

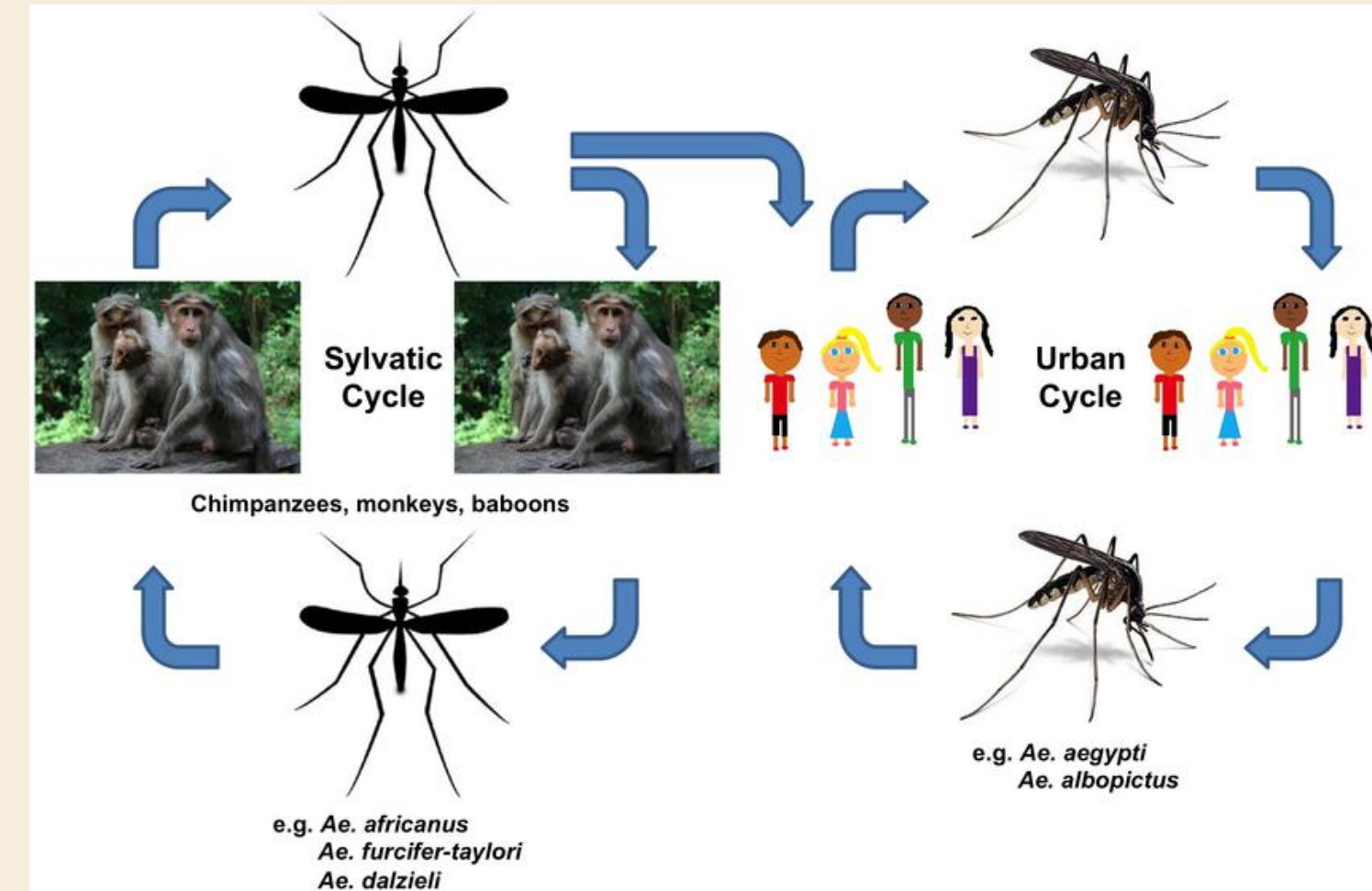
# Diagnosis and Clinical management of Chikungunya

