



सत्यमेव जयते



# Handbook on Prevention and Control of Dengue in School



**National Vector Borne Disease Control Programme**

22-Sham Nath Marg, Delhi-54

Directorate General of Health Services

Ministry of Health & Family Welfare

Government of India

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डा० नीरज ढींगरा  
निदेशक

**Dr. Neeraj Dhingra**  
Director

MBBS, D.Orth, M.D. (Community Medicine)

Tel. : +91-11-23918576

Fax : +91-11-23968329

E-mail : dhingradr@hotmail.com



भारत सरकार  
राष्ट्रीय वैक्टर जनित रोग नियंत्रण कार्यक्रम  
स्वास्थ्य सेवा महानिदेशालय  
स्वास्थ्य एवं परिवार कल्याण मन्त्रालय  
२२, शाम नाथ मार्ग, दिल्ली-११००५४

Government of India  
NATIONAL VECTOR BORNE DISEASE CONTROL PROGRAMME  
Directorate General of Health Services  
Ministry of Health & Family Welfare  
22, Sham Nath Marg, Delhi - 110054

### Foreword

Dengue became a major public health concern in India effecting both urban and rural areas. In absence of effective drug and vaccine for dengue, vector control is the only measure to minimize the risk. Community participation has proven crucial in prevention and control of Dengue in many endemic areas throughout globe. The *Aedes* mosquito, vector of dengue, bites during daytime, hence, the preventive measures taken at Schools by School administration, teachers and students can help in minimizing the risk of transmission. Children can play an important role as 'Brand Ambassador' through their assistance in source reduction activities under guidance of their teachers and elder family members.

In view of above, the development of this handbook in preventing mosquito-genic conditions in Schools was felt as a need of hour. Accordingly this Handbook is developed. I hope, this handbook will be beneficial in keeping children safe in school premises.

(Dr. Neeraj Dhingra)



Swachh Bharat : An opportunity for Dengue and Malaria Control  
Website : [www.nvbdc.gov.in](http://www.nvbdc.gov.in)



**Dr. Kalpana Baruah**  
**Joint Director**

Tel. : 91-11-22185955  
91-11-22185948  
Fax : 91-11-22185935  
E-mail: drkalpanabaruah@gmail.com



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भारत सरकार  
राष्ट्रीय वैक्टर जनित रोग नियंत्रण कार्यक्रम  
(स्वास्थ्य सेवा महानिदेशालय)  
स्वास्थ्य एवं परिवार कल्याण मन्त्रालय)  
डी.एम.आर.सी. बिल्डिंग, पोडीअम फ्लोर, ब्लॉक-3,  
आई.टी.पार्क, शास्त्री पार्क, दिल्ली-110053

Government of India  
**NATIONAL VECTOR BORNE DISEASE CONTROL PROGRAMME**  
(Directorate General of Health Services)  
Ministry of Health & Family Welfare  
DMRC Building, Podium Floor, Block-III  
I.T. Park, Shastri Park, Delhi-110053

## PREFACE

Dengue fever is an infectious viral disease transmitted by *Aedes* mosquitoes. It has become a household word in recent years with reporting of cases from all States of the country. As no specific drug and vaccine is available against Dengue infection, preventive measures especially vector control and personal protection are vital in minimizing the risk of transmission. In view of the day biting behaviour of vector mosquito, the measures taken at work place and public places are of utmost importance. Keeping in view of the vector behaviour and school timings, this Handbook has been developed to create awareness among the students and staff underlining the measures needed to be taken at Schools to interrupt transmission from the campus itself.

NVBDCP appreciates the constant patronage and encouragement given by the Director, NVBDCP in developing this Handbook. Technical comments and suggestions received from Experts are duly acknowledged. Also, the efforts of the Arboviral & IEC Divisions, NVBDCP for contributions towards finalization of this document are thankfully acknowledged.

