

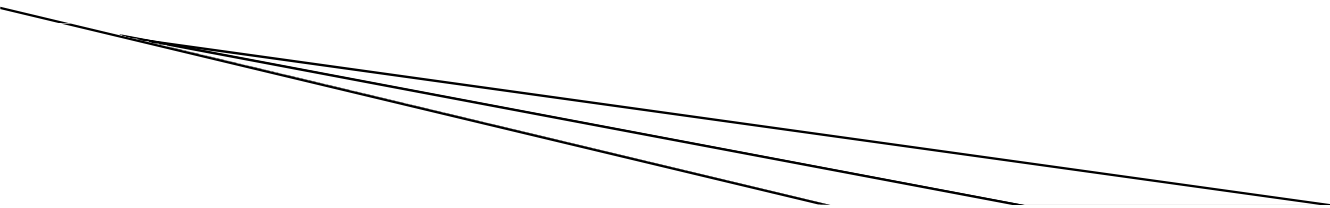
Chikungunya

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Introduction

- ▶ Chikungunya - a local word meaning “doubling up” owing to excruciating joint pains.
- ▶ Manifested by high fever and severe articular pains in the limbs and spinal column.



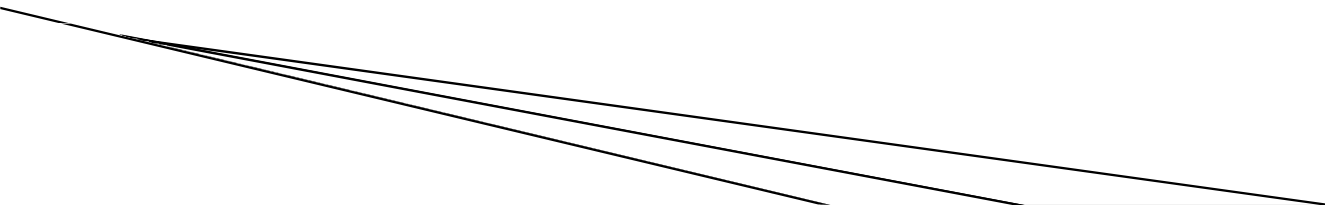
▶ **Agent:**

- ▶ A dengue like disease caused by a group A virus (**chikungunya virus**)

▶ **Reservoir:**

- ▶ Humans are the major source, or reservoir.

▶ **Incubation period:**

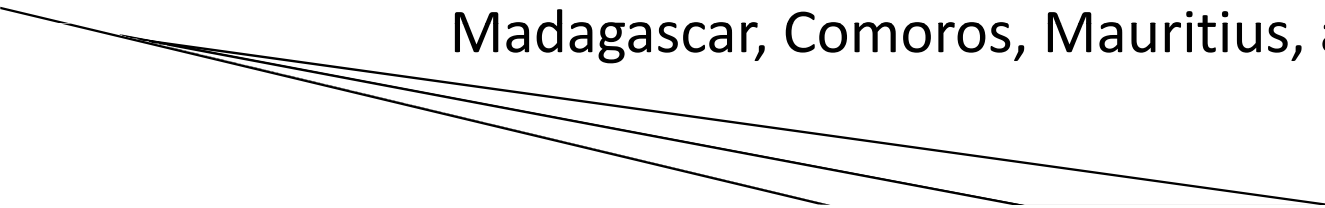
- ▶ 4-7 days
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Occurrence

- ▶ **In 1952-1953:**

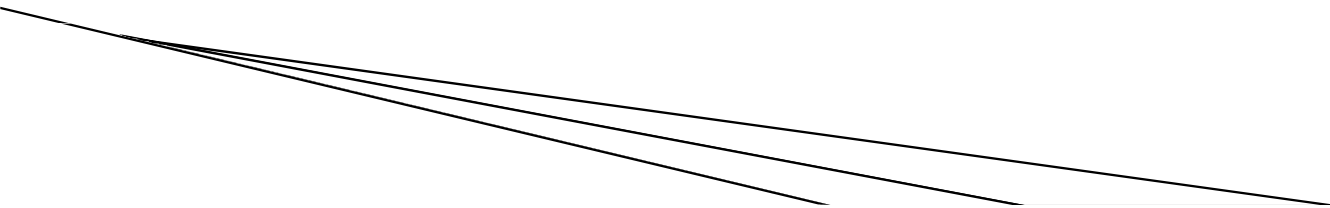
- First isolated from patients and mosquitoes during an epidemic in Tanzania.
- The first recognized outbreak occurred in East Africa.

- ▶ Epidemics were noted in the Philippines (1954, 1956 & 1968), Thailand, Cambodia, Vietnam, India, Burma and Sri Lanka.

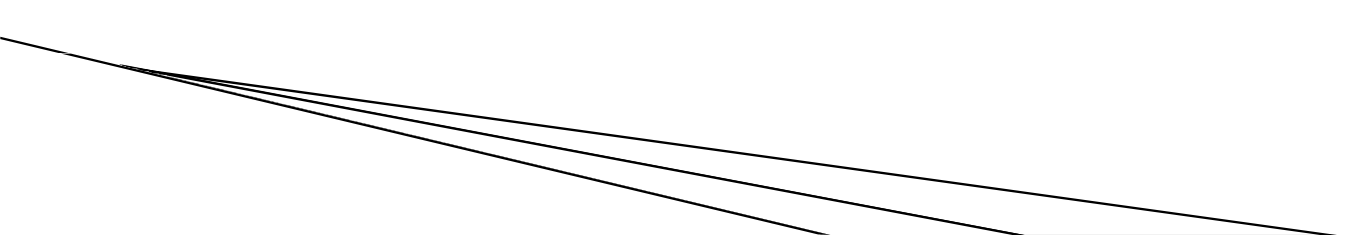
- ▶ Since 2003, there have been outbreaks in the islands of the Pacific Ocean, including Madagascar, Comoros, Mauritius, and Reunion Island .
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Outbreaks in India

- ▶ In 1963-64: Kolkata.
- ▶ In 1965, in Chennai & Vellore
 - gave rise to 3,00,000 cases in Chennai city alone.

