MID TERM PLAN

2011 to 2013

सत्यमेव जयते

For Prevention and Control of Dengue & Chikungunya

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Govt. of India

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CONTENTS

Executive Summary

Dengue Fever (DF) and Dengue Hemorrhagic Fever continue to maintain ever-increasing endemicity in India. Chikungunya virus of East Africa genotype and transmitted by *Aedes aegypti* and *Aedes albopictus* struck Indian Ocean Island in 2005. By 2006 it swept through coastal India causing 1.4 million cases concurrently with dengue transmission posing a major public health challenge for assessing the disease burden for these two infections and initiating a rapid response.

In India resurgence of epidemic dengue activity poses a major challenge as all the four serotypes of dengue have been reported and this upsurge has been associated with the geographical expansion of both the mosquito vectors and the viruses. The ecological disruption brings about a change in the epidemiology of dengue viruses as was observed during Common Wealth Games 2010 on account of massive construction activities dovetailed with incessant rains. Similarly unprecedented urbanization of the metropolitan cities puts enormous pressure on civic activities leading to shortage of housing, interrupted electricity and water supplies resulting in storage practices resorted by the community thereby making the environment, Aedes friendly.

There has been a steady invasion of the vector as well as the virus into hitherto newer states which never reported a case of DF/DHF before 2010. Amongst the States/UTs reporting DF/DHF for the first time (2010) were Assam, Andaman Nicobar Island, Dadar & Nagar Haveli, Jharkhand, Himachal Pradesh and Meghalaya thereby indicating that the expansion of the disease is not restricted to plains only but can be a phenomenon in hilly states as well. Other states like Bihar, Haryana, Uttarakhand and Uttar Pradesh which reported only lesser number of cases in 2009 have shown exponential increase in the number of cases during 2010.

The resurgence of DF/DHF in the country can also be attributed to the rapid development and economic expansion which not only led to urbanization but also increased movement of the people between cities and states. Between 2006-2008 only 14 states and 4 union territories reported dengue cases, the number increased to 20 and 29 during 2009 and 2010 respectively. The objectives and Elements and Strategies of the mid-term plan are as follows:

- To reduce the incidence of dengue and Chikungunya to bring down the disease burden
- To reduce the case fatality rate due to dengue

Key eight elements (Octalogues) of Mid Term Plan are as under:

(i) Disease and Vector Surveillance
(ii) Case management
(iii) Laboratory diagnosis
(iv) Vector management
(v) Outbreak response
(vi) Capacity building
(vii) Behaviour Change Communication
(viii) Inter-sectoral coordination
(ix) Monitoring & Supervision

Mid Term Plan will be operational in the country during 2011-2013

Chapter 1

Introduction

1.1 Dengue

Dengue is a self limiting acute mosquito transmitted disease characterized by fever, headache, muscle, joint pains, rash, nausea and vomiting. Dengue is caused by an arbovirus and spread by *Aedes* mosquitoes. Both *Ae. aegypti* and *Ae. albopictus* can transmit the disease. Some infections result in Dengue Haemorrhagic Fever (DHF) and in its severe form Dengue Shock Syndrome (DSS) can threaten the patient's life primarily through increased vascular permeability and shock.

Dengue fever can be caused by any one of four sero types of dengue virus: DEN-1, DEN-2, DEN-3, and DEN-4. The dengue viruses form a distinct complex within the genus flavivirus based on antigenic and biological characteristics.

1.1.1 Global Scenario

The global distribution of Dengue Fever is comparable to that of malaria, and an estimated 2.5 billion people live in areas at risk for epidemic transmission (http://www.cdc.gov). Each year, there are an estimated 50–100 million cases of DF and, depending on the year, 0.25-0.5 million cases of DHF. The case-fatality rate for DHF ranges by country and most fatal cases are among children and young adults. Amongst the WHO SEARO countries except DPR Korea all the other countries including India are endemic for dengue.

1.1.2 National Scenario

Dengue fever was reported 1st time in 1956 from Vellore town of Tamil Nadu. During last two decades from 1991 to 2010, out of 35 states/ UTs, 31 have reported Dengue cases (**Table-1).** The states that reported Dengue cases since 1991 to 2010 are shown in **Fig 1**. The state wise details on Dengue cases and deaths are annexed at **Table 2.**

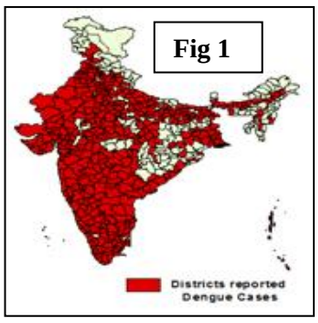
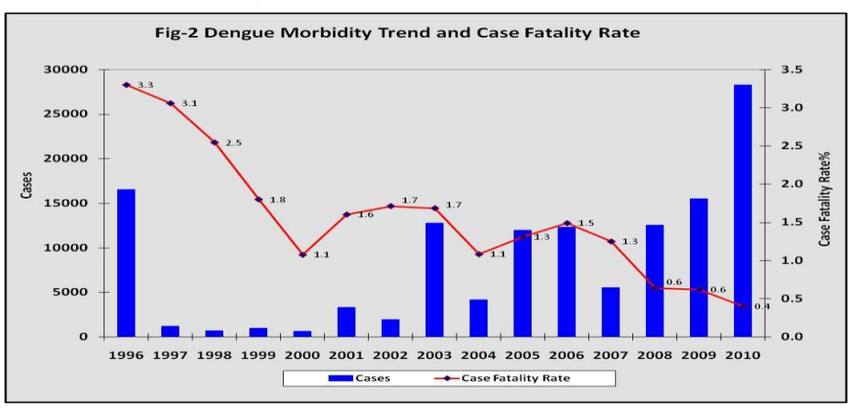


Fig 1

The case fatality rate (deaths per 100 cases) due to dengue was 3.3 % in 1996. Though it declined thereafter but consistently had been above 1.0% till 2007. After the National Guidelines on clinical management of DF/DHF/DSS were developed and circulated in 2007, the case fatality rate started declining as shown in the **Fig 2**.



1.2 Chikungunya

Chikungunya fever is also a viral disease transmitted by *Aedes* mosquito. Both *Ae aegypti* and *Ae. albopictus* are involved in transmission. It is a debilitating, but non-fatal viral illness. Chikungunya usually starts with sudden fever, chills, headache, nausea, vomiting, joint pain, rash and arthalgia.

After quiescence of three decades in 2006, Chikungunya outbreak occurred again in India. Though Andhra Pradesh and Karnataka had reported of clinically suspected Chikungunya cases in November and December 2005, serological confirmation of Chikungunya infection was done from 2006 January onwards. Chikungunya outbreaks in the country since 2006 are summarized in **Table-3** and the affected areas are shown in **Fig 3**.

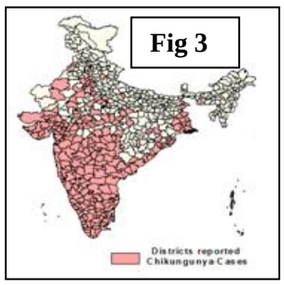


Fig 3

1.3 Factors contributing spread of Dengue and Chikungunya

Risk of dengue and geographical spread of both Dengue and Chikungunya has shown an increase in the recent years due to various factors in urban, peri-urban and rural areas, leading to proliferation of mosquito breeding sites which are as under:

a. *Demographic and societal changes*: Demographic and societal changes leading to unplanned and uncontrolled urbanization and *concurrent population growth* has put severe constraints on civic amenities, particularly water supply and solid waste disposal, thereby increasing the breeding potential of the vector species. Improved communication facilities (Rapid Transportation) has helped the disease the establish in rural areas.

b. *Effective mosquito control primarily based on source reduction is virtually nonexistent* in most of the dengue-Chikungunya endemic states

c. Solid waste management: There has been a significant increase in the use of Consumerism and introduction of non-biodegradable plastics, namely paper cups, used tyres, etc. that not only facilitate increased breeding compounded by nonexistent or insufficient solid waste collection and management.

d. *Increased population movement (work, travel, tourism or pilgrimage)* has resulted in a constant exchange of viruses (dengue serotypes and CHK virus)

e. Significant increase in plantations: Increased demand of rubber and being a profit making cash crop trend of rubber plantation is increasing and simultaneously increase in latex collecting cup, which are the most favourite breeding habitats of *Ae albopictus*.

f. Lack or poor infrastructure

1.4 Purpose of this Document

The intensity of dengue transmission has shown substantial increase over the years, therefore a need has arisen to revisit the current strategies of Long Term Action Plan and develop a programmatic and comprehensive Mid Term Plan for prevention and control of Dengue and Chikungunya in the country.

Chapter 2

Conceptual Framework of Mid Term Plan

2.1 Frame Work

The conceptual framework for this document is a comprehensive, integrated Mid Term Plan for dengue fever prevention and control that places equal weight, including fiscal and human resources i.e on all elements of the programme.

2.2 Objective: Followings are the specific objectives of the Mid Term Plan

- To reduce the incidence of dengue and chikungunya to bring down the disease burden
- To reduce the case fatality rate due to dengue

2.3 Elements: Key eight elements of Mid Term Plan would be called as the 'OCTALOGUE' in the document which are as under

(x) Surveillance -
- Disease Surveillance
- Entomological Surveillance

(xi) Case management
- Laboratory diagnosis
- Clinical management

(xii) Vector management
- Environmental management for Source Reduction
- Chemical control
- Personal protection
- Legislation

(xiii) Outbreak response
- Epidemic preparedness
- Media management

(xiv) Capacity building
- Training
- Infrastructure development
- Operational research

(xv) Behaviour Change Communication
- Social mobilization,
- IEC

(xvi) Inter-sectoral coordination
- Health & non health sector

(xvii) Monitoring & Supervision
- Review, field visit , feedback
- Analysis of reports

The strategies are explained in the subsequent chapters

2.4 Implementation period:
Mid Term Plan will be operational in the country during 2011 to 2013

Chapter 3

Surveillance

3.1 Concept

The objectives of surveillance for dengue and chikungunya are to:

- monitor trends in the distribution and spread of disease over time;
- detect the cases early for timely intervention;
- measure the disease burden;
- assess the social and economic impact of dengue and Chikungunya on the affected community;
- evaluate the effectiveness of prevention and control programme;

Dengue and Chikungunya surveillance has two components:- Epidemiological and Entomological

3.2 Epidemiological surveillance will be carried out as under :

- For effective epidemiological surveillance, uniform data collection would be carried out in prescribed formats. All suspected cases should be recorded.
- All components of surveillance i.e. collection, compilation, analysis and interpretation of data, follow-up action and feedback should be carried out in a systematic and organized manner.
- During transmission period (monsoon and post Monsoon reporting will be on daily basis by email or by fax.
- In non or low transmission period reporting will be on weekly basis. Report of the previous week (Monday to Saturday) should be compiled by the States and send to NVBDCP by every Monday.
- Strengthening of reporting system by provision of e-reporting mechanism. Software would be developed for this purpose.
- The state programme officers would arrange epidemiological, entomological, clinical and laboratory investigations, whenever necessary.
- Supervision and monitoring at all levels would be strengthened for ensuring effective surveillance.

3.2.1 Proactive surveillance

The most important component of the proactive system is serological surveillance designed to monitor dengue virus transmission, especially during inter-epidemic periods and to continually provide information on where transmission is occurring, what virus serotype or serotypes are involved and what type of illness is associated with the dengue and chikungunya infection. If this type of information is available without delay, one would be able to detect the introduction of virus into new area/s.

Note: In case of a IgM NS1 positive Dengue case detected during non-transmission period, the case should be investigated properly. It may be an index case or may an old case with low IgM titre.

3.2.2 Disease Surveillance:

The disease surveillance will include clinical diagnosis, monitoring of fever trends and sero surveillance. The medical OPDs of the hospitals will be the sites for monitoring the clinical cases as per the definitions and fever cases for an increase/ clustering and send samples of suspected or probable cases for the sero –surveillance.

3.3 Entomological Surveillance

Surveillance for dengue vector mosquito is important in determining the factors related to dengue transmission in order to prioritize areas and seasons for vector control.