(Dr Kalpana Baruah)



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# Handbook on Prevention and Control of Dengue in School

## Dengue and its transmission

Dengue is a disease transmitted by the bite of infected *Aedes* mosquito and caused by virus. Dengue fever causes flu-like symptoms, such as:

- high temperature (fever)
- severe headache
- muscle and joint pain
- facial flushing and skin rashes

## Mosquito responsible for Dengue virus transmission

Dengue is transmitted and spread by *Aedes* mosquitoes, also known as 'Tiger mosquito' due to presence of black and white stripes on legs and abdomen. In India, both species i.e. *Aedes aegypti* and *Aedes albopictus* are prevalent species. The *Ae. aegypti* is a major vector throughout country but in Southern and North-Eastern States, *Ae. albopictus* is an established vector of both Dengue and Chikungunya. The number of *Aedes* breeding sites increase during monsoon and post-monsoon period. *Aedes* mosquito bites during daytime and breed indoor, feed indoor and rest indoor in and near vicinity of human dwellings. *Aedes* mosquitoes breed in various type of domestic/peri-domestic containers holding water. It has four stages in life cycle i.e. Egg, Larva, Pupa and Adult. About three days after feeding on blood, the mosquito lays its eggs inside a container just above the water line. Eggs are laid over a period of several days, are resistant to desiccation and can survive for periods of six or more months. When rain floods the eggs with water, the larvae hatch. Generally larvae feed upon small aquatic organisms, algae and particles of plant and animal material in water-filled containers. The entire immature or aquatic cycle (i.e., from egg to adult) can occur in 7-8 days. The life span for adult mosquitoes is around three weeks. Details of life cycle of *Aedes* mosquito are at **Annexure-I**.



## Importance of prevention and control of dengue in Schools

Schools can have many places for dengue mosquitoes to breed. With the number of school going children coming to and from campus each day, a mosquito carrying the virus can spread dengue fever very quickly to areas/localities from where student belong. Therefore, it is essential that school campus needs to be checked every week and remove



or treat any container filled with water. Keeping in view the vulnerability in school settings, it is of paramount importance to reduce dengue transmission by controlling *Aedes* mosquito's breeding and personal protection in School premises. The details of activities are at **Annexure-II**.

### **Common Breeding places of Dengue mosquito in school**

In the school settings outside class rooms, the play grounds /compounds, toilets and school roofs are the probable places where *Aedes* vector mosquito breeding containers are generally found. Water holding containers, water coolers, drums, tin, barrels, pitchers, plastic tanks, cement tanks, discarded containers, disposables (glass, ice cream cups, cold drink bottles, cans), flower vases, earthen pots, potted plant trays, coconut shells, tree holes, coconut shells, bamboo stumps, plant axils, furniture/condemn items etc act as *Aedes* breeding sites.



Discarded cups



Discarded bottles



Overhead tanks



Empty ice cream cup



Water in toilet seat



Tray under plant pot

### **Common breeding sites of *Aedes* mosquito vector**

### **How children can participate in prevention and control of Dengue**

Children can play an important role in prevention and control of Dengue by active involvement in source reduction activities in supervision of elders. The activities at primary and above primary level children are as below:

#### **At Primary level**

- Personal protection by wearing long sleeved clothes and trousers/long pants
- Motivating other children in maintaining general cleanliness



- Informing Teachers/staff about open water storage tanks and containers
- Learning and practicing proper disposal of used plastic cups, glasses and bottles

### **At above Primary level**

- Personal protection by wearing long sleeved clothes and trousers/long pants
- Source reduction: detection and elimination of breeding places at school, home and surroundings
- Educating other children on daytime risk of Dengue infection
- Motivating other children in maintaining general cleanliness in and around schools, also involve them in detection and elimination of containers positive for *Aedes* breeding
- Informing Teachers/staff about open water storage tanks and containers
- Learning and practicing proper disposal of used plastic cups, glasses and bottles
- Sharing information on Dengue and its prevention in neighborhood



### **Role of teachers in prevention and control of *Aedes* breeding**

Teachers are good source of information for students. They can sensitize, motivate and involve the students for various activities for prevention and control of dengue. The following activities may be carried out by teachers:

- Encourage and educate students during 'Prayer' and other activities for involving in prevention and control activities of dengue
- Weekly monitoring/elimination of possible breeding sites within the school premises
- Educate students to cooperate with health staff while inspecting their schools and house
- During summer vacations, ensure to cover all water storage containers, overhead tanks, proper disposal of solid waste. It is important to cover all toilet sheets during vacation period preventing these places to be breeding ground for *Aedes* mosquitoes.

