



Vector Borne Diseases: Prevention, Treatment and Control

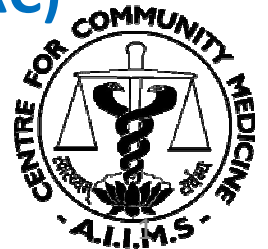
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शरीरपात्रं खलु धर्मसाधनम्



Outline of Presentation

- **Common Vector Borne Diseases in India**
- **Malaria**
- **Dengue**
- **Chikungunya**
- **Filaria**
- **Japanese Encephalitis Kala azar**
- **Prevention from the Vector Borne Diseases**

Common Vector Borne Diseases in India

- Malaria
- Dengue
- Chikungunya
- Filaria
- Japanese Encephalitis
- Kala azar

Mosquito

- Sandfly

Small Bite - Big Threat



Mosquito



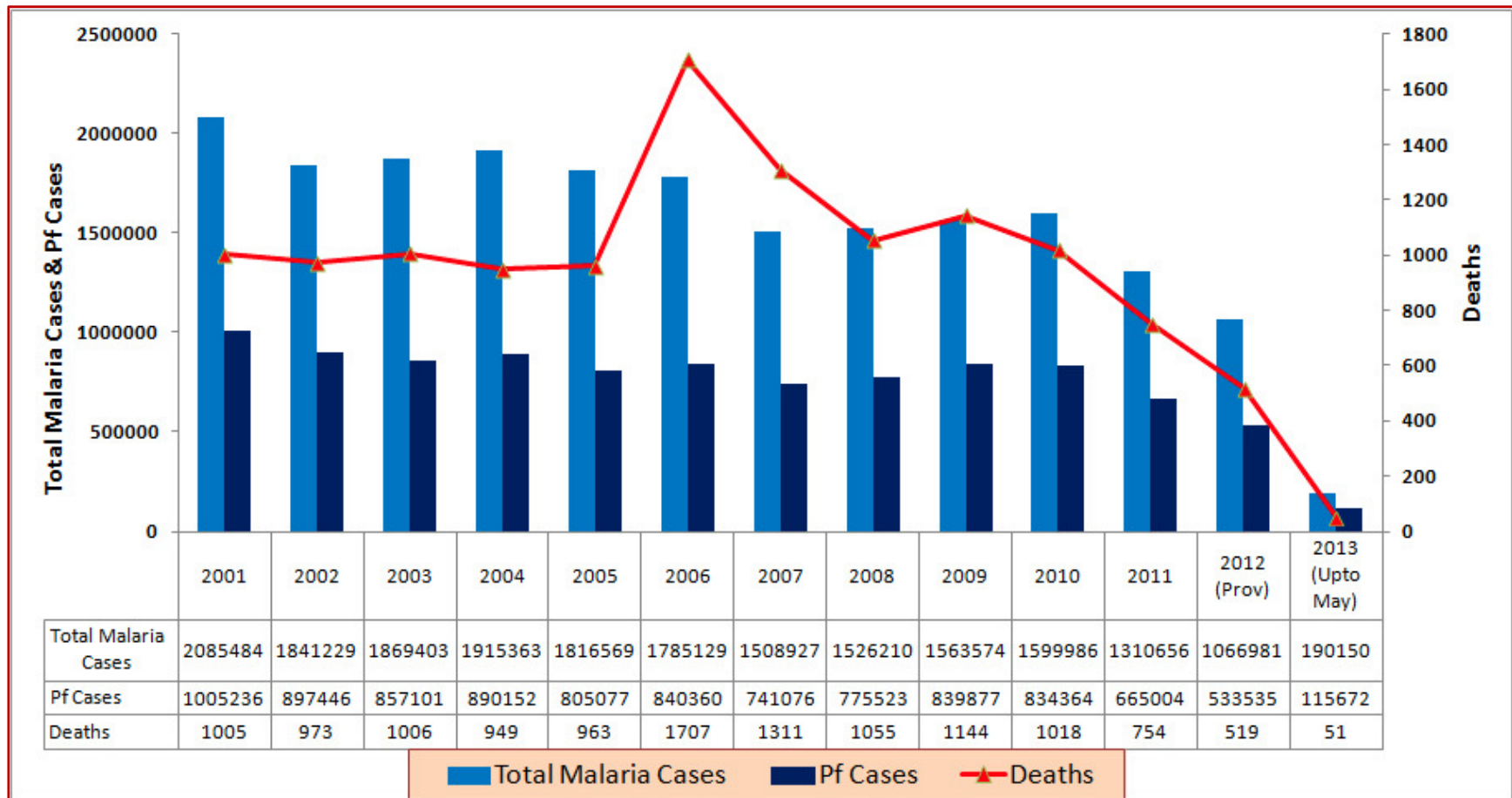
Sandfly

Malaria

Malaria

- **Mal'aria means "bad air"**
(Originally thought to be caused by foul air)
- **A life-threatening protozoan disease**
- **40% of the world's population is at risk of getting the disease**
- **80% of population in India lives in low malaria endemic region**
- **80% of malaria burden in India is confined to 20% of population that live in malaria endemic region in India**

