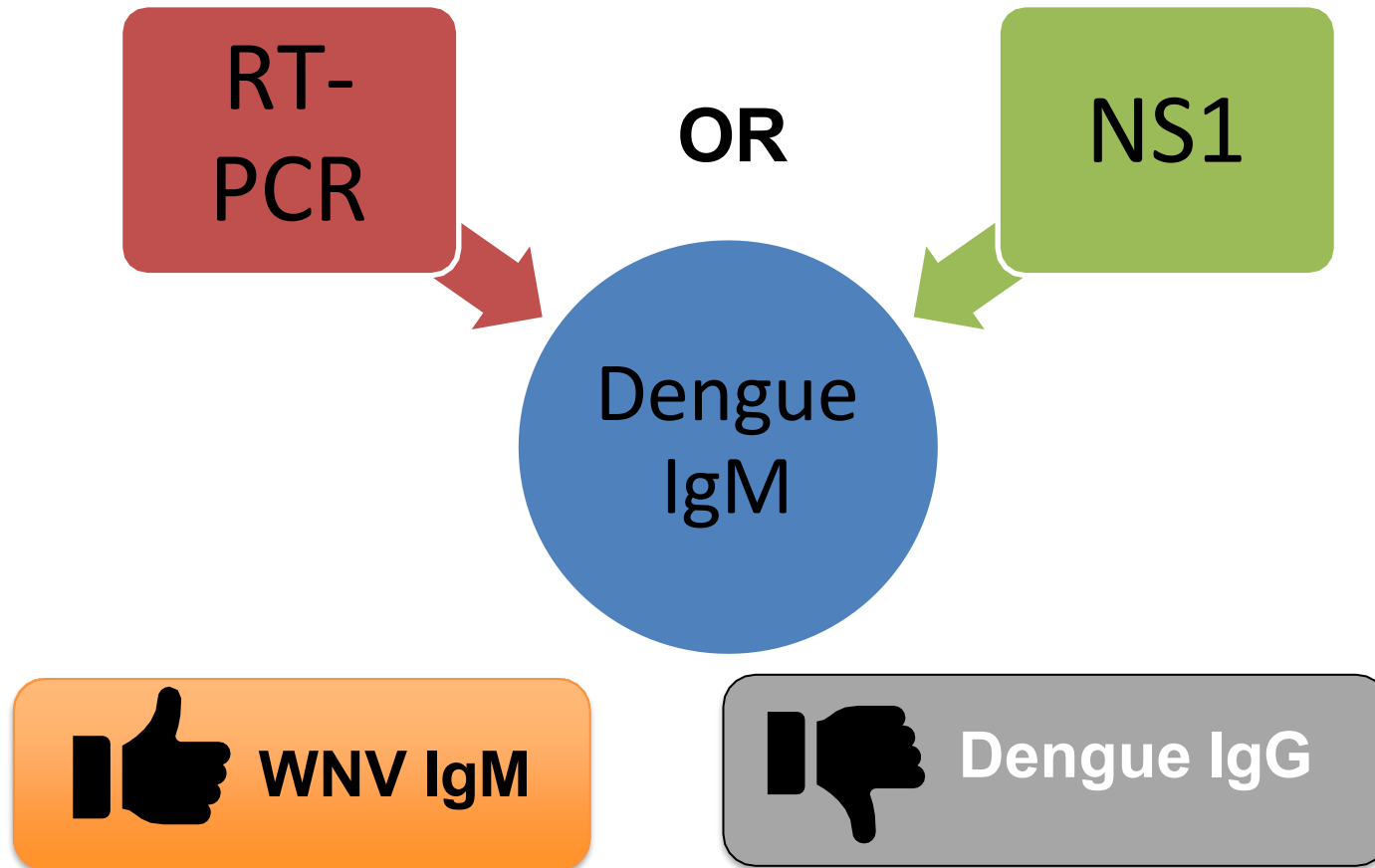
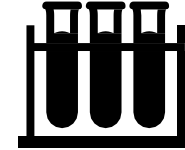