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# Chikungunya Fever (CF) Infection

- Chikungunya Fever is a mosquito-borne viral disease, caused by Chikungunya virus (CHIKV), an alphavirus in Togaviridae family
- CHIKV is a single-stranded RNA virus that exists as a single serotype
- CHIKV was first identified in the United Republic of **Tanzania** in 1952 and subsequently in other countries Africa and Asia



Chikungunya: A Potentially Emerging Epidemic? PLoS neglected tropical diseases. 4. e623



*Aedes aegypti*



*Aedes albopictus*

- Primarily transmitted to people through the bite of an infected mosquito, mainly *Aedes aegypti* (not found in HK) and *Aedes albopictus* (day biter and found in HK)



‘Chikungunya’: Makonde root verb ‘kungunyala’  
Meaning “that which bends up”, “to become contorted”

# Mode of transmission

1.

## Mosquito bite (most common)

- An uninfected mosquito feeding on a person who has CHIKV circulating in their blood, the mosquito can ingest the virus. The virus then replicates in the mosquito over several days, enters its salivary glands, and can be transmitted into a new human host when the mosquito bites them

2.

## Maternal-fetal (rare)

- Risk is highest when pregnant patients are symptomatic during the intrapartum period

3

## Blood borne (rare)

- Possible. Cases have been documented among laboratory personnel handling infected blood and a health care provider drawing blood from an infected patient



# “Clinical features of Chikungunya compared with Dengue and Zika virus infection”

Features	Dengue	Chikungunya	Zika
Fever	+++	+++	++
Rash	+	++	+++
Conjunctivitis	-	+	++
Arthralgia	+	+++	++
Inflammatory arthritis (characterized by prolonged morning stiffness)	-	+++	-
Myalgia	++	+	+
Headache	++	++	+
Haemorrhage	++	-	-
Shock	+	-	-