Trend of Malaria indices in India, 2001-13



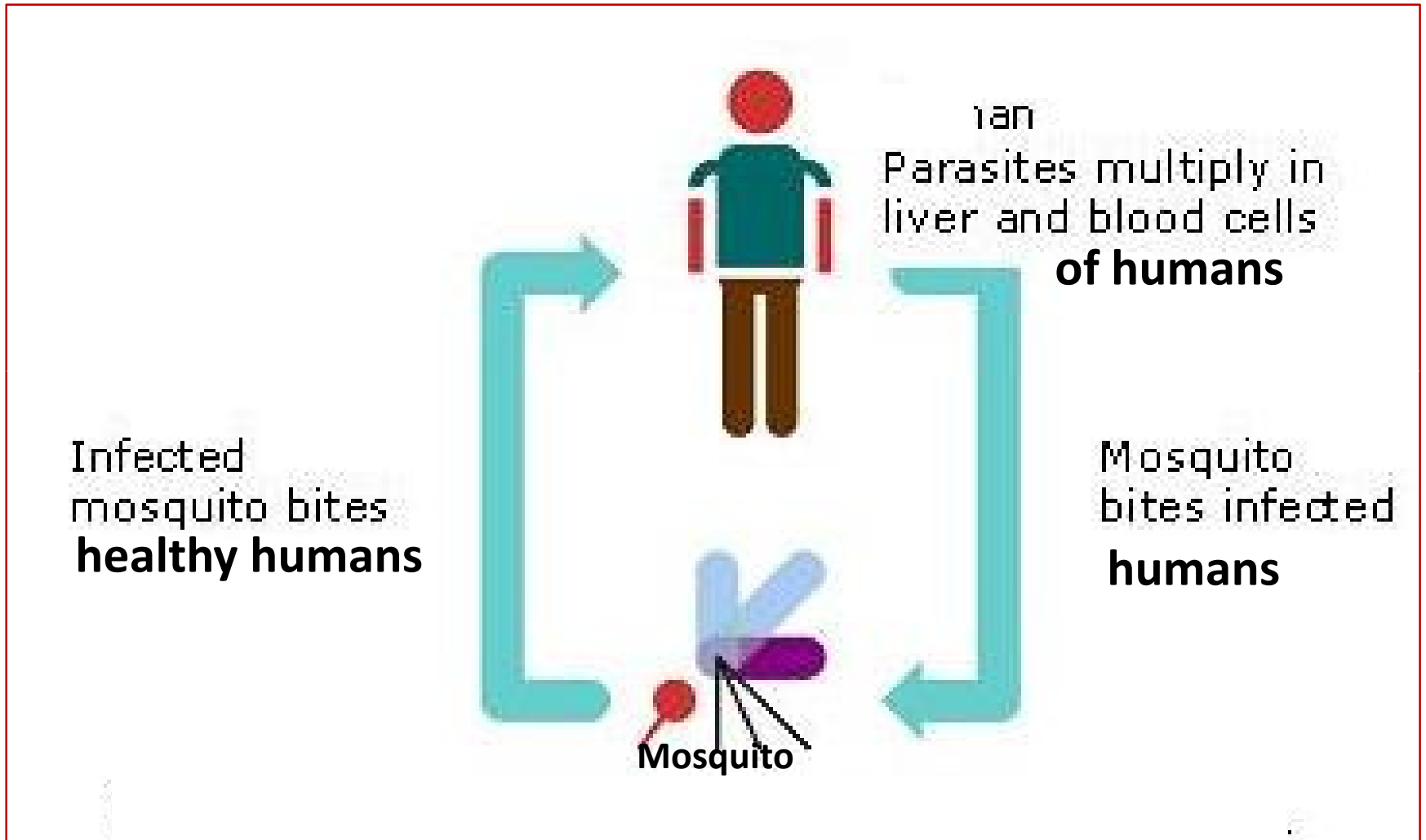
Source - <http://nvbdcp.gov.in/malaria3.html>

Mosquito

- **Female anopheles mosquito is the vector**
 - *P. vivax*
 - *P. Falciparum*
- **The mosquito breeds in polluted water bodies, brackish water, wells, cisterns, fountains, overhead tanks etc.**
- **Mosquito bites during night time**



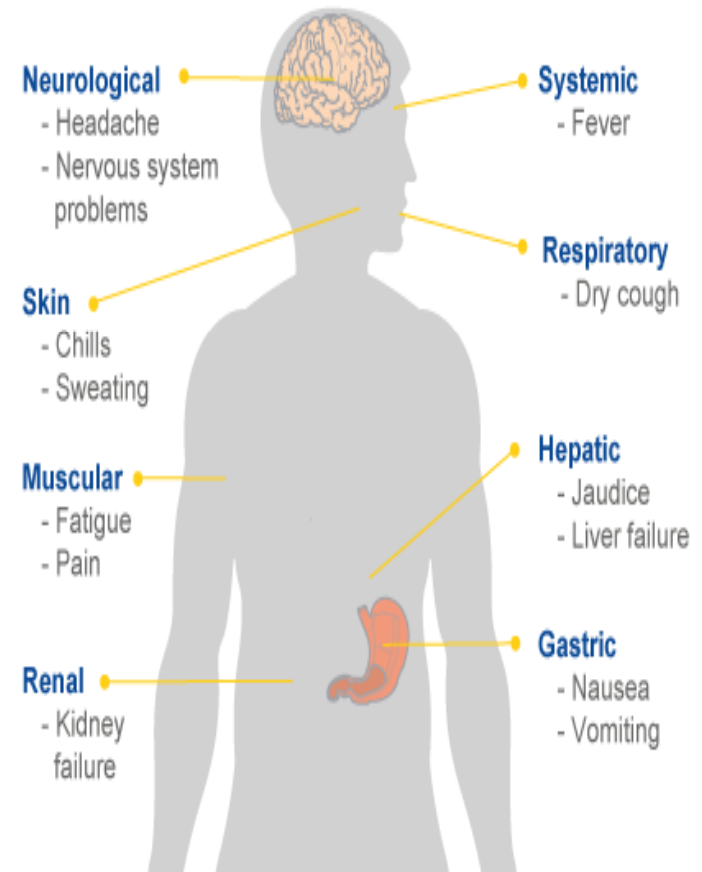
Transmission Cycle



Common Symptoms

Symptoms:

- **Fever (High grade)**
- **Chills & rigors**
- **Headache**
- **Body ache**
- **Non specific symptoms**



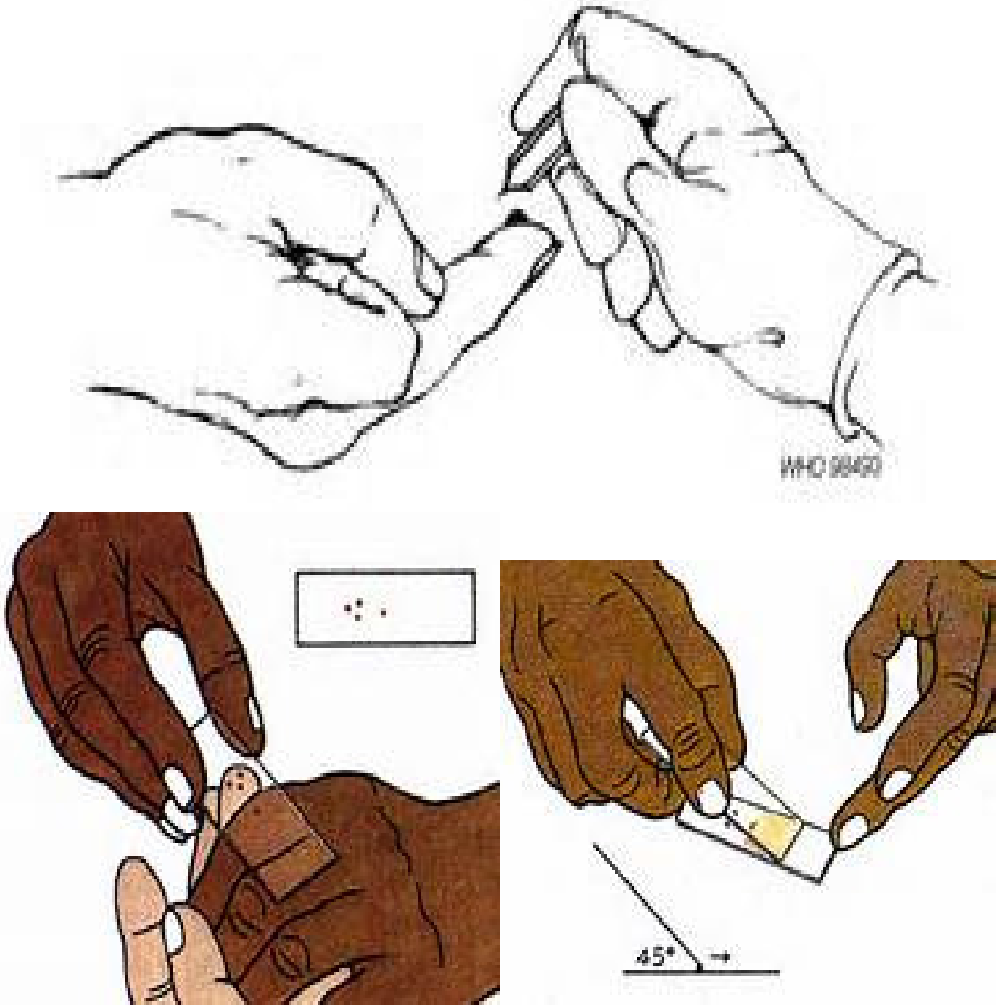
Severe Malaria - consequences

- **Jaundice**
- **Seizure**
- **Bleeding problems**
- **Liver failure**
- **Kidney failure**
- **Multi organ failure**
- **“Death” also as a possible outcome**

Diagnosis



Rapid Diagnostic Kit Test



Traditional slide test for parasite

Treatment

- **Rest and fever control (Tab.Paracetamol)**
- **Cold Sponging**
- **Chloroquine for three days**
- **Plasmodium vivax – Primaquine for 14 days (in addition to chloroquine)**
- **Plasmodium falciparum – Artesunate Based Combination therapy**
- **Severe malaria may require**
 - **Artesunate based combination therapy**
 - **Quinine**
- **Infants and pregnant women for giving special attention**

“Require immediate attention” with danger signs

- **Patient becomes unconscious**
- **Severe headache**
- **Seizures**
- **Bleeding from any site**
- **Development of jaundice**
- **Unable to pass urine**

Facilities available at AIIMS

- **Diagnosis of Malaria and its complications**
 - **Kit test**
 - **Slide test**
 - **Fluorescent microscopy**
 - **PCR**



- **Available at:**
 - **Dept of Microbiology**
 - **Dept of Pathology**

- **Management of malaria and its complications**
 - **Treatment of malaria**
 - **Blood transfusion**



