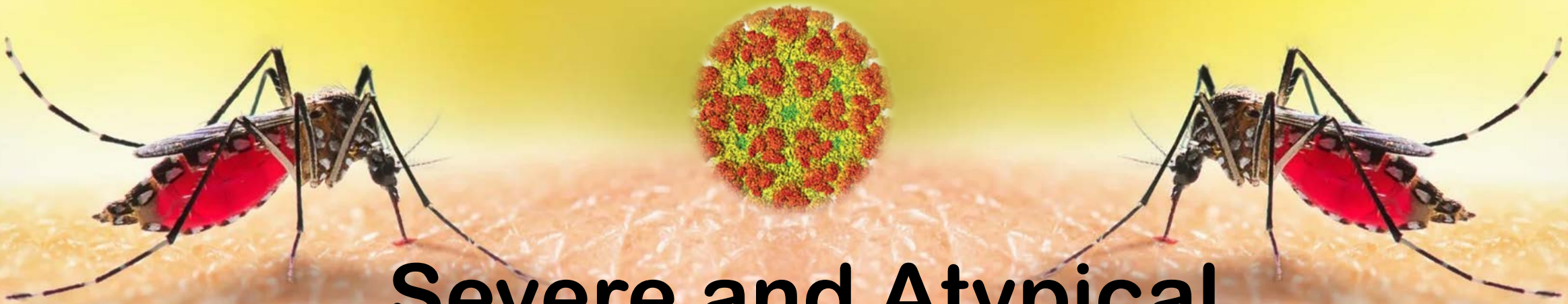
Mahidol University
Faculty of Medicine
Siriraj Hospital

Beyond Classic Chikungunya Fever



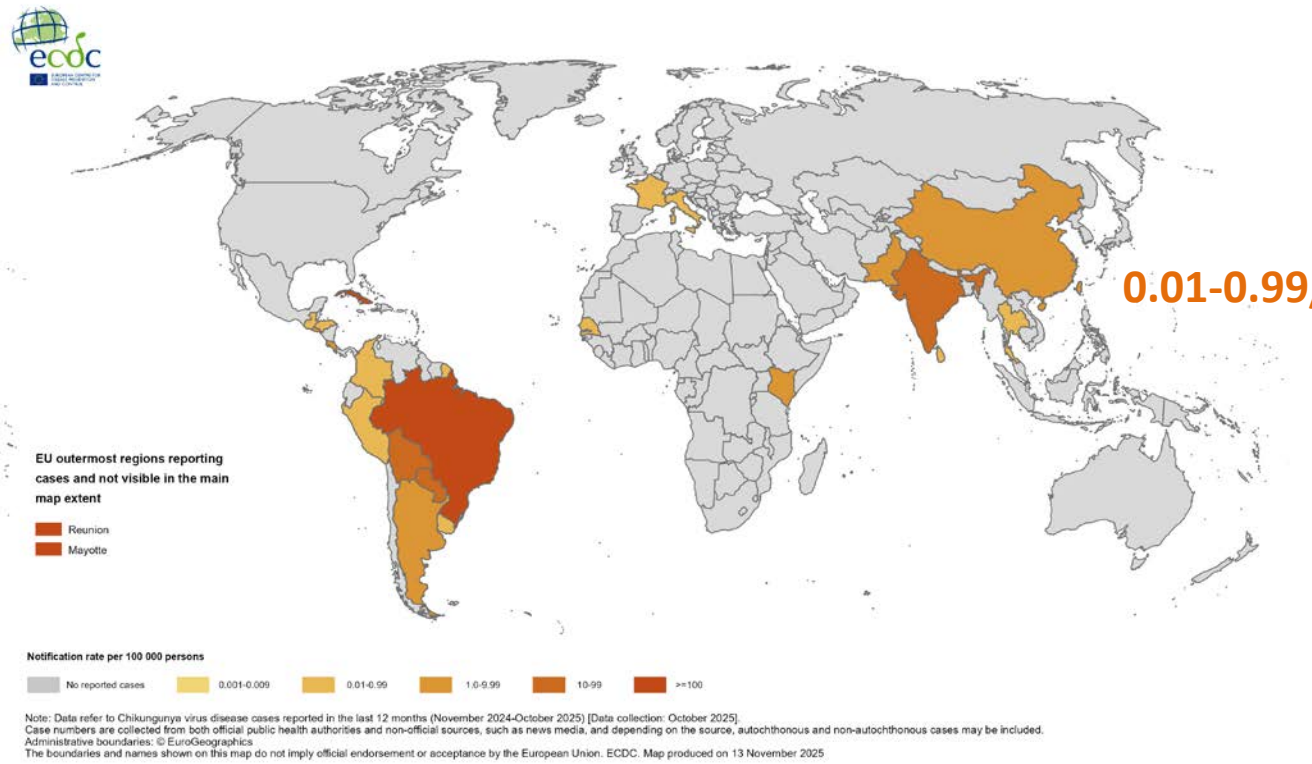
Severe and Atypical Manifestations in Children

