Introduction

The National Vector Borne Disease Control Programme (NVBDCP) is an umbrella programme for prevention and control of vector borne diseases (VBDs), viz., Malaria, Lymphatic Filariasis, Kala-azar, Dengue, Chikungunya and Japanese Encephalitis (JE). These diseases pose major public health problems and hamper socio-economic development. Generally the rural, tribal and urban slum areas are inhabited mostly by people of socio-economic groups who are more prone to develop VBDs and are considered as high risk groups.

About 75 million malaria cases and 0.8 million deaths were estimated annually during pre-Independence era. Malaria morbidity and mortality had affected agriculture, industrial development and national economy. Repeated attacks of malaria were responsible for deterioration in mental and physical capabilities resulting into enormous loss of productive man days. Global experience in malaria control and availability of the cost-effective intervention measures for malaria control with use of insecticides in fifties indicated that with their effective and efficient use, malaria could be controlled or even eradicated within a short period. Considering this concept, after independence, a centrally sponsored **National Malaria Control Programme (NMCP)** was launched in 1953 for malaria control in high endemic areas. This was modified in 1958 to a countywide **National Malaria Eradication Programme (NMEP)** in view of spectacular success of NMCP. The success achieved in preventing deaths due to malaria and also reducing annual malaria incidence to an all time low of 0.1 million cases by 1965 could not be sustained because of various technical, administrative and financial constraints. Resurgence of malaria became noticeable in 1976 with 6.47 million cases that necessitated launching of the **Modified Plan of Operation (MPO)** in 1977 with the immediate objectives to prevent deaths and to reduce morbidity due to malaria. MPO successfully brought down annual incidence of malaria from 6.47 million (0.85 million *P. falciparum*) in 1976 to 2.18 million cases (0.65 million *P. falciparum)* by 1984. The developmental activities like rapid and unplanned urbanization, construction, river valley projects, mega-industry, irrigation projects, etc. with deficient water management and inadequate mosquito control provisions again led to increased malaria incidence. Migration of population from endemic to other areas on account of such developmental projects also increased malaria transmission.

A major outbreak of malaria was reported from Rajasthan in 1994 which led to high level review by the then Prime Minister on 5th December, 1994. As a follow up of programme review, an Expert Committee was constituted which submitted its report on 27th January, 1995. Based on the recommendations of the Expert Committee, a **Malaria Action Programme (MAP) 1995** was developed and

disseminated to the states and Union Territories for prioritizing the high risk areas for implementation of revised strategy accordingly. During this period outbreaks were also reported from other states like Nagaland, Manipur, Gujarat Goa and Haryana. As a result of these outbreaks the annual incidence of malaria reached up to 3.04 million cases in 1996. By adapting MAP with focused approach and additional inputs provided to high endemic areas, the annual incidence of malaria was brought down to 1.51 million cases by the year 2007.

To tackle malaria problem in high risk areas other than North-Eastern (NE) states, an "Enhanced Malaria Control Project (EMCP)' with the assistance of World Bank was implemented during 1997-2005 with additional inputs in human resource, effective insecticidal spraying and IEC/BCC activities along with capacity building. The malaria incidence reduced in the project areas significantly. The strategies were focused on control of malaria; hence, the programme was changed from NMEP to **National Anti Malaria Programme (NAMP)** during the year 1998. To sustain the impact of this project, 124 high-endemic districts in 9 states have been identified for additional inputs through World Bank assisted Project in 2008 for a period of five years which is being implemented from 2009.

In North Eastern states, malaria control activities were intensified with additional financial supports provided under Global Fund supported Intensified Malaria Control Projects (IMCP) from July 2005 to June 2010. The Global Fund Supports have been extended through another Global Fund supported project Round 9 for a period of further five years (from Oct 2010 to Sep.2015) to cover all 86 districts of seven North-Eastern States.

The prevention and control of other vector borne diseases namely Lymphatic Filariasis, Kala- azar, was also being dealt by the Directorate of NAMP in addition to need based support for Japanese Encephalitis and Dengue. In view of synergies in prevention & control of vector borne diseases including Japanese Encephalitis and Dengue, the programme was renamed as **National Vector Borne Disease Control Programme** in the year 2003 with the integration of three ongoing centrally sponsored schemes viz., NAMP, NFCP and Kala-Azar Control Programme and converging prevention and control of JE and Dengue. In the year 2006, Chikungunya re-emerged in country and was also brought under purview of this Directorate since 2006.

Urban Malaria Scheme (UMS)

The implementation of control measures under erstwhile 'NMEP' showed reducing malaria incidence in rural areas of the country till 1965, but at the same time increasing trend of malaria was observed in some towns/ cities as a result of

which, Madhok Committee (1969) reviewed the problem and found that 10 urban areas in Andhra Pradesh and Tamil Nadu contributed 11.2% of the total malaria cases in the two states during 1963. The Committee felt that if effective anti-larval measures were not undertaken in urban areas, the proliferation of malaria cases from urban to rural areas might occur in a bigger way in many states and recommended adequate central assistance for tackling the problem. Accordingly the **'Urban Malaria Scheme'** was approved during 1971 as 100% centrally sponsored scheme which from 1979-80 was changed to 50:50 sharing basis between central and state governments. The UMS scheme was scaled up in phased manner by including 23 towns in 1971-72; 5 in 1972-73; 87 in 1977-78; 38 in 1978-79; 12 in 1979-80 and 17 in 1980-81 making total towns of 182. Since states have the responsibility of providing human resource and infrastructure, the scheme could be implemented only in 131 towns for which GoI is supplying anti-larvals. The drugs are made available through states. At present Urban Malaria Scheme is protecting about 116 million people from malaria and other mosquito borne diseases in 131 towns.

National Filaria Control Programme (NFCP)

The programme was launched in 1955 to delimit the problem and implement the treatment of microfilaria carriers and disease cases with Diethylcarbamazine tablets along with anti-larval measures in urban areas. Filaria is endemic in 20 States/UTs except Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, Sikkim, Jammu & Kashmir, Himachal Pradesh, Haryana, Punjab, Chandigarh, Rajasthan, Uttarakhand and Delhi and NFCP activities are implemented through 206 control Units, 224 Filaria Clinics and 22 Filaria Survey Units located in urban areas of endemic states. The programme has undergone various paradigm shifts and revised the strategy. Currently the disease has been targeted for elimination which is defined as *"Microfilaria carrier rate less than 1% and the children born after initiation of elimination activities are free from circulating antigenaemia (presence of adult filaria worm in human body)". The strategy of elimination is interruption of transmission by annual* Mass Drug Administration (MDA) with DEC and Albendazole to the population living at risk of LF excluding children below 2 years, pregnant women and seriously ill persons. This programme is being implemented in 250 LF endemic districts since 2004.The anti-larval operations in 227 towns covered under NFCP is continued and the budget of NFCP merged with UMS for this support. As per National Health Policy 2002, LF is targeted for elimination by 2015.

Kala-azar Elimination Programme

Kala-azar was highly endemic in India during pre-DDT era and had affected economic growth of country due to its high morbidity and mortality rates. Cyclic epidemics used to occur with an inter-epidemic period of about 10 years or more. With the launching of extensive insecticidal spraying under National Malaria

Control Programme/ National Malaria Eradication Programme since 1953 and 1958 respectively, the disease declined to negligible proportion due to collateral insecticidal benefit on Kala-azar vector, *Phlebotomus argentipes*, with consequent interruption of transmission. However, there was resurgence in the sixties and by seventies the; disease established itself in endemic form in Bihar followed by West Bengal. In the absence of any organized control activity, the disease slowly spread to several areas in these states. Considering the seriousness of the problem, a centrally sponsored **Kala-azar Control Programme** was launched in the year 1990-91. The disease has also been targeted for elimination by 2015 as per tripartite agreement between India, Nepal and Bangladesh. Various initiatives have been taken towards elimination of the disease.

Dengue, Chikungunya and JE

For prevention and control of these viral diseases, there were no separate programmes but need based assistance and technical supports were being provided by the Directorate. However, during 11th Plan period, separate budgeting was planned and various initiatives were taken to prevent outbreaks and contain the disease by strengthening surveillance, diagnosis, case management and awareness etc.

Entomological Surveillance

The three important components of vector borne disease transmission are causative organism (parasite or pathogen), human being as host and the transmitting agent – the vector. Not all the mosquitoes transmit the disease, hence the knowledge about the capacity of disease causing vectors to transmit disease and their predominance in terms of time and space are very crucial to facilitate the decision about their control strategies. Entomological surveillance covers all these aspects and for such entomological surveillance, 72 zonal malaria offices were established in the country with support of entomologists, insect collectors and support staff. The expenditure on this human resource is met by the States from state resources. In addition, 16 Regional Offices for Health & FW, GoI were also equipped with entomologists for carrying out entomological activities in addition to other public health activities. Gradually, due to non adherence of due importance to the entomological work and inability to fill up many vacant posts by the States, the progress on entomological surveillance has suffered. However, some states like Tamil Nadu, Andhra Pradesh, Gujarat and Maharashtra etc. have attached more importance on zonal teams and strengthened them with entomologists and better infrastructure supports. Presently out of 72 zones, only 50% are functional. To generate latest information about various entomological parameters in the country for revising prevention and control strategies against vectors at national, state and local level, the entomological zones need to be strengthened with additional human resource and infrastructure with basic minimum facilities like mobility support for field visits etc.

Objectives under NVBDCP:

During XI Plan, following objectives were enlisted:

- To prevent mortality due to Vector Borne Diseases namely Malaria, Kala-azar, Dengue/DHF and Japanese Encephalitis
- To reduce morbidity due to Malaria, Dengue/DHF, Chikungunya and Japanese Encephalitis
- Elimination of Kala-azar and Lymphatic Filariasis.

In pursuance to achieve the objectives under NVBDCP, Government of India has taken various initiatives and set the goal as under

- to reduce the case incidence including morbidity on account of malaria, dengue, chikungunya and Japanese encephalitis by 50% by 2017,
- to achieve elimination of Kala-azar and lymphatic filariasis by 2015.

Initiatives taken by GoI

- The programme has also been subsumed under National Rural Health Mission (NRHM) to improve the availability of services and access to health care to people, especially for those residing in rural areas, the poor, women and children.

Malaria:

- Strengthening of Human Resource by providing Contractual male Multi Purpose Workers (MPW), Lab. Technicians, District Vector Borne Disease Consultants, Malaria Technical Supervisor (MTS) and Involvement of ASHAs in high malaria endemic districts for diagnosis & treatment by imparting training and providing them performance based incentive @ Rs.5 for preparing blood slide, Rs.20 for complete treatment of malaria positive cases detected through Rapid Diagnostic Test (RDT) and Rs.50 for complete treatment of malaria positive case detected by microscopy, in identified high malaria endemic districts.
- Up-scaling use of RDT in the periphery through peripheral health workers and involving ASHAs.
- Expansion of effective drug – Artemisinin-based Combination Therapy (ACT) for all *falciparum* cases in the entire country (extending to village level).
- Up-scaling of use of Long Lasting Insecticidal Nets (LLIN) in high malaria endemic areas supported under externally assisted projects.

- Focused intervention in high malaria endemic districts with intensified supervision and monitoring.
- Identification of Sentinel surveillance hospital in high malaria endemic districts with strengthening of referral services for management of severe cases of malaria and avert malaria deaths.

Dengue & Chikungunya:

- A Long Term Action Plan was developed and sent to the States in 2007. Further in 2011, the Mid Term Plan for prevention and control of dengue has been developed which was approved by Committee of Secretaries (CoS) under the chairpersonship of Cabinet Secretary on 26.05.11.
- Diagnostic facilities have been increased from 170 Sentinel Surveillance Hospitals (SSH) to 311 which are linked to 14 Apex Referral Laboratories.
- Introduced ELISA based NS1 tests (antigen based) which can detect a case from the 1st day of disease in addition to existing Mac ELISA test (antibody based) which can detect a case only after 5th day of the disease.
- Monitoring of vector population in vulnerable areas.
- With the initiative of GOI, NIV field Unit at Allapuzha, Kerala has been established to strengthen the surveillance of Arbo-viral diseases in the State.
- Capacity building for the medical officers in case management.
- Intensive social mobilization campaigns through IEC/BCC activities and community participation in reducing breeding of mosquitoes.