3.3.1 Larval Surveillance

It is a very important component of the prevention and control strategy and should be undertaken at regular intervals. The procedure for assessing the level of prevalence is as follows:

3.3.1.1 Indices used to assess the *Aedes* larval and pupal infestations are:

House Index (HI): percentage of houses infested with larvae and/or pupae. HI provides information on extent of breeding. It is calculated as under:

$$HI = \frac{\text{Number of houses infested}}{\text{Number of houses inspected}} \times 100$$

Container Index (CI): percentage of water-holding containers infested with larvae or pupae. CI provides information on intensity of breeding. It is calculated as under:

$$CI = \frac{\text{Number of positive containers}}{\text{Number of containers inspected}} \times 100$$

Breteau Index (BI): number of positive containers per 100 houses inspected. BI is an yardstick for evaluation of the control strategy. It is calculated as under:

$$BI = \frac{\text{Number of positive containers}}{\text{Number of houses inspected}} \times 100$$

Pupal Index (PI): Number of pupae per house. PI gives information on intensity of transmission. It is calculated as under:

$$PI = \frac{\text{Number of Pupae}}{\text{Number of houses inspected}} \times 100$$

3.3.2 Adult Surveillance

For adult collections standard procedure may be adopted. In addition for intensified vector surveillance following methods are available. Adult collection is not envisaged in endemic areas as the adult may be infected with virus.

3.3.2.1 Oviposition traps

“Ovitraps: are devices used to detect the presence of *Ae. aegypti* and *Ae. albopictus* where the population density is low and larval surveys are largely unproductive (e. g. when the Breteau index is less than 5), as well as under normal conditions. They are particularly useful for the early detection of new infestations in areas from which the mosquitoes have been previously eliminated.

3.3.2.2 Tyre section larvitraps

Tyre section larvitraps of various designs have also been used for monitoring oviposition activity, The simplest being a water-filled radial section of an automobile tyre. A prerequisite for any design is that it either facilitates visual inspection of the water-filled radial section of an automobile tyre.

Adult *Aedes* vectors and their identification

Aedes aegypti

Silvery-white ‘sickle -shaped" pattern of scales on its scutum.

Aedes albopictus

White stripe down the center beginning at the dorsal surface of the head and continuing along the thorax.

Chapter 4

Case management

4.1 Dengue fever

Clinical Manifestations

Dengue fever is an acute febrile viral disease with clinical features that vary widely. It may present as an undifferentiated febrile illness with a maculopapular rash (often seen in children), a mild febrile syndrome similar to the flu, or the classical disease with two or more of the following manifestations: fever, headache, bone or joint pain, muscular pain, rash, pain behind the eyes, hemorrhagic manifestations (e.g., petechiae). In adults, recovery may be associated with prolonged fatigue and depression. During dengue epidemics, hemorrhagic complications may also appear, such as bleeding from the gums, nosebleeds, and bruising. It is very important to distinguish between DF with hemorrhagic symptoms and DHF so that appropriate therapy can be initiated in the case of DHF. Case fatality due to DF is very low, but case fatality due to DHF can be high. There is no specific treatment for DF beyond symptomatic treatment, rest, and rehydration. Further details with regard to clinical Management on Dengue are uploaded on NVBDCP website www.nvbdcp.gov.in

4.1.1 Laboratory Diagnosis

Early symptoms of dengue fever mimic other diseases often prevalent in areas where it is endemic, such as Chikungunya, malaria and leptospirosis. Hence for proper management rapid differential diagnosis is very crucial. Laboratory diagnosis can be carried out by one or more of the following tests:

a. Isolation of Dengue virus from serum, plasma, leucocytes or autopsy samples.
b. Demonstration of a fourfold or greater rise in reciprocal IgM antibody titres to one or more dengue virus antigen in paired sera samples.
c. Detection of dengue virus antigen in serum samples by NS1 ELISA or in autopsy tissue by immunohistochemistry or immunofluorescence.
d. Detection of viral genomic sequences in autopsy tissue, serum or CSF sample by PCR (Polymerase Chain Reaction)

4.1.1.1 Recommended tests- GoI recommends use of ELISA based antigen detection test (NS1) for diagnosing the cases from 1st day onwards and antibody detection test IgM Capture ELISA (MAC ELISA) for diagnosing the cases after 5th day of onset of disease for confirmation of Dengue infection. IgM-capture enzyme-linked immunosorbent assay (MAC-ELISA) had become widely used in the past few years. It is a simple, rapid test that requires very little sophisticated equipment. MAC-ELISA is based on detecting the dengue-specific IgM antibodies in the test serum by capturing them out of solution using anti-human IgM that was previously bound to the solid phase. If the IgM antibody from the patient's serum is anti-dengue, it will bind to the dengue antigen. An enzyme-substrate is added to give a colour reaction for easy detection.

The procedure involved is comparatively easier than other methods available for diagnosis of dengue infections due to which NVBDCP had been using MAC- ELISA for diagnosis of dengue infection in the network of Diagnostic Centres established/ identified in the Sentinel Surveillance Hospitals (SSHs) and Apex Referral Laboratories (ARLs) across the country **(Annexure-A)**. For details www.nvbdcp.gov.in

4.1.2 Rapid Diagnostic tests

A number of commercial Rapid Diagnostic Test (RDT) kits for anti-dengue IgM/IgG antibodies and NS1 are commercially available at present which produces the results within 15 to 23 minutes. However, the accuracy of most of these tests is not known

since they have not yet been properly validated. Hence currently use of RDT is not envisaged under the programme.

4.1.3 Collection of Specimens

Laboratory diagnosis of dengue depends on proper collection, processing, storage and shipment of the specimens. While collecting blood for serological studies from suspected DF/DHF cases all universal precautions should taken. Samples could be collected

- As soon as possible after the onset of illness, hospital admission or attendance at a clinic (acute serum, S1).
- Shortly before discharge from the hospital or, in the event of a fatality, at the time of death (convalescent serum, S2).
- In the event hospital discharge occurs within 1-2 days of the subsidence of fever collect a third specimen 7-21 days after the acute serum (S1) was drawn (late convalescent serum, S3).

While sending the samples for lab confirmation the day of onset of fever and day of sample collection should be mentioned to guide the laboratory for the type of test to be performed (NS1 for samples collected from day 1to 5 and IgM after 5days.

For details refer NVBDCP Laboratory Manual for Diagnosis of Dengue and Chikungunya.

4.1.4 Management of Dengue cases

The National Guidelines for Clinical management of Dengue Fever(DF)/ Dengue Haemorrhagic Fever (DHF) and Dengue Shock Syndrome (DSS) had been developed in 2007 in a brain storming session at All India Institute of Medical Sciences (AIIMS), New Delhi involving subject experts from National and International fame (complete guidelines, may be seen at www.nvbdcp.gov.in). However, these are only broad guidelines. The treating physician should consider the condition of the patient in totality and decide about management of an individual patient.

4.2 Chikungunya fever

4.2.1 Case definition

High clinical suspicion is the hallmark of diagnosis in the absence of clear cut clinical signs and symptoms.

- Suspect when a person has fever associated with rashes lasting for a week and a persistent arthralgia which is severe and prolonged.
- Diagnose when the above symptoms occur in a group of individuals from the same community or when there is an outbreak of Chikungunya and serological evidence is shown in a few individuals of the same community.
- Confirm when serum is positive for anti Chikungunya IgM is demonstrated or when the virus is demonstrated through RT-PCR test or cultured. In outbreak situation, all cases can not be confirmed.

At least 10 % samples could be sent to the reference laboratories for confirmation.

4.2.2 Laboratory diagnosis of Chikungunya

Routine laboratory diagnosis of Chikungunya includes demonstration of antibodies by serological methods, isolation of the virus and molecular demonstration of viral RNA. Isolation of the virus though considered a gold standard, however it is laborious and requires specialized laboratory setup.

Usually cases are diagnosed using simple laboratory tests for the demonstration of CHIKV specific IgM antibodies in patient's blood by ELISA. IgM antibodies appear as early as the 7th day of infection and may persist for at least 6 months after infection. Under NVBDCP IgM Capture ELISA is being used for diagnosis.

4.3 Management:

Currently, there is no specific treatment for chikungunya. Treatment is purely symptomatic. It is basically the use of non-salicylate analgesics and non-steroidal anti-inflammatory drugs (NSAIDs). Co-infection with dengue should be kept in mind. Drugs contraindicated in the management of dengue should also be avoided till dengue co-infection is ruled out.

For details refer national guidelines for Chikungunya case management.

4.4 Mortality

Chikungunya is a benign disease, death is very rare. In the outbreak of chikungunya in the Reunion Island epidemic in 2005 onwards, there were 237 cases of deaths with case fatality rate of 1/1000 cases. However, it was not sure whether the mortality was directly associated with Chikungunya or co- existing morbidities worsened with Chikungunya infections (*Jessaron L et al, 2006; Ledroms M et al, 2007*). Chikungunya infections may increase the morbidity as well as mortality due to coexisting infections.

Chapter 5

Vector Surveillance and Management

Aedes aegypti is the main vector of dengue and chikungunya in India. However, *Aedes albopictus* has also been found to be involved in southern areas. For successful vector control programme it is very essential to have the knowledge of the vector and it's biology.

5.1 Environmental management for source reduction

- Environmental modification: physical transformation of land, water and vegetation to reduce vector habitats without causing any adverse effects on the environment.

- Environmental manipulation: activities aimed at producing temporary changes in vector habitats that involve the management of "essential" and "non-essential" containers, and the management or removal of natural" breeding sites.

- Changes to human environmental modification are normally long lasting while environmental manipulations requires repeated activities in a time bound manner. Environment measure widely used to control *Ae. aegypti* and *Ae. albopictus* breeding are as under:

Production site	Empty, clean scrubbed weekly	Mosquito proof cover	Puncture or drain/store under roof	Collect, recycle/ dispose	Fill (sand/soil)
Water storage tank	+	+			
Drum	+	+			
Desert cooler	+				
Used tyres		+		+	+
Flower vase with water	+				
Roof gutter/sun shades	+				
Potted plants with saucers	+				
Ornamental pool/fountain	+				
Animal water container	+				
Ant-trap	+				
Discarded junks			+	+	
Discarded food & drink containers				+	
Disposable cups/ glasses					
Tree holes					+
Rock holes					+
Rubber collecting cups	+			+	
Fruit shells				+	
Shoot off palm leave				+	
Bamboo stumps				+	+

5.1.1 Environmental modification

a. Improved water supply

Whenever piped water supply is inadequate and available only at restricted hours or at low pressure, the storage of water in varied types of containers becomes a necessary practice that leads to increased *Aedes* breeding. The majority of such containers are often large and heavy (e.g. storage jars) and can neither be easily disposed of nor cleaned. In rural areas, unpolluted, disused wells become breeding grounds for *Ae. aegypti*. It is essential that potable water supplies be delivered in sufficient quantity, quality and consistency to reduce the necessity and use of water-storage containers that serve as the most productive larval habitats.

b. Mosquito-proofing of overhead tanks or underground reservoirs

Where *Ae. aegypti* larval habitats include overhead tanks and masonry chambers of piped waterlines, these structures should be mosquito-proofed. Similarly, mosquito-proofing of domestic wells and underground water-storage tanks should be ensured.

5.1.2 Environmental manipulation

a. Draining water supply installations

Water collection/leakages in masonry chambers, distribution pipes, valves, sluice valves, surface boxes for fire hydrants, water meters, etc. that serve as important *Ae. aegypti* larval habitats in the absence of preventive maintenance should be provided with soak pits.

b. Covering domestic water-storage containers

The major sources of *Ae. aegypti* breeding in most urban areas are containers storing water for household use, including clay, ceramic and cement water jars, metal drums, and smaller containers storing fresh water or rainwater. Water storage containers should be covered with tightly fitting lids or screens and care should be taken to replace them after water is used. An example of the efficacy of this approach has recently been demonstrated in Thailand.

c. Cleaning flowerpots/vases and ant-traps

Flowerpots, flower vases and ant-traps are common sources of *Ae. aegypti* breeding. Water that collects on the saucers that are placed below flowerpots should be removed every week. Water in flower vases should be removed and discarded weekly and vases scrubbed and cleaned before reuse. Alternatively, live flowers can be placed in a mixture of sand and water. Ant-traps to protect food-storage cabinets should be cleaned on a weekly basis and treated with common salt or oil.

d. Cleaning incidental water collections

Desert (evaporation) water-coolers, condensation collection pans under refrigerators, and airconditioners should be regularly inspected, drained and cleaned. Desert water-coolers generally employed in arid/semi-arid regions north India to cool houses during summer contain two manufacturing defects. The exit pipe at the bottom of the water-holding tray is generally fixed a few centimetres above the bottom. This exit pipe should be fitted at such a level that while emptying the tray, all the water should get drained off without any retention at the bottom. Desert coolers are normally fitted to windows with the exit pipe located on the exterior portion of the tray. These sites are usually difficult to access, and therefore, there is a need to change the design so that both the filling and emptying of the water-holding trays can be manipulated from the room, thus eliminating the need for climbing to approach the exit pipe from the exterior of the building.