HA Fact sheet on Chikungunya Fever

# Clinical manifestations in adults

## 1. Acute presentation

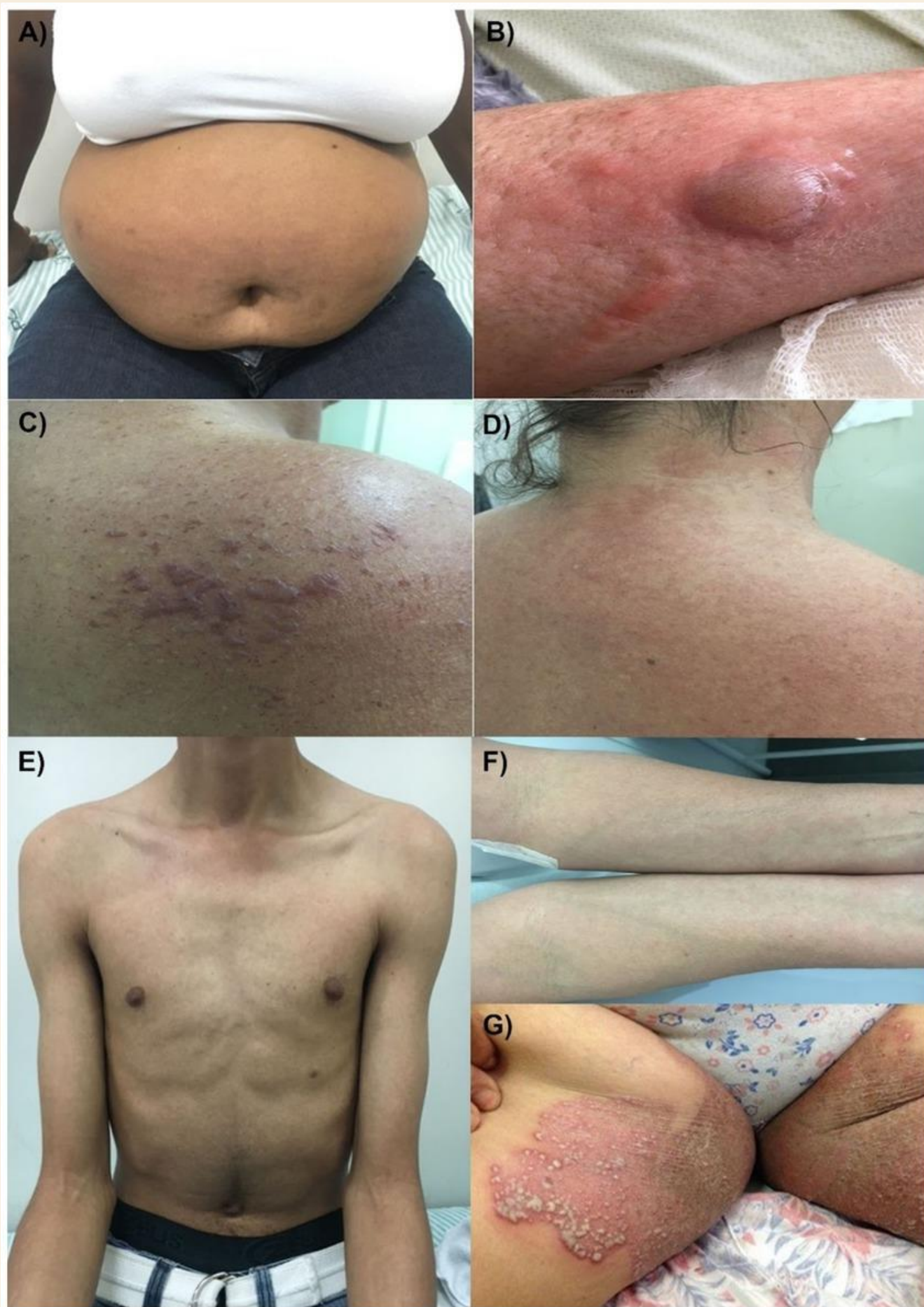
Incubation period: 3-7 days (range 1-12 days)  
3-28% of cases can be asymptomatic

### Classic triad: fever, arthralgia, skin rash

- Fever may be high grade ( $>39^{\circ}\text{C}$ ), usual duration is 3-5 days
- Arthralgia and arthritis
  - Morning stiffness, intense disabling pain, leading to immobilization
  - Usually bilateral and symmetric, involving hands wrists, ankles and knees
  - Axial skeleton can also be affected
  - Joint pain may precede fever (90% in an outbreak in Dhaka in 2017)







## Rash

- Morphology – usually macular or maculopapular rash
- Involvement – limbs and trunk, can involve the face and palm
- Onset - usually 3 days or later after onset of illness
- Lasting 3-7 days

**Figure** – Cutaneous clinical manifestations of patients during the acute phase of CHIKV infections: **(A)** urticaria; **(B)** vesiculobullous lesion; **(C)** minor vesiculobullous lesions; **(D)** erythema; **(E)** and **(F)** diffuse papular erythematous rash; and **(G)** vesiculopustular lesions, erythema, and scaling.

# Clinical manifestations in adults

Clinical characteristic	Percentage of frequency(%)
Fever	76–100
Polyarthralgia	71–100
Polyarthrititis	12–32
Myalgia	46–72
Dorsalgia	34–52
Nausea and vomiting	50–70
Skin rash	30–77
Headache	17–74
Conjunctivitis	3–56

Other symptoms: headache, myalgia, nausea, facial puffiness, red eyes, GI symptoms, usually self limiting

The duration of acute illness is usually 7-10 days

Montero A. Chikungunya fever - A new global threat. *Med Clin (Engl Ed)*. 2015;145(3):118-123.  
doi:10.1016/j.medcle.2014.05.013