Japanese Encephalitis (JE):

- Vaccination for Japanese Encephalitis under Routine Immunization in endemic districts.
- Special vaccination campaign in 7 districts of Uttar Pradesh and 2 districts of Assam.
- Strengthening of Sentinel Surveillance Hospitals for diagnosis of JE cases and treatment facilities at peripheral level.
- Strengthening of trained manpower.
- Involvement of Medical Colleges in AES/JE control programme.
- JE sub-office of Regional Office for Health & Family Welfare (ROH&FW) which is manned by Public Health Specialist has been established in Gorakhpur.
- GOI has also established Vector Borne Disease Surveillance Unit (VBDSU) at BRD Medical College, Gorakhpur for taking timely preventive measures.

- With the initiative of GOI, NIV field Unit at Gorakhpur has been established for detection and isolation of non JE viruses.
- A model action plan to strengthen public health measures for prevention and control of JE/AES was developed at Kushinagar, Uttar Pradesh under the chairmanship of DGHS, GoI in consultation with state health authorities and other stakeholders and same is under implementation.
- Following the visit of Honorable Union Minister of Health & Family Welfare to Gorakhpur, it was suggested to evolve a multi-pronged strategy towards prevention and control of JE/AES which resulted in the formation of Group of Ministers (GoM) constituted on 4th Nov. 2011. The recommendations of GoM have been approved by the cabinet for establishing National Programme for prevention & control of JE/AES in 60 high priority districts of 5 endemic states namely Assam, Bihar, Uttar Pradesh, Tamil Nadu and West Bengal.

Kala-azar:

- Up-scaling use of new diagnostic tools i.e. Rapid diagnostic test.
- Expansion of oral drug Miltefosine as the first line of treatment to all endemic districts in a phased manner.
- Incentives to Patient for loss of wages during the period of treatment.
- Free diet support to patient and one attendant.
- Incentive to Kala-azar activist / health volunteer / ASHA for referring a suspected case and ensuring complete treatment.
- Support to states for engaging 31 VBD Consultants and 186 Kala-azar Technical Supervisors (KTS) in 46 districts under World Bank Supported Project.

Elimination of Lymphatic Filariasis:

- Dissemination of guidelines for MDA and other technical aspects.
- Capacity building of states/districts and PHC.
- Prototype IEC material to all LF endemic states/UTs.
- Cash assistance for various activities towards LF elimination.
- Supply of drugs to all the endemic states. (This has been decentralized during 2011 to be procured by the state out of cash grant provided by GoI.

Organizational Infrastructure

The Directorate of NVBDCP, under the Directorate General of Health Services, Ministry of Health and F.W, Government of India, is the national level government agency for the programme. As such, it is responsible for formulating policies and guidelines, monitoring, and carrying out evaluations. It also provides financial and commodity assistance to states for programme activities as per approved pattern. The implementation part of the programme is the responsibility of states. The organizational structure is as under:

Sl. No.	Name of the post Designation	Posts		
		Sanctioned	In Position	Vacant
Medical				
1		1	1	0
	Director			
2	Addl. Director	1	1	0
3	Dy. Director (Med)	1	1	0
4	Asstt. Director (Med)	1	1	0
5	Asstt Director (Med.) (Asstts)	1	1	0
6	CMO/SMO	1	1	0
7	Epidemiologist (KA)	1	1	0
8	Asstt. Director (T&M)	2	2	0
Non-Medical				
9	Dy. Director (Ento.)	1	1	0
10	Central Coordinating Officer (CCO)	1	1	0
11	Dy. Director (L&A)	1	0	1
12	Toxiologist	1	0	1
13	Asstt. Director (Ento)	3	2	**1**
14	Asstt. Director (Chem)	1	0	1
15	Entomologist (CCCO)	1	1	0
16	Asstt. Entomologist (KA)	1	0	1
17	Asstt. Dir. (Asstts)	1	0	1
18	Dy. Asstt. Director (Asstts)	1	1	0
19	Dy. Asstt. Director (Ento)	2	2	0
20	Dy. Asstt. Director (St.)	2	0	2
21	P.R.O.	1	0	1
Total		**26**	**17**	**9**
Group 'B' (Gazetted)				
1	Administrative Officer	1	1	0
2	Account Officer			
3	Research Officer (Chem)	4	2	**2**
4	Asstt. Malaria Engineer	1	0	**1**
5	Hindi Officer	1	0	**1**
6	Sr. P.A.	1	0	**1**
	Total	**9**	**4**	**5**
Group 'C'				
		222	**110**	**112**

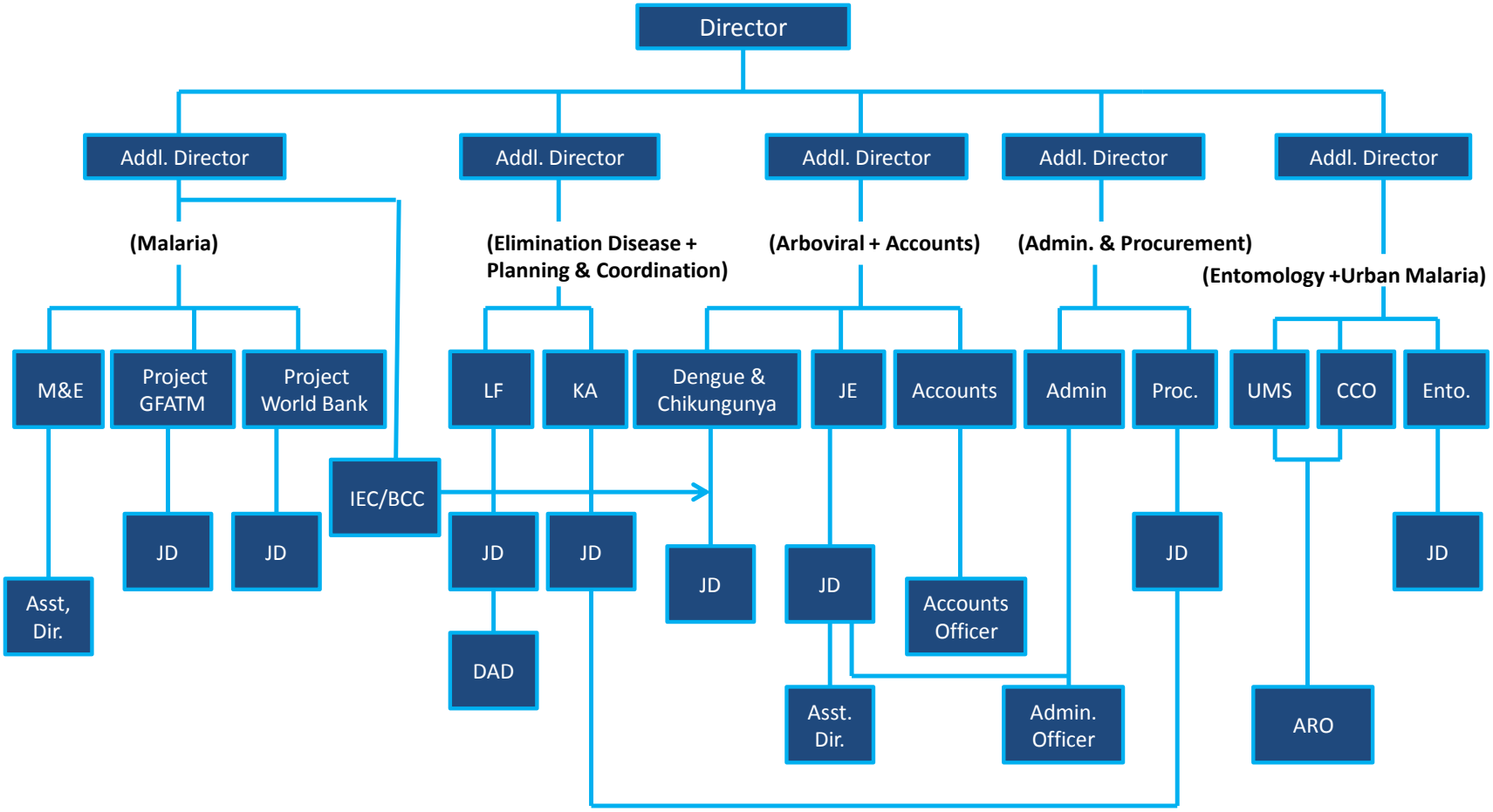
The Directorate of NVBDCP, initially designed for malaria control, has now been looking after six vector borne diseases, hence the work allocation with officers keep on changing. The present working organogram is depicted in a chart.

Government of India also has 19 Regional Offices for Health and Family Welfare (ROH&FW), located in 19 States. One or more states are covered under the jurisdiction of each ROHFW. They perform a vital role in monitoring of NVBDCP activities in the states. Besides conducting entomological studies (in collaboration with the States), these Regional Offices also perform therapeutic efficacy studies, cross-checking of blood slides for quality control, capacity building at the state level along with monitoring and supervision of VBDs.

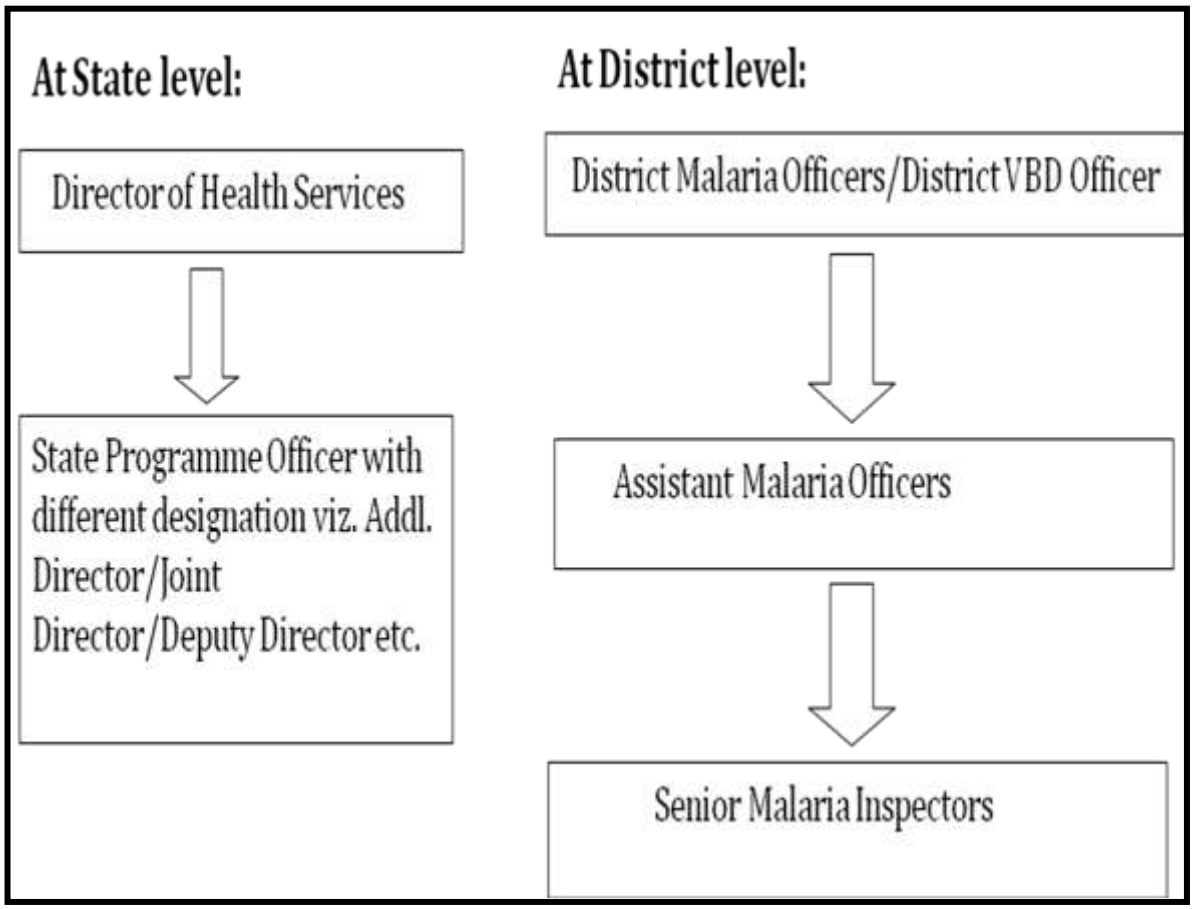
The states are responsible for implementing the programme activities including monitoring in accordance with central guidelines. Every state has a Vector Borne Disease Control Unit under its Department of Health and Family Welfare. It is headed by the State Programme Officer, who is responsible for day-to-day management. Each state has State Health Society at state level and District Health Society at district level through which the funds are released. They also play a role in district planning and in monitoring of programme activities within districts.