To overcome this problem National Center for Diseases Control (former NICD) has designed a cooler which does not allow mosquitoes to breed. Use of NICD cooler is envisaged under the programme. For details logon to www.nvbdcp.gov.in

e. Managing construction sites and building exteriors

Water-storage facilities at construction sites should be mosquito-proof. Housekeeping should also be stepped up to prevent occurrence of water stagnation. The design of buildings is important to prevent *Aedes* breeding. Drainage pipes of rooftops, sunshades/porticos often get blocked and become breeding sites for *Aedes* mosquitoes. Roof gutters of industrial/housing sheds also get similarly blocked. Where possible, the design of such features should minimize the tendency for mosquito breeding. There is a need for periodic inspection of such structures during the rainy season to locate potential breeding sites.

f. Managing mandatory water storage for fire-fighting

Fire prevention regulations may require mandatory water storage in some countries. Such storage tanks need to be kept mosquito-proof. These drums should be kept covered with tight lids; failing which larvivorous fish or temephos 1 PPM can be used.

g. Managing discarded receptacles

Discarded receptacles – namely tins, bottles, buckets or any other consumable packaged items such as plastic cups/trays and waste material, etc. scattered around houses – should be removed and buried in landfills. Scrap material in factories and warehouses should be stored appropriately until disposal. Household and garden utensils (buckets, bowls and watering devices) should be kept upside down to prevent accumulation of rain water. Similarly, in coastal areas canoes and small boats should be emptied of water and turned upside down when not in use. Plant waste (coconut shells, cocoa husks, etc.) should be disposed of properly.

h. Managing glass bottles and cans

Glass bottles, cans and other small containers should be reused, recycled or buried in and fills.

i. Tyre management

Used automobile tyres are of significant importance as breeding sites for urban *Aedes*, and are therefore a public health problem. Imported used tyres are believed to be responsible for the introduction of *Ae. Aegypti* and *Ae. albopictus* into newer areas. Tyres in depots should always be kept under cover to prevent collection of rainwater. New technologies for tyre recycling and disposal are continually coming into use, but most of them have proved to be of limited application or cost-intensive.
It is recommended that each community should look at ways to recycle/reuse used tyres so that they do not become breeding habitats.

j. Filling up of cavities of fences

Fences and fence-posts made from hollow trees such as bamboo should be cut down to the node, and concrete blocks should be filled with packed sand or concrete to eliminate potential *Aedes* larval habitats.

k. Managing public places

Municipalities should have in place a programme to inspect and maintain structures in public places such as street lamp posts, park benches and litter bins that may collect

water if not regularly checked. Discarded receptacles that may hold water, such as plastic cups, broken bottles and metal cans, should be regularly removed from public areas.

l. Managing plantation areas

Rubber plantations: The latex collecting cups in rubber plantations should be removed during monsoon season or should be kept upside down to avoid holding of rain water.

Coconut/Arecanut: The shoot off fruits and leaves of coconut should be removed weekly. Similarly the leaves of arecanut should also be removed. The plantation area may be cleaned weekly to avoid any water collection that allows breeding of *Ae. albopicuts.*

Pineapple plantation: Neem-cake (which is used as manure) powder can be sprinkled in the plantation area to avoid *Ae. albopicuts* breeding in leave axils.

5.2 Personal protection

a. Protective clothing

Clothing reduces the risk of mosquito bite if the cloth material is sufficiently thick or loosely fitting. Long sleeves and trousers with stockings may protect the arms and legs, which are the preferred sites for mosquito bites. Schoolchildren should adhere to these practices whenever possible.

b. Mats, coils and aerosols

Household insecticidal products, namely mosquito coils and aerosols are used extensively for personal protection against mosquitoes. Electric vaporizer mats and liquid vaporizers are more recent additions, and are marketed in practically all urban areas.

c. 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 such as DEET (N, N-Diethyl-m-Toluamide) can provide protection for few to several hours.

d. Insecticide-treated materials: Mosquito nets and curtains

Insecticide-treated mosquito nets (ITNs) LLIN have limited utility in Dengue and Chikungunya control programmes since the vector species bites during the day. However, nets can be effectively utilized to protect infants, and hospital setup. They can also be effective for people who generally have an afternoon nap.

5.2.1 Legislation

At the national level, all countries are signatories to the inter-sectoral Health Regulations which have a specific provision for the control of *Ae. aegypti* and other disease vectors around international seaports/airports. Various municipalities in the country, namely Mumbai Municipal Corporation, New Mumbai Municipal Corporation, Municipal Corporation Delhi, Chandigarh and Goa have adopted legislation for the prevention of “nuisance mosquitoes”. However, they lack in implementation at the ground level. Legislative support is essential for the success of dengue control programme.

The formulation of legislation on dengue/ Ae. aegypti should, therefore, take into consideration the following points:

(i) Legislations should be necessary component of all dengue prevention and control programmes. States/municipal corporations/local bodies should have promulgation of such legislation.

(ii) Legislation should contemplate inter-sectoral co-ordination among the ministries involved in national development in order to prevent isolated implementation of individual programmes and harmful environmental changes that could create potentially hazardous public health conditions e.g. mandatory health impact assessment of various development projects and building construction activities having inbuilt provisions of mosquito breeding free premises.

(iii) All existing decrees and resolutions on dengue/ *Ae aegypti* prevention and control must be reviewed, and their effectiveness evaluation in terms of structural, institutional and administrative changes.

(iv) Dengue should be added in the list of diseases that require mandatory notification by each state.

(v) Legislation should cover all aspects of environmental sanitation in order to effectively contribute to the prevention of all transmissible diseases.

(vi) In developing legislation, social component must be considered. Legislation should seek support based on justice and justification: individuals and the community must be persuaded that the law is for their benefits and intended to protect them and their families, and that compliance with it is one of the most important components for dengue control. Measures for dengue and chikungunya control in Urban, Rural and Panchayati Raj settings are annexed at **Annexure-B, C & D.**

Chapter 6

Outbreak Response

6.1 Emergency Preparedness

Outbreaks of arbo-viral diseases like dengue and chikungunya evolve quickly, requiring emergency actions to immediately control infected mosquitoes in order to interrupt or reduce transmission and reduce or eliminate the breeding sites of the vector mosquito. In order to meet such emergencies, it is essential that persons at all levels, including individuals, the family, the community and the public health personnel, contribute to preventing the spread of the epidemic. Two major components of the outbreak response are:

- Early diagnosis and appropriate clinical case management of dengue to minimize the number of dengue-associated deaths.

- Emergency vector control to curtail transmission of the dengue/chikungunya virus as rapidly as possible.;

a). Constitution of a Rapid Response Team (RRT)

All the States should have a multidisciplinary RRT including epidemiologists, entomologists, microbiologists/pathologist and IEC Officer/Consultant /Media officer in State and in each district HQ including Municipalities. On receipt of the report of a suspected or confirmed case from a SSH and in media the team should take up the following tasks:

- Technical: This involves the process of planning for laboratory samples (blood) and entomological survey, specimen Collection, storage and transportation techniques.
- Logistics: Administrative procedures including travel plans and other arrangements should be worked out. It is envisaged should establish and build partnerships whenever possible.

6.2 Case investigation,

6.2.1 Verification of the outbreak: In case of the report (line list) received from SSH, the RRT should

- Confirm whether any case reported earlier from the area, analyse/compare the previous and current data.
- If no information about any earlier case may be an index case
- visit the area as early as possible to collect information on cases, their clinical signs/ symptoms, history of exposures and other relevant epidemiological/ entomological and laboratory information (where possible) to substantiate the outbreak

6.2.2 Communication with authorities concerned and recommendation of control measures

Findings should be communicated to state/ district vector borne disease control programme Municipality Health Officer and/or officer for appropriate decision and implementation of recommended control measures.

6.3 Media Management

Print and electronic media shall be informed on day to day activities for control of dengue and chikungunya. During an outbreak the aim of risk communication, generally through the media, is to build public trust. It is done by announcing the epidemic early, communicating openly and honestly with the public (transparency), and particularly by

providing accurate and specific information about what people can do to make themselves and their community safer. This gives people a sense of control over their own health and safety, which in turn allows them to react to the risk with more reasoned responses. In endemic countries, involving the media before the occurrence of the seasonal increase in dengue enhances the opportunity to increase public awareness about the disease and the personal and community actions that can be taken to mitigate the risk.

Chapter 7

Capacity building

7.1 Training

Bringing national dengue programs in line with an integrated, community-based prevention and control approach will require training of personnel in new methods; conducting training/workshops to exchange new information; holding regional meetings to promote new strategies presenting plans of action and norms for dengue programs.

7.1.1 Clinical and laboratory-based surveillance, diagnosis and case management

It is proposed that treatment teams should be fully trained and available at all CHCs, district hospitals and tertiary care hospitals. Training should also be imparted to dengue/chikungunya treatment clinics and hospitals in private sector.

Because the success of laboratory techniques depends on mastering scientific knowledge and specific practices, training session should not attempt to cover all techniques in a short time, but should focus on one technique and allow sufficient practice time before the trainee learns additional techniques.

- There should be training in the following techniques: MAC-ELISA and NS1.
- Local, regional, and central level personnel will need training on dengue, its transmission, signs/symptoms, and vector`s characteristics. Also on completing forms, identifying reportable cases, and collecting and submitting blood samples.
- Training should be given to physicians and nurses on the clinical aspects of dengue and on the appropriate management of patients.
- Training should be given to Medical Officers on management of post chikungunya cases.

7.1.2 Vector Surveillance:-

- Statistical sampling methods for larval mosquito populations should be taught and used to optimize resource utilization.
- Workshops on redistributing responsibility and disseminating knowledge to the local level should be held at the central and regional levels.
- Courses emphasizing managerial skills should be presented at the regional level.
- Prevention and control methods using appropriate technology should be emphasized at all levels.
- Workshops emphasizing training skills should be presented at all levels to facilitate replication of courses.

7.1.3 Emergency control (Rapid Response)

- Training courses on the proper use and operation of space spray equipment should be conducted.
- Simulation exercises should be presented
- Workshops should be held to evaluate emergency strategies.

7.2 Strengthening Human resource:

7.2.1 At State level:

- The entomological setup is very poor in almost majority of the states. The vacant posts of entomologists and Insect collectors at each district and zonal level should be filled up.

- For source reduction activities domestic breeding checkers should be engaged. The funds required for this purpose should be reflected in state PIP every year with justification.
- The SSHs should have equipment (ELISA facility) trained microbiologist/pathologist and technicians.

7.2.2 At municipality level

- The entomological setup is very poor in almost majority of the municipalities accept the metropolitan cities. Each municipalities should ensure having trained entomologists and Insect collectors.
- For source reduction activities domestic breeding checkers should be engaged (like in Municipal Corporation of Delhi)

7.2.3 At National level

No additional infrastructure in terms of manpower has been provided after these integration of the major disease in the programme. Since both Dengue and Chikungunya are viral diseases and transmitted by the same vector mosquito is being looked after by one division only. it is therefore, proposed to strengthen the division of Dengue and Chikungunya by providing two (2) Consultants (one for Monitoring & Evaluation and other Entomology), one Data Manager and two Office Assistant to monitor the implementation of the Octalogue strategies of Mid Term Action Plan for Prevention and Control of Dengue and Chikungunya by states and other stakeholders, coordinate with the States; provide technical guidance by reviewing the data and by field visits. Besides, monitoring the functioning of RDCs & ARLs and supply of test kits also needs to be strengthened.