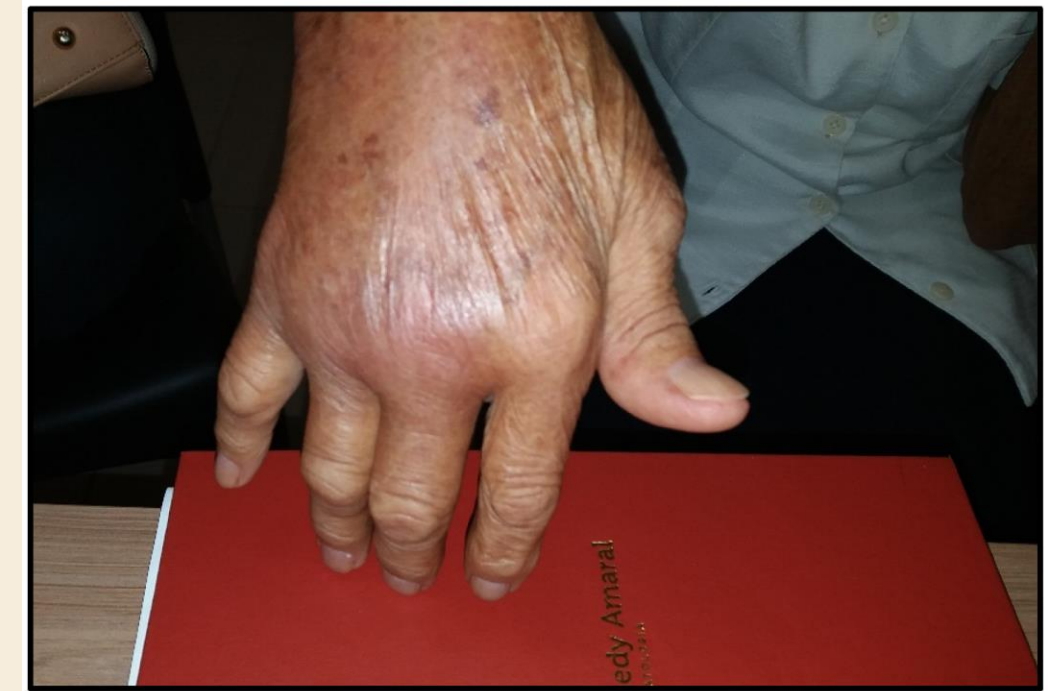
# Severe complications of Chikungunya

- 17 per 100,000 population in one series in France
- Severe complications include respiratory failure, cardiovascular decompensation, myocarditis, acute hepatitis, renal failure, hemorrhage and neurologic involvement; ocular manifestations (iritidocyclitis, retinitis, episcleritis, macular choroiditis, uveitis) and sensorineural hearing loss
- Risk factors: >65 years of age, underlying chronic medical problems (e.g. DM, cardiovascular disease)