Orasri Wittawatmongkol, MD.
Department of Pediatrics,
Siriraj Hospital Mahidol University

12-month Chikungunya virus disease case notification rate per 100 000 population, November 2024-October 2025

Map

17 Nov 2025



Countries with elevated risk for U.S. travelers

0.01-0.99/100,000 populations

- Brazil
- Colombia
- India
- Mexico
- Nigeria
- Pakistan
- Philippines
- Thailand

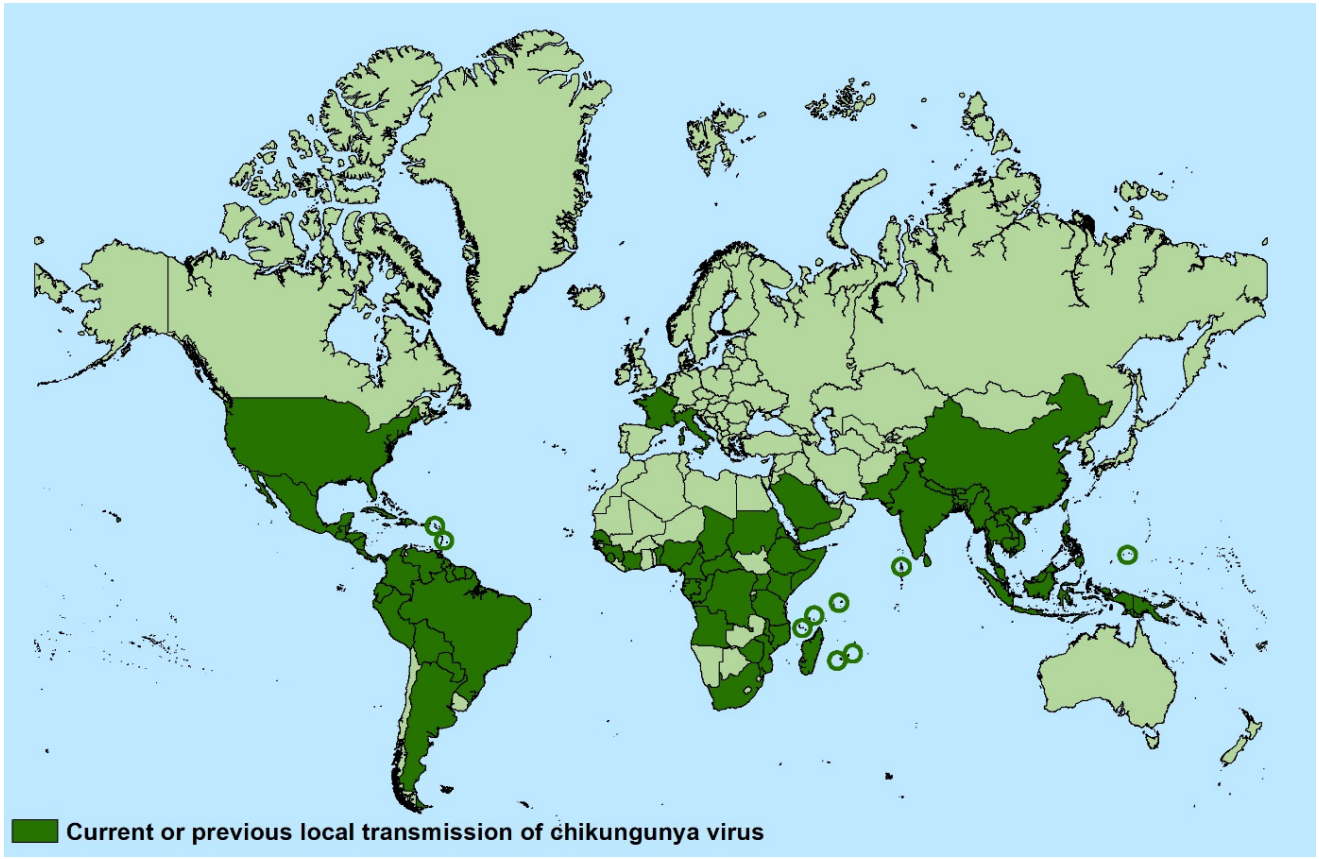
CDC Nov. 13, 2025

รู้ทัน ruthun rok malang โรคแมลง
กองโรคติดต่อนำโดยแมลง

รัฐบาล เตือนระวัง ‘ยุงลาย’ พาหะนำ ‘โรคชิคุนกุนยา’ หลังพบระบาดหนักหลายพื้นที่ แนะหากมีอาการไข้สูงเฉียบพลัน – ปวดเนื้อปวดตัว ควรรีบไปพบแพทย์