7.3 Operational research

It is desirable to prioritize research areas and develop new strategy by undertaking operational research with a view to improving its effectiveness and efficiency of the existing tools for giving greater scientific credibility to dengue and chikungunya control in India. The important areas of operational research are as under:

- Longitudinal studies on Dengue and Chikungunya diseases in the country, estimation of disease burden and transition of diseases in time and space, and identifying the disease specific risk factors leading to the development of appropriate measures for intervention.
- To study maintenance mechanism of dengue virus in nature, determine regional risk factors of Dengue & DHF and develop surveillance design capable of forecasting impending epidemic situations for their prevention and management in the country.
- To study vector bionomics and transmission dynamics of dengue and Chikungunya, identifying local risk factors to develop a strategic action plan for its prevention and control.
- Mapping of different vectors (Aedes) for understanding the vectors involved in transmission and adaptations towards different environment in respect of Dengue and Chikungunya.
- Determinants and predictors of diseases dengue and Chikungunya for the development of area-specific strategic action plans for their control to support national control programmes.

Chapter 8

Behavior Change Communication

8.1 Social Mobilization

Social mobilization is the process of bringing together all feasible and practical inter-sectoral social allies to raise people's awareness of and demand for dengue prevention and control, to assist in the delivery of resources and services, and to strengthen community participation for sustainability and self-reliance. Social mobilization expands the concept of "community" to include not just householders, villagers, or urban settlements, but many other social allies such as heads of state and other political leaders, various ministries, district and local government authorities, community and religious leaders, businesses, environmentalists, NGOs, service clubs, journalists, filmmakers, artists and entertainers, to name the most common examples.

8.2 IEC & BCC

8.2.1 Objective

To increase community awareness/mobilization about Dengue & Chikungunya related prevention and control services, with specific emphasis on endemic areas to empower the community to take prevention measures with following specific objectives:

- Increase the visibility of the problem
- Increase levels of political commitment
- Enhance mobilization of resources
- Community Mobilization
- Sustainability

Note: The media plan for community awareness with all the details is enclosed at Annexure I.

Chapter 9

Inter-sectoral Coordination

The prevention and control of dengue requires close collaboration and partnerships between the health and non-health sectors (both government and private), nongovernmental organizations (NGOs) and local communities. During epidemics such cooperation becomes even more critical, since it requires pooling of resources from all groups to check the spread of the disease. Inter-sectoral cooperation involves at least two components: (i) resource-sharing, and (ii) policy adjustments among the various ministries and non-governmental sectors. Suggested areas of work by various Ministries Inter-sectoral collaboration are at **Annexure-E.** Activities to be undertaken for dengue and chikungunya control in Urban, Rural and Panchayati Raj has been communicated to the states through the respective Ministries (guidelines are annexed at **B, C & D.)**

9.1 Resource sharing

Resource sharing would be sought wherever the dengue control coordinator can make use of underutilized human resources, e.g. community, religious, social and youth groups etc. to check mosquito breeding, spreading awareness and clean up discarded tyres and containers in neighbourhoods. The corporate sector will also be encouraged to adopt localities/public parks/places etc. for the cleanup operations.

9.2 Policy adjustment

The dengue control programme would seek the accommodation or adjustment of existing policies and practices of other ministries, sectors, and municipal governments to include public health as a central focus for their goals. For instance, the urban development sector would be encouraged to adjust its policies to give first priority to water supply improvements for the communities in slums at highest risk of dengue, education department can be encouraged to take up setting up a positive health club in each school with emphasis on various preventable diseases control activities etc.

9.3 Role of non-health sectors in dengue control

Contribution by various Organization and Ministries are crucial for Dengue and Chikungunya control as shown in the table follows. Necessary instructions to all the concerned Ministries need to be issued from time to time and coordinate.

Chapter-10

Monitoring & Evaluation (M & E) Dengue & Chikungunya

The effective control of Dengue and Chikungunya requires a strict supervision components viz. epidemiological situation, surveillance, case management including logistics & budget etc.

Monitoring is a process tool used to keep a watch on goal setting, situation analysis and planning activities aimed to achieve the set goals. Monitoring is also a managerial tool used to manage men, material and money to achieve the set goals of the programme.

Evaluation is an outcome tool. Assessment of input, process and output indicators are carried out to know the outcome. Depending on the outcome, the course of the programme is evaluated. In case there is a need for any change in the approach, it helps the programme managers to effect midterm corrections.

Data required for monitoring and evaluation is provided by the programme implementation through periodic reports and returns contained in prescribed Performa. They may be generated through disease surveillance or through special reports received through independent assessment programmes of different level supervisory officials. For the successful implementation of the programme, it is better that the monitoring and evaluation are carried out by independent authority other than the programme implementer (State). This could be an inbuilt system of the programme (carried out by central staff) or done through external independent agencies.

10.1 Flow of information

Information flow may start from the periphery to the centre or vice versa. While the information regarding output indicators and process indicators flow from periphery to the centre input indicator and outcome indicator information flows from centre to the periphery. Impact indicators have to be communicated to the periphery as a feedback from the centre to periphery. They would help in timely and complete reporting. During an epidemic situation reports are to be sent daily. During the inter-epidemic phase the reports are to be sent weekly /monthly. The reporting formats are at **Annexure F&G.**

10.2 Supervision – A set back of the current Dengue and Chikungunya has been perceived due to poor or nil supervision of the programme implementation at peripheral level.

The Officers from National level, Regional, State and District level should constantly supervise the monitor each component of the mid-term plan during their field visits and/ or through the reports. Observations made by the supervisors should be made component wise.

The Dte of NVBDCP and the respective state HQs will monitor the above components and maintain the data base. The data maintained/generated will be reviewed from time to time to assess the programme implementation at the peripheral level. Format for supervision are at **Annexure-H.**

Chapter 11

Budget

The necessary budgetary provisions have already been made in the Annual Action Plan for 2011-12 and it will be provisioned in the 12th five year plan. All the states will be requested to provision adequate budget in their respective PIP (NRHM) for effective implementation of Mid Term Plan strategies for prevention and control of dengue and chikungunya.

Table-1 States Reported Dengue Cases since 1991-2010

Sl. No.	State	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	Arunachal Pd.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Andhra Pd.	-	-	+	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+
3	Assam	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
4	Bihar	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	+	+	+
5	Chhattisgarh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+
6	Goa	+	-	-	+	-	-	-	-	-	-	+	-	+	+	+	+	+	+	+	+
7	Gujarat	-	-	+	+	+	-	+	-	+	+	+	+	+	+	+	+	+	+	+	+
8	Haryana	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
9	Himachal Pd.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
10	J&K	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-
11	Jharkhand	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
12	Karnataka	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
13	Kerala	-	-	-	-	-	-	-	+	-	-	+	+	+	+	+	+	+	+	+	+
14	Madhya Prades	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+
15	Meghalaya	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
16	Maharashtra	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
17	Manipur	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+
18	Mizoram	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	Nagaland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
20	Orissa	+	+	-	-	-	-	-	+	-	-	-	-	-	-	-	+	+	-	-	+
21	Punjab	-	-	-	+	-	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+
22	Rajasthan	-	-	-	-	-	-	+	+	+	-	+	+	+	+	+	+	+	+	+	+
23	Sikkim	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
24	Tamil Nadu	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
25	Tripura	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	Uttar Pradesh	-	-	-	-	-	+	+	-	+	-	+	-	+	+	+	+	+	+	+	+
27	Uttrakhand	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+
28	West Bengal	-	-	-	-	+	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+
29	A&N island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
30	Chandigarh	-	-	-	-	-	-	-	-	-	-	-	+	-	-	+	+	+	+	+	+
31	Delhi	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
32	D&N Haveli	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+
33	D&Diu	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34	Lakshdweep	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	Pondicherry	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	+	+	+	+
Total States		**4**	**4**	**7**	**5**	**5**	**7**	**9**	**8**	**9**	**8**	**12**	**12**	**13**	**15**	**14**	**18**	**18**	**18**	**20**	**27**

\+ Year Cases reported
\- Year when No case was reported

Table-1 STATE-WISE DENGUE CASES (C)AND DEATHS(D) IN THE COUNTRY

Sl No	State	2006		2007		2008		2009		2010	
		C	D	C	D	C	D	C	D	C	D
1	Andhra Pd.	197	17	587	2	313	2	1190	11	776	3
2	Assam	0	0	0	0	0	0	0	0	237	2
3	Bihar	4	0	0	0	1	0	1	0	510	0
4	Chhattisgarh	0	0	0	0	0	0	26	7	4	0
5	Goa	1	0	36	0	43	0	277	5	242	0
6	Gujarat	545	5	570	2	1065	2	2461	2	2568	1
7	Haryana	838	4	365	11	1137	9	125	1	866	20
8	Himachal Pd.	0	0	0	0	0	0	0	0	3	0
9	J & K	24	1	0	0	0	0	2	0	0	0
10	Jharkhand	0	0	0	0	0	0	0	0	27	0
11	Karnataka	109	7	230	0	339	3	1764	8	2285	7
12	Kerala	981	4	603	11	733	3	1425	6	2597	17
13	Madhya Pd.	16	0	51	2	3	0	1467	5	175	1
14	Meghalaya	0	0	0	0	0	0	0	0	1	0
15	Maharashtra	736	25	614	21	743	22	2255	20	1489	5
16	Manipur	0	0	51	1	0	0	0	0	7	0
17	Nagaland	0	0	0	0	0	0	25	0	0	0
18	Orissa	1	0	4	0	0	0	0	0	29	5
19	Punjab	1166	6	28	0	4349	21	245	1	4012	15
20	Rajasthan	1805	26	540	10	682	4	1389	18	1823	9
21	Sikkim	0	0	0	0	0	0	0	0	0	0
22	Tamil Nadu	477	2	707	2	530	3	1072	7	2051	8
23	Uttar Pradesh	639	14	132	2	51	2	168	2	960	8
24	Uttrakhand	0	0	0	0	20	0	0	0	178	0
25	West Bengal	1230	8	95	4	1038	7	399	0	805	1
26	A&N Island	0	0	0	0	0	0	0	0	25	0
27	Chandigarh	182	0	99	0	167	0	25	0	221	0
28	Delhi	3366	38	548	1	1312	2	1153	3	6259	8
29	D&N Haveli	0	0	0	0	0	0	0	0	46	0
30	Puducherry	0	0	274	0	35	0	66	0	96	0
TOTAL		**12317**	**157**	**5534**	**69**	**12561**	**80**	**15535**	**96**	**28292**	**110**

Table-3 CLINICALLY SUSPECTED CHIKUNGUNYA CASES

Sl. No	Name of the States/UTs	2006	2007	2008	2009	2010
1	Andhra Pd.	77535	39	5	591	116
2	Goa	287	93	52	1839	1429
3	Gujarat	75419	3223	303	1740	1709
4	Haryana	0	20	35	2	26
5	Karnataka	762026	1705	46510	41230	8740
6	Kerala	70731	24052	24685	13349	1708
7	Madhya Pd.	60132	0	0	30	113
8	Meghalaya	0	0	0	0	16
9	Maharashtra	270116	1762	853	1594	7431
10	Orissa	6461	4065	4676	2306	544
11	Punjab	0	0	0	0	1
12	Rajasthan	102	2	3	256	1326
13	Tamil Nadu	64802	45	46	5063	4319
14	Uttar Prd.	4	4	11	0	5
15	West Bengal	21	19138	17898	5270	20503
16	A&N Island	1549	0	0	0	59
17	Delhi	560	203	14	18	120
18	Lakshadweep	35	5184	0	0	0
19	Puducherry	542	0	0	0	11
Total		**1390322**	**59535**	**95091**	**73288**	**48176**

Sl. No.	State	Existing till 2010	New identified in 2011	Total*
1	Andhra Pradesh	10	15	25
2	A&N Islands	1	2	3
3	Arunachal Pradesh	0	1	1
4	Assam	2	6	8
5	Bihar	1	2	3
6	Chandigarh	0	1	1
7	Chhattisgarh	2	0	2

Annexure-A

8	Daman & Diu	0	1	1
9	Dadra&Nagar Haveli	0	1	1
10	Delhi	33	0	33
11	Goa	3	0	3
12	Gujarat	10	6	16
13	Haryana	6	4	10
14	Himachal Pradesh	0	2	2
15	Jammu & Kashmir	1	6	7
16	Jharkhand	2	2	4
17	Kerala	10	10	20
18	Karnataka	17	2	19
19	Lakshadweep	1	0	1
20	Maharashtra	15	8	23
21	Madhya Pradesh	12	3	15
22	Manipur	1	1	2
23	Meghalaya	0	3	3
24	Mizoram	0	1	1
25	Nagaland	0	2	2
26	Orissa	3	1	4
27	Pondicherry	2	2	4
28	Punjab	6	4	10
29	Rajasthan	9	10	19
30	Sikkim	0	2	2
31	Tamil Nadu	13	14	27
32	Tripura	0	1	1
33	Uttar Pradesh	10	12	22
34	Uttarakhand	2	2	4
35	West Bengal	10	2	12
	Total	**182**	**129**	**311**
***For details of name logon to www.nvbdcp.gov.in**				

State wise Regional Diagnostic Centres (Earlier Sentinel Surveillance Hospitals)

APEX REFERRANCE LABORATORIES

1. National Institute of Virology, Pune.
2. National Center for Disease Control (former NICD), Delhi.
3. National Institute of Mental Health & Neuro-Sciences, Bangalore.
4. Sanjay Gandhi Post-Graduate Institute of Medical Sciences, Lucknow.
5. Post- Graduate Institute of Medical Sciences, Chandigarh.
6. All India Institute of Medical Sciences, Delhi.
7. ICMR Virus Unit, National Institute of Cholera & Enteric Diseases, Kolkata.
8. Regional Medical Research Centre (ICMR), Dibrugarh, Assam.
9. King's Institute of Preventive Medicine, Chennai.
10. Institute of Preventive Medicine, Hyderabad.
11. B J Medical College, Ahmedabad.