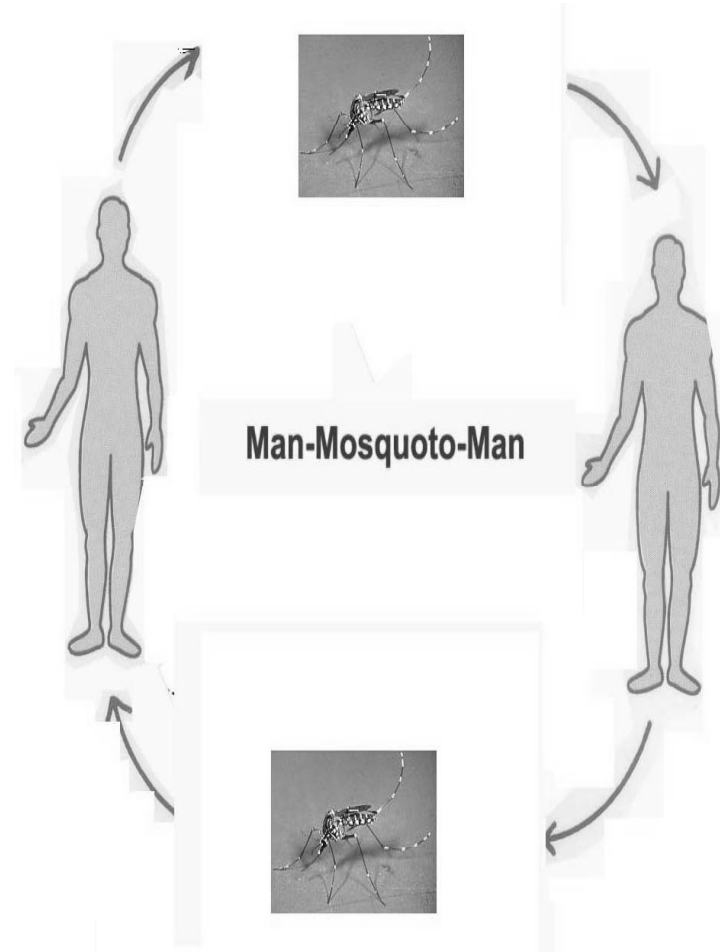


- ▶ Virus was not active since 1965.
- ▶ The disease reappeared after 41 years.
- ▶ During 2006,
 - 1.39 million officially reported cases spread over 16 states;
 - 45 per cent Attack Rate
 - First in Andhra Pradesh and it subsequently spread to Tamil Nadu.
- ▶ During 2011: 17,472 cases were reported.



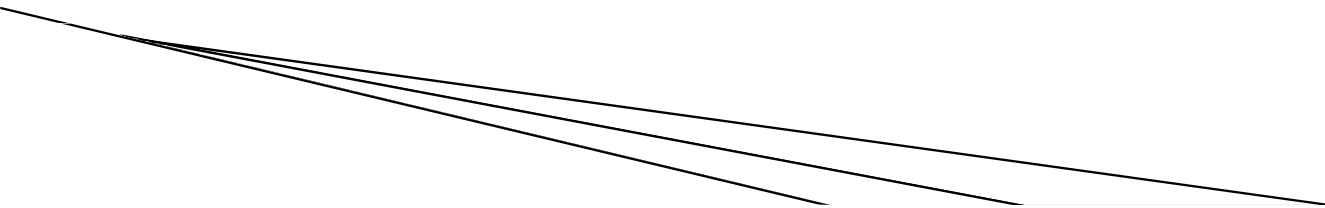
Mode of Transmission

- ▶ Chikungunya spreads by the bite of an **Aedes mosquito**.



Identification

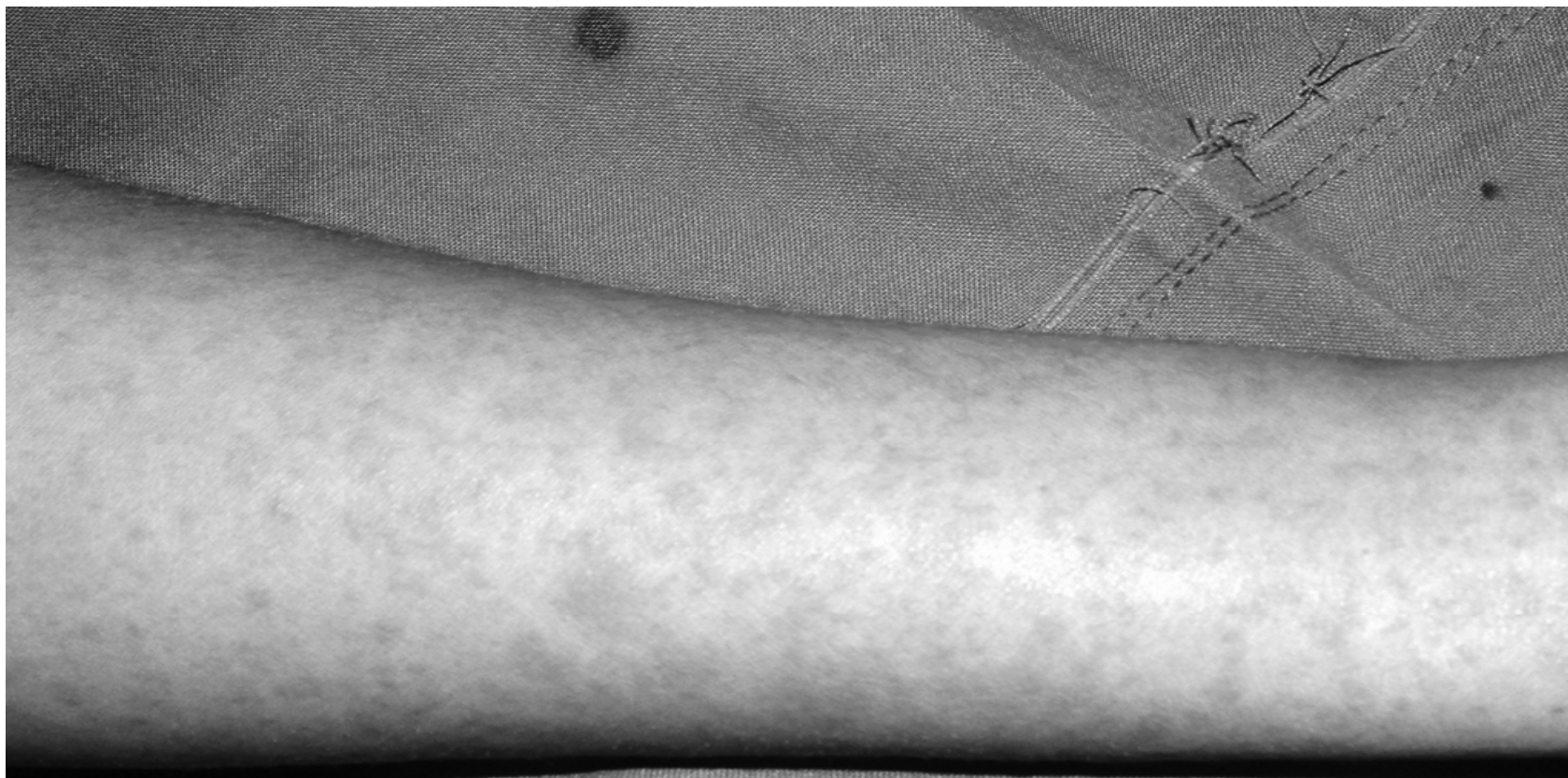
Clinical features:

- Sudden onset with fever, chills, anorexia, lumbago and conjunctivitis.
 - Adenopathy is also common.
 - Morbilliform rash, with purpura, on the trunk and limbs (60 to 80 per cent patients).
 - Cutaneous eruption may recur every 3 to 7 days.
 - Coffee coloured vomiting, epistaxis and petechiae.
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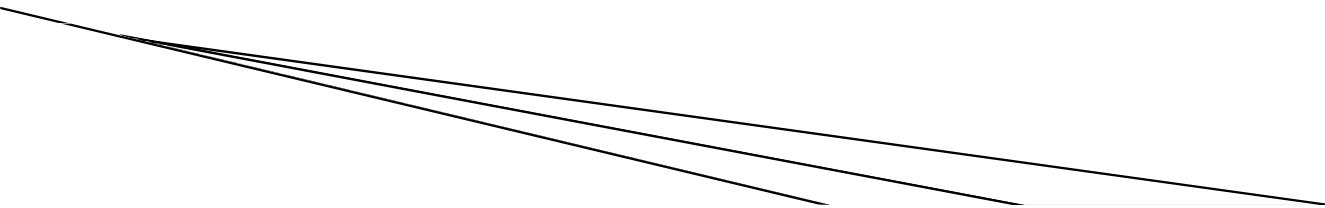
Conjunctival congestion



Papular rash

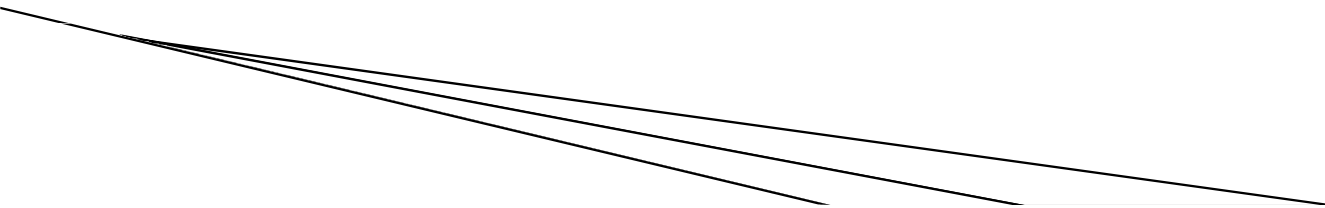


Arthropathy

- ▶ A prominent symptom, seen especially in adult patients.
 - ▶ Pain, swelling and stiffness, especially of the metacarpophalangeal, wrist, elbow, shoulder, knee, ankle and metatarsal joint.
 - ▶ Appears between 3rd and 5th day after the onset of clinical symptoms, and it can persist for months/ years.
 - ▶ No deaths have been attributed to chikungunya fever.
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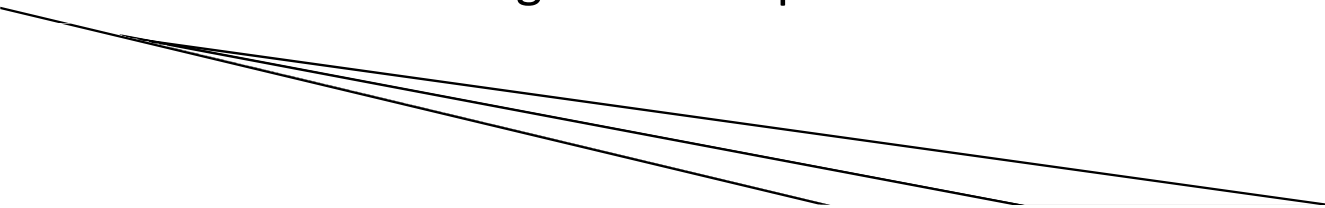
Diagnosis

- ▶ The virus can be isolated from the blood of febrile patients by the **intracerebral inoculation** in suckling mice or on VERO cells.
 - ▶ In serologic diagnosis - comparing acute – and convalescent – phase sera in the **Haemagglutination inhibition (HIA)** or **complement fixation test (CFT)**.
 - ▶ **ELISA** is used to detect IgM.
 - ▶ A reverse-transcription polymerase chain reaction (**RT-PCR**)/ nested PCR technique - **useful in rapidly diagnosing the disease.**
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Methods of Control

How can Aedes mosquito breeding be controlled?

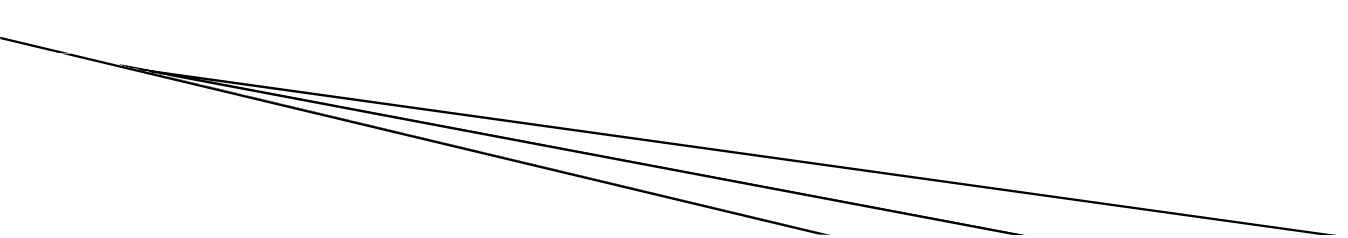
(a) Source reduction Method:

- ▶ Elimination of all potential vector breeding places near the domestic or peri-domestic areas.
 - ▶ Not allowing the storage of water for more than a week.
 - ▶ Straining of the stored water by using a clean cloth once a week to remove the mosquito larvae from the water and the water can be reused.
 - ▶ The sieved cloth should be dried in the sun to kill immature stages of mosquitoes.
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▶ **(b) Use of larvicides:**

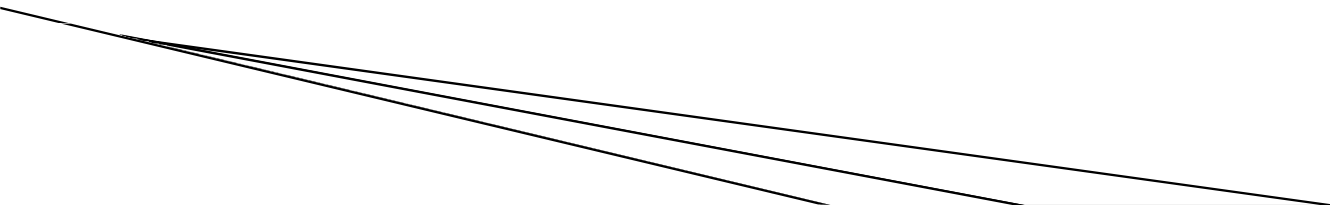
- ▶ Temephos can be used once a week at a dose of 1 ppm (parts per million).
- ▶ Pyrethrum extract (0.1% ready-to-use emulsion) can be sprayed in rooms (not outside) to kill the adult mosquitoes hiding in the house.
- ▶ ABATE-
 - prevent breeding for up to 3 months when applied on sand granules;
 - does not harm man and
 - does not affect the taste or water.

