

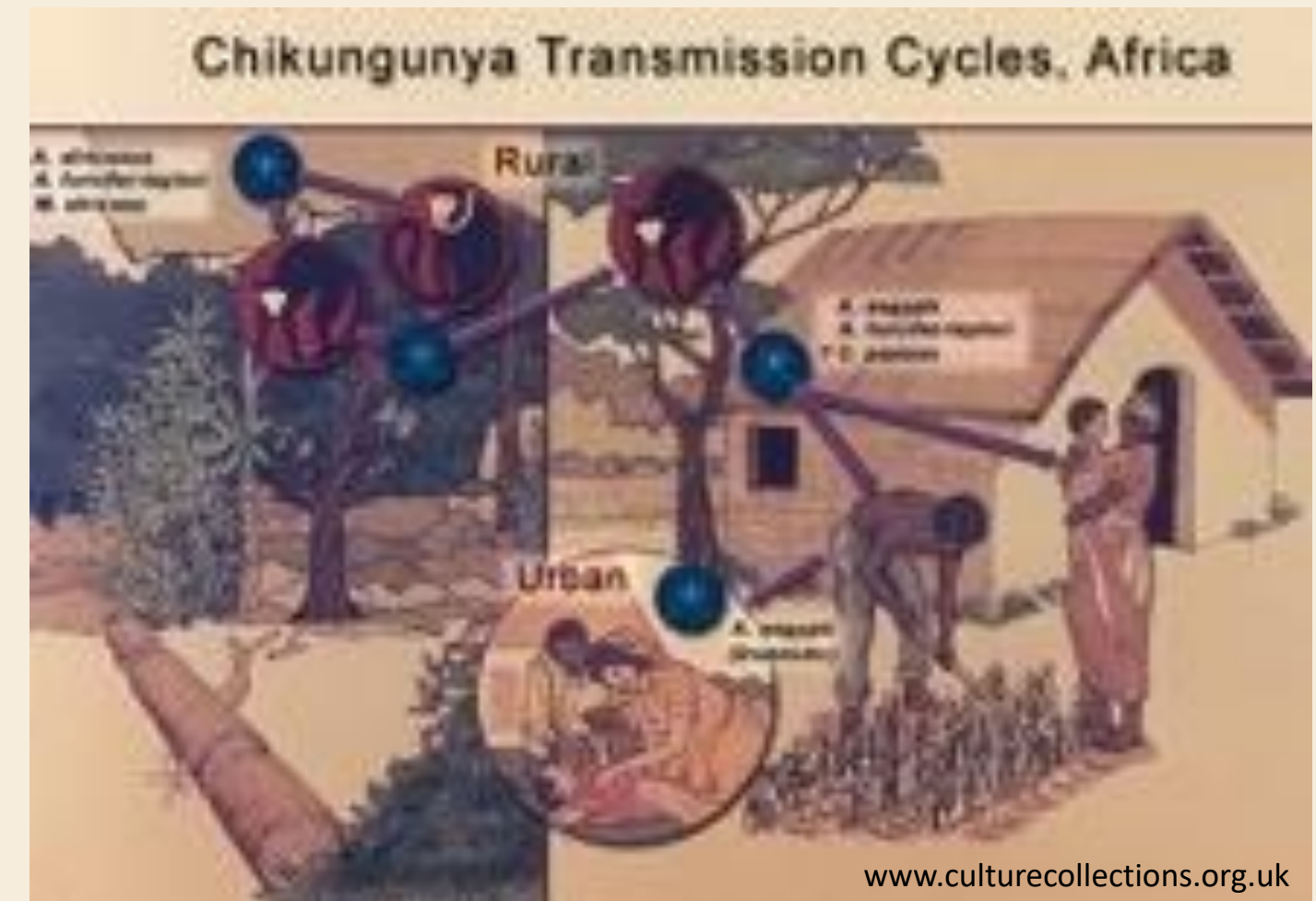
Diagnosis and clinical management of Chikungunya

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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
- 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)
- Incubation period: 1-12 days (commonly 3-7 days)