12. State Public Health Laboratory, Thiruvananthapuram, Kerala
13. Defence Research Development and Establishment, Gwalior
14. Regional Medical Research Centre for Tribals, (ICMR) Jabalpur, Madhya Pradesh

Annexure- B

National Vector Borne Disease Control Programme

MEASURES FOR DENGUE & CHIKUNGUNYA CONTROL IN URBAN AREAS

1. Urban Legislative Bodies (ULB), all Municipal Corporations are to develop and implement programme for water supply, sewerage, drainage and solid waste management to keep the environment free from vector breeding.

2. Mosquito free building construction activities by introducing necessary “Building Bye Laws”. (e.g. Mumbai Municipal Corporation Act 1928 for prevention of breeding during construction of developmental projects.) Anti larval measures must be taken by the construction authority and completion certificate only to be issued after proper disposal of storage tanks or dismantling such structures so that no rain water can accumulate. All developmental projects in urban and semi-urban/peri-urban areas should have clearance on anti-mosquito preventive measures after assessment by concerned Health Authorities.

3. Introducing **“**Civil Bye-Laws**”** by local bodies of cities and towns for proper disposal of refuse, junk material and solid waste material to prevent mosquitogenic conditions.

4. Orientation training of Junior Engineers, Public Health Engineering department personnel’s and other Engineering staff about vector control measures and preventive measures on water stagnation to be carried out.

5. Cover storm water drainage system and maintain them periodically by way of regular cleaning, desilting and maintain adequate velocity for flow of water to avoid mosquito breeding in stagnated water.

6. Flower pots and coolers require special attention as potential breeding spots in domestic situations like government buildings, hospitals, schools, religious places, public places, cinema halls, theaters, malls, entertainment venues. Anti larval measures with Temephos granules may be applied fortnightly. Wherever possible these potential breeding spots be dried up once in a week.

7. National Centre for Disease Control (former NICD) has designed a desert cooler which does not allow mosquitoes to breed due concealed water filling compartment, for which an award of Rupees One Lakh has also been received by the Institute. The same need to be promoted especially in Govt Departments (Details enclosed).

8. Use of larvivorous fish in the water bodies such as slow moving streams, lakes, ornamental ponds, etc. is also recommended, to prevent mosquito breeding in domestic and peri-domestic areas or residential blocks and government / commercial buildings, construction sites.

9. ULBs and all Municipal Corporations should ensure regular and timely deployment of skilled manpower (breeding checkers) for the control of mosquito breeding during monsoon and post monsoon season. They should also be involved in generating regular surveillance data on potential breeding sources and their reduction in metro cities, urban, peri-urban, semi-urban areas.

10. Over flow of water from the water tanks (individual and community) should be controlled through proper floating valves. Overhead tanks should also be properly covered.

11. Proper drainage system should be provided around all public stand posts to facilitate smooth drainage of waste water.

12. Fogging using Malathion and other chemicals as per national programme guidelines shall be periodically carried out.

13. Proper sanitation including community toilets and drainage facilities should be provided in an around the slums areas as well as make and shift sites of construction workers.

14. Normally mosquito breeding is high during monsoon period & post monsoon June to September (State wise variation is possible). Hence, the vector control measures should be intensified accordingly.

15. In order to ensure community mobilization through dissemination of messages to the masses schools/children should be involved in the awareness generation programme. In this regard, introduction of course curriculum for primary and secondary level of education should be advocated with the help of Department of Education.

16. Coolers, flower pots, bird baths, pet watering dishes should be drained, scrubbed, dried regularly (once in a week) before refilling. Temephos granules may also be used to control mosquito breeding in coolers.

17. Water should not be allowed to stagnate in waste and discarded materials like thermacol sheets, discarded tyres, disposable glasses /cups etc.

18. Stored water should be stained with a clean cotton cloth and replenished again after scrubbing, cleaning and drying of the container.

19. Preparedness of the ULBs should be reviewed before the monsoon season every year and subsequently during the transmission season as & where required. Proceedings of these review meetings should be communicated to the Directorate of NVBDCP (Director, NVBDCP, 22 Sham Nath Marg, Delhi-110 054, Fax No.:011- 23968329, email – nvbdcp-mohfw@nic.in) and State Programme Officers for Vector Borne Disease Control.

20. For more detailed guidelines log on to Directorate of National Vector Borne Disease Control Programme, Dept. of HFW, Ministry of HFW, GoI, website www.nvbdcp.gov.in or email to nvbdcp-mohfw@nic.in

All the above instructions should be followed by all ULBs and all Municipal Corporations to make them aware under their jurisdiction free of Dengue and Chikungunya.

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Annexure- C

National Vector Borne Disease Control Programme

MEASURES FOR DENGUE & CHIKUNGUNYA CONTROL IN RURAL AREAS

1. District Rural Development Authorities (DRDA) are to develop and implement programme for water supply, sewerage, drainage and solid waste management in the rural areas. While implementing such schemes like accelerated rural water supply programme, Central, Rural sanitation programme etc. special care should be taken to keep the environment free from vector breeding.

2. The projects being carried out under NREGP should also take care to avoid creation of mosquito breeding sites in and around the project areas.

3. Normally mosquito breeding is high during monsoon period & post monsoon June to September (State wise variation is possible). Hence, the vector control measures should be intensified accordingly. Special drive may be carried out for proper disposal of refuse, junk material and solid waste material to prevent mosquitogenic conditions before the monsoon season.

4. Orientation training of officers/officials of DRDA, including BDO, Engineers, Block Health Educators, Sanitary department, school teachers and Anganwadi Workers, on vector control measures and preventive measures to be carried out with the help of District /State Health Authorities.

5. Cover rain harvesting system with mosquito proof cover and maintain periodically by way of regular cleaning to avoid Aedes mosquito breeding in it.

6. Flower pots and coolers require special attention as potential breeding spots in domestic situations like government buildings, hospitals, schools, religious places, public places and cinema halls. Anti larval measures with Temephos granules may be applied fortnightly. Wherever possible these potential breeding spots be dried up once in a week.

7. Water should not be allowed to stagnate in waste and discarded materials like thermacol sheets, discarded tyres, disposable glasses /cups etc.

8. Tree holes should be filled with sand to avoid rain water collection and mosquito breeding.

9. Plantation areas (Rubber, Coconut, Arecanut, Pineapple, Bannana, Bamboo etc.) should be cleaned to avoid water stagnation in shot-off fruit shells and leaves which provides breeding habitat for *Ae. albopictus* mosquitoes.

10. National Centre for Disease Control (former NICD) has designed a desert cooler which does not allow mosquitoes to breed due concealed water filling compartment, for which an award of Rupees One Lakh has also been received by the Institute. The same need to be promoted especially in Govt Departments (Details enclosed).

11. Department of drinking water supply should ensure over flow of water from the water tanks under (individual and community) through proper floating valves and covering the overhead tanks properly.

12. In order to ensure community mobilization through dissemination of messages to the masses schools/children should be involved in the awareness generation programme. In this regard, introduction of course curriculum for primary and

secondary level of education should be advocated with the help of Department of Education. Schools should be advised for full sleeved uniform/dress to prevent mosquito biting.

13. Stored water should be strained with a clean cotton cloth and replenished again after scrubbing, cleaning and drying of the container.

14. Cream /oil based repellents may be applied or dressed with full sleeved clothing while entering in the plantation area during day time to prevent mosquito biting.

15. July should be observed as Anti Dengue month when all these activities should be carried out in campaign mode.

16. Fogging using Malathion and other chemicals as per national programme guidelines shall be periodically carried out.

17. Preparedness of the DRDA/Blocks should be reviewed before the monsoon season every year by the District Authorities and subsequently during the transmission season as & where required. Proceedings of these review meetings should be communicated to the Directorate of NVBDCP (Director, NVBDCP, 22 Sham Nath Marg, Delhi-110 054, Fax No.:011- 23968329, email – nvbdcp-mohfw@nic.in) and State Programme Officers for Vector Borne Disease Control.

18. For more detailed guidelines log on to Directorate of National Vector Borne Disease Control Programme, Dept. of HFW, Ministry of HFW, GoI, website www.nvbdcp.gov.in or email to nvbdcp-mohfw@nic.in

All the above instructions should be followed to make the areas under the jurisdiction of each DRDA/Block free of Dengue and Chikungunya.

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Annexure- D

National Vector Borne Disease Control Programme

MEASURES FOR DENGUE & CHIKUNGUNYA CONTROL IN PANCHYATS (VILLAGES)

1. District Rural Development Authorities (DRDA) implementing programmes for water supply, sewerage, drainage and solid waste management in the rural areas. While implementing such schemes like accelerated rural water supply programme, Central, Rural sanitation programme etc. special care should be taken to keep the environment free from vector breeding.

2. Normally mosquito breeding is high during monsoon period & post monsoon June to September (State wise variation is possible). Hence, the vector control measures should be intensified accordingly. Special drive may be carried out for proper disposal of refuse, junk material and solid waste material to prevent mosquitogenic conditions before the monsoon season.

3. Orientation training of PRI Members, Gram Pradhan, Mahila Mandal, Self Health Groups, ASHA, School, teachers and Anganwadi Workers, on vector control measures and preventive measures to be carried out with the help of District /State Health Authorities.

4. Flower pots and coolers require special attention as potential breeding spots in domestic situations like government buildings, hospitals, schools, religious places, public places. Anti larval measures with Temephos granules may be applied fortnightly. Wherever possible these potential breeding spots be dried up once in a week.

5. Water should not be allowed to stagnate in waste and discarded materials like thermacol sheets, discarded tyres, disposable glasses /cups etc.

6. Tree holes should be filled with sand to avoid rain water collection and mosquito breeding.

7. Plantation areas (Rubber, Coconut, Arecanut, Pineapple, Bannana, Bamboo etc.) should be cleaned to avoid water stagnation in shot-off fruit shells and leaves which provides breeding habitat for *Ae. albopictus* mosquitoes.

8. National Centre for Disease Control (former NICD) has designed a desert cooler which does not allow mosquitoes to breed due concealed water filling compartment, for which an award of Rupees One Lakh has also been received by the Institute. The same need to be promoted especially in Govt Departments (Details enclosed).

9. Department of drinking water supply should ensure over flow of water from the water tanks under (individual and community) through proper floating valves and covering the overhead tanks properly.

10. In order to ensure community mobilization through dissemination of messages to the masses schools/children should be involved in the awareness generation programme. In this regard, introduction of course curriculum for primary and secondary level of education should be advocated with the help of Department of Education. Schools should be advised for full sleeved uniform/dress to prevent mosquito biting.

11. Stored water should be stained with a clean cotton cloth and replenished again after scrubbing, cleaning and drying of the container.