At the district level, the vector borne disease control programme is managed by the erstwhile District Malaria Officer (DMO), however the states have been requested to redesignate this post as District Vector Borne Disease Officer in order to synchronize the prevention and control activities for all the six vector borne diseases covered under the programme. The district level officers are under the control of District Health Officer which also has different designations in different states like Chief Medical Officer (CMO), Deputy Director Health Services, District Medical Officers, Civil Surgeons, Chief Medical & Health Officers, Joint Director of Health Services etc. The programme is also monitored under NRHM through the District Health Societies under the chairmanship of respective District Collectors. Within the district the staff under primary health care system is involved in implementation at block level (CHC), at PHC, sub-centre and village level. The institutions created under NRHM like Village Health & Sanitation Committees, ASHAs etc. are involved at the grass root level. The functioning of state level is shown in a chart.

Working Organogram of Dte. National Vector Borne Disease Control Programme (NVBDCP)



Organogram – NVBDCP at State/District Level



VBD Policy & General Guidelines

The policy under NVBDCP for prevention, control and elimination of vector borne diseases has been displayed on the website of National Vector Borne Disease Control Programme. However, the general strategies and pattern of assistance under the programme have been outlined below:

i. **Disease Management** (for reducing the load of Morbidity & Mortality) including early case detection and complete treatment, strengthening of referral services, epidemic preparedness and rapid response, and preventive measures like vaccination (for JE) and Annual Mass Drug Administration (for LF)

ii. **Integrated Vector Management** (For Transmission Risk Reduction) including Indoor Residual Spraying in selected high risk areas, use of Insecticide treated bed nets (ITN/LLINs), use of Larvivorous fish, anti larval measures in urban areas like source reduction and minor environmental engineering

iii. **Supportive Interventions** (for strengthening technical & social inputs) including Behaviour Change Communication (BCC), Public Private Partnership, Inter-sectoral convergence, Human Resource Development through capacity building, Operational research including studies on drug resistance and insecticide susceptibility, monitoring and evaluation through periodic reviews/field visits and web based Management Information System.

The **existing strategies for prevention and control of vector borne diseases** focus on surveillance, including early detection and prompt treatment, human resource development, behaviour change communication, supervision and monitoring, quality assurance and quality control of diagnostics, drugs and operational research. In brief, the strategies for different diseases are:

Malaria:

- Focused interventions in high malaria endemic areas.
- Early diagnosis and treatment by
    - Strengthening of human resources for surveillance and laboratory support
    - Use and scale up of Rapid Diagnostic Test (RDT)
    - Introduction and scale up of Artemisinin-based Combination Therapy (ACT) for Pf cases
- Up-scaling use of Long Lasting Insecticidal Nets (LLINs)

- Indoor Residual Spray (IRS)
- Intensive monitoring & supervision
- Intensified Information, Education and Communication (IEC) and Behaviour Change Communication (BCC) activities involving community.

Dengue & Chikungunya:

- Strengthening of monitoring and vector surveillance.
- Strengthening of Apex Referral laboratories and sentinel surveillance hospitals.
- Training / re-orientation of medical officers on dengue / DHF case management.
- Intensive IEC/BCC activities by involving community and Village Health & Sanitation Committee / local municipal bodies.
- Follow-up with States and municipal bodies for enactment and implementation of legislative measures against breeding of vector (mosquitoes).
- Inter-sectoral convergence for preventing vector mosquito breeding.
- Periodic reviews, focused & intensive supervision.

Japanese Encephalitis:

- Strengthening of referral services, diagnostic facilities, monitoring and surveillance activities
- Capacity building for proper case management at Primary Health Centre (PHC) / Community Health Centre (CHC)/District Hospital.
- Targeted vaccination, with single dose live attenuated SA-14-14-2 vaccine, for children between 1-15 years of age, under Universal Immunization Programme (UIP) in a phased manner, and inclusion of JE vaccine in routine immunization in affected districts.
- BCC for personal hygiene and sanitation in affected communities.
- Strengthening of PHCs/CHCs for early case management.
- Involvement of ASHAs in early case referrals and dissemination of information to general public on prevention and control of AES/JE.

Kala-azar:

- Expansion of new Tools i.e. Rapid Diagnostic Kits (RDK) & oral drug Miltefosine to increase acceptance and compliance of treatment
- Free diet to all the Kala-azar patients (including old and new) and one attendant & incentive to patient towards loss of wages during the full period of treatment.

- Incentive to ASHA/Volunteer for referring suspected cases of Kala-azar and ensuring complete treatment after confirmation by Rapid Diagnostic Kit (RDK) for kala-azar.
- Two rounds of focused indoor residual spraying (IRS) under strict supervision & monitoring using NRHM institutions.

Lymphatic Filariasis:

- Implementation of Mass Drug Administration with two drug combination (DEC+Albendazole) in filaria endemic districts (Mf rate>1%) for interruption of transmission.
- Specific intensive Behaviour Change Communication (BCC) campaign for mass drug administration.
- Training /re-orientation for mass drug administration for health personnel at different levels, including drug distributors, medical officers, paramedical staff
- Hydrocele operations for relief of the patients.
- Training on home based care for morbidity management.

The **revised pattern of Central Assistance to State/UTs** under NVBDCP, as approved during 11th Five Year Plan, is indicated below:

General guidelines

- The Programme is an integral component of NRHM and will be implemented under the overall umbrella of NRHM. The Programme will be monitored at the national level through the mechanisms established under NRHM.
- Directorate of NVBDCP will be the nodal agency for policy recommendations and issuance of technical guidelines whereas the State Government/UT Institutions will be the primary implementing agencies.
- As per the guidelines issued under NRHM and Dte. of NVBDCP, the State Governments have to reflect their requirements and activities and physical targets, whether to be funded by Central or State or any other source, in the Programme Implementation Plan (PIP). The PIPs must reflect the overall financial envelope indicating various components i.e. funding from State, Govt of India and any other source and physical targets.
- Assistance by GOI – whether cash or commodity or otherwise - will be based on the approved PIPs of the State Govts, commonly known as Record of Proceedings (RoP) of the National Programme Coordination Committee (NPCC). The additional requirement of the State, over and above the approved PIP i.e. RoP must be met by the State Govt from their resources by creating new budget lines, if required.

- The GOI funds will be routed through State and District Health societies under the umbrella of NRHM, except the component of salary and other charges of UTs which will be through treasury route.
- The externally aided projects supported either by World Bank or GFATM or any other source will be governed by their specific terms and conditions contained in their financing agreement or any other instrument signed by GOI.

Infrastructure and Manpower Support

- The basic infrastructure and manpower for Malaria, J.E, Dengue, Chikungunya, Kala-azar and Filaria are to be provided by the State/UT Governments.
- Key human resources like District Malaria Officer/District Vector Borne Disease Officer, Assistant Malaria Officer (AMO), Biologist, Malaria Inspectors/Multi Purpose Supervisors (Male), Lab. Technicians and Multi Purpose Workers (Male) should be filled up immediately by the State/UT Governments as per the requirement.
- Under the GFATM/World Bank supported NVBDC project, various State level Consultants, District VBD Consultants both for Malaria and Kala-Azar, Malaria and Kala-Azar Technical Supervisors, Lab. Technicians and other supporting staff have been provisioned for the Project States to strengthen the project implementation.
- GoI will provide funds to high malaria endemic states to engage male multipurpose workers (MPW) in high malaria risk areas. The states have to submit a Memorandum of Understanding (MOU) indicating that state will fill up all the vacancies of MPWs (Male) during the 11th plan period.
- ASHAs would be involved by paying performance based incentives as per the detailed guidelines.
- In view of Elimination of Lymphatic Filariasis (ELF) programme, in all filaria endemic districts, integration of National Filaria Control Programme (NFCP) units should be done by merging the treatment activities (by filaria clinics) with district/taluk hospitals and anti-larval operations (by filaria control units) with urban malaria scheme. This should be done by re-deploying the staff by the states with a view to utilize the human resources optimally.

Cash Assistance

- **Malaria:**

  - **North-Eastern (NE) States & UTs** – For North-Eastern (NE) States & Union Territories, for effective implementation of the programme cash

assistance would be continued to be released for meeting 100% Operational cost by Central Government.

- **Other than NE & UTs** - The cash assistance provided to the States other than NE or UTs is component based i.e. the funds are released for certain activities related to prevention & control of vector borne diseases. While releasing the funds, the tentative budget break-up along with the guidelines would be issued to the States.

- **For Elimination of Lymphatic Filariasis,** 100% support is provided for various preparatory activities towards Elimination of Lymphatic Filariasis, excluding the infrastructure and staff component. The preparatory activities includes training, sensitization, meetings, IEC, mobility, mf survey, line listing, morbidity management, honorarium to drug distributors and supervisors etc. Govt. of India will supply anti-filarial tablets to meet the requirement of the States, based on technical assessment.

- **For Elimination of Kala-azar** To meet the operational cost, 100% central assistance is being provided to four kala-azar endemic states since December, 2003. Under this pattern, the total expenditure both on operational cost, material and equipment would continue to be met by the Central Government except for manpower cost. The Central Government will continue supplying diagnostic kits, drugs and insecticides as is being done hitherto.

- **For Japanese Encephalitis**, Dengue and Chikungunya control, the Govt. of India will provide cash assistance depending on the need and available funds for various activities to be carried out by the States. These diseases are outbreak prone and the funds are allocated to the states as cash grant for meeting the expenses covering the national strategy aimed at prevention and control of these diseases. The decentralized funds shall provide an impetus to the states for identifying the gaps and equalizing the funds as per the state requirement.

- **For Emergent situations/outbreaks**: In addition to all above, Govt. of India will consider to support to contain the emergent situations/outbreaks of vector borne diseases in any State or UT.

Commodity Assistance:

- Government of India provides commodity support in the form of drugs and insecticides to the states/UTs. The following items have been decentralized which are to be procured by states out of cash grant provided by GoI. :

    - **Drugs:** Chloroquine, Primaquine(2.5 & 7.5 mg), Quinine injection, Quinine sulphate tablets, DEC tablets (100 mg), Albendazole tablets (400mg)

- **Diagnostics:** NS-1 for Dengue, RDT for malaria in states not supported with Global fund and World Bank
- **Larvicides & adulticides:** Temephos, Bti and Pyrethrum extract

- **Additional resources** for malaria control have been provided to selected high-risk areas in North-Eastern states, Orissa, Jharkhand and West Bengal through External Aid from GFATM from July 2005 to June 2010. New project with GFATM support for malaria control in 7 NE states (excluding Sikkim) has also been approved and made effective from October 2010 for five years (Project cost is US$ 102.54 million)

- **Similarly, additional resources** are being provided under World Bank project on "Malaria Control & Kala-azar elimination" from 2008-09 for a period of 5 years (Project cost is US$ 250 million). In phase one, 50 malaria endemic districts in 5 states namely Andhra Pradesh, Madhya Pradesh, Orissa, Jharkhand, Chattisgarh & 46 kala-azar endemic districts in 3 states namely Bihar, Jharkhand and West Bengal have been included. These endemic areas are supported with rapid diagnostic test kits, Artemesinin based combination drugs (ACT) for treatment of *P. falciparum* cases and rapid diagnostic Kits & Miltefosine drug for treatment of kala-azar cases. The additional human resource is also provided to the states for improved monitoring.

- Ministry of Health & Family Welfare, GoI vide order no. Z-17013/1/2009-VBD dated, the April 2010, has conveyed the above pattern of assistance and guidelines to all the States/UT's.