เมื่อวันที่ 4 สิงหาคม **นายอนุกูล พฤกษานุศักดิ์** รองโฆษกประจำสำนักนายกรัฐมนตรี เปิดเผยว่า จากสถานการณ์ฝนตกชุกอย่างต่อเนื่องครอบคลุมหลายพื้นที่ ส่งผลให้เกิดสภาพอากาศที่ชื้นแฉะมีแอ่งน้ำท่วมขัง ทำให้พาหะนำโรคอย่างยุงลาย สามารถขยายพันธุ์ได้มากขึ้นในหลายพื้นที่ ปัจจุบันพบว่า มีการแพร่ระบาดของ **“โรคไข้ปวดข้อยุงลาย”** หรือ **“ชิคุนกุนยา”** (Chikungunya virus disease) ในพื้นที่ 5 จังหวัด ได้แก่ จ.เชียงใหม่ บึงกาฬ เลย หนองคาย และลำพูน

Countries and Territories with Local Transmission of Chikungunya Virus



- CHIKV infections reported in > 100 countries
- The first outbreak in Asia in 1958, occurred in Bangkok, Thailand
- In Thailand 2019, a large outbreak of CHIKV resulted in > 13,000 cases in Bangkok and some provinces in the south, > 2,700 cases reported in Bangkok

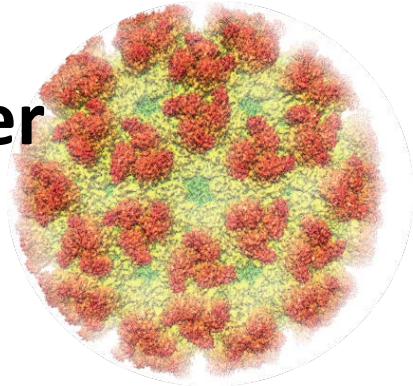
https://www.cdc.gov/chikungunya/geo/index.html

Chikungunya Virus Infection

- **Chikungunya (**Makonde language**) "that which bends up”**
- **Chikungunya virus (CHIKV): *Alphavirus* of the *Togaviridae* family**
- **First identified in 1952 in Tanzania**

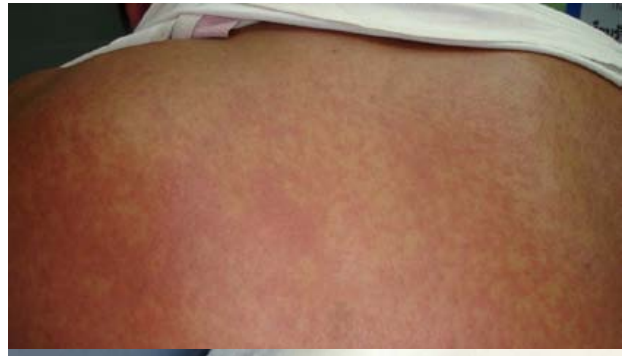
Transmission:

- **Mosquito-borne, human to human by biting of infected female mosquitoe: *Aedes aegypti* and *Aedes albopictus***
- **Incubation period:** typically 3–7 days (range 1–12 days)
- **Mother to child transmission:** Intrapartum, when mother was viremic around the time of delivery
- **Rare in utero transmission, mostly during second trimester**
- **No reports of transmission virus through breastfeeding**