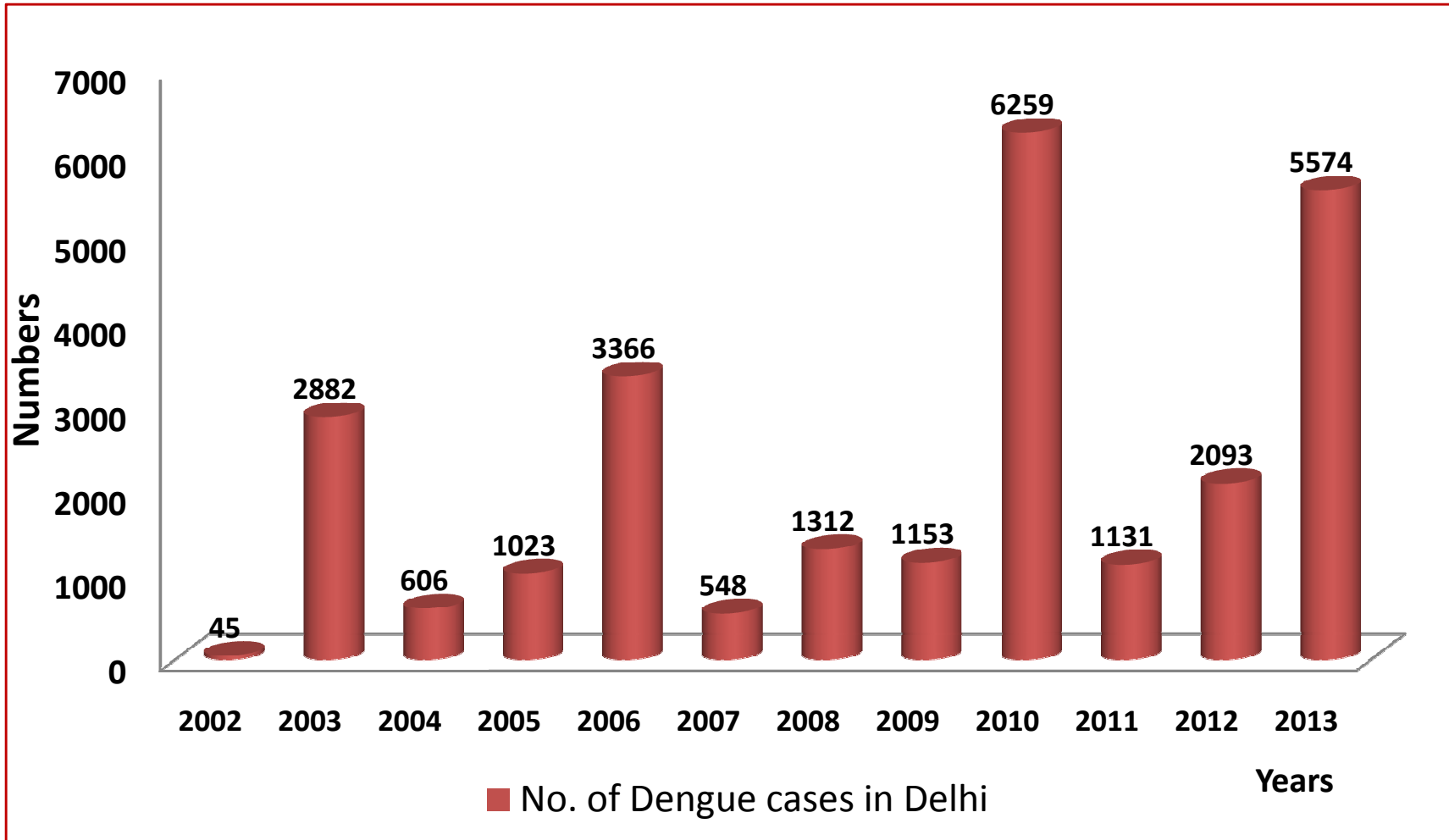
- **Available at:**
 - **Dept of Medicine/Pediatrics**
 - **Blood bank**

Dengue

Dengue

- Dengue fever is caused by Dengue virus
- It is pronounced as “Dengee”
- Occurs in **epidemic form** from time to time
- Common name of the disease is ‘**break-bone fever**’
(*Haddi Tod Bukhar*)

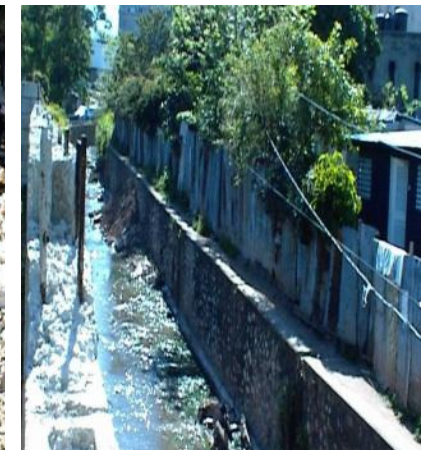
Reported Dengue Cases in Delhi, 2002 – 2013