Aedes aegypti



Aedes albopictus

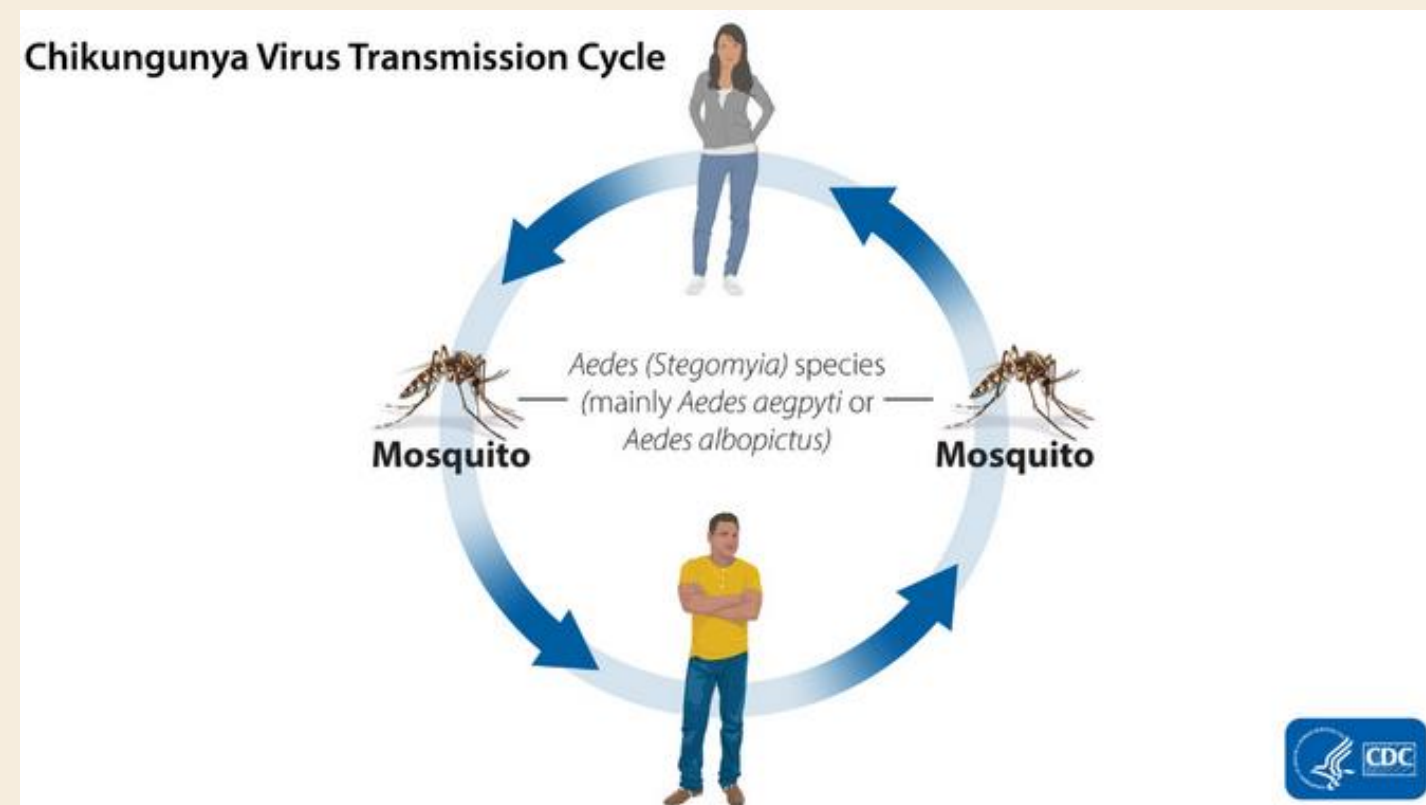


‘Chikungunya’: Makonde root verb ‘kungunyala’
Meaning “that which bends up”, “to become contorted”

Mode of transmission

1. Mosquito bite (most common)

- When an uninfected mosquito feeds 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
- The virus again begins to replicate in this newly infected person and reaches high concentrations in their blood, at which point they can further infect other mosquitoes and perpetuate the transmission cycle



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 manifestations in adults

1. Acute presentation

- Following an incubation period of 3-7 days (range 1-12 days), patients may present with fever and malaise
- 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
 - Macular or maculopapular rash – usually 3 days or later after onset of illness
 - Limbs and trunk, can involve the face, lasting 3-7 days
- Headache, myalgia, nausea, facial puffiness, red eyes, GI symptoms, usually self limiting
- The duration of acute illness is usually 7-10 days



“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 features of *Arbovirus* related disease