# Chronic arthritis and arthralgia

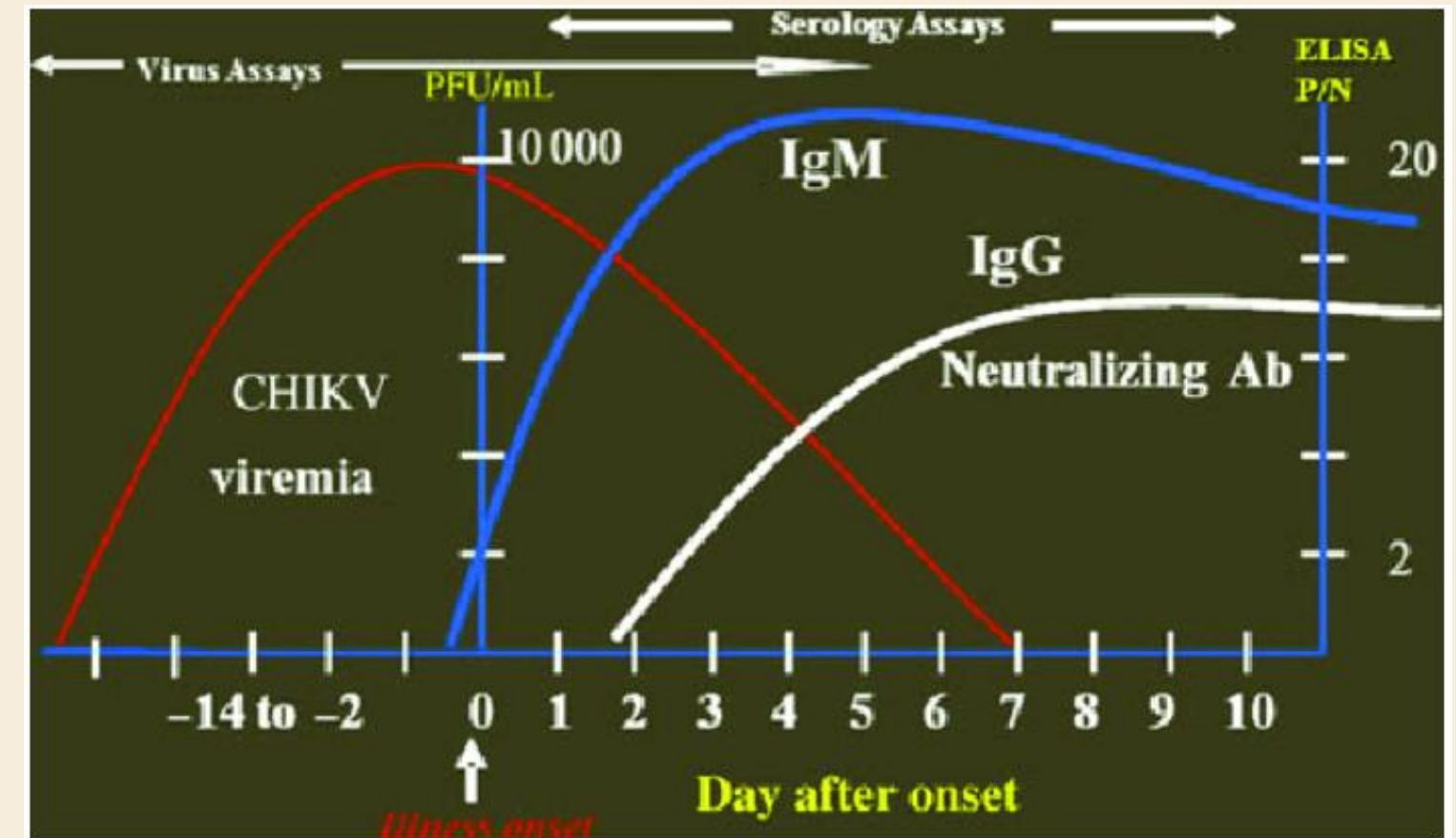
- Chronic musculoskeletal disease occurs in 15-40% patients
- Range due to variability in geography and individual comorbidities
- Usually involve joints affected during acute illness, can be relapsing, unremitting or incapacitating; some patients may develop new chronic inflammatory polyarthritis
- Risk factors: age, severity of acute arthritis, pre-existing osteoarthritis
- Duration > 3 months, median 6 months



F/82, 2 years after CHIKV infection. Intense arthritis of metacarpophalangeal joints and wrist

# Diagnosis

- Suspicion in patients with acute onset of compatible symptoms and relevant epidemiologic exposure
- Laboratory tests:
  - Lymphopenia, thrombocytopenia, raised hepatic transaminases – mild
  - RT-PCR (Clotted blood): for detection of Chikungunya virus RNA within the first week following onset of symptoms (sensitivity 100%, specificity 98%)
  - IgM is usually present 5-7 days after symptom onset. Convalescent serum should be collected 10-14 days after acute serum.