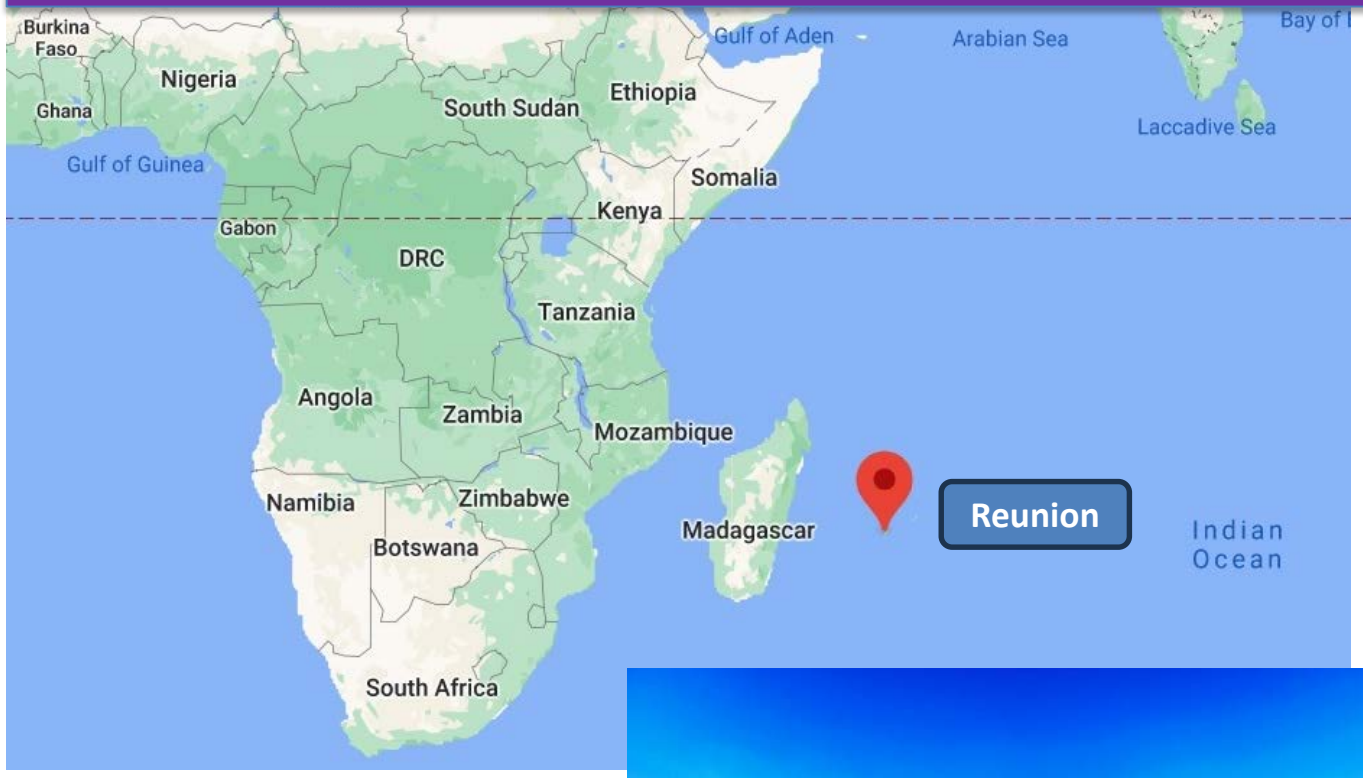


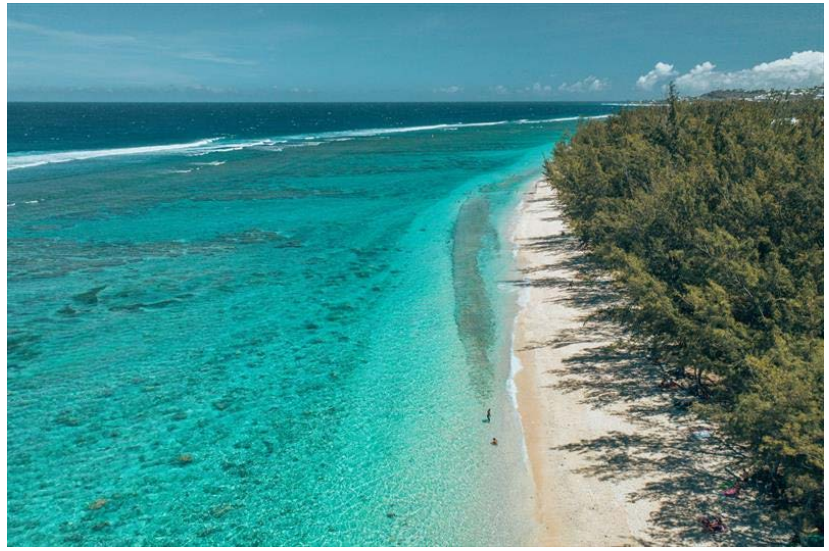
Clinical Manifestations

- Sudden-onset fever, severe arthralgia, headache, skin rash
- Rash: macular, maculopapular, bullous, skin blistering
- Conjunctival injection, photophobia
- Myalgia, disabling arthralgia and arthritis:
  - Migratory polyarthritis
  - Finger, wrist, ankle, elbow and knee joints: most commonly affected
- Tenosynovitis, tendinitis or bursitis
- In adults, chronic arthralgia (>3 months) may last for several years
- Permanent joint destruction: rare