- ▶ Aerosol spray of ultra low volume (ULV) quantities of malathion or sumithion (250 ml/hectare)
 - be effective in interrupting transmission and stopping epidemics of DHF.
 - The tiny droplets kill the mosquitoes in the air as well as on water.
- ▶ By making 2 ULV treatments (10 days)
 - reduce adult mosquito densities by more than 98 per cent for several weeks.

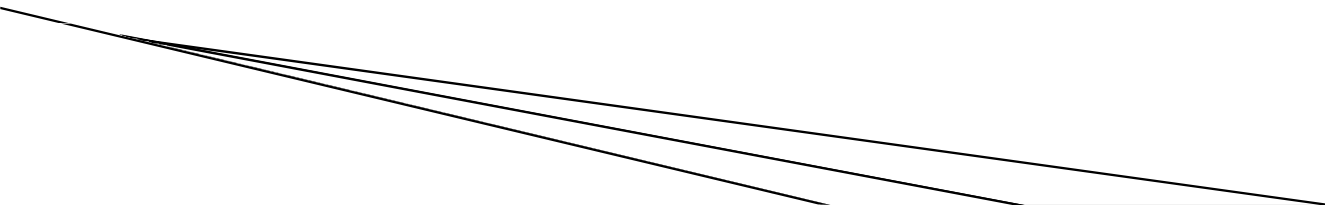


(c) Biological control:

- ▶ Like introduction of larvivorous fish, namely Gambusia and Guppy in water tanks and other water sources.

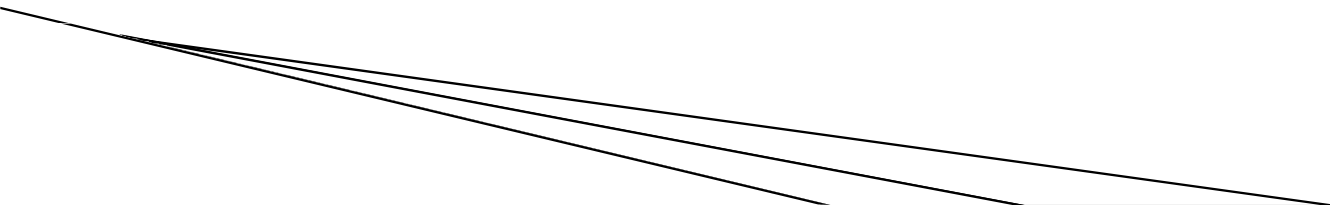


Treatment

- ▶ **No specific treatment** of chikungunya infection and it is usually self limiting.
 - ▶ Analgesics, antipyretics like paracetamol, diclofenac sodium, chloroquine along with fluid supplementation are recommended to manage infection and relieve fever, joint pains and swelling.
 - ▶ Drugs like aspirin and steroids avoided.
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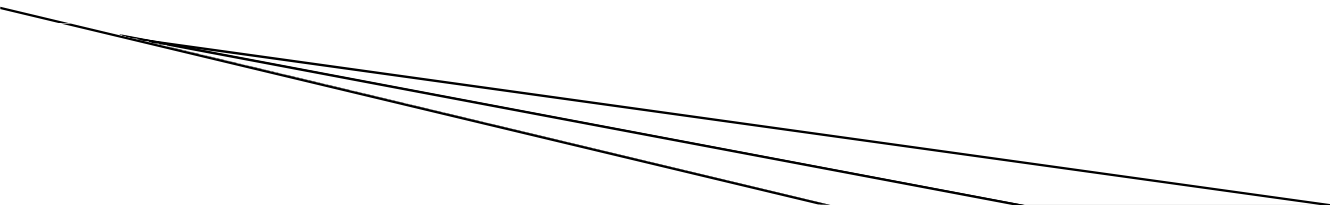
Preventive measures

- ▶ There is neither chikungunya virus vaccine nor drugs are available to cure the infection.
- ▶ Prevention, therefore, centers on avoiding mosquito bites.
- ▶ Eliminating mosquito breeding sites is another key prevention measure.



To prevent mosquito bites, do the following:

- ▶ Use mosquito repellents on skin and clothing
- ▶ When indoors, stay in well-screened areas. Use bed nets if sleeping in areas that are not screened or air-conditioned.
- ▶ When working outdoors during day times, wear long-sleeved shirts and long pants to avoid mosquito bite.



Yellow Fever

Facilitator:

Dr. NAVEEN KRISHAN GOEL

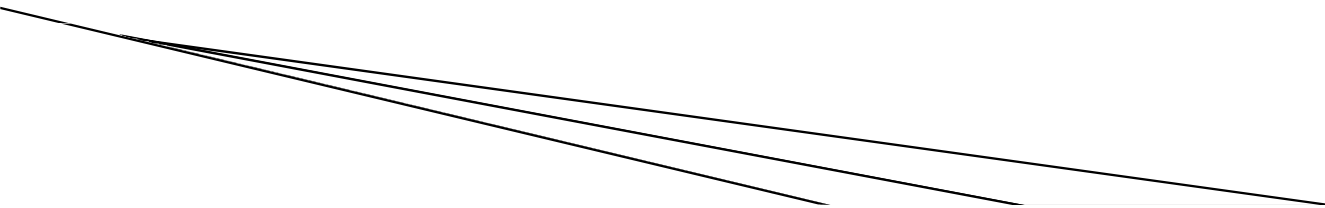
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Yellow fever

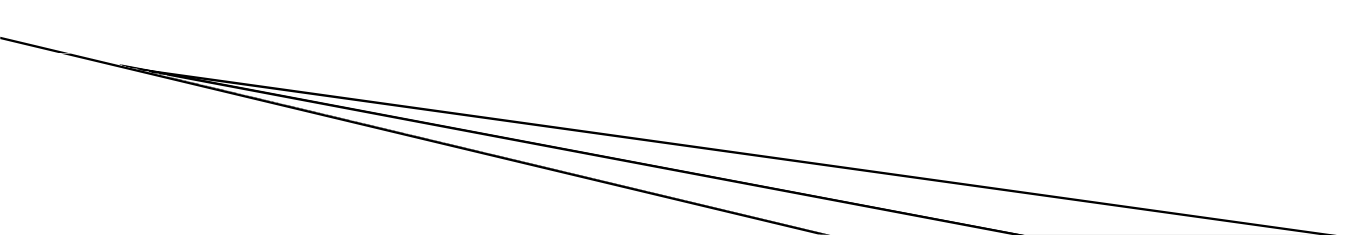
- ▶ Yellow fever was the first viral haemorrhagic fever to be described.
- ▶ It is a mosquito – borne infection endemic to Africa and South America.
- ▶ Its presentation is widely variable ranging from a minimal flulike illness to a fulminant disease characterized by haemorrhage, hepatic failure, renal failure and death.
- ▶ Yellow fever has been cited in historic texts dating back to 400 years ago.
- ▶ The “yellow” in the name originates from the jaundice that occurs in seriously ill patients.