- The Budget outlay and expenditure under NVBDCP since 2007-08 is as below:

(***Rs. in Crores***)

Year	Approved B.E.	Approved R.E.	Actual Expenditure
2007-08	399.50	399.50	385.38
2008-09	472.25	359.06	297.60
2009-10	442.00	402.00	338.87
2010-11	418.00	487.22	408.31
2011-12	520.00	520.00	518.47

Malaria

Malaria is an acute parasitic illness mainly caused by *Plasmodium Vivax* and *Plasmodium falciparum* in India. However sporadic cases of *P.malariae* are also reported. The diagnosis is confirmed by microscopic examination of a blood smear and Rapid Diagnostic Tests. Majority of the patients recover from the acute episode within a week. Malaria continues to pose a major public health threat in different parts of the country, particularly due to *Plasmodium falciparum* as it is sometimes prone to develop severity and death, if not treated early.

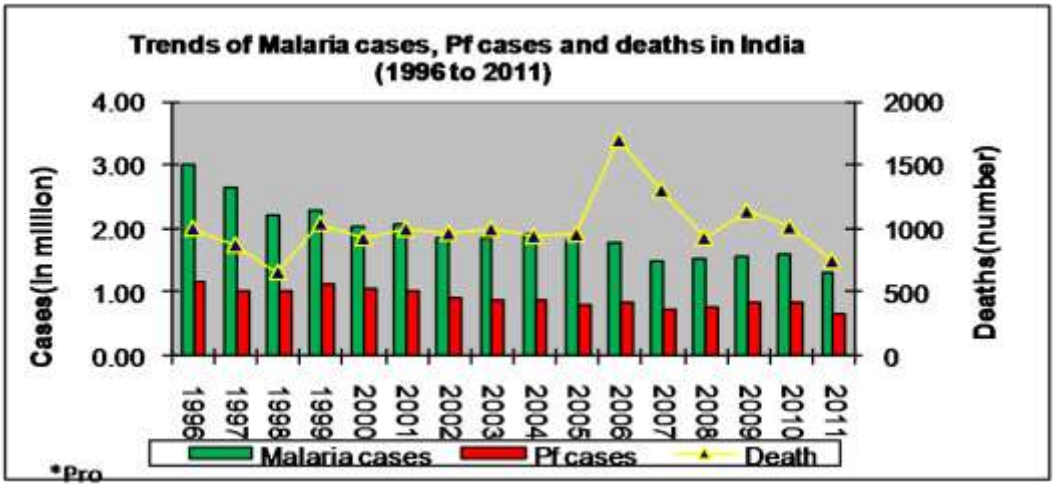
There are 9 species of Malaria vectors in India, out of which the major vector mosquito for rural malaria viz. *Anopheles culicifacies*, is distributed all over the country and breeds in clean ground water collections. Other important Anopheline species namely *An.minimus* and *An.fluviatilis* breed in running channels, streams with clean water. Some of the vector species also breed in forest areas, mangroves, lagoons, etc, even in those with organic pollutants. In urban areas, malaria is mainly transmitted by *Anopheles stephensi* which breeds in man-made water containers in domestic and peri-domestic situations such as tanks, wells, cisterns, which are more or less of permanent nature and hence can maintain density for malaria transmission throughout the year. Increasing urbanization, industrialization and construction projects with consequent migration, deficient water and solid waste management and indiscriminate disposal of articles (tyres, containers, junk materials, cups, etc.) create mosquitogenic conditions and thus contribute to the spread of vector borne diseases. **The milestones** in malaria control programme in India, is indicated below:

Prior to 1940	No organized National Malaria Control Programme
Prior to 1953	Malaria cases in India estimated to be 75 million with one million deaths
1953	Launching of National Malaria Control Programme
1958	Launching of National Malaria Eradication Programme
1966	Cases reduced to 0.1 million with NIL deaths
Early 70's	Resurgence of malaria
1971	Urban Malaria Scheme launched
1976	Malaria cases 6.46 million highest in post DDT era
1977	Modified Plan of operations (MPO) formulated and policy circulated
1984-1998	Annual incidence reported within 2-3 million cases
1995	Malaria Action Programme
1997	World Bank assisted Enhanced Malaria Control Project (EMCP)
2005	Global fund Assisted Intensified Malaria Control Project (IMCP)
2006	ACT introduced in areas showing choloroquine resistant falciparum malaria.
2008	Revised NVBDCP Drug Policy, extending ACT to high risk Pf districts
2009	World Bank assisted Project on Malaria Control & Kala-azar Elimination LLIN introduced
2009	Artemisinin mono-therapy banned in the country
2010	Revised NVBDCP Drug Policy – 2010 extending ACT for all *Pf* cases. Global Fund (Rd 9) Assisted Intensified Malaria Control Project (IMCP-II)

Epidemiological Situation: The data on malaria surveillance is generated at Village/ sub-center level, which are compiled at PHC/ Block Level & sent to Districts. Districts in turn submit the PHC wise data to State from where it is compiled district-wise & transmitted to Directorate of NVBDCP. As per the system, the data of previous month is submitted to state between 5-10th of succeeding month. The State wise data is compiled at Central Dte. and on every 25th, the Monthly Epidemiological Situation (MES) is generated for previous month, e.g. the MES generated on 25th April will have data till March. The status of total cases, Pf cases, deaths and API from 2000 to 2011 is given in **Table-1**.

The trend (**Fig.1**) shows that the cases have consistently declined from 2.08 million to 1.31 million during 2001 to 2011. Similarly Pf cases have declined from 1.0 to 0.67 million cases during the same period. This indicates declining trend of overall endemicity of malaria in the country.

Fig.1: Trends of Malaria cases, Pf cases and deaths

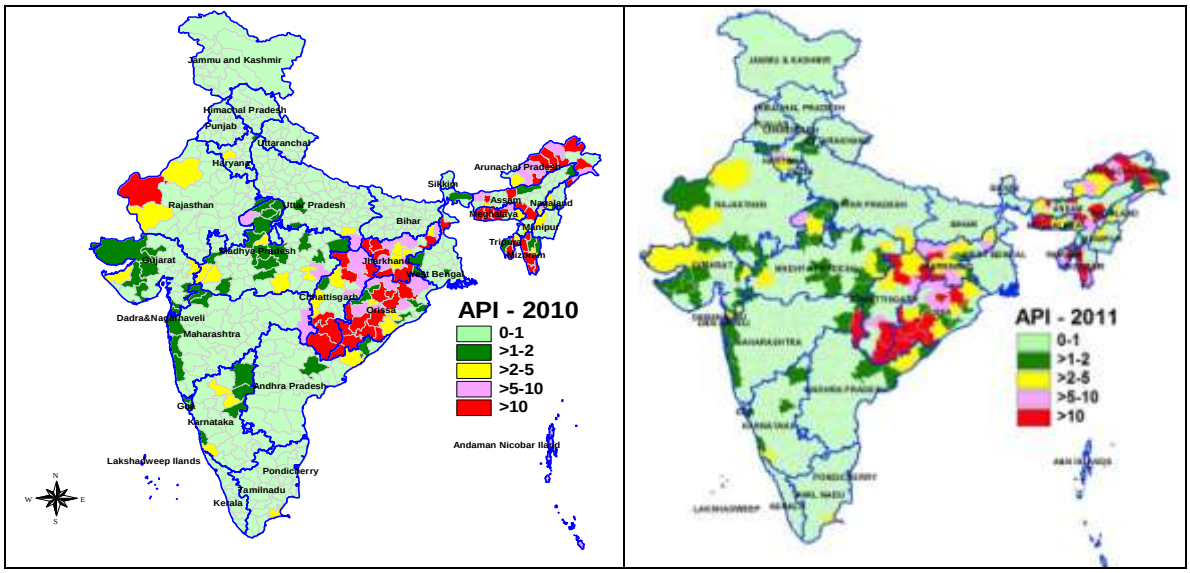


Further analysis of malaria incidence for 2011 has been done and State/UTs have been classified in different categories based on Annual Parasite Incidence (annual cases per thousand population). The results are indicated below:

S. No.	API	No. of States /UTs	Name of States /UTs
1.	**>10**	**2**	Dadra and Nagar Haveli and Arunachal Pradesh
2.	**5-10**	**4**	Mizoram, Meghalaya, Orissa, Chhattisgarh
3	**2-5**	**3**	Jharkhand and Tripura and Andaman & Nicobar Islands
4	**1-2**	**6**	Assam, Gujarat, Haryana, Madhya Pradesh, Nagaland, Daman and Diu
5	**<1**	**15**	Andhra Pradesh, Jammu & Kashmir, Karnataka, Maharashtra, Goa, Manipur, Rajasthan, Sikkim, Tamilnadu, Uttarakhand, Uttar Pradesh, West Bengal, Chandigarh, Lakshadweep*, Puducherry
6	**<0.1**	**5**	Bihar, Delhi, Himachal Pradesh, Kerala, Punjab,

* Only Imported Cases

Comparative status (2011 Vs 2010) of distribution of districts based on API



The analysis of district-wise API in 2000, 2010 and 2011 reveals that the number of districts with API>2 have continuously decreased from the year 2000 to 2010 and further in 2011. The number of districts with API <1 has increased from 370 in 2000 to 447 in 2010 and further to 458 in 2011. The number of districts with API >10 has decreased from 59 in 2000 to 54 in 2010 and further to 40 in 2011.(**Table-2**)

Malaria situation in States:

An overall improvement was observed in the malaria situation at the country level. The state-wise situation also shows that most of the states have recorded a decline in total malaria cases, Pf cases and deaths. The comparative status of state - wise epidemiological data for 2010 and 2011 are given in **Table 3**.

The analysis of the state wise data of year 2011 shows that:

- 90% of malaria cases in the country are reported from 12 states namely Orissa, Jharkhand, Chattisgarh, Maharashtra, Madhya Pradesh, Gujarat, West Bengal, Uttar Pradesh, Assam, Rajasthan, Andhra Pradesh and Haryana.
- Similarly, 90% of Pf cases are reported from 8 states namely Orissa, Chhattisgarh, Jharkhand, Assam, Madhya Pradesh, Andhra Pradesh Meghalaya and Maharashtra. 90% of deaths in 2011 are reported by 9 states. Gujarat was the highest contributor (16.9 %), followed by Maharashtra, Madhya Pradesh, Orissa, Meghalaya, Assam, Rajasthan, Chhattisgarh, and Mizoram.

- 9 states/UTs have reported API>2 during 2011. The Annual Parasite Incidence (number of positive cases per 1000 population) in 2011 is highest in UT Dadra and Nagar Haveli (14.5) followed by Arunachal Pradesh, Mizoram, Meghalaya, Orissa, Chhattisgarh, Jharkhand, Tripura and A&N Islands
- NE states contributed 13.09 % to Pf cases, 8.69 % to total malaria cases and 21.51% to the deaths due to malaria reported in the country in 2011.
- The states covered under World Bank Project contributed 85.17% to Pf cases, 77.08 % to total Malaria cases and 71.18 % to deaths reported in the country in 2011.

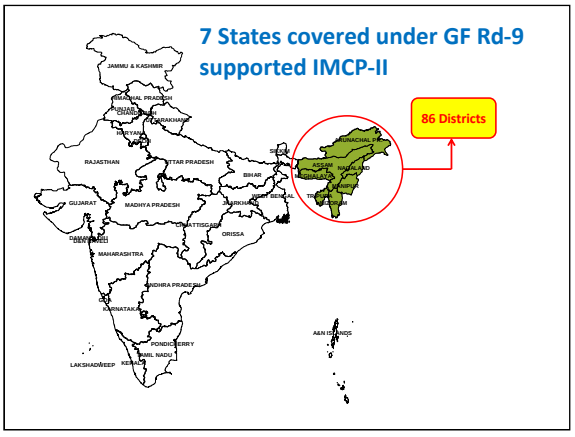
Externally supported projects:

Additional support for combating malaria is provided through external assistance in high malaria risk areas. There are two such externally funded projects which are currently being implemented for malaria control:

(i) Global Fund Supported Intensified Malaria Control Project (IMCP-II)
(ii) World Bank Supported Project on Malaria Control & Kala-azar Elimination.

