

# Will the experience of malaria control help in the control of dengue in Jaffna district?

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While in the process of eradicating malaria (a mosquito-borne disease) from Jaffna district, the district faces a new challenge of another mosquito-borne disease, namely dengue/dengue hemorrhagic fever.

Dengue hemorrhagic fever and the dengue shock syndrome are fatal, if not treated (no specific drug is available) and supported properly. In addition, studies revealed that most of the victims were school students and their studies were affected, as the patients need long term of rest.

The regional Anti Malaria Campaign (AMC) is working hard, with the alignment of national AMC, towards the eradication of malaria from the Island. The AMC, which follows the WHO protocols, could be able to bring down the malaria cases under control (Fig 1).

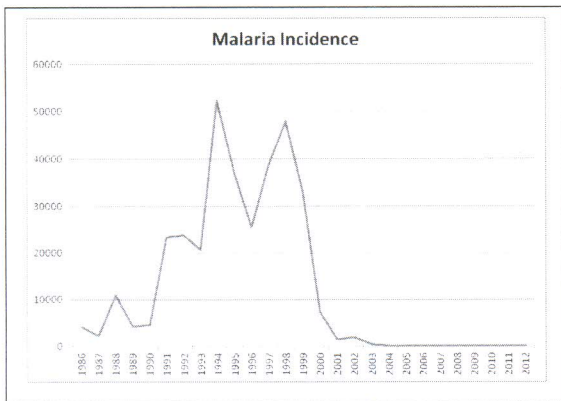


Figure 1: Malaria incidence in Jaffna district from 1986 to 2012

(Source: AMC, Regional Directorate of Health Services, Jaffna)

Needless to say, the district is at the final stage of malaria eradication. But, the AMC is facing the challenge of imported malaria cases (parasites), as the *Anopheles* vector mosquitoes are present in the region.

While about to succeeding in eradicating malaria, dengue/dengue hemorrhagic fever is becoming a major threat to the district (Fig 2).

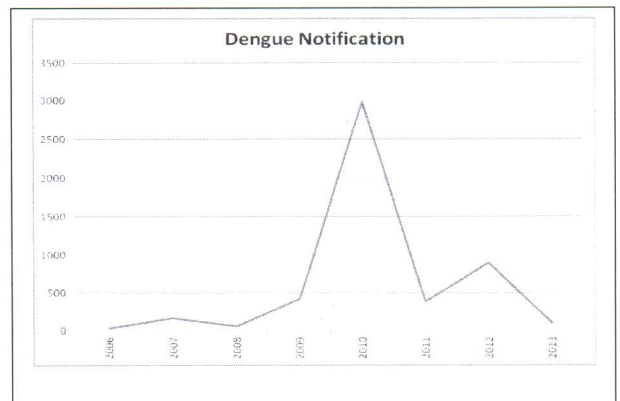


Figure 2: Notified dengue and dengue hemorrhagic fever cases in Jaffna district from 2006 to 2013 April

(Source: Regional Epidemiology Unit, Regional Directorate of Health Services, Jaffna)

In this juncture, let us discuss whether the experience in malaria control can be used to control this newly emerged mosquito-borne disease.

First of all, the AMC is dedicated, committed and worked hard without any disturbances even during the 3 decades of arm conflict prevailed in the region. They achieved their target by following the steps recommended by WHO and the guidance of national AMC

1. Eradicating the parasite
  - a. Early detection (active and passive) of the disease
  - b. Prompt, correct and complete treatment
2. Integrated vector control measures
  - a. Integrating physical, chemical and biological methods
3. Prevent vector man contact
  - a. Issuing bed nets (mainly impregnated bed nets)
4. Surveillance of vector mosquitoes
  - a. Larval collection and adult collection (Cattle Bait Net and Hut collection)
5. Encouraging community participation

Let us compare the diseases malaria and dengue in the aspects of causative organism and the vector (Table 1)

Table 1: Comparison of malaria and dengue

	<b>Malaria</b>	<b>Dengue</b>
<b>Causative organism</b>	Protozoa ( <i>Plasmodium</i> spp)	Virus (Dengue virus)
<b>Treatment</b>	Drugs available	Drugs NOT available
<b>Vector</b>	<i>Anopheles</i> spp	<i>Aedes</i> spp
Biting behavior	Early morning and late in the evening	Day time
Resting behavior	Indoor	Outdoor
Host preference	Zoophilic	Anthropophilic
Breeding site	Fresh water	Small water collections with dark background