Atypical and severe, even fatal manifestations of CHIKV as well as evidence of vertical transmission were first described in 2005–2006 during an outbreak on Réunion Island





Chikungunya Case Definitions
by World Health Organization. Nicaragua, 20-21 May 2015

- **Typical case:** self-limited, non-severe exanthematous fever

- **Atypical case:** a laboratory-confirmed CHIKV patient presenting with **neurological, cardiovascular, dermatological, ophthalmological, hepatic, renal, respiratory, or hematologic involvement**

- **Severe case:** a laboratory-confirmed CHIKV-infected patient presenting with **at least one organ or system dysfunction that threatens life and requires hospitalization**

WHO. Chikungunya: case definitions for acute, atypical and chronic cases Wkly Epidemiol Rec 2015;90:410-4.

เด็กหญิงไทย อายุ 8 ปี 8 เดือน ภูมิลำเนา จรัญสนิทวงศ์ 23

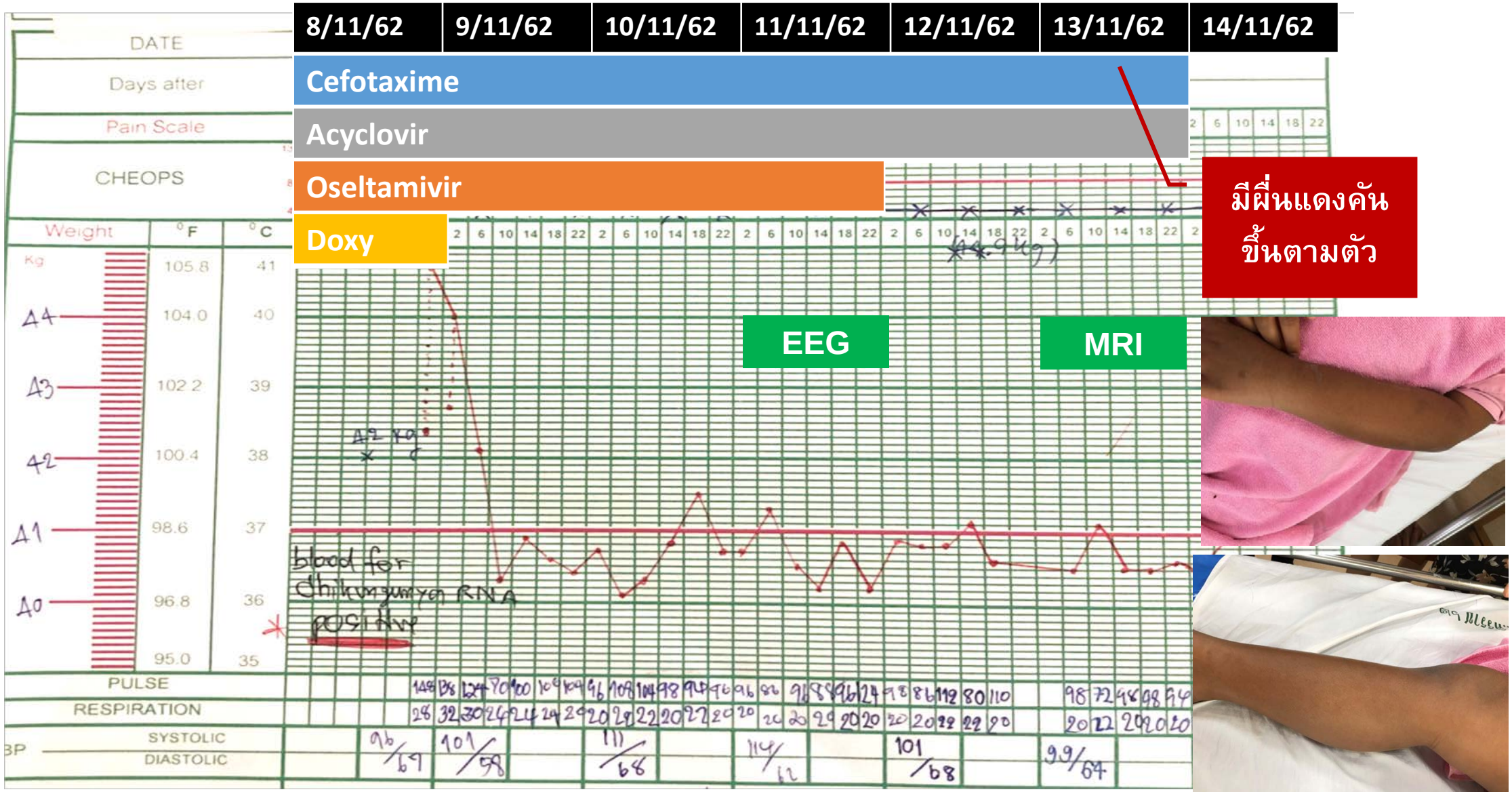
- อส: ไข้และซึมลง 1 วัน ก่อนมาโรงพยาบาล
- 1 วันก่อนมีไข้สูง ไม่มีไอหรือน้ำมูก ไม่มีคลื่นไส้อาเจียน ไม่มีถ่ายเหลว ไม่มีปัสสาวะแสบขัด ไม่มีผื่นขึ้นตามตัว กินอาหารได้ตามปกติ
- 6 ชั่วโมงก่อน ซึมลง เรียกไม่รู้สึกตัว ตาลอย พูดเพ้อ ไม่มีเกร็งกระตุก ไม่มีปัสสาวะอุจจาระราด มีถ่ายเหลว 1 ครั้ง ไม่มีมูกเลือดปน