The areas covered under these projects are as under:

(i) The Global Fund supported Intensified Malaria Control Project (IMCP-II)



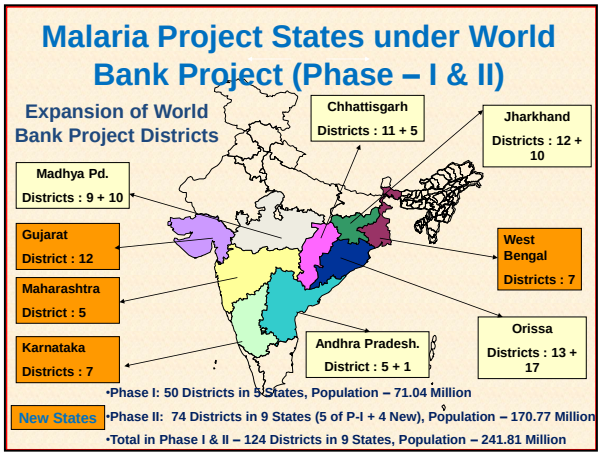
Global fund Round 9 supported Intensified Malaria Control Project (IMCP-II) is being implemented since October 2010 for a period of five years in 7 NE States. The project area covers a population of 42 million in 86 districts.

The strategies of the project are early diagnosis and complete treatment, integrated vector control including promotion of ITN (LLINs), through intensive IEC and capacity building & training of the health workers & community volunteers. Specific inputs are provided to these project areas in the form of manpower, RDTs, drugs and LLINs. The period for first phase is for two years starting from October 2010 to Sept. 2012. The Phase-II will be granted by the GFATM based on the experience of the phase I. CARITAS India is the Principal Recipient 2 (PR2) in the project.

Additional Support provided in project area is listed below:

- Human resource such as Consultants and support staff for project monitoring units at state and district level and malaria technical supervisor and laboratory technicians at sub-district level.
- Capacity building of Medical Officer/Lab. Technicians/ Fever Treatment Depots/Volunteers etc.
- Commodities such as Long-Lasting Insecticidal Nets (LLINs), Rapid Diagnostic tests for quick diagnosis of Malaria, alternate drugs i.e. Artemesinin based Combination Therapy and Inj. Artesunate for treating severe malaria cases.
- Planning & administration including mobility support, monitoring, evaluation and operational research (studies on drug resistance and entomological aspects).

(ii) The World Bank Supported Project on Malaria Control & Kala-azar Elimination.



This project has been approved for 5 years effective from 2009 to December 2013. The total financial outlay for this project is Rs.1000 crore. This project covers 124 malarious districts of nine (9) states namely Andhra Pradesh, Chhattisgarh, Gujarat, Jharkhand, Madhya Pradesh, Maharashtra, Orissa, Karnataka & West Bengal and 46 Kala-azar districts in three states namely Bihar, Jharkhand and West Bengal. The project is being implemented in two phases. Phase one covered 50 most malaria endemic districts in five States namely Andhra Pradesh, Chhattisgarh, Madhya Pradesh, Orissa and Jharkhand and 46 kala-azar districts in Bihar, Jharkhand & West Bengal. From 3rd year, Phase two is being implemented in remaining 74 high malaria endemic districts.

Additional support provided in this project are:

- Provision of Human Resource like Consultants & Support staff at National, State, District & Sub District level for Surveillance& monitoring.
- Promotion & use of long lasting Insecticide Nets (LLINs) in high malaria endemic areas.

- Social Mobilization and vulnerable community plan to address the issues of marginalized sections.
- Strong BCC/IEC activities at Sub district level through identified agencies.
- The project also envisaged the safe guard policies by undertaking Environmental Management Plan (EMP) on safe disposal & for prevention of environmental hazards.
- Capacity building of Medical Officer/Lab Technicians/Fever Treatment Depots/ Volunteers etc.
- Supply of rapid kits for Malaria and drug Artemesinin based combination therapy (ACT) for treatment of PF cases.

Challenges in malaria control:

- Delay in reporting of cases
- Inadequate treatment and treatment compliance
- Use of bednets/LLIN by the community
- Refusal of indoor residual spray by the community and quality spray

Malaria Control Strategy

- **Preventive**
  - Use of Insecticides for Residual Spray
  - Use of Long Lasting Insecticide Nets (LLINs) / treated ordinary bednets
- **Curative**
  - Early detection and completion of treatment
  - Use of Rapid Diagnostic Tests (RDTs) by ASHA/AWW/MPWs in high endemic and remote areas
  - Microscopy in all Primary Health Centers
  - Use of Artemesinin based Combination Therapy (ACT) for all confirmed *P.falciparum* cases

Additional supports under projects are provided in terms of human resource and logistics such as Rapid Diagnostic Kits (RDK) for quick detection of *falciparum* malaria cases, Artemesinin-based Combination Therapy (ACT) for treatment of all *Pf* cases, Artesunate Injection, Synthetic Pyrethroid for IRS and Long Lasting Insecticidal Nets (LLINs). The support is also provided for the mobility, supervision, monitoring & evaluation, training and IEC/BCC activities.

Additional support from domestic budget for 9655 contractual Male Multi Purpose Health Workers have been provided to 17 states in malaria problematic areas.

Operational Research

- **Operational research** activities of monitoring of therapeutic efficacy, insecticide resistance, pharmaco-vigilance exclusively focusing on side effects of drugs, quality assurance of rapid tests and household survey were entrusted to NIMR in the year 2008-09.
- **Current Projects:** Currently various operation research projects undergoing at NIMR and its field stations are as follows:

Name of the activities (research Project)	Duration
Monitoring the therapeutic efficacy of antimalarial medicines in India.	5 yrs (Jan 09 - Dec 13)
Monitoring of Insecticide Resistance of Mosquito Vectors in India	2 yrs (Jan 09 - Dec 11)
Quality Assurance for Laboratory Diagnosis of Malaria	2 yrs (Jul 09 - Jun 11)

Monitoring the therapeutic efficacy of anti-malarial medicines in India

Studies are being conducted at 15 sites in the country (13 for *P. falciparum* and 2 for *P. vivax*) in collaboration with NVBDCP and State Health Authorities.

- The studies conducted during 1st year (2009 – 10) have shown the efficacy of ACT (AS +SP) for P. falciparum in the range of 93.8-100% and 100% efficacy of chloroquine for P. vivax.
- The studies conducted during the second year (2010-11) have shown the efficacy of chloroquine for P. vivax as 100% in Gulbarga, Karnataka while the efficacy of ACT (AS+SP) for P. falciparum ranged from 96.3 – 100% (PCR corrected) at 11 sites. In addition to clinical efficacy, the molecular markers of drug resistance of partner drug sulphadoxine have also been monitored.
- During the third year, 16 studies were planned and study has been completed at 10 sites. Efforts were made during III year to repeat all the study sites of first year (2009-10) and also sites where failures were observed during second year (2010-11).The data analysis and molecular studies of III year are in progress. Till date, the data generated shows that the prescribed antimalarials, ACT (AS+SP) for *P. falciparum* and

chloroquine for *P. vivax* by the National Programme are highly effective and safe.

1. Pharmacovigilance of antimalarials

The study was initiated in collaboration with AIIMS and NVBDCP. The objective of the study is to assess the benefits, harm, effectiveness and risk of antimalarials. Training programmes for DMOs were conducted in 12 states. The data is being collected by Medical Officers in the adverse event reporting formats. Completed forms are being forwarded to the NIMR/AIIMS nodal centre; which verifies/validates causality analysis, analyzes data, prepares reports and passes final data to National Pharmacovigilance Cell & National Programme for necessary actions. Till date, about 3000 filled in Adverse Events Reports (AER) forms have been received. They include 1360 forms filled in by the medical officers and information of 1624 patients participating in therapeutic efficacy study. One hundred and thirty six forms were incomplete. A total of 74 adverse events have been reported in the form of nausea, vomiting, giddiness and gastritis etc. The sample size of the study is about 10000 samples in 5 years.

2. Quality Assurance of Malaria Rapid Diagnostic Tests (RDTs)

The study was initiated to assess the quality of RDTs procured and supplied by NVBDCP in July 2009. Quality control panels prepared from Pf malaria positive cases following the Standard Operating Procedures of NVBDCP were used for assuring the quality of RDTs. NVBDCP is the nodal centre and NIMR is National Referral Laboratory for this project. Training programmes were conducted in Assam, Meghalaya, Manipur, Mizoram, Nagaland, Arunachal Pradesh, Orissa, Jharkhand, Chhattisgarh, Karnataka, Andhra Pradesh, Madhya Pradesh, Gujarat and Maharashtra.

- Out the 199 study districts, training was conducted for 179 districts which were attended by District Programme Officers of 138 districts and till date ninety eight districts are continuously sending RDTs to NIMR.
- Till date, 1980 RDTs have been received by NIMR, of which 1604 have been tested, out of which 1473 gave satisfactory results, giving 91.8% panel detection score and 100% specificity.
- Seventeen of 97 districts showed discordant results with panels of parasitaemia 200 / µl. On repeating the samples, 7 showed discordant results.
- Guidelines sent for proper storage/transport of RDTs. Project has been funded till March 2012.

3. Monitoring of Insecticide Resistance of Mosquito Vectors

- Work started in 2009 and funds are provided by NVBDCP. Project tenure was reduced to two years from the earlier 5 years.
- Insecticide Resistance in malaria vector in India has been carried out in 79 districts of the 6 states viz., Andhra Pradesh (5 districts), Chhattisgarh (11 districts), Jharkhand (19 districts), Madhya Pradesh (9 districts), Orissa (29 districts), West Bengal (6 districts) ,

Initiatives for Monitoring

- **Sentinel sites:** Two sentinel sites have been identified in all the project districts and Lab. Technicians (LTs) are provided for strengthening the diagnostic services at sentinel sites. The States of Madhya Pradesh and Orissa have started monitoring the reporting form these sentinel sites. Other states are in process of making those centres fully functional and start regular reporting from these centres.

  - So far 89 centres have been identified as Sentinel Sites. The data received from the sentinel sites have helped the state and the project districts to identify the problem areas both in terms of the place and the activities and has helped them to take corrective actions at the local level.

- **Reporting Formats:** The existing recording and reporting formats were revised for case management activity and the vector control activities. These formats have been communicated to the states and are being implemented by the states. At the National level, the effort has been initiated to integrate the VBD reporting system with the HMIS -reporting system under NRHM. The format for reporting through HMIS by the District Programme Management Unit has been designed and now under the final stage of implementation.

- **Lot Quality Assurance Sampling (LQAS)** method is used at sub-district level, by MTS for assessing the progress of impact of the project. The training of first batch of MTS for use of LQAS was completed in Orissa during 19th to 22nd October, 2009. A Pilot study of its use was carried out in Orissa with the technical support of DFID. Based on its observation, the First round of survey was completed in the project districts in the States of Andhra Pradesh, Chhattisgarh, Madhya Pradesh & Orissa. The State of Jharkhand has started the survey only in the month of March 2011. Data collection for the Second round is done in March-April 2011 and 3rd round has been done during Sept. to Dec. in Madhya Pradesh, Odisha and Andhra Pradesh. The results of the same are used at the local level for identification of weak areas. This method is

also being used in GF supported IMCP project areas and it is used to collect information of important indicators to be reported semi-annually. The state level trainers of IMCP states were also trained along with the trainers of the WB project states. It is a good example of 'good practice' of one project being extended to another project in the country.

Consultancy services: Seven agencies have been engaged under World Bank assisted Project for different work as indicated below:

No.	Scope of Work	Agency
1	Behaviour Change Communication (BCC)	New Concept Information Systems Pvt. Ltd., New Delhi
2	Social Mobilization & Service Delivery (SM & SD)	VHAI, New Delhi
3	Tools & Methods for Community Consultation	JPS Associates, New Delhi
4	Supply Chain and Logistic	SAMS, New Delhi
5	Environment Management Plan	SENES Consultants India Pvt. Ltd., Kolkata
6	Periodic Implementation & Fiduciary Review of Decentralized Activities	JPS Associates, New Delhi
7	Training of trainers at state and district levels	NIHFW, Delhi

- **Agency for BCC** - NVBDCP has awarded contract on 28th January 2011 to M/s New Concept for undertaking BCC activities on Malaria control and Kala-azar elimination for WB project states. The agency carried out desk review and formative research in all the World Bank supported states to find out the status of awareness amongst the community and the need to enhance acceptance of NVBDCP services. Findings were shared with the states (9 & 10 Dec 2011 for malaria states in Delhi ; 13th Dec 2011 for Kala-azar states in Patna).
- A meeting involving other agencies i.e VHAI, JPS and CARITAS, India was held on 25th February'11 at NVBDCP to work out modalities of different agencies. This was followed by another meeting at World Bank office on March 3, 2011. All the agencies were requested to work in close collaboration with each other so as to avoid duplications.