Epidemiology: Global

- ▶ Confine almost entirely to South and Central America and Africa.
 - The virus is constantly present with low levels of infection in these areas.
 - Periodically this viral presence amplifies into regular epidemics.
- ▶ Over 500 million people live in 31 endemic countries in Africa and are considered to be at risk of suffering from Yellow fever.
- ▶ In South America, over 400 million people live in 13 endemic countries and in several Caribbean islands.
 - at high risk: Bolivia, Brazil, Colombia, Ecuador and Peru.

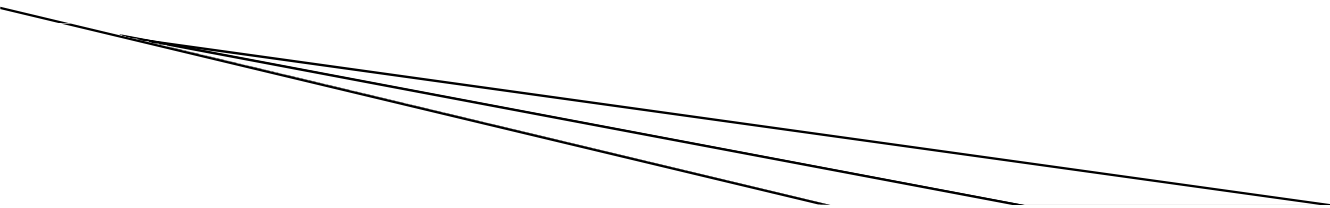
- ▶ The global incidence of Yellow fever fluctuates with the occurrence of large epidemics in Africa.
 - ▶ The World Health Organization estimates (early 1990s), every year:
 - 2,00,000 cases of Yellow fever with 30,000 estimated deaths.
 - ▶ However, due to underreporting, only a small percentage of these cases are identified.
 - ▶ A small number of imported cases also occur in countries free of Yellow fever.
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- ▶ In the past centuries (XVII to XIX), outbreaks of yellow fever were reported in:
 - North America (Charleston, New Orleans, New York, Philadelphia, etc)
 - Europe (England, France, Ireland, Italy, Portugal and Spain).
- ▶ Yellow fever has never been reported from Asia.
- ▶ However, WHO considers this region to be at risk because the appropriate primates and vectors are present.

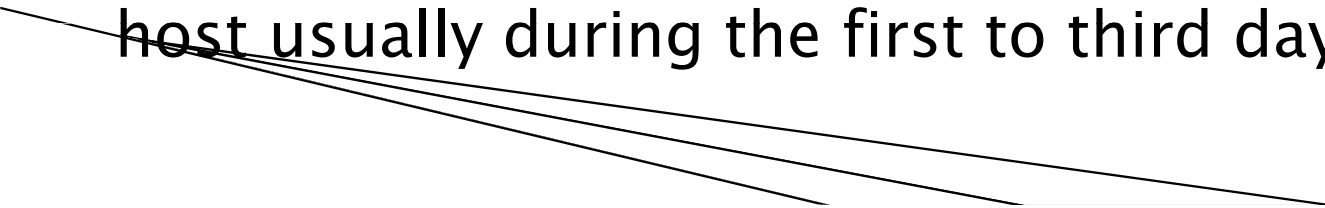


Agent

- ▶ *Flavivirus*, belonging to the family *Togaviridae*.
- ▶ A small (40 to 60 nm), single stranded positive sense, enveloped RNA virus.
- ▶ The envelope consists of a lipid bilayer containing an envelope glycoprotein and a matrix protein.

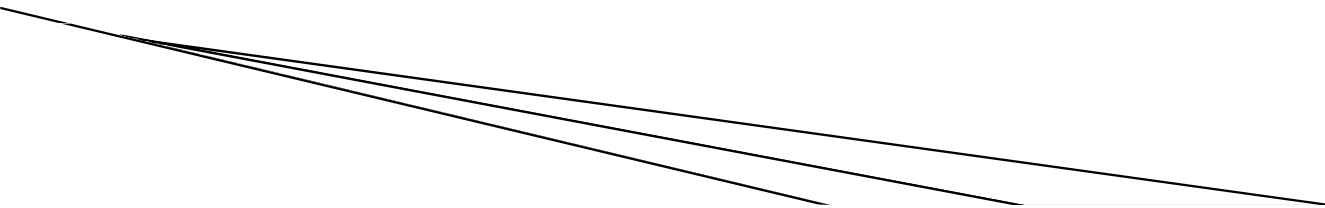


Vectors

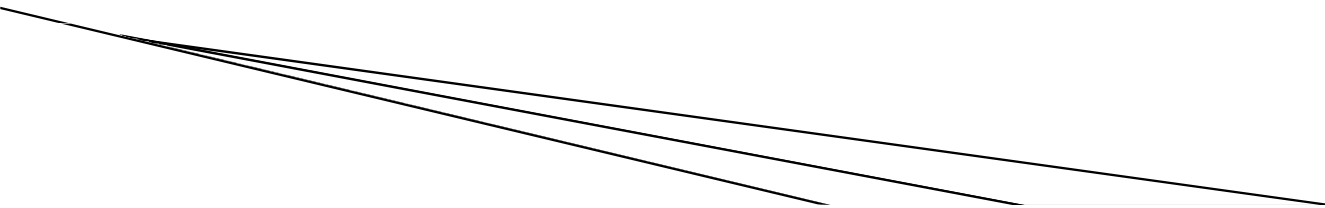
- ▶ *Aedes* mosquitoes and *Haemogogus* (only in South America).
 - In Africa, the principal vectors for forest transmission are the *Aedes africanus* and *Aedes simpsoni*.
 - In both the continents, the principal urban vector is the *Aedes aegypti*.
 - In South America *Haemogoggus spegazzinii* is the principal vector for forest transmission.
 - ▶ May be domestic (breeding close to and around houses), wild (breeding in the jungle) or semi – domestic types.
 - ▶ Female mosquitoes become infected by feeding on an infected host usually during the first to third day of fever.
- 

- ▶ **Extrinsic incubation period in the mosquitoes:**
 - From 4 to 18 days (avg. 12 days) depending on the ambient temperature.
 - ▶ Once the mosquito becomes infective, it remains so for the rest of its life.
 - ▶ During subsequent blood meals, the virus is transmitted to a new vertebrate host.
 - ▶ In addition, Yellow fever virus can be transmitted **transovarially**, allowing viral survival in the absence of adult mosquitoes.
- ▶ **Intrinsic incubation period in human beings is between 2 – 6 days.**