### **Role of School Management**

Identification of Nodal person- School authority need to identify a person who is responsible for health education, activities and coordination related to dengue prevention. The identified person may be any Teacher/Sports Instructor or school

staff. The nodal person will be responsible for following activities for prevention and control of dengue:

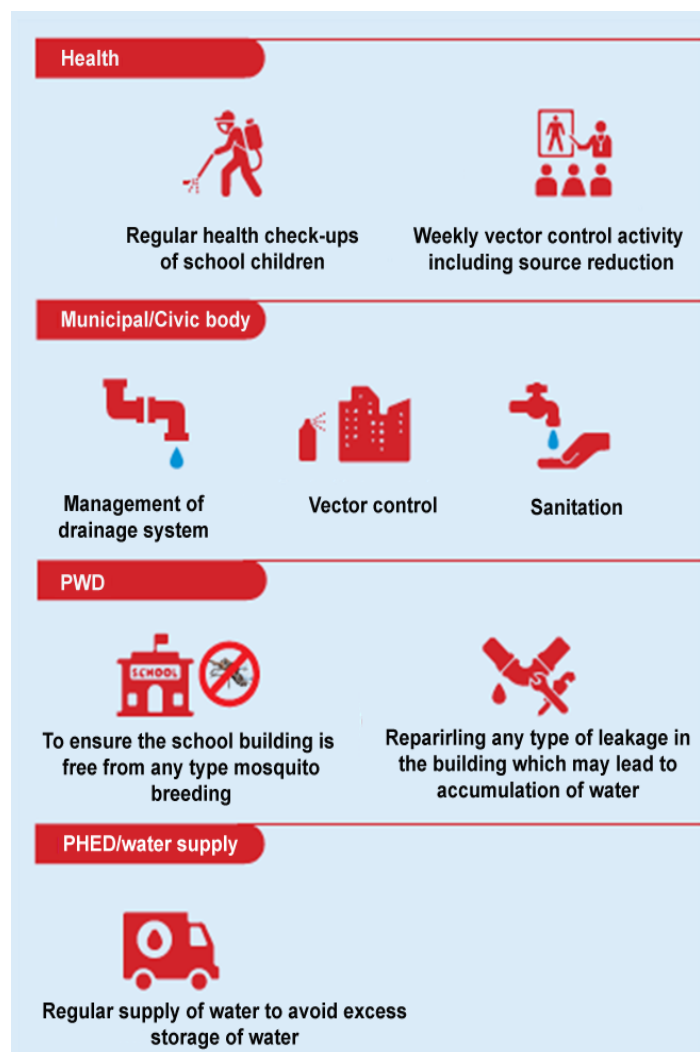
- to provide knowledge and awareness about dengue causes, symptoms and prevention and control
- Coordination with other departments e.g. Health, Civic bodies, Sanitation, Jal Board, PWD/CPWD, Water Supply etc.

A Teacher-Student working group may also be identified to coordinate the prevention and control activities within schools.

### Role of other stakeholders and coordination with them

In prevention and control of dengue in School premises, various other Departments play vital role. School administration needs a regular coordination with departments like Health, Municipal bodies, PWD/CPWD, Public Health Engineering etc. to ensure and keep the school environment free from threat of dengue.

In case of any need, this group may contact with Health department, Municipal/Civic body, PWD, PHE/water supply who may help school authorities in maintaining *Aedes* free environment in school.