Annexure-E		
Suggested areas of work by various Ministries for Inter-sectoral collaboration		
Sl No	**Agencies**	**Suggested Areas of Work**

12. Cream /oil based repellents may be applied or dressed with full sleeved clothing while entering in the plantation area during day time to prevent mosquito biting.

13. July should be observed as Anti Dengue month when all these activities should be carried out in campaign mode. Funds provided to Village Health & Sanitation Committee (VHSC) under NRHM may be utilized for these activities as per guidelines.

14. Fogging using Malathion and other chemicals as per national programme guidelines shall be periodically carried out.

15. Preparedness of the DRDA/Blocks should be reviewed before the monsoon season every year by the District Authorities and subsequently during the transmission season as & where required. Proceedings of these review meetings should be communicated to the Directorate of NVBDCP (Director, NVBDCP, 22 Sham Nath Marg, Delhi-110 054, Fax No.:011- 23968329, email – nvbdcp-mohfw@nic.in) and State Programme Officers for Vector Borne Disease Control.

All the above instructions should be followed to make the areas under the jurisdiction of each Gram Panchyats free of Dengue and Chikungunya.

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1.	**Ministry of Urban Development / Construction Agencies (CPWD).**	• Provision of appropriate funds and human resource in the local bodies for timely action. • Introducing civic bye-laws by local bodies of cities and towns for proper disposal of refuse, junk materials and solid waste to prevent mosquitogenic conditions. Imposition of penalties for abetting mosquitogenic conditions. • Incorporation of mosquito free building construction activities by introducing "Building Bye-laws". No building to be handed over without clearance of local health department. • Health Impact Assessment for each construction project. • Combined and coordinated prevention and control activities in consultation with district health authorities. • Constitution of Joint Team (Engineering and Health) for closely monitoring Vector activities at construction site especially during rains. • In-service training of Public Health Engineers on vector control activities.
2.	**Local Governments/ Corporations/ Municipality.**	• Close monitoring of dengue and Chikungunya situation in the areas under local body control including Health. • Timely deployment of domestic breeding checkers for source reduction activities • Enactment of byelaws • Constant review of the situation through regular meetings with all concerned departments. • Organising meetings at community level for creating awareness on prevention of Dengue.
3	**Ministry of Rural Development.**	• Sensitization of DRDA officials on preventing mosquitogenic condition • Maintenance of rural water supply, sanitation campaign. • Closing of dysfunctional wells, filling of unwanted ponds, ditches with NREGA. • Organising meetings at community level for creating awareness on prevention of Dengue.
4	**Ministry of Panchayati Raj.**	• Monitoring of surveillance & vector contro interventions. • Advocacy on vector control at community level. • Community education and awareness. • Motivating community for source reduction activities to eliminate vector breeding. • Jawahar Rojgar Yojna funds to be used in improving drainage and sanitation programme. • Ensuring uninterrupted water supply.
5	**Ministry of Science and Technology**	• Planning for adequate funding for research on development of vaccine and drug for Dengue and Chikungunya
6	**Ministry of Surface Transport.**	• Use of discarded and old tyres for road toping (rubberization)

		• Filling of ditches created during construction of roads. • Avoiding creation of junk yards and tyre pile ups.
7	**Ministry of Earth Science (Meteorological Department).**	• Weather forecasting and regular information on rainfall, temperature and humidity. • Sharing of the data with local health authorities on regular basis.
8	**Ministry of HRD.**	• Curriculum on Vector control in educational institutes to be incorporated. • Issuing directions for monthly drive on cleaning of school premises, cleanliness of surroundings and checking water containers for mosquito breeding. • Incorporation of vector control activities in the training curriculum of ICDS functionaries under the Department of Women & Child Development as well as their involvement in vector control activities. • Creating awareness amongst school children on causation and prevention of Dengue and Chikungunya at the time of prayer. • Organizing short plays and competitive type essay writing on Dengue and Chikungunya .
9	**Ministry of Irrigation.**	• Identifying nodal officer for overseeing mosquito control measures (Source reduction) • Seepage control, de-silting, maintenance of canals/sub-canals and regulatory chambers, flushing, drainage, etc. • Prevention of mosquitoesgenic conditions.
10	**Ministry of Agriculture.**	• Organising training programmes for local farmers on reducing mosquitoes breeding sources.
11	**Ministry of Railways.**	• Prevention of water stagnation in construction areas. • Prevent mosquito breeding near railway yards / tracks and residential colonies.
12	**Ministry of Defence**	• Control of mosquito breeding in defence establishments, para-military forces.
13	**Ministry of Commerce**	• Measures to prevent accumulation of water in Rubber/ Plantations and Coir plants. • Screening of labours at the time of recruitment and thereafter at repeated intervals for sign & symptoms of vector borne diseases • Regular Health Education on prevention and control of vector borne diseases • Adoption of integrated vector management at these sites to prevent build up in vector density

Annexure-F

Daily Report of Dengue cases in …….. State - ……..

Reporting date: - ……..

SL NO	District	Total No. of blocks (Taluks) in the District	Total Dengue affected (Since …….)				Dengue (On the day)				Dengue Cumalative (from …….)				Remarks
			Taluks/Corp.	PHC	Villages (areas)	Population of affected Villages	Suspected Dengue Cases	Blood sample collected	Positive Cases	Death	Suspected Dengue Cases	Blood sample collected	Positive Cases	Death	
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
Total															

Annexure-G

Daily Report of Chikungunya Cases in …….. State - ……..

Reporting date: - ……..

SL NO	District	Total No. of blocks (Taluks) in the District	Total Chikungunya affected (Since ……..)				Chikungunya (On the day)				Chikungunya Cumalative (from ……..)				Remarks
			Taluks/Corp.	PHC	Villages (areas)	Population of affected Villages	Suspected Chikungunya Cases	Blood sample collected	Positive Cases	Death	Suspected Chikungunya Cases	Blood sample collected	Positive Cases	Death	
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
Total															

Annexure- H

Format for Monitoring and Supervision

1. Monthly Epidemiological situation analysis

Name of the Districts	Total Population	Total No of PHC/ Ward	No of PHCs /Ward (population) affected	Cases	Deaths	No of New PHCs/Ward (population) affected	Cases	Deaths

2. Surveillance

2.1 Laboratory based sero-surveillance through Regional Diagnostic Centre (RDCs)

No of RDCs identified	No of RDC made functional			No of RDC providing diagnostic services
	Equipped with ELISA facility	Having trained laboratory staff	Contingency grant released	

b. Diagnostic facility

Name of the RDC	Total Samples received/tested		No of Kits received/ used			Samples referred to Apex Ref labs	Sending regular report to heath authorities	Average time from receipt of sample till report
	DEN	CHIK	DEN NS1	DEN IgM	CHIK			

2.2 **Fever alert surveillance**

Name of the District	No of total PHC	No of PHCs receiving report from IDSP	No of fever outbreak report received	No of fever outbreak investigated	Investigation results	Remedial measures undertaken

3. **Case management**

Name of the District	Total no of hospital equipped for treatment and management of cases				Nos of the Districts having emergency hospitalization plan
	Nos of medical officers	Nos trained	Nos of cases treated	Nos of cases referred	

4. Entomological surveillance

Name of the District	Presence of an effective entomological unit	Analysis of entomological indices at weekly interval	Trend of Aedes breeding detected (Increase/ decrease in comparison to the previous fortnight)			Remedial measures undertaken
			HI	CI	BI	

5. Rapid Response Team* (RRT) on report of a new case

Name of the District	Presence of an effective RRT	No of PHCs/ Wards visited during the previous month	No of reports received from RDC	Time taken from receiving the report till RRT	Investigation results	Remedial measures undertaken

* each member should be trained

6. **Capacity building**

Nos of trainings organized for / Nos to be trained/ Nos trained during the year*							
Core team of trainers	Medical Officers on case management	Lab team on sero-diagnosis	RRT	Entomological monitoring	Community volunteers on detection & elimination of breeding	Health workers on fever alert	District level officers on M&E

* Wherever necessary separate column may be made for each group

7. **IEC & Intersectoral Coordination**

Name of the District	Nos with effective IEC/media plan	No of health awareness camps/ meetings organized at			No of meetings organized for			No of news paper clippings published	No of TV/ Radio spots prepared	Any other, specify
		PHC	Ward	School	Intersectoral partners	Media	Others, specify			

8. **Legislative measures** - The Bye-laws including HIA shall be prepared by the respective states and implement through the Districts and Civil authorities/ Municipalities.

Name of the District	Implementing bye-laws effectively	Measures undertaken	Name of the Civil authority /Municipality	Implementing bye-laws effectively	Measures undertaken	Any other, specify

9. **Operational Research**

Name of the Project	Conducted by	Funds provided	Duration/ Area of study	Expected result	Justification of the outcome to improve the programme	Any other, specify

10. **Mobility**

- The supervisor should see the mobility support (Nos of vehicle/ funds for POL/ nos of driver) available at the district level.
- Special arrangement made for RRT.

- Also look for the tour dairy of the district level officers including RRT and review the tour reports submitted after each visit.

11. Logistics

- The supervisor should see the total logistics required/estimated for dengue and Chikungunya as per annual action plan.
- Centrally sponsored component, and to be procured by the state.
- Allocation made to each district (component wise) and for HQ including RRT.
- Areas should be prioritized based on epidemiological situations.
- Logistics received and utilized in each quarter should be monitored for proper and targeted utilization and ready response for emergency.

12. Budget

- The supervisor should see the total amount required/estimated for dengue and Chikungunya as per annual action plan and received by the state.
- Allocation made to each district (component wise) and for HQ.
- Expenditure plan should be prepared for each quarter and total incurred in each quarter should be monitored for proper and timely utilization of the funds and for submission of Statement of expenditure and utilization certificate.

13 Calendar of activities

The month wise activities to be carried out at National, State and district level including the responsible officer is as under

13.1 Activity at National level

Agency responsible: Dte. of NVBDCP, MOH&FW

Sl No	ACTION	TIME LINE	RESPONSIBLE OFFICER
1	Brain Storming on lessons learnt from Delhi 2010 outbreak involving ICMR, NCDC, Medical Colleges, Professional bodies – IMA, IAP, API, NGOs etc.	January	Director, NVBDCP
2	Workshop on developing IEC strategies for dengue prevention & control	January	Director, NVBDCP
3	Advisories to sensitize State on prevention and control of Dengue and to develop a focused and action orientated plan in the line of Long term action plan.	January	Director, NVBDCP
4	Requirement of logistics - Estimation of diagnostic kits	January	Director, NVBDCP
5	Address by Hon'ble Health & Family Welfare Minister to Mayors, CEOs of Municipal Corporations of big cities	February	JS(PH), MOH&FW
6	Concurrence of NIV, Pune for production of supply of requisite quantity of test kits, communication to State(s) about the allocation,	February	Director, NVBDCP

7	Review meetings with Regional and State level Officers of endemic States at National headquarter.	February	Director, NVBDCP
8	Advisories to State to gear up for ensuing transmission season during Anti Dengue month by ensuring all activities including case detection through improved surveillance by identified Regional Diagnostic Centres, entomological monitoring to assess breeding of vector mosquito/s , social mobilization of the community in preventing vector breeding and sensitization of all stakeholders at Public and Private sector.	July	Director, NVBDCP
9	Organizing training courses /orientation workshops : a. State and district level officers on implementation and monitoring of programme strategies at grassroots' level	November	Director, NVBDCP
	b. Clinicians/specialist of tertiary and secondary care hospitals on national guidelines for case management	December	
	c. Re-orientation of laboratory teams of identified institutes on diagnosis.	December	
10	Monitoring of State level activities including functioning of Regional Diagnostic Centres.	Round the year	Director, NVBDCP