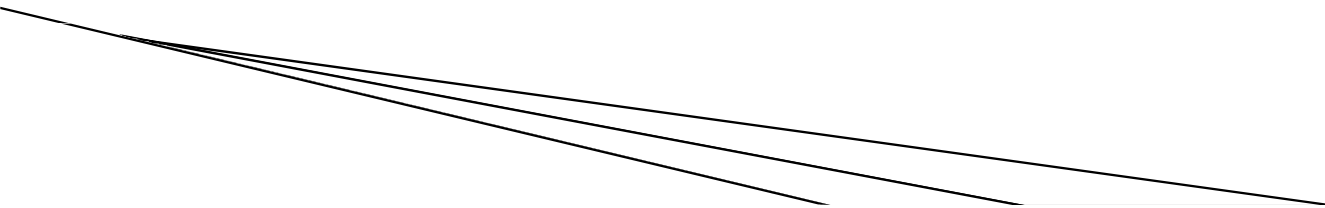
Host

- ▶ Humans and monkeys are the principal hosts.
 - ▶ The reservoir of urban Yellow fever is sub – clinical human cases.
 - ▶ For rural Yellow fever the most important animal reservoir is the monkey.
 - ▶ In endemic areas almost 30% monkeys may be infected.
 - ▶ Monkey is the only reservoir for jungle Yellow fever
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Transmission

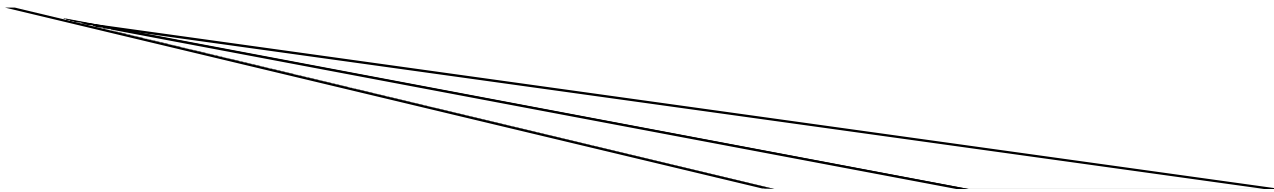
- ▶ Three transmission cycles can be distinguished in Africa:
 1. The sylvatic (in jungle areas, mainly affecting the wild monkeys),
 2. The intermediate (primarily affecting both man and monkeys) and
 3. The urban (mainly affecting human beings in high population density areas).
 - ▶ In South America, only the sylvatic and urban Yellow fever cycles of transmission are seen.
 - ▶ The normal low risk to travellers increases with travel to jungle areas in endemic countries and in or near cities during urban outbreaks.
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Period of Communicability

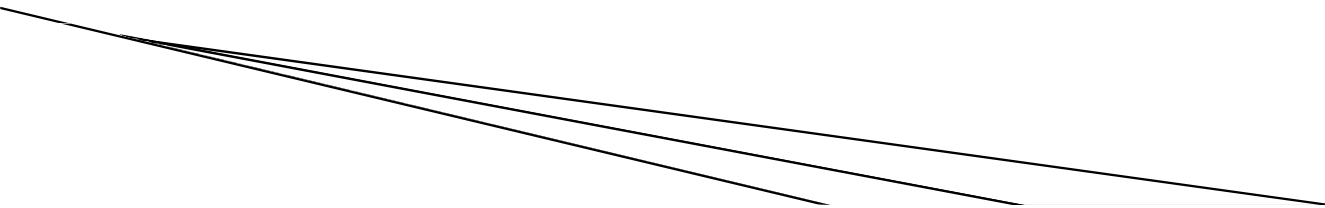
- ▶ The case is infective to the vector mosquito during the later part of the incubation period and first three clinical days.
 - ▶ An infected individual, therefore, can spread infection for about four to six days, starting two to three days after exposure to the infection.
 - ▶ It is to prevent the entry of such individuals in India that rigorous rules and regulations are enforced.
- 

Clinical features

- ▶ Some infections may be completely asymptomatic.
- ▶ The disease presents in two phases.
- ▶ “Acute” phase:
 - fever, muscle pain, headache, loss of appetite, nausea and vomiting.
 - The high fever may be paradoxically associated with a slow pulse.
 - After three to four days most patients improve and their

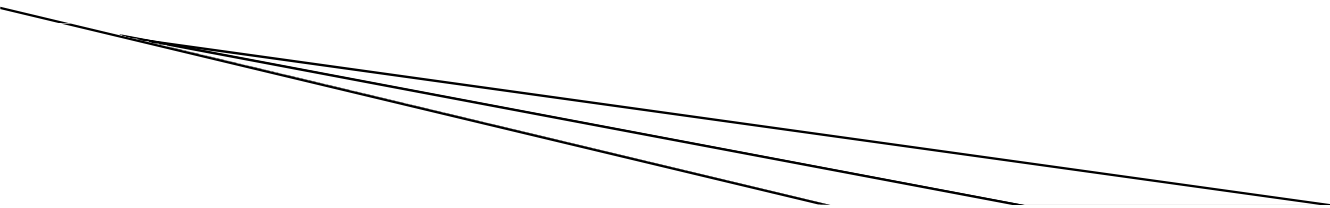


‣ **“Toxic phase”**

- About 15% of patients enter a “toxic phase” within 24 hours.
 - rapidly develops jaundice, abdominal pain with vomiting.
 - Bleeding can occur from the mouth, nose, eyes and/ or stomach.
 - Blood may appear in the vomit and faeces.
 - Kidney function deteriorates.
 - About half of the patients in the “toxic phase” die within 10 – 14 days.
 - The remaining recover without significant organ damage.
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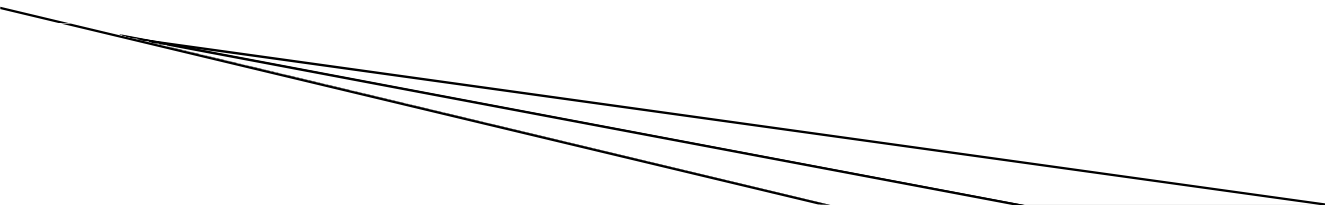
Diagnosis

- ▶ Yellow fever is difficult to recognize, especially during the early stages.
- ▶ It can easily be confused with malaria, typhoid, rickettsial diseases, haemorrhagic viral fevers, dengue fever, leptospirosis and viral hepatitis