### Monitoring by Head of the School

All the activities need to be monitored by the Principal/Head of the School from time to time to ensure smooth functionality of all dengue prevention activities.

## Key messages for prevention and control of Dengue in School premises

### Do's

- Cover all water tanks and containers with well fitted lids
- Paint inside the coolers before use in summer
- Empty, scrub and dry coolers every week before refilling to prevent breeding of Dengue mosquitoes
- Put wire mesh on doors and windows to prevent entry of mosquitoes
- All unused containers, junk materials, coconut shells etc. should be properly disposed off
- Change water in flower vases, plant pots, bird bath every week
- Cover the toilet seat during vacations
- To avoid mosquito bites, wear full-sleeved clothing
- Use mosquito repellents to prevent *Aedes* mosquito bites

### Don'ts

- Don't allow water to stagnate in and around houses in coolers, buckets, barrels, flower pots, bird baths, freeze trays, coconut shells etc.
- Don't throw broken utensils, unused bottles, tins, old tyres and other junks as *Aedes* mosquitoes breed in these objects during rainy season
- Don't use the old grass of cooler in the next season

### **Proper disposal of Solid Waste**

School authorities need to make arrangement for proper disposal of solid waste to minimize the risk of creation of *Aedes* breeding sites. If needed, the authorities may coordinate with respective municipal body for necessary actions.

### **Actions for Sensitization on dengue**

- Organizing quiz show, essay writing, street play, drama, nukkad natak, Bal Sabha, rally, etc.
- Encouragement of inter-personal communication, group meetings, etc.
- Organizing workshop, open sessions and case studies with the help of Health Departments

- Distribution of pamphlets and other material for sensitization
- Initiation of 'Mosquito Free School and Premises' and also link with Swachh Bharat Abhiyan (display the message i.e. Hamara School Mosquito Free)
- Awareness about the importance of observing 'National Dengue Day' on 16 May and July as 'Anti Dengue Month' every year and spreading the message in the community
- Ensuring covering of water tanks and containers with tight lids
- Checking and sensitization about stagnation of water in coolers, buckets, barrels, flower pots, bird baths, freeze trays, coconut shells, etc. in school premises and their houses under the supervision of any adult member (family member/Teacher/Health Worker) and encourage for source reduction activities
- Ensuring the involvement of 'Little Champs' for cleaning of their school, home and mohalla once in a week will be known as Source Reduction Week (SRW) i.e., Swachh week/Dry week
- Sensitization through story, audio-visual show on Saturday/Monday for source reduction activities and linking with Swachh Bharat Abhiyan followed by feedback session
- Need to strengthen and promote Balsabha, cultural programme, script writing and local talent, etc. and organize these at least once a week. This may be published in local print media or broadcast on community radio.
- Recognize children's participation/work/best story/best picture/documentary/exhibition/poster/banner and best practices, etc. at the state and national levels.

### **Actions to ensure personal protection to avoid mosquito bites (transmission prevention)**

- i. **Protective clothing:** Clothing reduces the risk of mosquito bite if the material of the cloth is sufficiently thick or if the garment is loosely fitting. Long sleeved shirts and trousers with stockings may protect the arms and legs, which are the preferred sites for mosquito bites. School children should adhere to these practices whenever possible.
- ii. **Repellents:** Repellents are common means of personal protection against mosquitoes and other biting insects. These are broadly classified into two categories- natural repellents and chemical repellents. Essential oils from plant extracts are the main natural repellent ingredients, such as citronella oil, lemon grass oil and neem oil. Chemical repellents (creams, spray etc.) can provide protection from a few to several hours.

- iii. **Screens/wire mesh on doors and windows:** Tight-fitting screens/wire mesh can be used on doors and windows to prevent mosquitoes from entering in halls, classrooms etc.
- iv. **Mosquito nets/bed nets:** Mosquito nets have limited utility in dengue control programmes since the *Aedes* bites during the day. However, nets can be effectively utilized to protect school children at their home during sleep at daytime. All children may be sensitized to use of mosquito nets if they are having fever.