Reference: WHO, CDC,CHP, HA Factsheet

	Zika virus	Dengue fever	Chikungunya fever	West Nile virus	Yellow fever	Japanese encephalitis
Mosquito 1° vector	Aedes aegypti	Aedes aegypti	Aedes mosquitos	Culex mosquitoes	Aedes aegypti	Culex tritaeniorhynchus
Incubation period	3 - 12 days	3 - 14 days	1 to 12 days	2-14 days	3 to 6 days	4-14 days
Asymptomatic %	80%	50%	3-28%	Estimated 70-80%	Majority	99%
CF	- Fever - Rash (maculopapular) - Muscle and joint pain - Conjunctivitis (non-purulent)	- Fever - Headache - Rash - Muscle and joint pain - Retro-orbital pain - Nausea, vomiting - Minor Bleeding (Petechiae/ Bruises)	- Fever - Headache - Rash (maculopapular) affecting the trunk and limbs - Muscle and joint pain of the wrist, knee, ankle, and small joint, can be severe and debilitating - Conjunctivitis - Nausea, vomiting	- Fever - Headache - Rash (maculopapular) on the trunk of the body - Muscle pain - Enlarged lymph node - Retro-orbital pain - Nausea / vomiting	- Fever - Headache - Muscle pain with prominent backache - Shivers - Loss of appetite - Nausea / vomiting	- Fever - Headache - vomiting
Severe form	Rare	- Severe abdominal pain - persistent vomiting - bleeding gums - blood in vomit	Rare	<u>Severe form</u> - Headache - High fever - Neck stiffness - Stupor - Disorientation - Coma - Tremors - Convulsions - Muscle weakness - Paralysis	(15% of cases) - Jaundice - Abdominal pain - Vomiting - Bleeding - CFR (20-50%)	- High fever - Headache - Neck stiffness - Disorientation - Coma - Seizures - Spastic paralysis
Vaccine available	No	Yes (Not locally registered in HK)	Yes IXCHIQ® & VIMKUNYA® (Not locally registered in HK)	No	Yes (>9m old, visit to affected areas, effective after 10 days)	Yes (inactivated Vero cell culture-derived vaccine (JE-VC) & cell culture-derived live attenuated vaccine)

Severe complications of Chikungunya

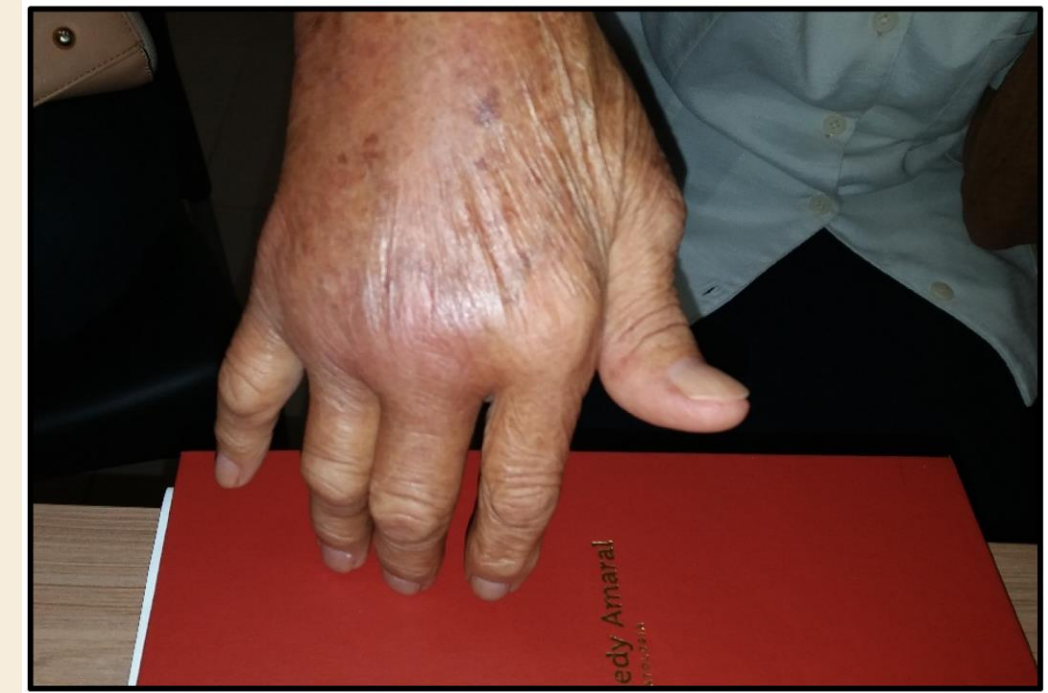
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Severe complications

- Severe complications and death have been reported during chikungunya outbreak
- Severe complication (17 per 100,000 population in one series in France) include respiratory failure, cardiovascular decompensation, myocarditis, acute hepatitis, renal failure, hemorrhage and neurologic involvement
- Ocular manifestations (iridocyclitis, retinitis, episcleritis, macular choroiditis, uveitis) and sensorineural hearing loss
- Occur more often among patients >65 years and patients with underlying chronic medical problems (e.g. DM, cardiovascular disease)