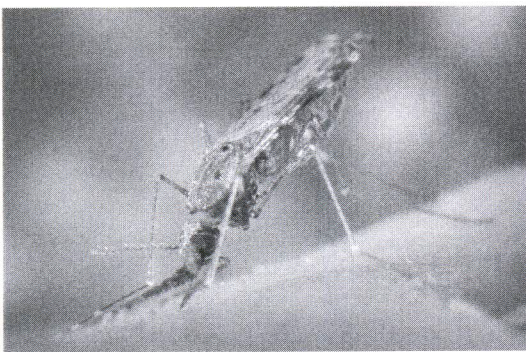


Figure 3: Malaria vector mosquito (*Anopheles* spp)  
(Source: Google images)

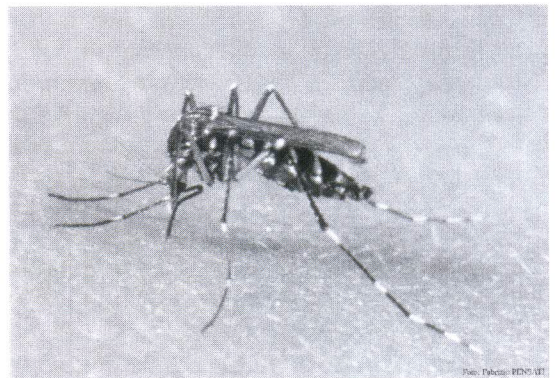


Figure 3: Dengue vector mosquito (*Aedes* spp)  
(Source: Google images)



## Challenges in controlling dengue

The major challenge faced by the health authorities in controlling dengue is no drug or licensed vaccine availability for the particular virus. At the same time, malaria was mainly controlled by the elimination of parasite from the population by the complete treatment. Therefore, controlling vector is the key to control the dengue, in addition to prevent the vector-man contact.

## Vector mosquitoes

Malaria vector mosquito (Fig 3) prefers animal blood than human blood whereas the dengue vector mosquito (Fig 4) prefers human blood. Hence, *Aedes* mosquito has the higher vectorial capacity compare to *Anopheles* mosquito.

## Mosquito control

### Adult control

As *Anopheles* mosquitoes rest indoor, the indoor residual spraying (IRS) method was mainly used as a chemical control measure to control the malaria vector. In contrast, *Aedes* mosquitoes rest outdoor; fogging (using technical malathion) is in practice in order to control the adults.

Though the IRS is within the buildings and easy to apply compare to fogging, the dedication and hard work of the spraying men will help to control dengue as malaria.

### Larval control

Filling the pits or draining the water as physical method and spraying "abate" like chemicals to the water bodies were the methods used to control *Anopheles* immatures. In addition, *Tilapia* and *Poecilia reticulata* like lavivorous fish were introduced to the water tanks. Moreover, *Bacillus thuringiensis* (Bt) also tried to control malaria vector mosquito larva.

*Aedes* mosquitoes breed in small water collections with dark background like coconut shell, tyres, plastic containers, tins, pots, polythene bags and tree holes. Therefore, it is easy to control *Aedes* mosquito by source reduction, i.e. removing the breeding sites.

But, the challenge here in the source reduction is the places like hospitals, schools, public places,

religious places, trade institutions and abandoned lands.

Public awareness and community responsibility are the crucial in removing the breeding places and keeping the environment clean in the above mentioned places.

Community mobilization, earlier experience in malaria control, will help to overcome the above obstacle.

## Prevention of man vector contact

*Anopheles* mosquito has the biting behavior in early morning and late in the evening. Therefore, bed nets were very useful to prevent vector man contact. In contrast, *Aedes* mosquitoes bite in the day time. Hence, instead of using bed nets, wearing full cloths (due to the hot climate how far it is feasible is questionable) and using mosquito repellents are the practical ways of preventing vector man contact.

## Public awareness and Community participation

During the periods of malaria outbreak, AMC put up posters and banners requesting the malaria suspected patients to be confirmed and complete the treatment. Mobile clinics were conducted with the cooperation of community centers. Volunteers visited door to door of the malaria patients' houses and made sure the complete treatment. These experiences will be very useful, as public awareness and community participation are the vital in the control of dengue.

## Conclusion

As drugs and vaccines are not available for dengue/ dengue hemorrhagic fever, vector control along with public awareness and community participation is the important strategy to control the above disease. The experience gained from control of malaria by the health authorities, especially by the AMC, is definitely useful in the control of dengue/dengue hemorrhagic fever, though vector bionomics differ.

## Acknowledgements

The authors thank the Regional Epidemiologist and Regional Malaria Officer for their assistance.