### Use of IEC materials

For raising awareness and knowledge on issues relating to dengue, variety of print



and audio-visual IEC materials may be used which address variety of issues including information about the vector, risks of dengue, source reduction, personal protection, etc. These IEC materials include display posters, display panels, leaflets, handbills, flipbooks, wall writing and painting, plays, drama etc. A live demonstration of

the dengue vector (larvae and adult) may be done with the help of Health Department/Municipal body.

### Training of School children for prevention and control of Dengue

School children need to be trained on how to detect and eliminate the breeding of dengue vector in and around schools, houses and in the neighborhood. School children may be taken around the school premises in groups during the games period. Dengue homework card scheme may also be adopted.

To encourage school students, they can be asked to cover at least 10 open containers in their respective households or in the neighborhood (under the guidance of parents) and monitor it for 6 months to see whether the cover is in place or not. All activities by school children need to be done under the supervision of adults.

### Dengue prevention and Co-curricular activities

Co-curricular activities provide an opportunity for active involvement of School children for dengue prevention activities by engaging them through activities like drawing/debate/poem/essay writing/quiz competitions, plays, drama etc. in which different aspects of dengue transmission, prevention etc may be covered.



## Projects for school children

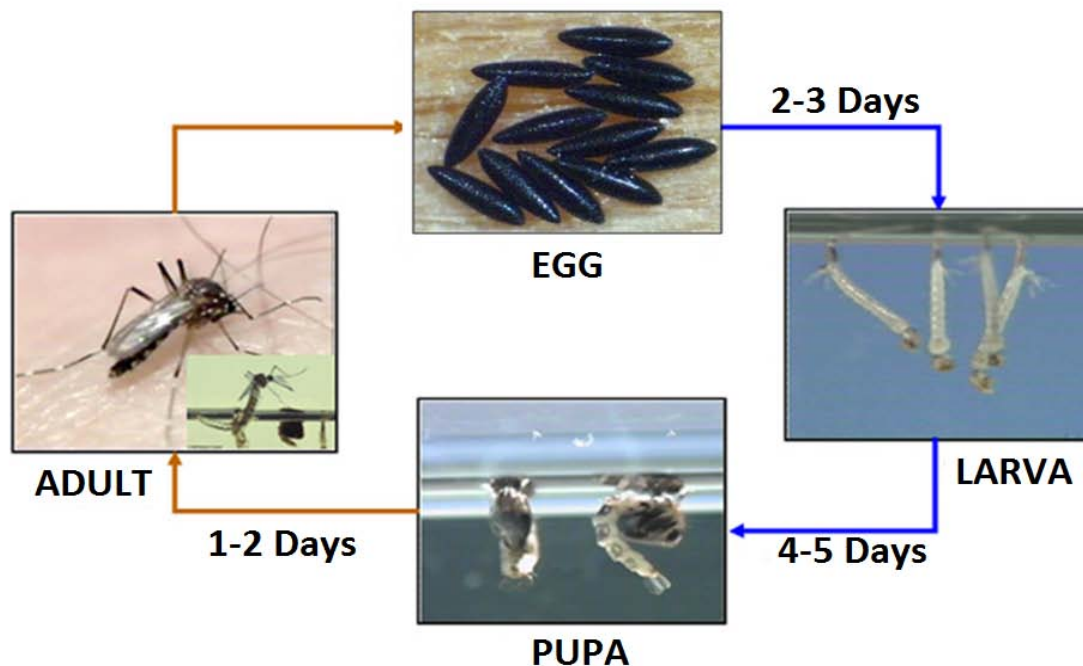
Simple projects for involvement of school children may be developed for ensuring their active participation in dengue control activities. It will include information on identification of the *Aedes* mosquito, different types of breeding sites, source



reduction activities, life cycle of vector mosquito and Do's and Don'ts for prevention and control of dengue. Students will complete project cards/ reports under the supervision of their teachers/parents and submit to the teacher within a specific time period. They may be rewarded after assessment of their project. Classes which have

done commendable work in vector control may also be recognized.