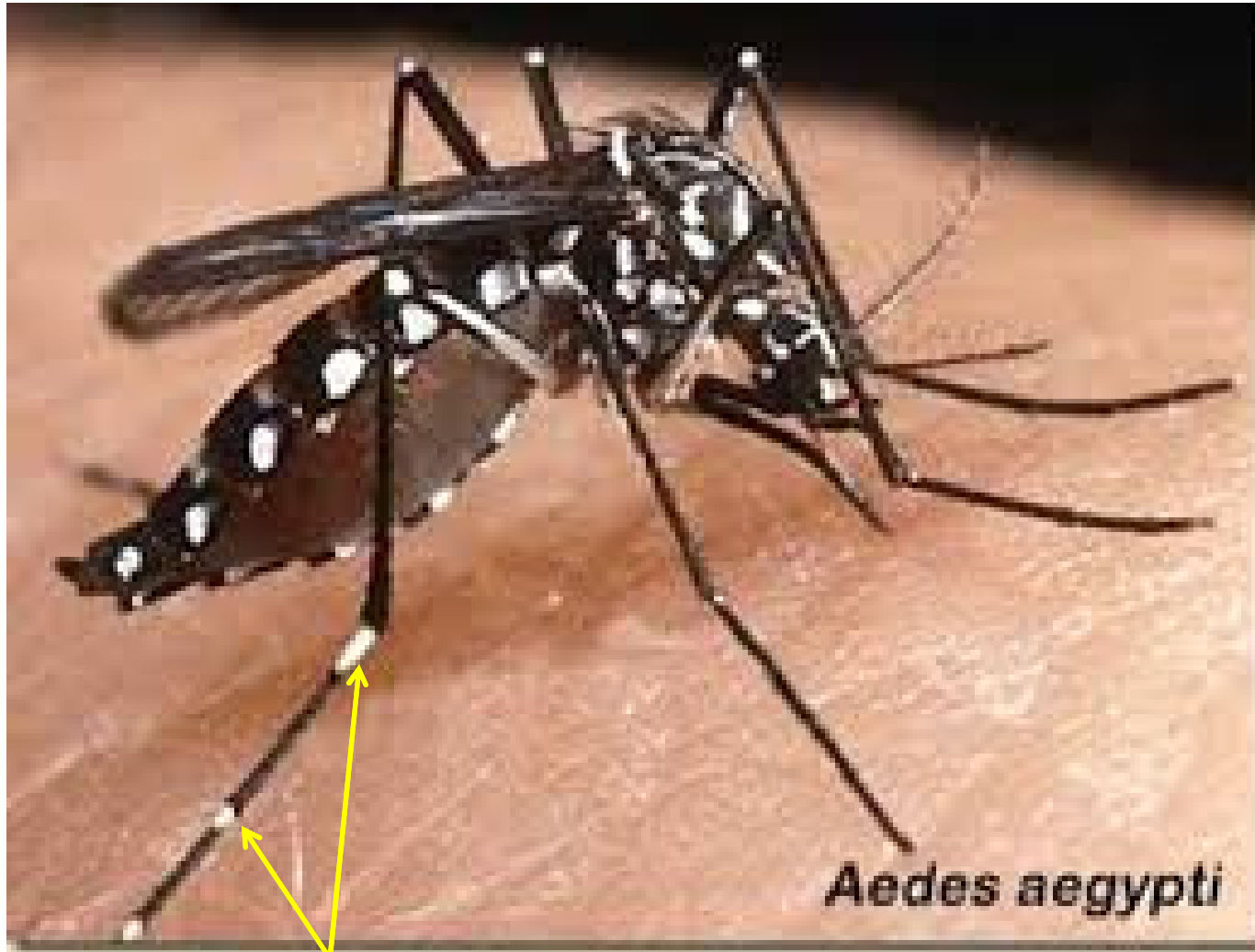


Source - <http://nvbdcp.gov.in/malaria3.html>

What is Dengue ?

- Common disease in tropical and subtropical countries
- Causative agent is a **virus**
- The vector is mainly a mosquito called *Aedes aegypti* commonly known as ***Tiger Mosquito***
- Environment Helps transmission





Presence of black and white patches over the legs (Tiger Mosquito)

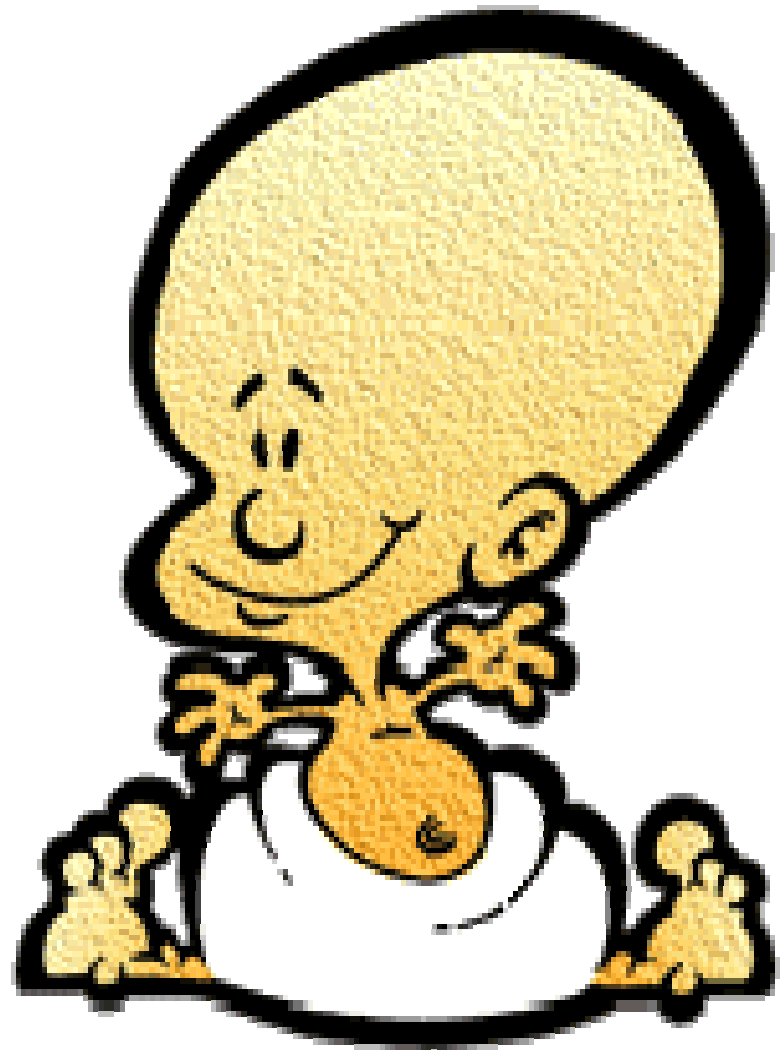
Environmental Factors

- Season: **July – December**
- Biting time mostly during **day**
- Ideal Temperature- **20-28 degree Celsius.**
- Humidity - high
- Tiger mosquito breeds in fresh water pools