Time course of chikungunya virus (CHIKV) viremia and immune response. Limit of detection (LOD) of real-time reverse transcription-polymerase chain reaction (RT-PCR) assay is approximately 100 plaque-forming units (PFU)/mL (approximately 1 RNA transcript/reaction); the LOD of the immunoglobulin M (IgM) antibody capture enzyme-linked immunosorbent assay (ELISA) positive-to-negative ratio (P/N) is >2. Abbreviations: Ab, antibody; IgG, immunoglobulin G.

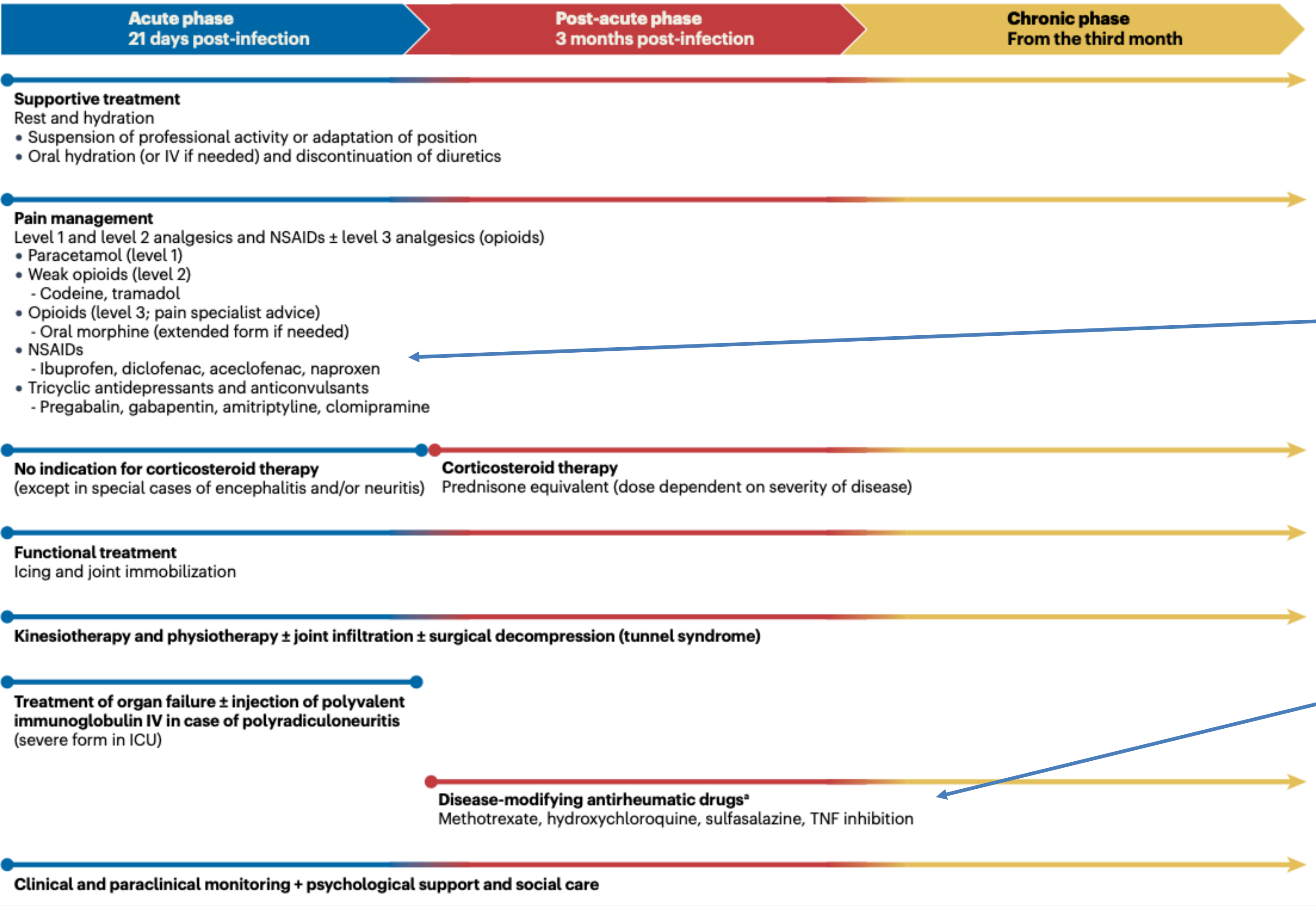
Johnson BW, Russell BJ, Goodman CH. Laboratory Diagnosis of Chikungunya Virus Infections and Commercial Sources for Diagnostic Assays. J Infect Dis. 2016 Dec 15;214(suppl 5):S471-S474. doi: 10.1093/infdis/jiw274. PMID: 27920176; PMCID: PMC5657184.