Chronic arthritis and arthralgia

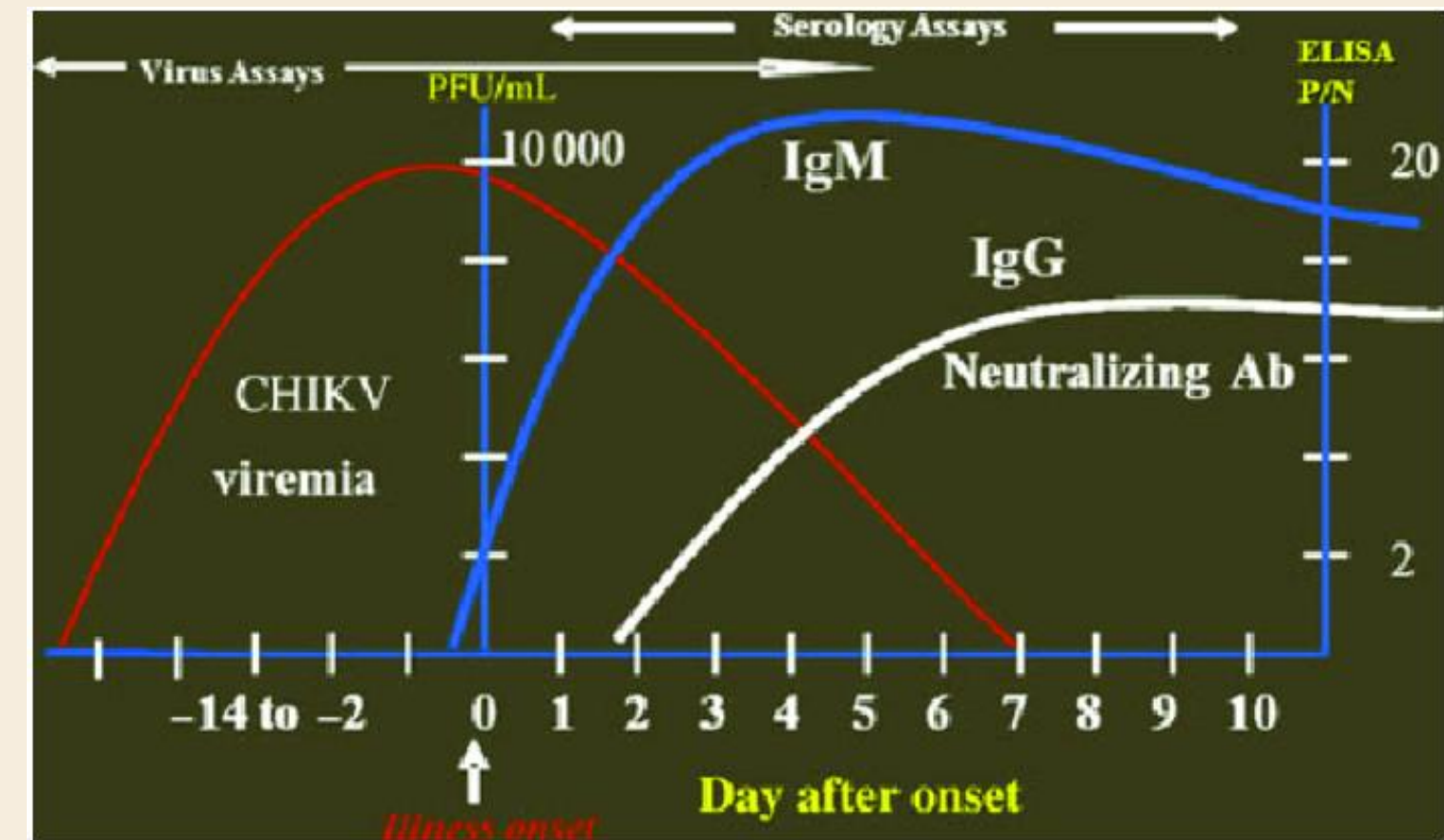
- Chronic musculoskeletal disease occurs in 15-40% patients
- Range due to variability in geography and individual comorbidities
- Usually involve joints affected during acute illness, can be relapsing, unremitting or incapacitating; some patients may develop new chronic inflammatory polyarthritis
- 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
 - RT-PCR (Clotted blood): for detection of chikungunya virus RNA during first 5 days 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.