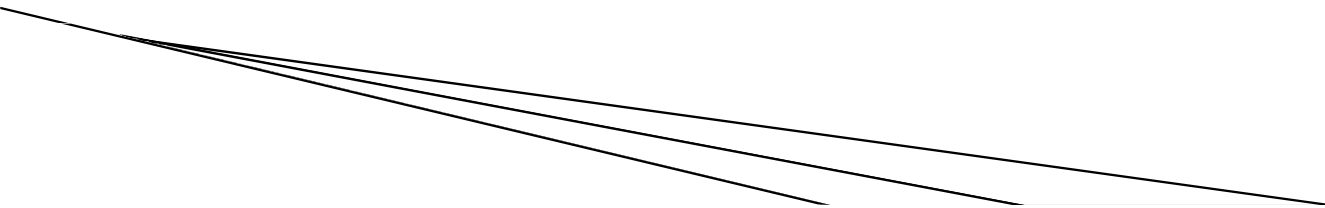


Lab investigations

- Leukopenia
 - Thrombocytopenia
 - Prothrombin time & Clotting time prolonged
 - LFTs deranged

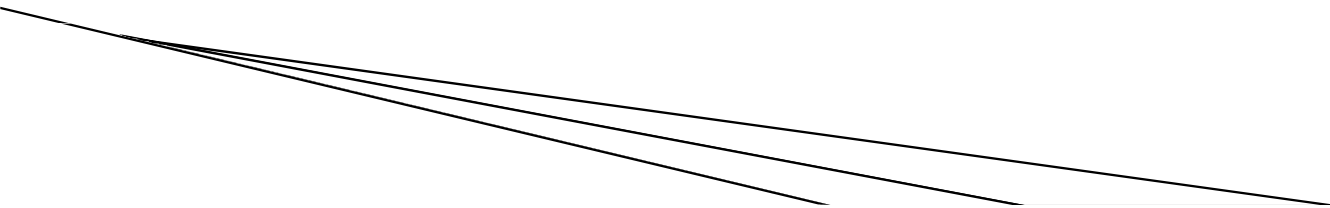
 - PCR
 - ELISA
 - HI, CFT
 - Isolation of virus
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Treatment

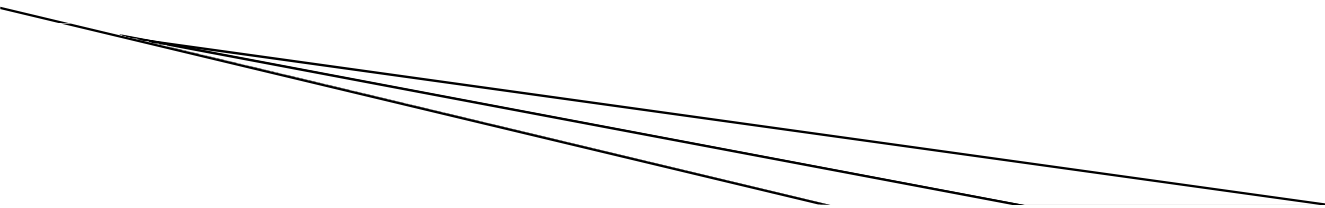
- ▶ No specific treatment for Yellow fever.
 - ▶ Supportive care is critical.
 - ▶ Dehydration and fever must be corrected with oral rehydration salts and anti – pyretics.
 - ▶ Any superimposed bacterial infection should be treated with appropriate antibiotics.
 - ▶ Intensive supportive care may improve the outcome for seriously ill patients.
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Prevention and Control

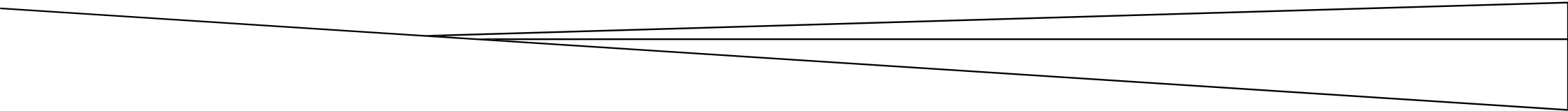
- ▶ Vector control and vaccination are the cornerstones of Yellow fever control.
- ▶ Yellow fever vaccine:
 - ▶ During the 1930s, both wild – type Yellow fever virus strains, Asibi and French, were attenuated to derive live vaccines known as 17D and the French neurotropic.
 - ▶ Currently, 17D is the only strain of Yellow fever virus used for vaccination c vaccine, respectively



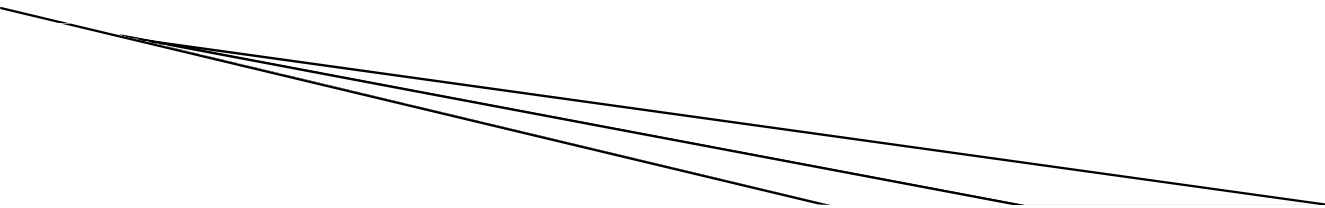
Yellow fever vaccine

- ▶ More than 95% of vaccinated people develop neutralizing antibodies within 10 to 14 days of immunization.
 - ▶ The international Yellow fever vaccination certificate becomes valid 10 days after vaccination and remains valid for a period of 10 years.
 - ▶ 0.5 ml, Subcutaneously, upper arm.
 - ▶ A single dose of yellow fever vaccine is sufficient to confer sustained immunity and life-long protection against yellow fever disease.
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Kyasanur Forest Disease (KFD)

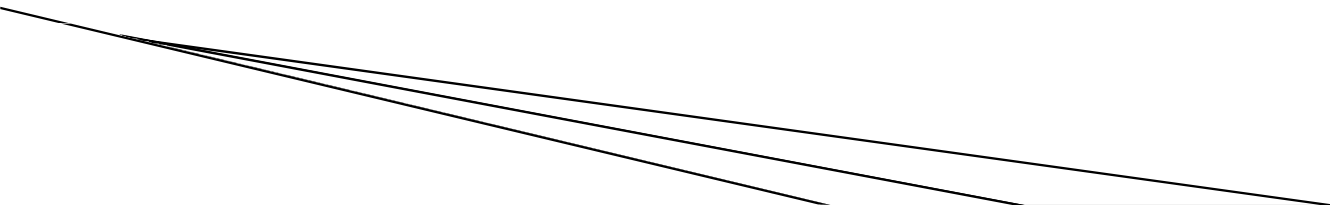


Kyasanur Forest Disease

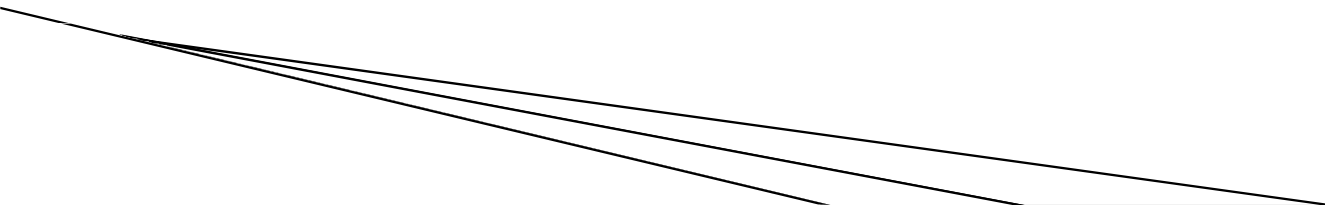
- ▶ Febrile disease associated with haemorrhages
 - ▶ Arbovirus flavivirus
 - ▶ Ticks
 - ▶ First recognize in 1957 in Shimoga district (Karnataka)
 - ▶ 'Monkey disease' because associated with dead monkeys.
 - ▶ KFD named after the locality (Kyasanur forest) from where virus was first isolated.
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Magnitude of problem