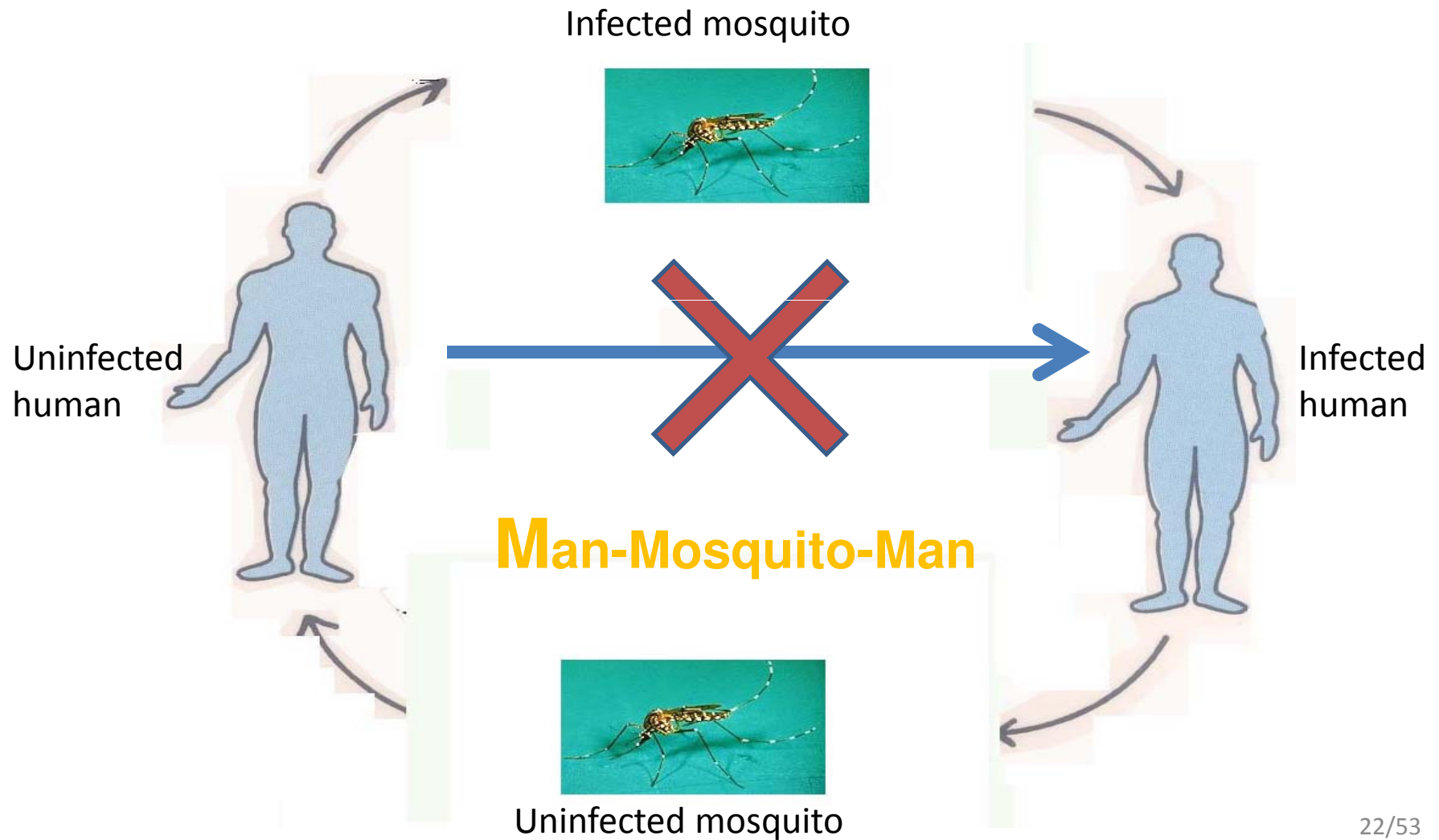


Vulnerability to Dengue

- All age groups & both sex are vulnerable
- Those previously infected by dengue are more likely to experience severe form of disease, if re-infected



Transmission Cycle



Symptoms

- **Fever**
- **Rash**
- **Headache**
- **Muscle pain**
- **Joint pain**
- **Pain behind the eyes**

Dengue Hemorrhagic fever

- **Decrease in Platelet count (a component of blood) leads to bleeding**
 - **Bleeding from gums**
 - **Bleeding into joints**
 - **Bleeding under the skin causing its discolouration**
 - **Petecheal hemorrhages**
 - **In gut causing black colored stools or even frank blood**



Treatment

- **Fluids**
- **Rest**
- **No injections are required**
- **Paracetamol for pain and fever**
- **Monitor platelet count and Blood pressure**
- **In severe cases, platelet transfusion /blood transfusion**



“Require immediate attention” with danger signs

- **Bleeding from any site**
- **Severe abdominal pain**
- **Prolonged frequent vomiting**
- **Unconsciousness**
- **Raise in the temperature**

Facilities Available at AIIMS

- **Diagnosis**

- Kit test
- Virus culture
- Reverse Transcriptase Polymerase Chain Reaction (RT-PCR) test
- Arterial Blood Gas (ABG) analysis