Acute encephalitis

Lumbar puncture:
Open pressure 24 cmH2O, Close pressure 16 cmH2O
CSF: clear, WBC 4, RBC 2 , Protein 25 mg/dl, Sugar 76 mg/dl

EEG: Abnormal EEG: slow PDR for age
Interpretation: suggests mild encephalopathy

- **PE: T 42°C, BP 96/67 mmHg, HR 148 bpm, RR 28 /min, SpO2 97%, BW 42 kg (P97), Ht 136 cm (P50-75)**
- **GA: A Thai girl, drowsiness, not pale, no jaundice, no cyanosis**
- **Skin: no rash, no petichiae**
- **CVS: normal S1 S2, no murmur**
- **RS: lungs - clear**
- **Abd: soft, no hepatosplenomegaly**
- **CNS: Drowsiness, not co-operate, E3V1M5, can localized pain, equally movement, Reflex 2+ all extremities, BBK: plantar flexion both, clonus: negative, stiff neck: negative, cranial nerves - intact**


8/11/62
9/11/62
10/11/62
11/11/62
12/11/62
13/11/62
14/11/62
Cefotaxime
Acyclovir
Oseltamivir
Doxy
มีผื่นแดงคัน
ขึ้นตามตัว
EEG
MRI
DATE
Days after
Pain Scale
CHEOPS
Weight
°F
°C
105.8
41
104.0
40
102.2
39
100.4
38
98.6
37
96.8
36
95.0
35
PULSE
RESPIRATION
SYSTOLIC
DIASTOLIC
BP
blood for
chikungunya RNA
positive

CBC

Hb	13
HCT	37.8
MCV	80.4
WBC	14820
seg%	80.6
Lymph%	11.5
Mono%	7.8
Eos%	-
baso%	0.1
band%	-
Platelet	320000

CSF for meningoencephalitis multiplex PCR

E.coli K1	not detected
H.influenzae	not detected
L.monozytogenes	not detected
N.meningitidis	not detected
S.agalactiae	not detected
S.pneumoniae	not detected
CMV	not detected
Enterovirus	not detected
HSV1	not detected
HSV2	not detected
HSV6	not detected
human parechovirus	not detected
VZV	not detected
C.neoformans/gatti	not detected

Lab for specific pathogens

NP Wash	
Enterovirus Ag	negative
Enterovirus 71 Ag	negative
Influenza A Ag	negative
Influenza B Ag	Negative
Respiratory virus	Negative

Dengue	
NS1	negative
IgG	negative
IgM	negative

IFA for S.typhus	negative
IFA for M.typhus	negative
Blood for Chikungunya RNA	**Positive**
CSF Chikungunya RNA	**Positive**

Mycoplasma titer	Negative <1:40

Culture	
Hemoculture	Negative
Urine	Negative
CSF	Negative
Stool	Negative

PLOS One

RESEARCH ARTICLE

Re-emerging outbreaks of chikungunya virus infections of increased severity: A single-center, retrospective analysis of atypical manifestations in hospitalized children during the 2019 outbreak in Bangkok, Thailand

Artchavit Boonanek[1], Kulkanya Chokephaibulkit[1,2], Wanatpreeya Phongsamart[1], Keswadee Lapphra[1], Supattra Rungmaitree[1], Navin Horthongkham[3], Orasri Wittawatmongkol[1]*

PLoS One. 2025 Sep 25;20(9):e0330527

The Bangkok Outbreak in 2019: Hospitalized Children with Confirmed CHIKV

N= 31
Median age: 9.5 years
(IQR 6.9–12.5)

Included CHIKV cases (n = 31)
- RT-PCR-confirmed (n = 30)
- IgM-confirmed (n = 1)