# Standardized GCRS for Chikungunya test

Item	Details
Specimen type	Clotted blood
GCRS description	Chikungunya test
GCRS proforma	<u>Indication for Chikungunya test</u> 1. Date of fever / symptoms onset compatible with Chikungunya fever (dd/mm/yyyy) 2. Travel history to affected areas within 12 days before symptoms onset (Yes / No) a. Please indicate the place of travel: b. Date of return to Hong Kong (dd/mm/yyyy)
Performing Lab	● Send out to PHLSB
Requesting location	Available in all HA hospitals

Remarks: If the specimen is collected more than 7 days after symptom onset, PHLSB may request an additional blood sample to evaluate a four-fold rise in antibody titre





No specific antiviral therapy

Avoid aspirin and other NSAIDs till dengue fever excluded (bleeding risk)

Refer rheumatologist for DMARDs in chronic phase

# Isolation of confirmed cases

1. Notify via NDORS/ eChikungunya
2. Inform MCO of CHP to issue an isolation order
3. Admit to **designated** ward (mosquito free environment) for isolation during the period of viraemia, **at least 6 days from onset of symptoms**. Apply **standard precautions**
4. Enhance mosquito control in hospital areas



# Prevention

## ● Mosquito protection

- Minimizing mosquito exposure: Aedes mosquitoes bite primarily during the daytime
- Personal protection: use of mosquito repellent (DEET, icaridin, IR3535)
- Environmental control

## ● Vaccination

Two approved Chikungunya vaccines (Not available in HK)

- IXCHIQ (live attenuated vaccine)
- VIMKUNYA (recombinant vaccine)
  - Vaccination for selected high risk travelers/ laboratory workers



# Facing an Infectious Disease Outbreak

## 1. **Emergency Preparedness for unprecedented and unexpected events**

- Surge capacity, especially ICU
- Infection control measures
- Manpower deployment, Staff facilities

## 2. **Crisis Management plan**

- Timely information sharing & build communication capabilities
- Contingency plan – centrally coordinated with clear lines of authority, command and control