- **Available at:**

- Dept of Microbiology
- Dept of Pathology

- **Treatment**

- In-door admission
- IV infusion
- Blood transfusion



- **Available at:**

- Dept of Medicine/Pediatrics
- Blood bank

Japanese Encephalitis

Japanese Encephalitis (JE)

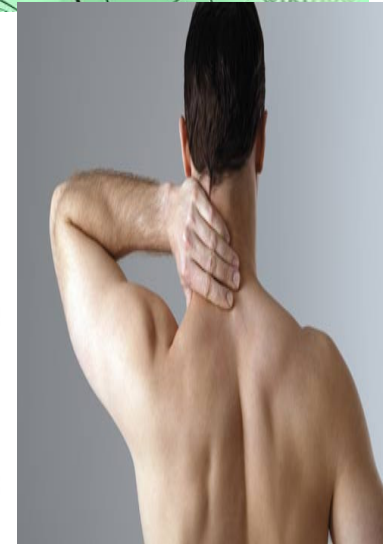
- **JE is mostly present in in Southern India, Uttar Pradesh, North Eastern states, Haryana**
- **Agent - Group B arbovirus (Flavivirus)**
- **Transmitted by Culex mosquitoes**

Symptoms

- **Starts with**
 - **Fever**
 - **Headache**
 - **Weakness**

Rapidly progress to

- **High grade fever**
- **Neck pain**
- **Vomiting**
- **Seizure**
- **Inability to speak**
- **Paralysis**



Treatment

- **Consists of symptomatic management .**
- **May include**
 - **Sponging for fever**
 - **Paracetamol**
 - **Drugs for Seizure**
 - **Oxygen therapy**
 - **Patient may need referral to higher level of health care facility**

Danger signs

- **Unconsciousness**
- **Seizure**
- **Poor respiration**
- **Paralysis**

Chikungunya

Epidemiology

- **Viral disease**
- **Transmitted by tiger mosquito (*Aedes Aegyptus*)**
- **Out break of chikungunya in India occurred in 2006,
affecting 14 lakh people**

Symptoms

- **Fever**
- **Chills**
- **Headache**
- **Generalized body ache**
- **Skin rash**
- **Small joint pains**

Treatment

- **Analgesics**
 - **Paracetamol**
 - **Diclofenac**
- **Plenty of fluid**
- **Avoid aspirin**
- **Normal food intake**



Filaria

Epidemiology

- **Caused by : Microfilaria**
- **Transmitted by : Culex mosquito**
- **Mainly prevalent in costal areas due to hot and humid conditions**



Culex mosquito

Clinical features

- Majority remains asymptomatic
- Fever
- Swelling and pain in limbs
- Permanent disfigurement of limbs
- Some people may develop allergic reactions



Diagnosis & Treatment

• DIAGNOSIS

- Blood examination for microfilaria
- Antibody test

• TREATMENT

- Di-Ethyl Carbamazine with Albendazole
- Ivermectin with Albendazole



Ivermectin
+
Albendazole



DEC
+
Albendazole



“Require immediate attention” with danger signs

Generally filariasis do not lead to any life threatening complication

Medication cause larval death in body which could sometimes lead to allergic reactions like swelling of body, itching etc.

Any reactions after taking medication should be reported to the doctor

Kala-Azar

Epidemiology

- **Caused by parasite
Leishmania donovani**
- **Transmitted by sandfly**
- **The organism may remain in
the body for a long time in
liver, spleen and bone**
- **In India found in
Bihar, Jharkhand, West Bengal
and pockets of Uttar Pradesh**



Clinical features

- Intermittent fever
- Weakness
- Fullness of abdomen due to increase in size of liver and spleen
- Grey discoloration of skin with loss of hair
- Decrease in hemoglobin



Management

Diagnosis

- **Blood test for antibody**
- **Dipstick test**
- **ELISA**
- **Biopsy**



- **Available at:**
 - **Dept of Microbiology**
 - **Dept of Pathology**

Management

- **Sodium stibogluconate**
- **Pentamidine**
- **Amphotericin-B**
- **Miltefosine**