Typical manifestations (n = 3)

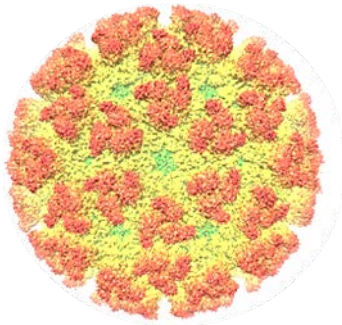
Atypical manifestations (n = 28)

Non-severe presentation (n = 24)

Severe presentation (n = 4)

- **70% No underlying diseases**
- **The most common manifestations:**
  - **Fever 100.0%, biphasic fever 16%**
  - **rashes 77.4%**
  - **myalgia 41.9%, arthralgia 35.5%**
  - **80% had lymphopenia at presentation**

23/31 tested for Dengue
17.4% had co-infection



ECSA–IOL strain with the E1:226A genotype (E1:K211E/E2:V264A),
which enhanced viral infectivity, dissemination, and transmission in Aedes aegypti mosquitoes

PLoS One. 2025 Sep 25;20(9):e0330527

90% of Cases had Atypical Manifestations

- Neurological 22.6%, meningoencephalitis 16%
  - 15% in Brazil, 11% in Honduras, and 10% Reunion island
- Acute kidney injury 22.6%
- Nausea/vomiting 22.6%
- Septic shock 12.9%
- Bullous skin lesions 19.4%
- Generalized erythroderma 6.5%
- Hyperpigmentation 13% (centrofacial area and extremities) "brownie nose" or the 'Chik' sign

PLoS One. 2025 Sep 25;20(9):e0330527

Skin Manifestations of CHIKV infection

Pediatric CHIKV patients with neurological involvement

Patient No.	Sex	Age	Diagnosis	Days between fever and neurological onset	CSF Profile						Neuroimaging
					Protein (mg/dL)	Glucose (mg/dL)	CSF/SGlu	RBC (cells/mm^3)	WBC (cells/mm^3)	RT-PCR	
1	M	8 y	Meningoencephalitis	2	17	70	0.84	0	2	NE	Normal CT brain
2	M	12 y	Encephalopathy	2	13	67	0.71	1	3	–	Not performed
3	M	8 y	Encephalopathy, septic shock, DIC, AKI, rhabdomyolysis	9	78	45	0.59	18,000	22	–	Not performed
4	F	8 y	Meningoencephalitis	2	44	51	0.56	65	2	+	Normal CT brain and MRI
5	M	7 m	Meningoencephalitis	2	30	71	0.67	67	1	NE	Normal CT brain
6	M	6 d	Congenital CHIKV, TTN, septic shock, hypotonia, OMD, meningoencephalitis	1	80	44	0.49	17,750	14	+	Lenticulostriate vasculopathy from U/S brain
7	M	4 d	Congenital CHIKV, DENV infection, sepsis, OMD, ASD, meningoencephalitis	1	50	61	0.45	1,260	5	+	Cystic changes in bilateral germinal matrix hemorrhage from U/S brain

All 6/7 of children developed neurological symptoms within 2 days of fever onset

PLoS One. 2025 Sep 25;20(9):e0330527

Children with Severe CHIKV Presentations

Table 3. Clinical complications and underlying medical conditions of four children with severe CHIKV presentations.

Case	Sex	Age	Underlying medical condition(s)	Clinical complications
1	M	8 y	Asthma, ASD, left renal agenesis, MPHD	Shock, encephalopathy, rhabdomyolysis, upper GI bleeding, transaminitis, adrenal insufficiency, AKI
2	M	5 y	Asthma, global developmental delay	Shock
3	F	12 y	N/A	Shock, transaminitis, AKI
4	M	6 d	LGA, full-term	Congenital CHIKV, respiratory distress, shock, meningoencephalitis

PLoS One. 2025 Sep 25;20(9):e0330527

Two Cases of Congenital CHIKV Infection at Siriraj Hospital 2019

- Mothers had typical non-severe CHIK infection 2 days before delivery
- Term babies developed fever Day 4th and Day 6th of life, maculopapular rash, sepsis-like symptoms, meningoencephalitis
- Both of them developed oromotor dysfunction and turned to be normal at within 2 months of age.
- One was hyperactive but had normal clinical development at 1 year 7 months of age
- The other was diagnosed with delayed speech at 2 years of age

Congenital CHIKV Infection

- First report during the Réunion Island outbreak 2005
- Perinatal transmission: 27.7–48.3% in Latin America
- Mother had CHIKV viremia during the perinatal period
- Onset of symptoms: median day 4 (range: 3–7) of life

Common features:

- Fever, rash, poor feeding, pain, edema or distal joint edema
- Petechiae, thrombocytopenia and lymphopenia
- Meningoencephalitis/encephalitis, encephalopathy, intracerebral hemorrhages, status epilepticus, multiorgan failure

Ge´rardin P, et al. (2008) PLoS Med 5(3): e60.