What kinds of activities did patients do during the trip



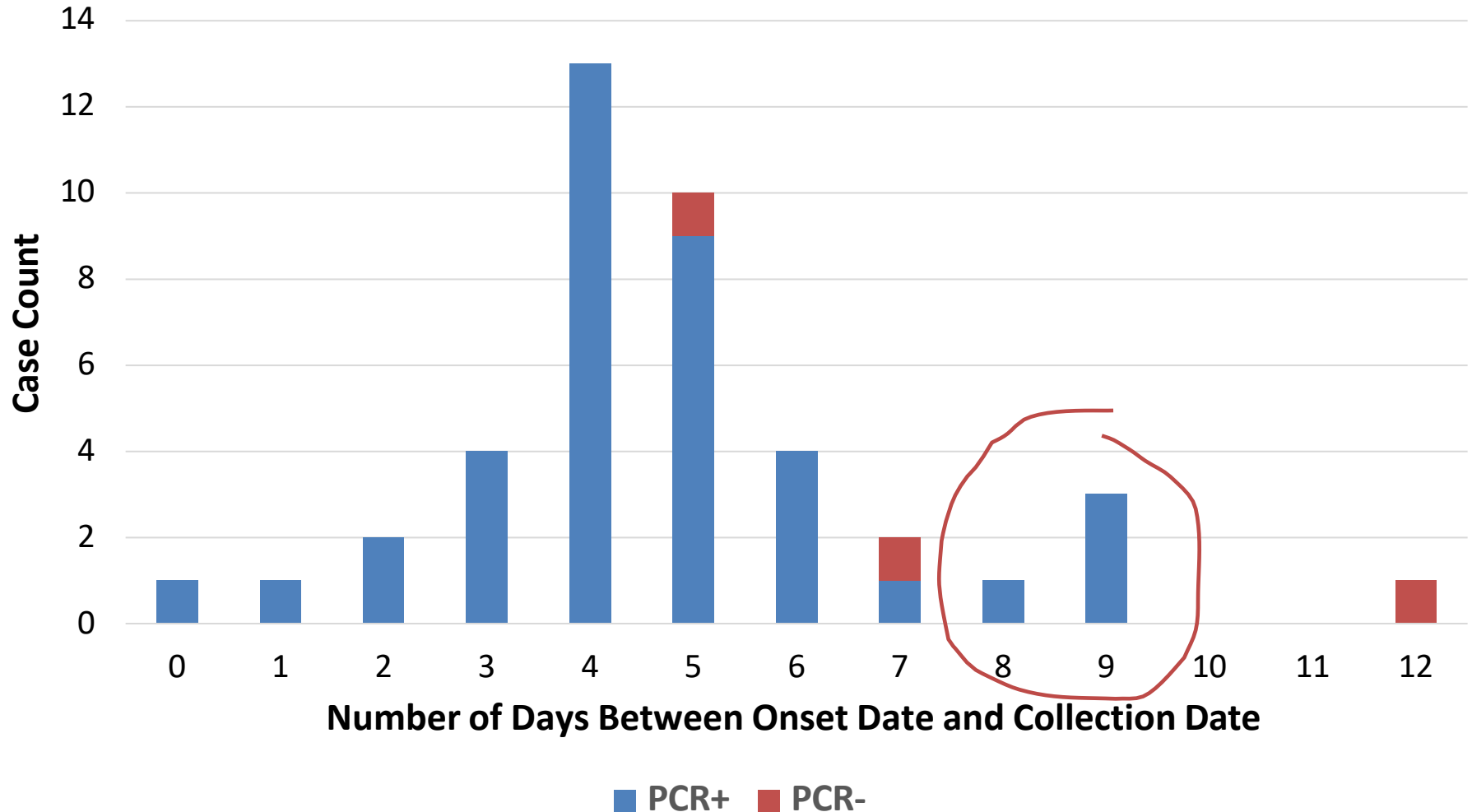
Were they exposed to mosquitoes while there?