- **Available at:**
 - **Dept of Medicine/Pediatrics**

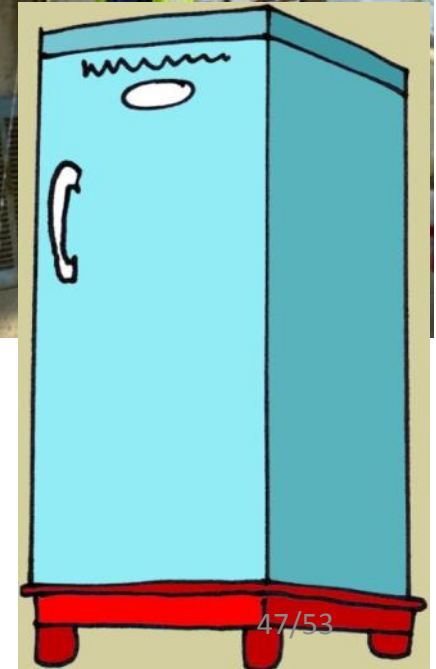
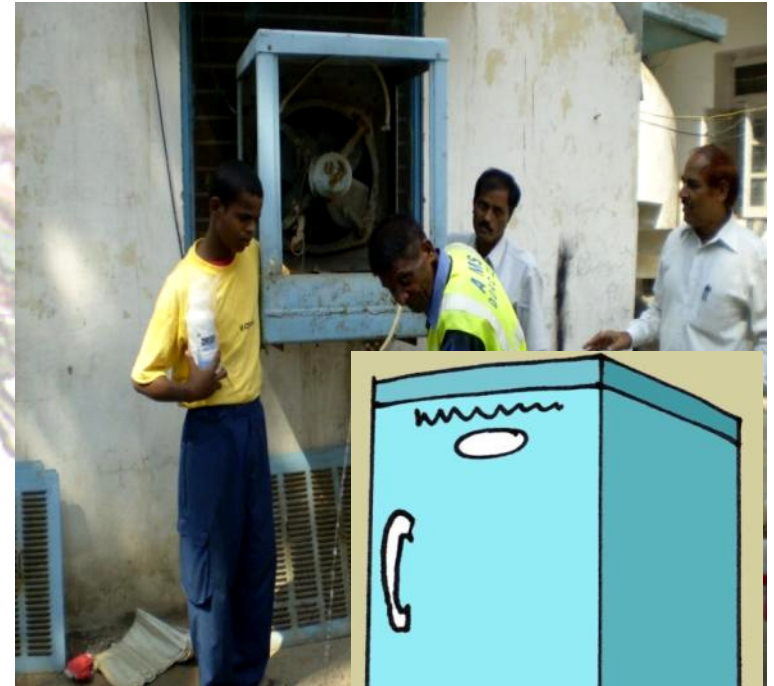


Prevention from the Vector Borne Diseases



1. Reducing the source where the mosquito can breed . . . 1

- **Don't allow** water to remain stagnant in and around your house.
- **Clean** the blocked drains.
- **Empty** - room air coolers and flower vases completely at least **once in seven days** and then refill them
- Tray below the fridge also to be cleaned



1. Reducing the source where the mosquito can breed . . . 2

- **Dispose off old containers, tins, and tyre etc.**
- **Keep the water tanks and water containers tightly covered so that the mosquitoes can not enter them and start breeding**
- **Fill the ditches**



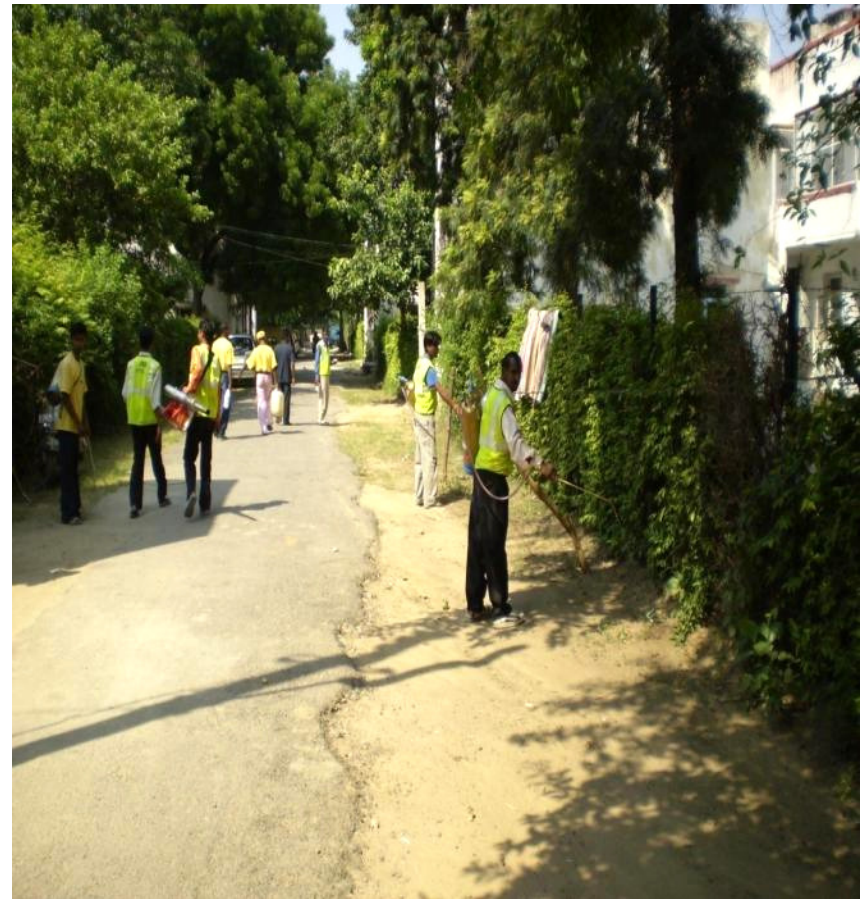
2.Killing the mosquito and larvae . . . 1

- Introduction of some types of small fish (Gambusia, Lebister) which eat mosquito larva into water bodies
- Pouring oil over the water sources



2. Killing the mosquito and Larvae . . . 2

- Don't turn away spray workers whenever they come to spray your house
- Spraying of DDT, Malathion and Pyrethrum etc.
- Spraying over all the walls of the house



2. Killing the mosquito and Larvae . . . 3

- **Don't forget to spray**
 - **Behind the photo-frames**
 - **Curtains**
 - **Calendars**
 - **Corners of house**
 - **Stores**
- **Use insecticidal sprays in all areas within the house at-least once a week**



3. Personal protection

- Wear clothes which cover the body as much as possible
- Mosquito net
- Mosquito nets treated with insecticides
- Mosquito repellent
 - Sprays
 - Creams
 - Coils
 - Mats
 - Liquids



Vector Borne Diseases
can be Easily Prevented!



It is
Your, Mine and ...
***Our* RESPONSIBILITY**