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

Clinical Management

1. Supportive treatment

- No specific antiviral therapy
- Rest, adequate fluids and symptomatic relief by using analgesics, antipyretics like paracetamol or non-steroidal anti-inflammatory drugs (NSAIDS) naproxen, ibuprofen
- Aspirin and other NSAIDS should be avoided initially if dengue fever has not been excluded because of the risk of bleeding complications
- Patients with chronic arthritis (>3 months) may be referred to a rheumatologist specialist for other treatments e.g. DMARDS

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

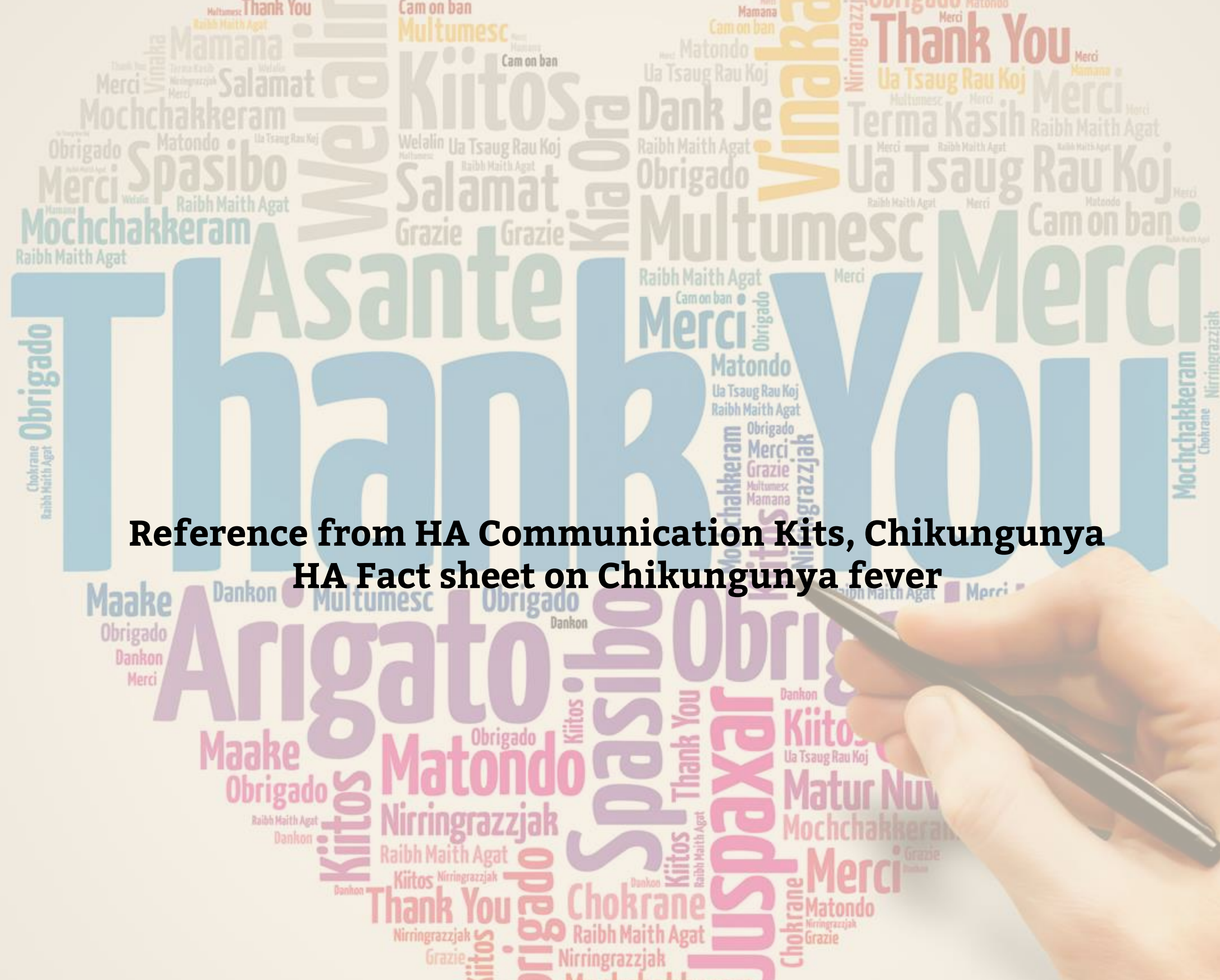
● Vaccination

- Two approved chikungunya vaccines (Not available in HK)
- IXCHIQ (live attenuated chikungunya vaccine)
- VIMKUNYA (recombinant chikungunya vaccine)
 - Vaccination for selected high risk travelers/ laboratory workers

Summary

● Summary for diagnosis and management of Chikungunya fever

- Chikungunya virus is an arthropod-borne virus transmitted by mosquitoes that causes 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 for treatment and 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**