- ▶ Four districts in Karnataka (Shimoga, North Kannada, South Kannada and Chikamagaloor)
- ▶ Outbreak in 1983–84: 2167 cases and 69 deaths
- ▶ Deaths of monkeys are considered as heralds of this disease in endemic areas.



Natural hosts and Reservoirs

- ▶ Rats and Squirrels: main reservoirs.
 - ▶ Bats and birds: less important hosts.
 - ▶ Monkeys: Amplifying hosts but *not effective maintenance hosts*.
 - ▶ Cattles: important in maintaining tick population.
 - ▶ Man: incidental or dead end host.
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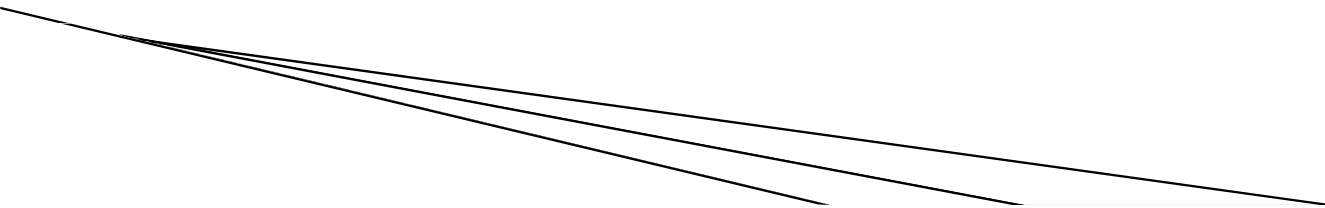
▶ **Mode of transmission:**

- Bite of infective ticks (nymphal stage)
- No evidence of man to man transmission.

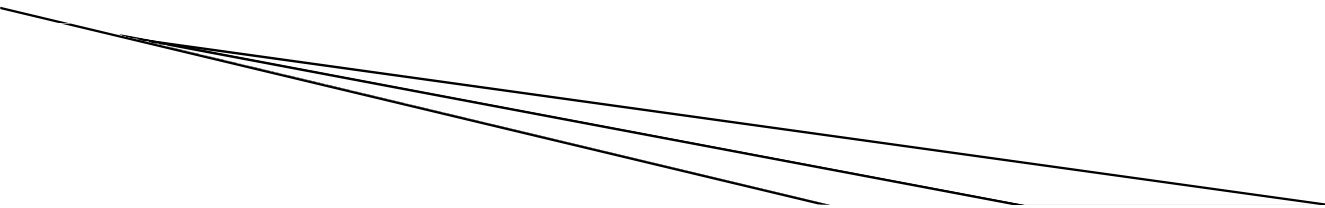
▶ **Incubation period:**

- 3 – 8 days.

▶ **Case fatality rate:**

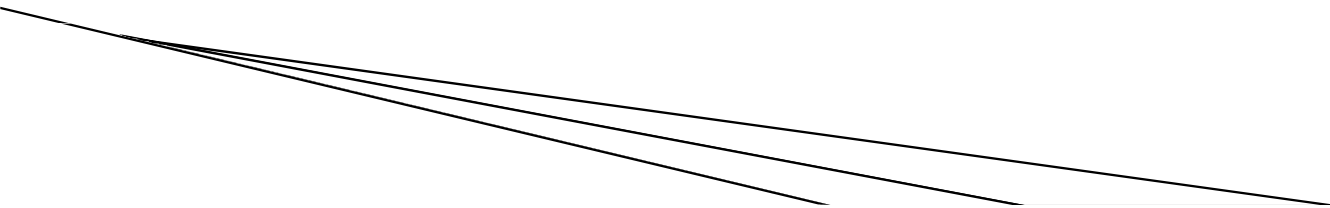
- 5–10 %
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Clinical features

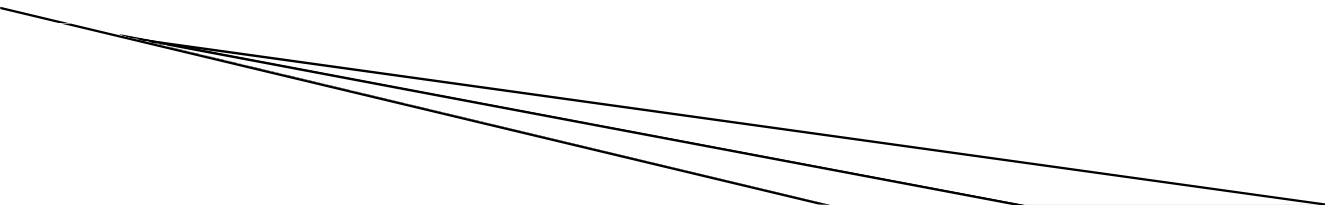
- Sudden onset of fever, headaches, myalgia
 - GI disturbances
 - Hemorrhages from nose, gums, stomach and intestine may occur
 - Mild meningoencephalitis
-
- **Diagnosis:**
 - Detection of virus in blood and/or serological evidence.
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Prevention and Control

- ▶ Control of Ticks
- ▶ Vaccination of population at risk with killed vaccine
- ▶ Personal protection
- ▶ Health education



Q Fever

- ▶ Zoonotic disease
 - ▶ *Coxiella burnetti* : causative agent
 - ▶ Ticks: vectors as well as reservoirs
 - ▶ Hosts: cattle, sheep, goats, tick
 - ▶ Transmission:
 - inhalation of infected dust from soil contaminated by urine or feces of diseased animal
 - through abrasions, conjunctivae or ingestion of contaminated foods e.g. meat, milk
- 

- ▶ **Incubation period:** 2–3 weeks
- ▶ **Clinical features:** acute onset of fever, chills, general malaise and headache.
- ▶ No rash
- ▶ Can cause pneumonia, hepatitis, encephalitis and rarely endocarditis.

- ▶ ***Prevention and Control measures:***

- ▶ Treatment: Doxycycline for 18 months or longer.
 - ▶ Pasteurization
 - ▶ Sanitary cattle sheds
- 