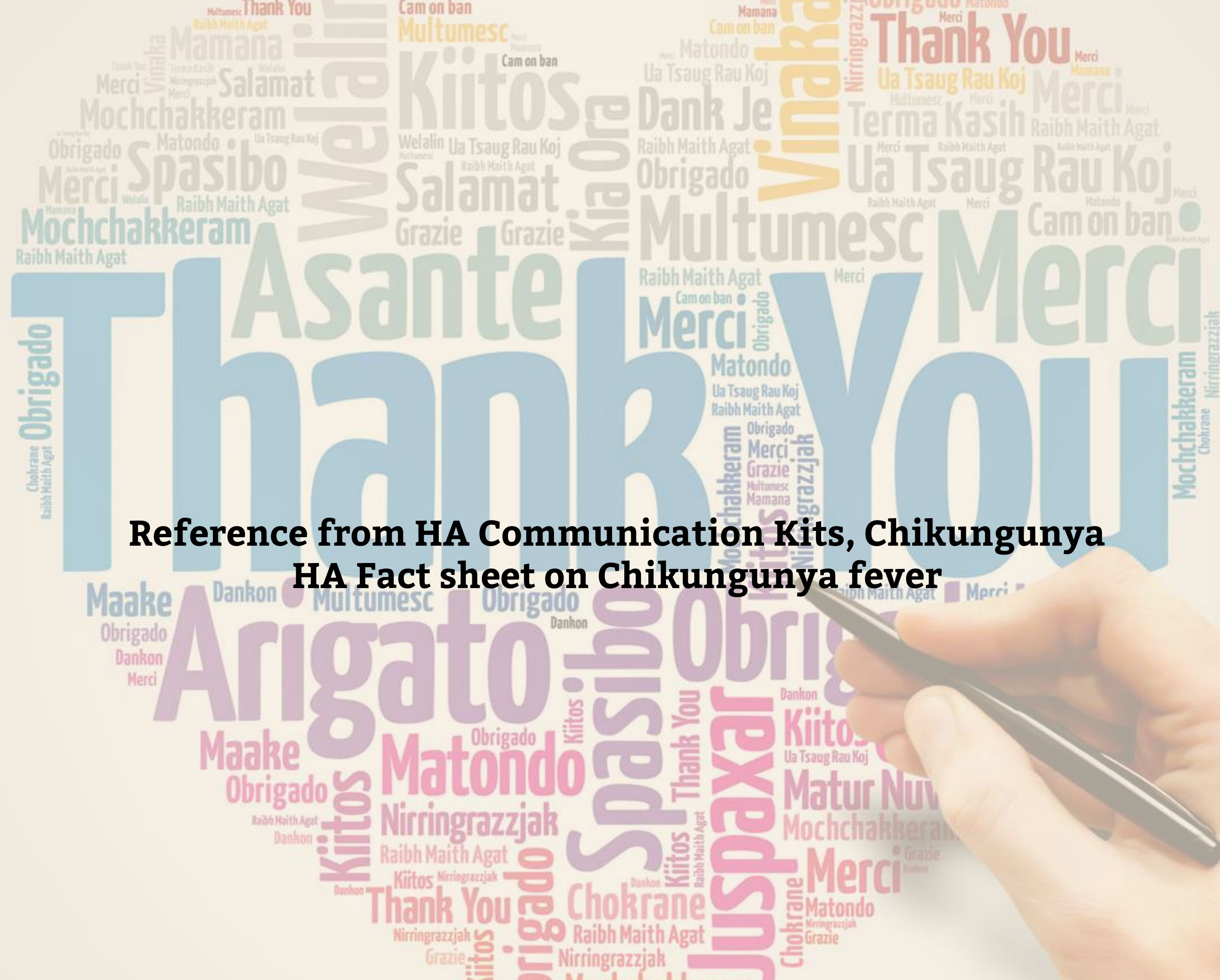
## 3. **Teamwork, communication & trust**

## 4. **Education, training, practice, development and research during peace time**

## 5. **International collaboration**

# Summary

- Chikungunya virus is an arthropod-borne virus transmitted by mosquitoes that causes fever, acute febrile polyarthralgia and inflammatory arthritis, as well as cutaneous eruptions and other systemic manifestations
- Diagnosis should be suspected in patients with recent travel history to endemic areas, with acute onset of fever and polyarthralgia/ rash
- The diagnosis is established by detection of Chikungunya viral RNA via RT-PCR or Chikungunya virus serology
- No specific antiviral therapy is available for treatment; management during acute phase is supportive
- Monitor joint symptoms and refer specialist if symptoms persist



**Reference from HA Communication Kits, Chikungunya  
HA Fact sheet on Chikungunya fever**