- **Agency for Social Mobilization and Service Delivery –** NVBDCP has awarded contract on 1st February 2011 to M/s Voluntary Health Association of India for undertaking contract for consultancy services for Social Mobilization and Service Delivery for Malaria Control and Kala-azar elimination amongst vulnerable communities under the World Bank project. The agencies have organized inception workshops from Feb-March 2011 involving state VHAIs and District level implementing agencies in the states of Andhra Pradesh, Chhattisgarh, Jharkhand, Madhya Pradesh and Orissa for malaria and Bihar, Jharkhand and West Bengal for Kala-azar. The agency has submitted inception report in April 2011. The agency has undertaken the service delivery at sub district level through identified 96 NGOs in 2,531 villages of 76 districts in 7 states covering 1,512,713 populations.

- **Agency for developing VCP Tools & methods for community Consultation** - For 'developing tools & methods for community consultation under vulnerable community plan' M/s JPS associate has been engaged. The agency has developed questionnaires as tools and methods for consultations at various levels regarding malaria and kala azar. The agency has also developed a two year plan for community consultations and training modules which shall be utilized by the agency engaged by NVBDCP for social mobilization and service delivery. These modules will be used for TOTs to health sector workers including field level NGOs. A meeting involving other agencies i.e VHAI, JPS and CARITAS, India was held on 25th February'11 at NVBDCP to work out modalities of different agencies. This was followed by another meeting at World Bank office on March 3, 2011.

- **Agency for monitoring Supply Chain and Logistics** – The contract with Strategic Alliance Management Services Pvt. Ltd., (SAMS) has been signed on 23rd March 2011. The consultant agency will assist NVBDCP in Inventory / Logistic Management Information System, Procurement Activities, follow-up with Procurement Agency appointed by MOH&FW and will also assist in Storage and Capacity Development at various levels. The consultant agency is following up with various states and districts for updating information pertaining to logistics (drugs and commodities).

- **Environmental Management Plan** - The contract for Environmental management Plan (EMP) with M/s Senes Consultants India Pvt. Ltd was signed on 26th March 2011. The consultant agency assists NVBDCP in capacity building of the implementing agencies i.e. state, district and sub district in environment management in the project states and districts. The agency will also monitor the implementation of EMP activities as per the required regulations and guidelines at state, district and sub district level

and assist to provide information on the status on the implementation of EMP in project districts. A meeting with the agency was organized at the World Bank office on 11th April 2011 to discuss agency's plan of action. The agency has started activities in a phased manner, starting with two states – Bihar and Orissa. The activities in the other project states will commence after the experience gained in pilot districts.

- **Periodic Implementation and Fiduciary Review of Decentralized Activities** – The contract for Periodic Implementation and Fiduciary Review of Decentralized Activities in the project districts was signed with the M/s JPS on 29th June 2010. Inception report has been submitted. Field visits are in progress. Quarterly reports are submitted as planned.

- **Training of Trainers at State and District levels:** NIHFW at New Delhi has been engaged to develop a pool of trainers at State and district level for the training on VBDs to the Medical officers and other paramedical staff. Training in 179 districts of 12 states has been completed.

Incentives to ASHAs for Malaria

The GoI has started incentive scheme to ASHAs for increasing their involvement and to improve the implementation component of VBD control programme. Accordingly, various slabs have been earmarked for providing the incentives. Under the scheme, ASHA is entitled to Rs. 5/- per slide for slide prepared by her, Rs. 20/- for giving complete treatment to a Pf confirmed through RDT done by her and Rs. 50/- per case for giving complete treatment to cases diagnosed through microscopy as incentive, with a overall limit of Rs. 200/- per month.

This has resulted in increased surveillance and case detection**.** However, treatment completion aspect is yet to improve for desired outcomes.

Contractual MPWs:

To improve the surveillance in the high-risk districts throughout the country (including non-project districts), GoI has allocated 9655 MPWs to be appointed in the identified high-risk districts from the domestic funding. Out of total sanctioned posts, 6054 have been recruited and 5287 have undergone training in malaria. The states have been asked to expedite the recruitment process so that the surveillance can be improved in those districts. This will result in an effective improvement in the implementation of the programme.

Introduction of bivalent RDT

At present about 100 million fever cases suspected to be malaria are screened for malaria annually under the National Vector Borne Disease Control

Programme. In addition to that, 5% of negative slides (about 5 million) and all positive slides (1.5 million) are to be cross checked for quality control. Due to the shortfall of technicians there is delay in reporting the results. Use of RDTs for detection of *P. falciparum* (Pf) cases was introduced in the programme during 2004-05 and at present, around 14 million RDTs are being procured and used annually.

With the present Pf-specific RDT, there is no reduction in the load of microscopy as all slides for all patients with negative RDT result (around 97% of total slides) are to be sent for microscopy to detect/ rule out *P.vivax* (Pv). Although Pv infections usually do not result in fatalities, but some mortalities due to Pv especially in children, are being reported from various parts of the country during recent times. Therefore, it has been felt that Introduction of bivalent RDT will be useful in early treatment of Pv in areas where microscopy results get delayed.

If bivalent RDT is used, there will be no need to examine the blood slides of those patients with negative RDT result. In the prevailing situation at present, the average efficiency of microscopy may not be more than 60% in many microscopy centres. Microscopy cannot be replaced with RDT at any circumstance and maximum scope for RDT is estimated to be around 40 million (40%) annually and remaining 60% cases will need microscopy for diagnosis. The bivalent RDTs would supplement and help in immediate diagnosis and prompt treatment but can never replace microscopy which is still considered the gold standard for diagnosis of malaria. The expert group recommended introduction of bivalent RDTs in the programme right away without waiting for the field trial, which may take a minimum of one year or more. It was also opined that at present it may be used in high malaria endemic areas where Pf specific RDT is already being used.

The bivalent RDTs would primarily be used in the remote and hard-to-reach areas where microscopy results cannot be made available within 24 hours. However, RDTs may also be used in PHCs, secondary and tertiary level facilities, for patients arriving in odd hours when the laboratory technician is not immediately available and in emergencies like severe malaria. Regarding the criteria for selection of RDTs, the recommendations are as under:

In areas where bivalent RDT is introduced, operational research would be conducted and data thus generated will be analyzed for further expansion of bivalent RDT use in the country. The research protocol will include both HRP2 and pLDH based kits in areas with high and low endemicity and in high and low parasitaemia cases.

The microscopy centres, with the reduced load, would be strengthened by capacity building of the laboratory technicians and better logistic support so as to provide quality microscopy services.

Alternate combination therapy for P*f* malaria

The AS-SP combination which is being used in the country's programme is one of the combination which has shown an efficacy of around 95-100% in all the sites except Gadchirauli district of Maharashtra where it was 93%.

Following ACT combinations are recommended by WHO:

- Artemether plus lumefantrine,
- Artemesinin based plus amodiaquine,
- Artemesinin based plus mefloquine,
- Artemesinin based plus sulfadoxine-pyrimethamine and
- Dihydroartemisinin plus piperaquine.

As per the results available of efficacy trial conducted in the country, the cure rate was very good in all the combinations. The strength and limitations of all the combinations were discussed in the expert group meeting held on 18-02-2011. The expert group arrived at the consensus that AS-SP combination used in the programme may be continued, as it was rolled out for the treatment of all Pf cases in the country only in 2010 and also because it is showing good efficacy at present. The decision on shift to other Fixed Drug Combinations will be taken when other new FDC ACTs with single daily regimen are available or if efficacy of the AS-SP combination declines, whichever is earlier.

Estimation of malaria cases and deaths in the community:

The under reporting of deaths due to malaria through the health care delivery systems and non reporting by many sectors to programme was deliberated at Dte. of National Vector Borne Disease Control Programme on August, 10. WHO has estimated malaria burden and as per their estimation there would be 13 million cases and 22 thousands deaths due to malaria annually. A committee was, however, formed under the chairmanship of Dr. Padam Singh for estimation of deaths due to malaria.

Midline survey: The NVBDCP is planning to conduct the midline survey in transmission season of 2012 (Aug. Sept. 2012) with the help of National Institute of Medical Statistics (NIMS).

Partnerships

With the technical and administrative strength of the national malaria control programme, it relies relatively little on the support of external partners. Still:

1. WHO has provided regular technical collaboration in malaria control. Currently, the country office has one national programme officer and

consultants for various functional areas assisting the programme.

2. World Bank has provided financial support since 1998 and GFATM since 2005. Both of these institutions have financing as their main mission in disease control. The recent World Bank project has been started from 2009 and the GF round 9 supported IMCP-II have been initiated from October 2010.

3. Few NGOs collaborate on malaria control in endemic districts, being partners of the local health authorities. A mechanism for "public-private partnership" allows state and district level malaria control programmes to establish local partnerships with NGOs (see www.nvbdcp.gov.in). This is happening especially for BCC. In the GFATM Round 9 project, CARITAS India, a consortium of NGOs has been included as a Principal Recipient (PR2) for the IMCP –II project in North-East, complementing the service delivery.

4. Collaboration with neighbour countries takes place mainly through arrangements of the WHO South-East Asian Regional Office. As malaria control is strengthened in the North-East of India, there will be an increasing need for direct border collaboration with Bangladesh and Myanmar.

5. Collaboration with training institutions, PHFI, NIMR and NCDC is taken up for training of VBD consultants, operational studies and for monitoring of Programme.

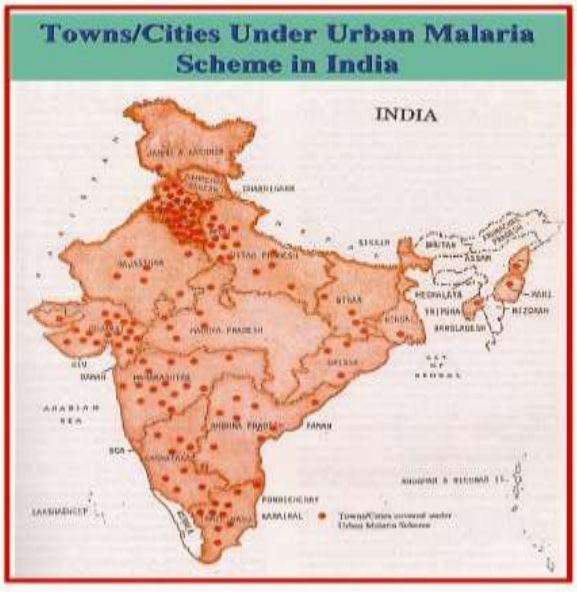
Urban Malaria Scheme

Malaria in urban areas was considered to be a marginal problem restricted to mega towns only and was considered that local bodies are capable of handling it. Therefore, while launching the National Malaria Eradication Programme in 1958, Urban Malaria was not included. By 1970s, incidence of rural malaria came down drastically i.e. 0.1 to 0.15 million cases per year but the urban town reported rising trend. Madhok Committee in 1970, investigated the problem and assessed that 10 to 12% of total cases were contributed by urban areas. The committee recommended anti-larval measures for containment of urban malaria, because it was feared that proliferation from urban to rural may spread and nullify the gains already made.

Malaria in urban areas is contributed by large scale rural-urban migrations triggered by rural "push" (for earning livelihood) and urban "pull" (for availing both Medicare/ educational opportunities) phenomenon. Demographic and societal changes, unplanned urbanization, completion of projects in total disregard of health impact assessment and incorporation of non eco-friendly technologies all contributed to increased vector breeding potential. Insufficient capacities of the civic bodies to deal with water supply, sewage and solid waste disposal led to an all round disruptions. Intermittent water supply led to increased water storage practices which resulted in extensive breeding of *Anopheles stephensi*, vector of urban malaria and Aedes aegypti, vector of dengue fever.

Historical Background

Urban Malaria Scheme was approved during November, 1971 and it was envisaged that 131 towns would be covered under the scheme in a phased manner. The expenditure on this scheme is treated as plan expenditure in centrally sponsored sector.



OBJECTIVES:

The Urban Malaria Scheme aims at:

a) To prevent deaths due to malaria.
b) Reduction in transmission and morbidity.