13.2 Activity at State level

Agency responsible: State Vector Borne Disease Control Programme Officer

Sl No	ACTION	TIME LINE	RESPONSIBLE OFFICER
1	Development of district level action oriented and situation specific plan in the line of Long Term Action Plan for prevention and control of Dengue.	January	SPO
2	Review meetings with zonal and district level officers, civic bodies for situation analysis lesson learnt, gaps identified/realized from previous year epidemiological situation and way forward for improvement.	January	SPO
3	Requirement of insecticides & process for procurement /supply to districts	February	SPO
4	Diagnostic kits - Convey month wise requirement of diagnostic kits for each Sentinel Surveillance Hospital to NVBDCCP and NIV, Pune & confirmation of	February	SPO

	consignee details.		
5	Assessment of requirement of therapeutics and diagnostics for case management in Hospitals.	March	SPO
6	Review the status and availability of trained Rapid Response Teams at district and state level (name and contact numbers should be available).	March	SPO
7	Review the status of Budget availability and utilization at state & districts.	March	SPO
8	Supply of IEC prototype for translation into local language/dilect by the districts (if required) and ensure its visibility at grass root level and provision of budget for the purpose.	April	SPO
9	Meeting with the intersectoral partners to sensitize them on prevention of mosquitogenic conditions.	April	SPO
10	Organizing training courses for district level officers, MOs, para-medical staff, VHSC, NGOs, PRI Members and private practitioners.	April	SPO
11	Planning of activities and logistics for observation of Anti dengue month during July including social mobilization of the community for source reduction at campaign mode	May	SPO
12	Appeal of Chief Ministers / Health Ministers to MLAs and other representatives of people including Panchayats for their active co-operation for social mobilization of the community for elimination of vector breeding in domestic and peri-domestic situation during anti dengue month observation.	July	SPO
13	Monitoring functioning status ofRegional Diagnostic Centres & submission of performance report to NVBDCP.	Monthly	SPO
14	Monitoring and analysis of the district level entomological reports and timely feedback.	Monthly	SPO
15	Cross checking of entomological activities (larval breeding) carried out at district level.	Randomly	SPO
16	Submission of regular epidemiological reports to NVBDCP.	Daily during transmission & weekly in non transmission	SPO

13.3 Activity at District level

Agency responsible: District Vector Borne Disease Control Programme Officer

Sl No	ACTION	TIME LINE	RESPONSIBLE OFFICER
1	Development of block level action oriented and situation specific plan in the line of Long Term Action Plan for prevention and control of Dengue.	January	DMO
2	Preparation of Action Plan for entomological monitoring and social mobilization of the community including involvement of village health and sanitation committee.	January	DMO
3	Meeting of MO I/c PHCs, representatives of IMA, Indian system of medicine, self-help groups, representatives from *Zilla Parishad* and educational institutes to inform them about the importance of source reduction activities and their respective roles and to discuss PHC-wise micro action plans.	February	DMO
4	Ensuring availability of sufficient quantity of insecticides and spray equipment	February	DMO
5	Issue guidelines to PHCs on clinical diagnosis of dengue cases, referral of cases as and when necessary and for sending blood samples of the suspected cases to the nearby diagnostic facility.	February	DMO
6	Identification of a nodal person for the activities carried out at various levels (urban setup as well as at rural setup) to maintain Aedes mosquito free status.	March	DMO
7	Assessment of training need and logistic requirement of Rapid Response Team.	April	DMO
8	Training of Paramedicals, Village Health & Sanitation Committee Members, PRI members,	April-May	DMO
9	Supply of IEC materials to PHCs and ensure its visibility at grass root level and provision of budget for the purpose.	May-June	DMO
10	Planning for sensitization of the community and other stakeholders including School children during anti dengue month (July).	July	DMO
11	Estimation of the requirement of insecticide (larvicide and adulticide) and spray equipment and submission to state.	September	DMO
12	Submission of compiled report as per format designed by NVBDCP.	Daily during transmission season and weekly in non transmission period	DMO
13	Ensuring timely implementation of public health response in the areas reporting cases on receipt of line list from Sentinel Surveillance Hospital.	Round the year	DMO

Annexure -I

Media Plan

To increase community awareness/mobilization about Dengue & Chikungunya related prevention and control services, with specific emphasis on endemic areas to empower the community to take prevention measures with following specific objectives:

- Increase the visibility of the problem
- Increase levels of political commitment
- Enhance mobilization of resources
- Sustainability through Community Mobilization

1. MEDIA PLAN CURRENTLY IN PLACE/PRACTICE IN COUNTRY

NVBDCP being the nodal agency for vector borne disease control programme, is funding various media activities for carrying out information dissemination for control of DF and DHF to different states. NVBDCP is also directly carrying out information dissemination through Prasar Bharati (Kalyani I programme) and DAVP (Print-newspapers and Electronic-TV & Radio). The states are also carrying out the media activities for sensitization of community using print and electronic media. Apart from this at state level group communication activities like miking, health fairs, wall painting, street play, mobile van etc. are also used.

2. SHORTCOMING IN THE PRESENT MEDIA PLAN

Following shortcomings have been observed in the media plan from the field experience and various reports on the morbidity and mortality.

A. Lack of coordination among different agencies involved in disease control.
B. Poor reach of messages to people living in far-flung areas.
C. Poor involvement of corporate sector
D. Poor sensitization of media

3. STRATEGY FOR REINFORCEMENT OF MEDIA PLAN

A. Redefining of target audience
B. Redefining of messages according to target audience

A. Redefining of target audience

The target audience shall be divided into functional three categories

(i) **Primary** - Community how is at risk of Dengue and Chikungunya viz. general population and people living in far-flung areas.

(ii) **Secondary** – How assist in spreading of message to primary audience viz PRI, Urban local bodies (municipal councils), Village health sanitation committee members, ASHAs, Community leaders, Youth organizations, Resident welfare associations etc.

(iii) **Tertiary** – Large institutions and corporate houses that can have a role in dissemination of information viz. Media, CII, ASSOCHAM, FICCI etc.

B. Redefining of messages according to target audience

(i) Channels of communication

a) Mass Communication
   - *Print - News papers, Popular Magazine*
   - *Electronic – TV, Radio, Internet, SMS*

b) Group Communication
   - *Wall painting-Panchyat ghar, School buildings, Health facilities*
   - *Signages-hoarding, bus stop panels, health facilities*
   - *Health fair-Standees, Posters*
   - *Street play/Puppet show-Flyers*
   - *Mobile van-Flyers*

c) Inter Personal Communication
   - *One to one interaction*

ASHA, MPW, Kalyani Club members, Youth group members etc. should be involved in IPC along with IEC

(ii) Messages according to channels of communication

a) **Annexure- i** – prototype for mass communication messages
b) **Annexure- ii** – prototype for group communication messages
c) **Annexure- iii** – prototype for interpersonal communication messages

1. BUDGET SUPPORT

NVBDCP has been funding states for carrying out various activities for information dissemination with respect to DF/DHF through the mass media. The budget support proposed for this activity for the year 2011-12 is as follows:

Sl. No.	Level	Cost	Breakup of cost
1	National	*Provision already made in BE 2011-12*	Mass media: 100%
2	State	*To be released through state societies. As per ROP.*	Mass media: 20% Mid media: 45% IPC: 35%

2. EXPECTED OUTCOME

- Reduction in mosquito genic conditions around human habitation
- Active involvement of various stakeholders in the programme
- Better coordination between different agencies
- Reduction in number of new dengue fever cases
- Fever cases seeking early diagnosis and health care facilities

Annexure -i

Prototype for Mass Communication - News Paper/Magazine

Shri S. Gandhiselvan
Hon'ble Minister of State for Health & Family Welfare

Shri Ghulam Nabi Azad
Hon'ble Minister of Health & Family Welfare

Shri Dinesh Trivedi
Hon'ble Minister of State for Health & Family Welfare

STOP MOSQUITO BREEDING IN AND AROUND YOUR HOME

Mosquitoes which spread Dengue and Chikungunya breed in clean water and bite during day time

- Make sure that all water tanks and water storage containers are covered
- Empty & dry/scrub coolers, drums, plant pots, bird bath, flower vases etc. every week
- Don't allow water to accumulate in old tyres, disposable cups, glasses, coconut shells and other containers

Adopt personal protection methods like full-sleeved clothing, mosquito repellents and mosquito nets to prevent mosquito bites

In case of high fever accompanied with headache, pain behind the eyes, joint & muscular pain, skin rash and fatigue, go to your nearest hospital/health centre

Let's us work together to Prevent Dengue & Chikungunya.

Issued in public interest by National Vector Borne Disease Control Programme, Directorate General of Health Services, Ministry of Health & Family Welfare, Government of India
www.nvbdcp.gov.in

Shri S. Gandhiselvan
Hon'ble Minister of State for Health & Family Welfare

Shri Ghulam Nabi Azad
Hon'ble Minister of Health & Family Welfare

Shri Dinesh Trivedi
Hon'ble Minister of State for Health & Family Welfare

Don't let mosquitoes breed inside & near your home.
They can cause deadly diseases like Dengue or Chikungunya.

Mosquitoes which spread Dengue and Chikungunya breed in clean water and bite during day time

- Make sure that all water tanks and water storage containers are covered
- Empty & dry/scrub coolers, drums, plant pots, bird bath, flower vases etc. every week
- Don't allow water to accumulate in old tyres, disposable cups, glasses, coconut shells and other containers

- Use personal protection methods like full-sleeved clothing, mosquito repellents and mosquito nets to prevent mosquito bite
- In case of high fever accompanied with headache, pain behind the eyes, joint & muscular pain, skin rash and fatigue, go to your nearest hospital/health centre
- Self medication should be avoided. Health providers should be consulted before taking medicine.

Prevent mosquito breeding to prevent Dengue & Chikungunya.

Issued in public interest by National Vector Borne Disease Control Programme, Directorate General of Health Services, Ministry of Health & Family Welfare, Government of India
www.nvbdcp.gov.in

* Newspaper ads must be half page and coloured

* Add in magazine may be adjusted according to the available space but the messages should be clearly visible and not clumsy

Prototype for Mass Communication – TV/Radio/Internet/SMS

TV Spots (Audio visual spots of 40 sec, with description of the content)

Munna Bhai: (Title)

1. The spot is based on the two most popular characters of famous hindi film "Munna Bhai MBBS", played by Sanjay Dutt as "Murli Prasad Sharma (Munna Bhai)" and Arshad Warsi as "Circuit". The spot involves dialogue between these two characters discussing about Dengue and Chikungunya.
2. Dengue and Chikungunya are showcased as dangerous diseases.
3. It's stated that drums, coolers, bird bath, flower vases, plant pots should be cleaned every week.
4. Don't allow water to stagnate in old tyres, disposable cups and glasses, coconut shells, etc.
5. Mosquito that spread Dengue & Chikungunya breeds in clean water. Prevent yourself from mosquito bite.
6. In case of fever take paracetamol and don't take aspirin.
7. Sign and symptoms to identify the disease:
    a. body pain
    b. high fever accompanied with headache
    c. joint & muscular pain
    d. skin rash
    e. fatigue
8. In case of symptoms, contact doctor. Don't start self medication.

Mahmannawazi: (Title)

1. The common sites at house hold level where Dengue and Chikungunya mosquito could breed like flower vases, plant pots etc. are show with mosquito larva.
2. Punch line is "Mahamannawazi yaa Macharnawazi".
3. It's stated that drums, coolers etc. should be cleaned every week.
4. Don't through anything which can accumulate water like disposable cups and glasses, coconut shells, etc.
5. Wear full-sleeved cloths.
6. Sleep under bed-net.
7. In case of fever and fatigue take paracetamol and don't take aspirin.
8. Sign and symptoms to identify the disease:
    a. body pain
    b. high fever accompanied with headache
    c. joint & muscular pain
    d. skin rash
    e. fatigue
9. In case of symptoms, contact doctor.

Aye Bhai: (Title)

1. The common sites of mosquito breeding like overhead tank, drums, coolers, bird bath, flower vases, plant pots etc. are shown with Dengue larva.
2. Mosquito that spread Dengue & Chikungunya breeds in clean water.
3. It's stated that drums, coolers etc. should be cleaned every week.

4. Don't through anything which can accumulate water like disposable cups and glasses, coconut shells, etc.
5. Prevention is the best way to avoid Dengue and Chikungunya.

10_10: (Title)

1. The spot illustrates preventive measures to stop mosquito breeding by school children.
2. Children are empting drum, cooler, flower vases, plant pots to prevent mosquito breeding. (once in every week)
3. Children are shown burring disposable cups and glasses, coconut shells, etc. in a pit to prevent water accumulation in these things.
4. It's stated that mosquito that spread Dengue & Chikungunya breeds in clean water
5. Wear full-sleeved cloths to prevent from mosquito bite.
6. In case of fever take paracetamol and never take aspirin.