A systematic review: 42 studies
266 babies with confirmed vertical CHIKV infection

- 70 % had fever
- 94 % sepsis-like syndrome requiring ICU admission,
- Neurological manifestations (68.7 %): hypoactivity, irritability, meningoencephalitis, seizures, and intracranial hemorrhage
- Dermatological lesions (55.2 %): maculopapular rash, hyperpigmentation, or bullous dermatosis;
- Cardiovascular manifestations, 51.5 %
- Hyperalgesia or diffuse limb edema, 46.2 %
- Respiratory symptoms 41.7 %
- 39.8 % developed motor, cognitive, or visual sequelae.

FCPADM Ferreira, et al. Vertical transmission of chikungunya virus: a systematic review.PLoS ONE, 16 (2021),

Clinical Manifestations of Chikungunya in Children and Adults

Features	Children	Adults
Fever	Sudden onset, high-grade (> 38.9°C), duration 1–8 d	
Skin	• Maculopapular rash (33–60%) • Pigmentary changes (42%) • Bullous rash/skin blistering in 38–48% of infants <6 mo of age	• Maculopapular rash on trunk and limbs (35–50%) • Pigmentary changes (rare) • Bullous rash/skin blistering or photosensitivity (rare)
Mucocutaneous	• Oral ulcers (rare)	Oral ulcers (16%)
Musculoskeletal	• Myalgia, arthralgia (30–50%)	• Arthritis/arthralgia, symmetric, more commonly affecting distal joints (87–99%) • Tenosynovitis (common) • Back pain (more common) • Myalgia (60–93%)

Nicole Ritz, et al. PIDJ July 2015;34: 789-791

Clinical Manifestations of Chikungunya in Children and Adults

Features	Children	Adults
Chronic joint manifestations	• Arthralgia/arthritis persistent for 2 years (5–11%)	• Arthralgia persistent or recurrent for 1 y in up to 57% • Arthralgia/arthritis, persistent for 3–5 y (12%)
Hemorrhagic manifestations	• Purpura, ecchymoses (10%) • Severe bleeding from nose, gums, gut, and shock (up to 19% in neonates)	• Purpura, ecchymoses (occasional) • Severe bleeding from nose, gums, gut, and shock (rare)
Neurological manifestations	• Headache (15%) • Seizures, acute encephalopathy, meningoencephalitis (14–32%)	• Headache (40–81%) • Encephalopathy, meningoencephalitis, acute flaccid paralysis, Guillain–Barre syndrome (<0.1%)
Asymptomatic disease	• 35–40% (rare in neonates and infants)	16–27%

Nicole Ritz, et al. PIDJ July 2015;34: 789-791

OPEN ACCESS Freely available online

PLOS | NEGLECTED TROPICAL DISEASES

Neurocognitive Outcome of Children Exposed to Perinatal Mother-to-Child Chikungunya Virus Infection: The CHIMERE Cohort Study on Reunion Island

Patrick Gérardin[1,2,3]*, Sylvain Sampériz[1], Duksha Ramful[1,2,4]¶, Brahim Boumahni[1]¶, Marc Bintner[1], Jean-Luc Alessandri[1], Magali Carbonnier[1], Isabelle Tiran-Rajaoefera[1], Gilles Beullier[5], Irénée Boya[6], Tahir Noormahomed[7], Jocelyn Okoï[8,9], Olivier Rollot[2], Liliane Cotte[1], Marie-Christine Jaffar-Bandjee[1], Alain Michault[1], François Favier[2], Monique Kaminski[3], Alain Fourmaintraux[1], Xavier Fritel[3,10,11]

- Compared the neurocognitive function at age 2 years

unexposed-uninfected N=65	Exposed -uninfected N=70	p-CHIKV-infected children N=33

- 51% of infected children had global developmental delay (GND) compared to 15% of uninfected children (P=0.001).
- 75.0% of the children with a history of CHIKV encephalopathy had a Gross Neurologic Deficits (50% moderate, 25% severe) compared with 38.1% of children presented with "mild prostration"

Ge ´rardin P, et al. PLoS Negl Trop Dis 8(7): e2996

CHIKV should be suspected in endemic countries and tested for in febrile children, esp. those with rash and neurological involvement.

THANK YOU!