Life cycle of Aedes mosquitoes



**Egg:** Egg is about 1 mm. in length, cigar shaped in appearance and black in colour. The egg hatches into larva in 2-3 days. The eggs are capable of withstanding desiccation upto one year and can survive during dry period.

**Larva:** There are four larval stages. The larva shows graceful movement and feed mainly at bottom of water. They remain in groups in the corners of the container. Total period of larval stages ranges from 4-5 days.

**Pupa:** The fourth instar larva becomes pupa in 24-48 hours. Pupa is a non-feeding stage but actively swims and floats. The pupa becomes adult within about 1-2 days.

**Adult:** The adult mosquitoes rest for some time after emergence on the pupal skin on the walls of containers till their wings and legs get harden and then they fly. After about 24 hrs. of emergence, female mosquitoes go for mating and blood meal for development of eggs.

**Why weekly monitoring of Aedes breeding is needed?**

Aedes mosquito completes its life-cycle from egg to adult in one week, so the weekly monitoring of premises is needed for source reduction activities.

### Activities for prevention and control of Dengue

Activities	Actions	Resource persons
Sensitization on Dengue	<ul style="list-style-type: none"> <li>• Organization of quiz show, essay writing, street play, drama, nukkad natak, Bal Sabha, rally, etc.</li> <li>• Encouragement group meetings, etc.</li> <li>• Organizing workshop and open sessions</li> <li>• Distribution of pamphlets and other IEC material</li> <li>• Initiation of 'Mosquito Free School and Premises' and also link with Swachh Bharat Abhiyan</li> </ul>	Little Champ & Teachers
Sensitization for 'National Dengue Day' and 'Anti Dengue Month'	<ul style="list-style-type: none"> <li>• Awareness about the importance of observing 'National Dengue Day' on 16 May and July as 'Anti Dengue Month' every year and spreading the message in the community</li> </ul>	Little Champs, Teachers & Health Workers
Identification of breeding sources	<ul style="list-style-type: none"> <li>• Ensuring covering of water tanks and containers with tight lids</li> <li>• Checking &amp; sensitization about stagnation of water in coolers, buckets, barrels, flower pots, bird baths, freeze trays, coconut shells, etc. in school premises and their houses under the supervision of any adult member (family member/Teacher/Health Worker) &amp; encourage for source reduction activities</li> <li>• Ensuring the involvement of 'Little Champs' for cleaning of their school, home and mohalla once in a week will be known as Source Reduction Week (SRW) i.e., Swachh week/Dry week</li> <li>• Sensitization through story, audio-visual show on Saturday/Monday for source reduction activities and linking with Swachh Bharat Abhiyan followed by feedback session</li> </ul>	Little Champs
Live demonstration	<ul style="list-style-type: none"> <li>• Live demonstration of <i>Aedes</i> mosquito and larva during Morning Prayer, events, etc.</li> <li>• Demonstration of possible breeding sites</li> </ul>	Health staff
Recognition and appreciation	<ul style="list-style-type: none"> <li>• On the basis of their active involvement in source reduction/mosquito free premises/engagement of school, Little Champs need to be rewarded. In the same way, every student will be getting their score which will be added to their annual score card.</li> </ul>	State and District Health Officials

In addition to the above, the following activities can also be considered:

- In dengue prevention & control, children may be involved including NSS, NCC.
- Need to strengthen and promote Bal Sabha, cultural programme, script writing and local talent, etc. and organize these at least once a week. This may be published in local print media or broadcast on community radio.
- To recognize their participation/work/best story/best picture/documentary/exhibition/poster/banner and best practices, etc. at the state and national levels.



## Notes

*Students are the rays of hope  
They can make the world better*

**Directorate of National Vector Borne Disease Control Programme**  
**<https://www.nvbdc.gov.in>**