Strategies under Urban Malaria Scheme:

Under the scheme, Malaria Control strategy will comprise of:

(i) **Parasite control:** Treatment is done through passive agencies viz. hospitals, dispensaries both in private & public sectors and private practitioners. In mega cities, malaria clinics are established by each health sector/ malaria control agencies viz. Municipal Corporations, Railways, Defence services.

(ii) **Vector control** including source reduction, use of larvicides, use of larvivorous fish, space spray, minor engineering and legislative measures.

The control of urban malaria depends primarily on the implementation of urban bye-laws to prevent mosquito breeding in domestic and peri-domestic areas or residential blocks and government/commercial buildings, construction sites. Use of larvivorous fish in the water bodies such as natural water bodies, slow moving streams, lakes, ornamental ponds/fountains etc. is also recommended. Larvicides are used for water bodies, which are unsuitable for use of larvivorous fish. Awareness campaigns are also undertaken by Municipal Bodies/Urban area authorities.

The control measures recommended under UMS are as below:

a) Source reduction

Environmental methods of controlling mosquito breeding including source reduction minor engineering works, by filling ditches, pits, low lying areas, streamlining, canalizing, de-silting, de-weeding, trimming of drains, water disposal and sanitation, emptying water containers once in a week and observing weekly Dry Day etc.

b) Anti-larval measures

Chemical: Recurrent anti-larval measures at **weekly intervals** with approved chemical larvicides (Temephos and Bti) to control the vector mosquitoes are recommended.

Biological Control: In some urban areas larvivorous fish like *Gambusia affinis* and *Poecelia reticulata* are also used in certain situations, where the chemical control is not feasible. Biological larvicide, *Bacillus thuringiensis* israelensis either wettable powder or aqueous suspension are also used for control of aquatic stages of vector mosquitoes.

c) Aerosol Space Spray

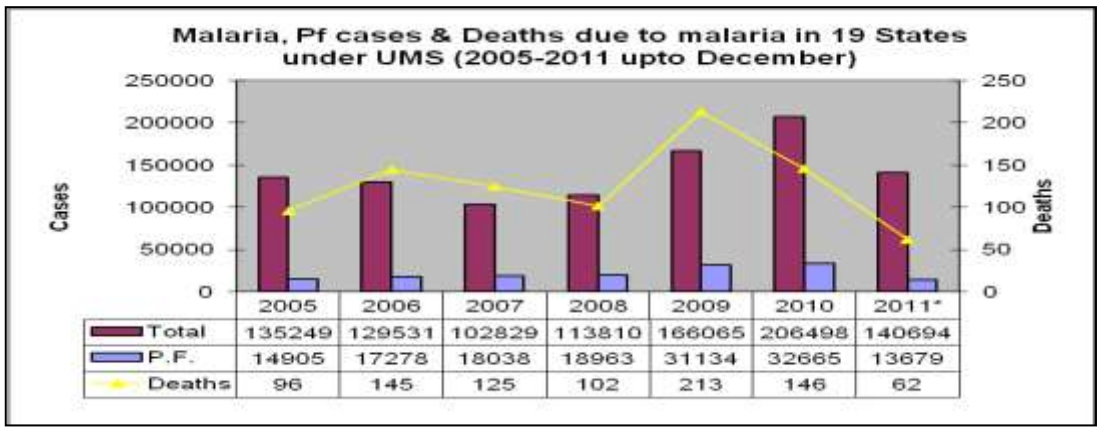
Space spraying of pyrethrum extract (2%) in 50 houses in and around every malaria and dengue positive cases to kill the infective mosquitoes is recommended.

Epidemiological and disease specific background:

Rapid urbanization and high population movements for employment opportunity in towns/cities has resulted in creation of urban slums with high to very high breeding potentials of disease vectors and transmission of vector borne diseases.

The Dte. of NVBDCP has been monitoring the Urban Malaria situation in 131 towns in 19 states, with a population of 130.3 millions, which is 11.2 percent of total population of the country. During the year 2011, a total of 140694 malaria cases were reported from 131 towns with approximate proportion of 11.6 percent of total malaria cases recorded in the country with 2.2 percent (13679) *Plasmodium falciparum* (Pf) cases and 14.4 percent (62) deaths due to malaria were reported from 131 towns under Urban Malaria Scheme. The SPR, SfR and Pf percentage were 2.09, 0.20 and 9.72, respectively.

The corporation of metropolitan cities like Chennai, Kolkata and Mumbai together contributed 77 percent of total malaria cases reported from towns under Urban Malaria Scheme. These three metropolitan cities contributed 58.1 percent of *P.falciparum* cases. The Kolkata Municipal Corporation contributed 30.5 percent and 32.4 percent respectively of total malaria and *P.falciparum* cases; Municipal Corporation of Greater Mumbai contributed 28.0 percent and 8.1 percent of total malaria and *P.falciparum* cases while Chennai Municipal Corporation contributed 18.2 percent and 2.3 percent of malaria and *P.falciparum* cases respectively during the year 2011. The proportion of *P.falciparum* cases was highest with 32.4 percent in Kolkata Municipal Corporation among these three metropolitan corporations. Most of the towns (12 out of 18 towns) under Urban Malaria Scheme in the state of Gujarat have reported more than 10 percent *P.falciparum* cases. Similarly Dimapur, only town under Urban Malaria Scheme in Nagaland



	2005	2006	2007	2008	2009	2010	2011*
Total	135249	129531	102829	113810	166065	206498	140694
P.F.	14905	17278	18038	18963	31134	32665	13679
Deaths	96	145	125	102	213	146	62

have been reporting high SPR and proportion of *P.falciparum* cases.

In urban areas, large number of people avail medicare services from the private sector. The reporting system from the private sector is practically nil. Therefore, actual malaria disease burden is much more than the reported burden. The hospitals in the cities/towns also provide referral services to malaria cases including the severe and complicated forms of malaria from the catchments areas of the cities/ towns. Therefore, there is a need to strengthen the referral facilities and capacity of the hospitals for management of malaria cases. The current status of **staff position** under **UMS** is as follows:

Current status of staff under UMS in 2011

S.No.	Post	Sanctioned	In Position	Vacant
1	Biologist	131	50	81
2	Malaria Inspector	163	116	47
3	Insect Collector	167	106	61
4	SFW	1433	1002	431
5	FW	4383	3386	997
6	Driver	57	33	24
	TOTAL	**6334**	**4693**	**1641**

Vector control issues and challenges:

Urban population is increasing at an unprecedented pace. In addition to expanding urban population, there are other factors contributing to the rise of vector borne diseases.

(i) **Increasing urbanization:** The proportion of urban population to the total population has increased in the last few decades. This has been triggered by rural "push" (for earning livelihood and "urban pull" (for availing both Medicare/ education opportunities) phenomenon.

(ii) **Poor disease surveillance activities:** While there is an extensive mechanism for active surveillance for detection of malaria cases in rural areas, there is no comparable mechanism in urban towns.

(iii) **Haphazard growth of towns :** Haphazard and unplanned growth of towns has resulted in creation of "urban slum" with poor housing and sanitary conditions promoting vector mosquito breeding potential for malaria, filarial and dengue fever/ Dengue hemorrhagic fever.

(iv) **Drinking water supply:** In urban towns, the increasing population pressure has burst the water supply system. Regular water supply has now been replaced by intermittent supply (Delhi) and in towns located in water scarcity areas; supplies are restricted to 2 to 3 times in a week (Hyderabad & Chennai). Water storage practices in artificial containers have generated

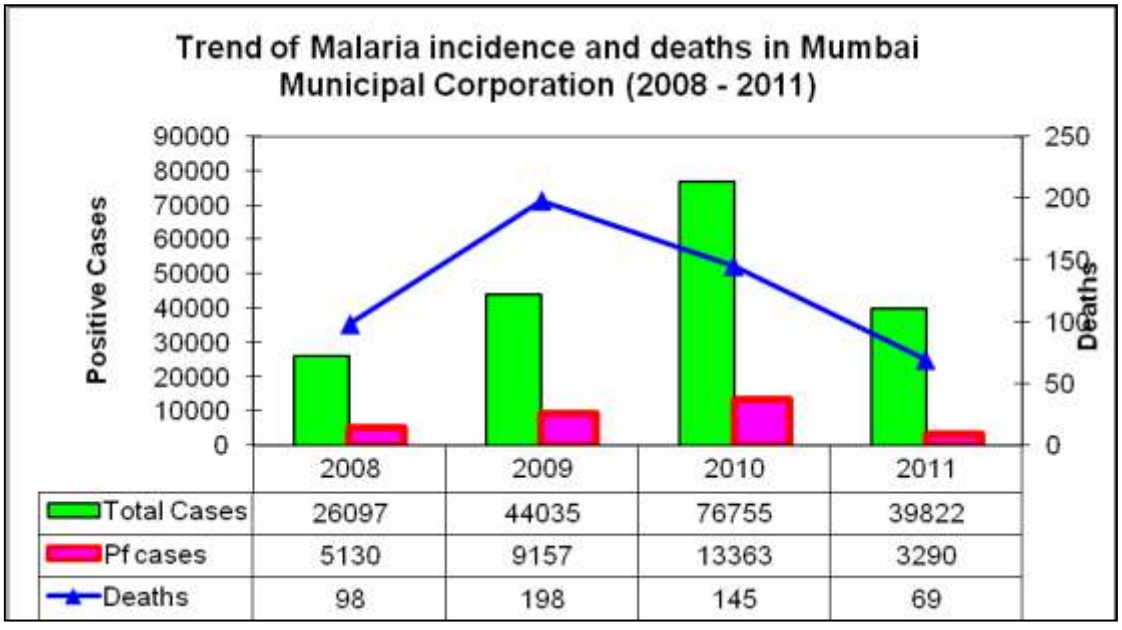
breeding potential of *An. stephensi* vectors of urban malaria and *Aedes aegypti*, the vector of DF/DHF

(v) **Development project with Health Impact Assessment (HIA):** Development project activities without health impact assessment have resulted in malaria outbreaks in short terms and endemic malaria with foci of *P. falciparum* resistance strains in long term.

(vi) **Spatial Spread of Urban Areas:** Urban towns are expanding under population pressure spatially. There is growth of sub-cities, for example, Gurgaon sub-city, Greater Noida, Dwarka in National Capital Territory of Delhi, Navi Mumbai in Greater Mumbai etc. These projects lack infrastructure, water supply, solid waste removal resulting in heavy vector breeding potential. Vertical growth further complicated the problem with its water storage problem.

(vii) **Inadequate health infrastructure:** With rapid growth of population in urban towns, existing staff strength has not corresponded with the need and is therefore inadequate for service delivery.

Malaria Control in Mumbai: Malaria emerged as a major public health problem and ensuing upward trend. Most of the malaria cases were reported from construction sites, slum pockets and semi government land owing authorities. The frequent visits by NVBDCP officers were undertaken and malaria was controlled successfully in 2011.



	2008	2009	2010	2011
Total Cases	26097	44035	76755	39822
Pf cases	5130	9157	13363	3290
Deaths	98	198	145	69

Capacity Building: Training activity for Pest Control Officer, Public Health Engineers of Municipal Corporation of Greater Mumbai (MCGM), Air and Seaport Health Organizations and Engineers from building construction of MCGM for containment of vector borne diseases during November, 2011.