Radio Spots (Audio spots with detail script)
Script-1

(Intro of the Show) Newspaper mein dengu ki khabar to padi hogi na aapne? to Ab main aapko isi se related eak important information deti hoon,
Aapko pata hai? Dengue machar din mein he katata hai.Dengue ke symptoms hain - Tez bukhar, sar mein dard ka hona, muscle aur joint mein dard hona..Yahan tak ki ankhon ke peche dard hona, rashes pad jana bhi dengue ke lakshan hote hai.!! In sabse bachna hai to kya karna hai?? ayein main batati hoon....
Kyunki ye machar saaf aur khade pani mein he panapta hai islye apne ghar mein cooler, flower pots, athva **bird path** mein pani har hafte saaf kare aur usme naya pani bhar ke rakhe .Apne ghar ke as pass pade kuda kachra jaise khali cups, glasses, thermocol pieces , plastic containers, plastic sheets mein pani ekatha na hone de kyuki isme jama hone wale pani mein bhi dengue ka machar panapta hai . Iske alava chatt pe pani ke tanki ka dhakkan khula na rakhe aur agar ho sake to use samay samay pe saaf karne ki koshish kare. Dengue se bachne ka sabse acha tarika hai ki ap apni puri body cover rakhe kyuki ye machar din mein he katata hai.
Sabse important baat.jo apko dhyan mein rakhni hai.... ki bukhar hote he doctor se salha zaroor le aur aesi stithi mein ap paracetamol le sakte hai Disprin bilkul bhi nahi le.
Ministry of Health & Family Welfare dwara jaanhit mein jaari

Script-2

(Intro of the Show) Main aapko aajki important information ke baare mein bata rahi thi na ...to eak baat aur..Dengue me kamzori to mehsus hoti hi hai iske alava agar ye bukhar zyada serious ho jaye to Dengue Haemorrhagic fever ka roop le leta hai iske symptoms takriban dengue fever se milte julte hote hai lekin ismein sharir ke andhruni hisso mein bleeding start ho jati hai aur zyada bleeding se patient shock ki stithi mein ja sakta hai jisse mrityu bhi ho sakti hai. Ohh my god, zara bach kar rahiye aur gaur se iske precautions sun lijiye...
Din mein machcharon ke kaatne se bachne ke liye hath paro ko dhak kar rakhe aur khas tor se bache aur buzurg din mein sote samay machardani ka upyog kare kyuki dengue ka machar din mein he katta hai aur aese mausam mein jaha tak ho sake cooler na chalaye lekin jaisa ki apko pata he hai ki ajkal barish ki wajah se vatavaran mein pehle se he bahut nami hai islye agar apko cooler chalana he hai to bena pani ke he chalaye.

Very very important thing....yaad rakhein ki...Dengue fever mein ap paracetamol le sakte hai disprin bilkul bhi na le aur jald se jald nazdiki sarkari swastha kendre mein janch karvae ye suvidha bilkul muft hoti hai.
Ministry of Health & Family Welfare dwara jaanhit mein jaari

Internet

- Don't allow water to stagnate in and around your area.
- Dengue mosquito breeds in clean stagnant water and bites during day time.
- Ensure that water is not stagnated in discarded cups, glasses, thermocol sheets, plastic sheets, old discarded tyres etc.
- Water equivalent of one table spoon, if stagnated is sufficient for breeding of Dengue mosquito.
- Ensure that flower pots, earthen pots and coolers are emptied, dried and cleaned every week before refilling.
- Overhead tanks must be properly covered and should not overflow.
- Wear protective clothing (full sleeved cloths) to prevent mosquito bites.
- Platelets are not mandatorily required by each and every dengue fever patient.
- Any fever may be Dengue fever, immediately contact your nearest health facility.
- Delay in immediate diagnosis and treatment of Dengue fever may result in DHF which may be fatal.

SMS (with 160 character limit)

- Dengue Mosquito breeds in clean stagnant water and bites in day time. Wear full-sleeved cloths & use mosquito repellents to prevent mosquito bite

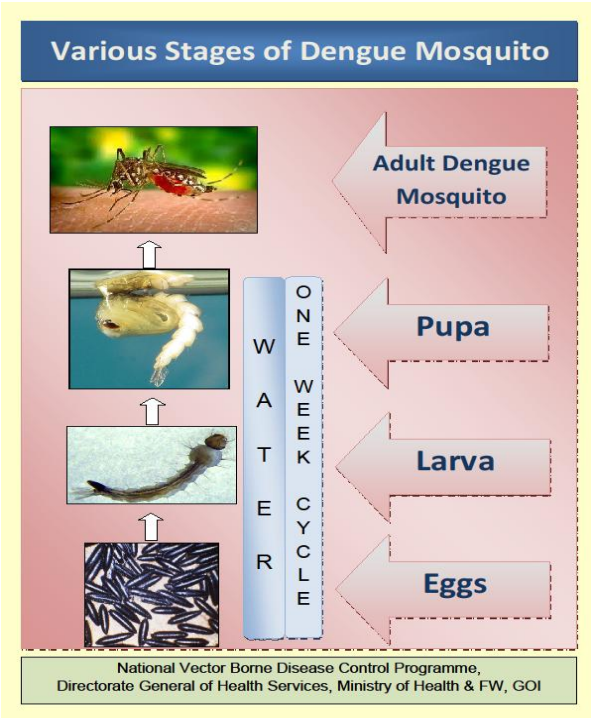
- Change water in flower vase, bird pots, coolers every week and cover overhead tanks with lid to prevent the breeding of Dengue mosquito

- Don't allow water to stagnate in waste materials like plastic bottles, thermocol cups, glasses etc. to prevent the breeding of Dengue mosquito

Annexure-ii

Prototype for Group Communication

Formats for publicity in small groups through posters, standees, signage, flyers



List of Hospitals for Testing of Dengue and Chikungunya in Delhi

Dr. Venugopal
Swami Daya Nand Hospital, Dilshad Garden Shahdara
Ph. 9899299544, 22582512

Dr. B. Nath
Satyawadi Raja Harish Chandera Hospital,
DDA Flats, Narela, Delhi
Ph. 9810540198, 27787304

Dr. P. P. Singh
Hindu Rao Hospital, Near Malka Ganj, Delhi
Ph. 9811480756, 23973946

Dr. N. V. Kamat
Sanjay Gandhi Memorial Hospital,
S-Block, Mangol Puri, Delhi
Ph. 9810446260, 27921117

Dr. A. K. Bangotra
Dr. Baba Shaib Ambedkar Hospital (BSA),
Sector - 6, Rohini, Delhi
Ph. 9810766588, 27055585

Dr. J. Prasad
Safdarjung Hospital, Safdarjung Enclave, New Delhi
Ph. 26190763

Dr. Vinod Kumar
Pt. Madan Mohan Malviya Hospital,
Malviya Nagar, New Delhi
Ph. 9811974320, 26680603

Dr. N. Raj
Sardar Vallabh Bhai Patel Hospital (SVBP),
West Patel Nagar, New Delhi
Ph. 25885944

Dr. A. K. Sikdar
Achraya Bikshu Govt. Hospital, (ABG) Moti Nagar, ND
Ph. 9868513093, 25423011

Dr. N. C. Das (A.M.S.)
Ram Manohar Lohia Hospital, Sader Patel Road, ND
Ph. 9868464455, 23346441

Dr. S. Batra
Lok Nayak Jai Prakash Narayan Hospital,
Delhi Gate, Delhi
Ph. 9810070839, 2323927/201

Dr. N. Singh
Deen Dayal Upadhyay Hospital,
Near Clock Tower, Hari Nagar, Delhi
Ph. 25494337

Dr. P. C. Dishit
Guru Teg Bahadur Hospital,
Dilshad Garden, Shahdara Delhi
Ph. 9868399500, 22581730

Dr. K. K. Kalra
Chacha Nehru Bal Chikitsalya
Hospital (CNBC), Geeta Colony, Delhi
Ph. 9810302124, 22042749

Dr. Jiley Dar
Lal Bahadur Shastri Hospital (LBS),
Khichripur, Near Kalyan Vas, Shahdara
Ph. 9711901610, 22774145

Dr. K. K. Deori
Maharishi Balmiki Hospital, Pooth Kalan, Narela, Delhi
Ph. 9818064219, 27761522

Dr. Shammi Bhasin
Dr. Hedgewar Arogya Sansthan,
Karkardooma Shahdara, Delhi
Ph. 9971325316, 22393155

Dr. Renu Dutta
Director Professor, HOD Microbiology Dept.
Lady Hardinge Medical College (Smt. Sucheeta
Kriplani Hospital), Panch Kuiya Road, New Delhi
Ph. 23343984, 23408190, 23408169/23343984

Dr. Vijay Lakshmi Malhotra
Sr. Microbiologist, Dept. of Microbiology
Kalawati Saran Children's Hospital , Bangla Sahib
Marg, New Delhi - 1
Ph. : 23344160 - Ext. 227, 23408504

Maj. Gen. OP Mathew
Army Hospital R & R Dhaula Kaun, Delhi -10
Ph. 23338245

Wing Commd. S.P.Singh
Microbiologist, Dept. of Microbiology
Base Hosp., Delhi Cantt, Delhi - 10
Ph. 23337067, 23337000

Dr. JN Mohanty
ESI Hospital Basaidarapur,
Basai Dara Pur, Ring Road, Delhi
Ph. 9858114116, 25100664

Dr. Promila Gupta
Guru Govind Singh Govt. Hospital,
Raghuvir Nagar, New Delhi
Ph. 9871417358, 25989417

Dr. Rekha Aggarwal
Babu Jagjivan Ram Memorial Hospital,
G.T.Karnail Road, Jahangirpuri, Delhi
Ph. 27631610

Dr. A. K. Dang
Bhagwan Mahavir Hospital, Pitampura, New Delhi
Ph. 9313205980, 27034535

Jag Parvesh Chander Hospital
(JPC) Shastri Park Shahdara
Ph. 9910800606, 22184454

Dr. A. K. Mishra, Dr. N. C. Joshi
Joshi Road, Karolbag, Delhi
Ph. 9250073444, 23611786

Dr. Madur Kudesia
Kasturbha Hospital, Jama Masjid, Delhi - 6
Ph. 9717787412, 23274376

Aruna Asaf Ali Hospital,
Rajpur Road, Near Old Police Lines, Delhi
Ph. 9718994040, 23965532

Dr. A. K. Aggrawal
Charak Palika Hospital, NDMC Moti Bagh, Delhi
Ph. 9818092430, 26870934

Dr. Rajiv Kumar
Rao Tula Ram Memorial Hospital,
Jaffarpur, Najafgarh, Delhi
Ph. 9810562656, 25318444

Dr. Manju Shukla
Gobind Ballabh Pant Hospital, Delhi Gate, Delhi
Ph. 231237254

Dr. Breham Parkash
Northern Railway, Central Hospital, Basant Lane,
Connaught Circus, New Delhi
Ph. 9717630501, 23742364

* These should be translated in regional/local language and should also be adapted to the local needs.

Annexure-iii

Prototype for Inter Personal Communication

Flip books on dengue sign and symptoms, common places of mosquito breeding, information about availability of health facilities may be developed.

Guidelines for prevention and control of Dengue and Chikungunya

A. National Guidelines developed by NVBDCP

1. Long Term Action Plan prevention and control of Dengue and Chikungunya in the Country - 2007.
2. Guidelines for Clinical Management of DF, DHF and DSS - 2007
3. Guidelines for Chikungunya Cases Management - 2010
4. Laboratory manual for Diagnosis of Dengue and Chikungunya - 2010

B. WHO Guidelines

1. Comprehensive Guidelines for Prevention and Control of DHF, WHO SEARO-1996
2. Guidelines on Clinical Management of Chikungunya Fever, WHO SEARO - 2008
3. Dengue - guidelines for diagnosis, treatment, prevention and control new edition, WHO HQ Genava & TDR – 2009
4. Comprehensive Guidelines for Prevention and Control of DHF second edition WHO SEARO-2010

NATIONAL VECTOR BORNE DISEASE CONTROL PROGRAMME
DIRECTORATE GENERAL OF HEALTH SERVICES
MINISTRY OF HEALTH AND FAMILY WELFARE
GOVERNMENT OF INDIA

www.nvbdcp.gov.in