2. Order Appropriate Tests





PCR Testing, LAC 2023 (N=42)



IgM antibody, RT-PCR and NS1 tests
are available at commercial laboratories



Testing can be conducted at LAC DPH Public Health Laboratory

3. Report to Public Health



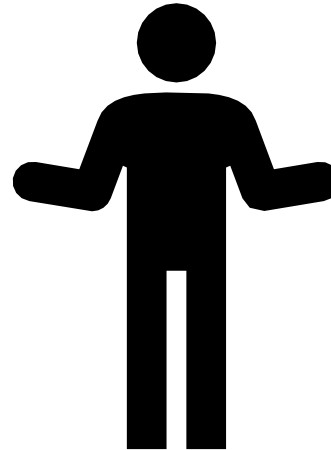
Report any suspected **locally acquired** dengue immediately by phone.

	Weekdays	After-hours
Los Angeles County DPH Acute Communicable Disease Control	8:30am–5pm: call 213-240-7941	call 213-974-1234 and ask for the physician on call
Long Beach Health and Human Services	8am-5pm: call 562-570-4302	call the duty officer at 562-500-5537
Pasadena Public Health Department	8am-5pm: call 626-744-6089	call 626-744-6043

- ❖ Travel-associated dengue must be reported to Public Health within 1 working day by email, fax, phone, or mail

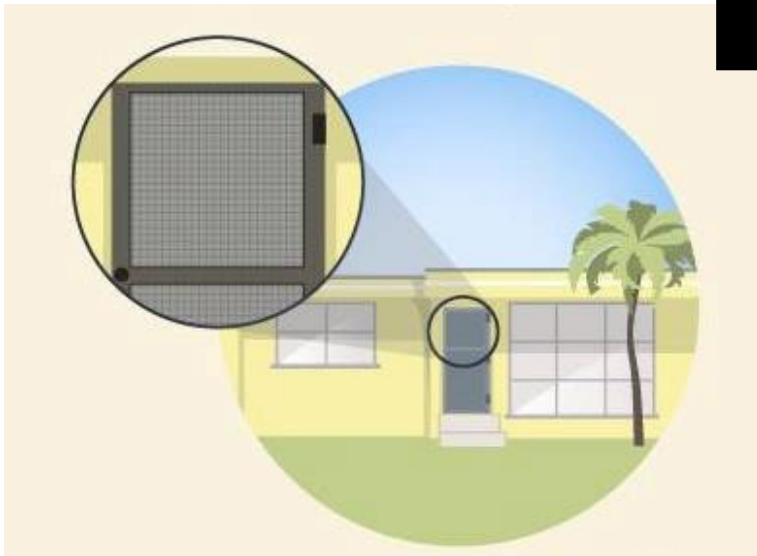
4. Promote prevention measures

Encourage use of insect repellents



- | | |
|-------------|---------------------------------|
| ✓ DEET | ✓ Oil of lemon eucalyptus (OLE) |
| ✓ Picaridin | ✓ Para-menthane-diol (PMD) |
| ✓ IR3535 | ✓ 2-undecanone |

Control mosquitoes indoors and outdoors



1. <https://www.cdc.gov/mosquitoes/prevention/index.html>

Mosquitoes breed in standing water

Counsel patients before travel





Acknowledgements

- ❖ Acute Communicable Disease Control, LAC DPH
- ❖ Centers for Disease Control and Prevention
- ❖ Vector Control Districts in LAC
- ❖ LAC Public Health Laboratory
- ❖ Pasadena Public Health Department
- ❖ Long Beach Department of Health and Human Services
- ❖ California Department of Public Health



THANK YOU!

LAC DPH Dengue Website:

<http://publichealth.lacounty.gov/acd/VectorDengue.htm>

Centers of Disease Control and Prevention Dengue Website:

<https://www.cdc.gov/dengue/index.html>

Subscribe to Los Angeles Health Alert Network:

<http://publichealth.lacounty.gov/lahan/>

To find your Vector Control District by zipcode:

www.socalmosquito.org