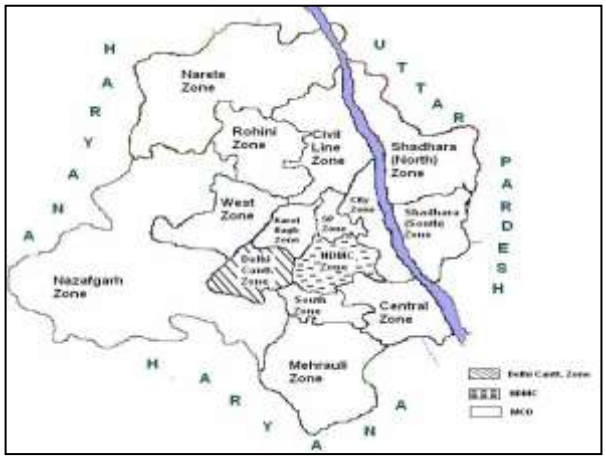




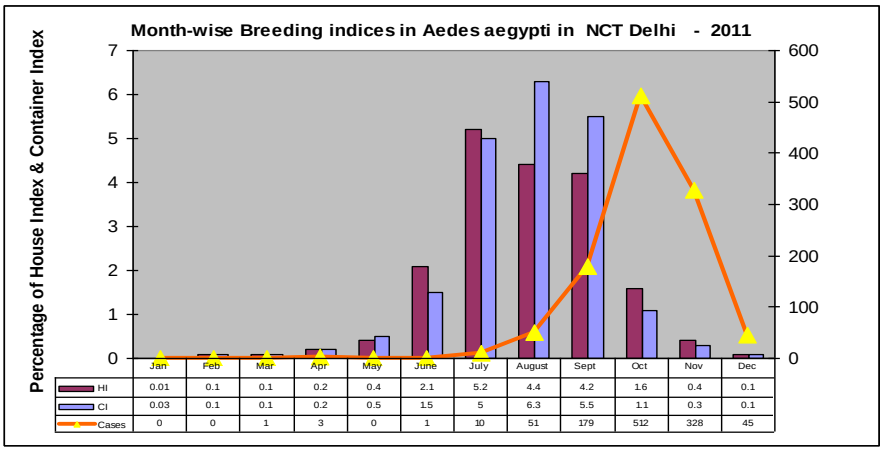
Central Cross Checking Organization

The Central Cross Checking Organization (CCCO) of NVBDCP monitors the implementation of anti-larval measures in areas of MCD & NDMC for elimination of breeding of Aedes mosquito. Vector Borne Disease Control strategies in NCT Delhi are implemented by the following agencies:

1. Municipal Corporation of Delhi (area covered 1399.26 sq. km.)
2. New Delhi Municipal Council (area covered 42.74 sq. km.)
3. Delhi Cantonment Board (42.89 sq.km.)
4. Jawahar Lal Nehru University (restricted area)
5. Zoological Park (restricted area)
6. India Institute of Technology (restricted area)
7. All India Radio (restricted area)
8. President's Estate (restricted area)
9. Northern Railways (restricted area)



The findings are informed to concerned State Programme Officers, Chief Medical Officers and Biologists for control of *Aedes aegypti* the vector of dengue. The CCCO also involved in training activities organized by Municipal Corporation of Delhi and New Delhi Municipal Council. Entomological surveillance carried out by CCCO revealed high vector breeding indices during transmission month i.e. August to October. The breeding indices of *Aedes aegypti* were high in bordering zones of MCD like Shadhara (North), Shadhara (South), South and NDMC areas. Vector breeding was also found in major hospitals like All India Institute of Medical Science, Safdarjung Hospital, Ram Manohar Lohia Hospital, Lady Harding



Medical College and in premier educational institution like Indian Institute of Technology, Delhi, National Institute of Fashion Technology, Delhi and in many schools and colleges as well.

CCCO also regularly monitors implementation of vector control measures in Gurgaon, Faridabad, Noida and Ghaziabad in NCR regions during pre monsoon months.

S.No.	Dated	Locality	HI	CI	BI
GHAZIABAD					
1	25.5.11	MMG Civil Hospital Ghaziabad	0.0	3.1	0.0
2	25.5.11	Narender Mohan Hospial staff Qrt. Mohan Nagar	0.0	5.6	0.0
3	25.5.11	Indira Colony , Shahibabad	4.3	3.8	3.8
NOIDA(Goutam Budh Nagar)					
1	01.6.11	Dr. Bhim Ambedkar Hospital Sect.-39	0.0	0.0	0.0
2	01.6.11	Noida Depot Secter -16	0.0	2.6	0.0
3	01.6.11	Noida Sect-52	0.0	0.0	0.0
4	01.6.11	Noida Sect. 37,(Residential Complex)	0.0	0.0	0.0
GURGAON					
1	26.5.11	Shivaji Nagar	1.9	4.2	4.2
2	26.5.11	Om Nagar	7.7	5.4	5.4
3	26.5.11	Office Of The Executive Eng. Provinicial Divi.No.-1	0.0	8.5	0.0
FRIDABAD					
1	27.5.11	Office Municipal Corporation Commissioner F-Block	0.0	8.6	0.0
2	27.5.11	Rahul Colony Faridabad	0.0	5.3	0.0
3	27.5.11	Central State MCF Faridabad	0.0	5.3	0.0
4	27.5.11	National Association For Blind Fridabad	0.0	6.3	0.0

The team of CCCO took up an entomological survey in Municipal Corporation of Greater Mumbai (MCGM) to assist the entomological department in organized vector surveillance for the control of malaria and other vector borne diseases. The CCCO team also involved in training activities for pest control officers and other agencies like Airport Authority of India, Port Trust, Building Department, CPWD and Ahmedabad Municipal Corporation organized at MCGM.

Central Cross Checking Laboratory

Malaria Clinic under the Directorate of National Vector Borne Disease Control Programme was established way back in 1971 to provide diagnostic facilities of fever cases/confirmation of plasmodial infection in NCT-Delhi under Urban Malaria Scheme. The Malaria Clinic has been engaged for collection and examination of blood smears from fever case patients or patients referred to clinics. The CCCO laboratory has also been engaged in examination of blood smears collected during survey or slides those were brought by officers from fields during their visits to various states. The CCCO Laboratory has also been examining blood smears sent from various hospitals in NCT Delhi. The following functions are performed:

1. The discrepancy observed in preparation of blood smears, quality of staining and identification of parasites is conveyed to programme officers.

2. During the year 2011 a total of 332 blood smears were collected and examined at Malaria Clinic, NVBDCP out of which 73 were found positive for malaria parasite indicating the SPR of 22%. Out of these 73 positives, 1 was positive for *P.falciparum*. The patient with *P.falciparum* infection was followed up after institution of radical treatment by examining blood smears of the patient collected on Day-14 and Day-28. On both occasions blood smears were found negative for *P.falciparum* infection.

3. During the year 2011, a total of 6109 slides were received and examined / cross-checked from various zones under MCD and NDMC. The highest discrepancy was detected in Narela zone (1.2%) followed by Rohini (0.68), Shahdra North (0.63%) and South zone (0.26%).

4. It was also found that a blood slide declared negative at malaria clinic under Shahdra (North zone of MCD) was found with *Plasmodium falciparum* infection, a great cause of concern.

5. Two days re-orientation training was organized involving Assistant Malaria Inspectors and Laboratory Technicians. Details of laboratory services under NVBDCP were discussed and also evaluated these perceptions about laboratory services under NVBDCP.

Entomological Surveillance

Entomological surveillance covers knowledge about capacity to transmit disease and their predominance in terms of time and space, which are crucial to facilitate the decision about control strategies. For such entomological surveillance, 72 zonal malaria offices were established during 1977 in the country with support of entomologists, insect collectors and support staff. The expenditure on this infrastructure is met by the States from state resources. In addition, 16 Regional Offices for Health & FW, GoI were also equipped with entomologists for carrying out entomological activities in addition to other public health activities. Gradually, due to non adherence of due importance to the entomological work, the progress on entomological surveillance has suffered, though some states like Tamil Nadu, Andhra Pradesh, Gujarat and Maharashtra etc. have attached more importance on zonal teams and strengthened them with entomologists and infrastructure. Presently out of 72 zones, only 50% are functional. To generate latest information about various entomological parameters in the country, the research institutes of ICMR like NIMR is collaborating with the programme. The main observations made during the year 2011, on vector prevalence (indicated here as per man hour density), susceptibility status of vectors against different insecticides and feeding preference of mosquitoes (indicated as anthropophilic index (human blood index) are briefly given as follows:

Vector Prevalence: The density of vector mosquito species was monitored by the existing zonal entomological teams and the details of statewise observations are indicated in terms of per man hour density (**Table-4**).

Susceptibility status of malaria vector: Susceptibility tests were conducted with DDT4%, Malathion 5%, Deltamethrin, cyfluthrin 0.15%, Lambdacyhalothrin 0.05%, alphacypermethrin, bifenthrin and permethrin on different species of vector mosquitoes.The tests indicated DDT resistance in district Ghandhinagar, Ahemdabad, Surendernagar,of Gujarat, Tarantaran of Punjab, W.Godavari, Nalgonda, Rangareddy of Andhra Pradesh, Dhar, Gwaliar, Morena, Jabalpur, Ashoknagar, of Madhya Pradesh. However, it was susceptible in district Sangrur of Punjab. **Test with malathion 5.0%** revealed that *An.culicifacies* was resistant in district Mehsana, Banaskantha, Gandhinagar, Sabarkantha of Gujarat, district E.Godavari, West Godavari of Andhra Pradesh, District Jabalpur of M.P. , district Gadchiroli, Thane of Maharashtra. **Test with Deltamethrin 0.05%** revealed that *An. culicifacies* tested against deltamethrine was found resistant in district Valsad of Gujarat, tolerant in district Sabarkantha Mehsana, Patan of Gujarat, district Gadchirolli, Thane of Maharashtra and district Jabalpur of M.P. ***Cyfluthrine*** resistance was found in district Vododara of Gujarat, tolerant in district Gadchiroli and Thane of state Maharshtra, *district* Sabarkantha Mehsana, Patan,

Gandhinagar, Kheda, Narmada, Banaskantha of Gujarat. *An.culicifacies* tested against **lambdacyhalothrine 0.05%** was found tolerant in district Kheda of state Gujarat district Morena *of M.P,* Gadchiroli and Thane of Maharshtra whereas it was found susceptible in district Gwaliar of state M.P. **Test with Alpha cypermethrin 0.75%** revealed that *A.culicifacies* was found to be resistant against alpha cypermethrin in district Gandhinagar, Sabarkantha, Valsad of Gujarat; district Dhar, Morena, Guna of M.P. ; district Gadchiroli of Maharshtra. However, it was found to be tolerant against in district Kheda, Banaskantha of state Gujarat.; district Gwaliar of M.P. *but* was susceptible in district Patiyala, Ropar of Punjab and district Ratlam of M.P. No resistance was noted against **Biofenthrin 0.1% and permethrine 0.75%.** The data is indicated in **Table-5.**

Mosquito Blood Meal Analysis through Enzyme Linked Immunosorbant Assay Test (Elisa)

During the year 2011, a total 2662 mosquito blood meal samples of various mosquito species*; An. culicifacies , An. subpictus, An. vagus, An. maculatus, An. philippinensis, An. minimus, An. barbirostris, An. stephensi, Cx. vishnui, Cx. quinquefaciatus, Cx. tritaeniorhynchus, Cx. pseudovishnui, and Aedes aegypti,* were received from different states viz., Andhra Pradesh, Gujarat, Punjab, Himachal Pradesh, Karnataka, Madhya Pradesh, Arunachal Pradesh, Assam, Nagaland, Tamil Nadu, Haryana and Maharashtra (**Table-6)***.*

The tests with *An. Culicifacies* were performed in Arunachal Pradesh, Assam,Gujarat, Himachal Pradesh, Haryana, Karnataka,Madhya Pradesh, Maharashtra, Punjab, Tamil Nadu. However, these tests were performed with *An. Fluviatilis* in Himachal Pradesh, with *An. Minimus* in Nagaland, with *An. Stephensi* in Karnataka and Nagaland, with *An. Annularis* in Assam, karnataka and with *An. philippinensis* in Assam and Nagaland.

The tests were performed for J.E. vectors i.e. with Cx. Vishnui and Cx. pseudovishnui in Karnataka and with Cx. tritaeniorhynchus in Karnataka and Tamilnadu.

A total of 2567 mosquito blood meal samples were processed during the year 2011 out of which 1494 (58.2%) blood meal samples were found positive and 1073 (41.8%) samples found non reactive. The result revealed that highest proportion of *An. culicifacies* fed on bovine host thus shows zoophilic in their feeding preference. *Cx. quinquefasciatus* showed tendency towards the feeding on human blood (Anthrophilic) and showed 55.4% feeding on human blood.

Dengue

Dengue is an outbreak prone seasonal viral disease caused by any one of four strains of Dengue virus (DEN-1, DEN-2, DEN-3, or DEN-4). The virus is transmitted to humans by the bite of an infected *Aedes* mosquito. It is the fastest-growing arbo-virus infection with a rapidly evolving epidemiology and is listed among the 40 emerging diseases of global importance. Dengue has also been identified as one of the 17 neglected tropical diseases by WHO (*First WHO report on neglected tropical diseases: working to overcome the global impact of neglected tropical diseases. 2010).*

Dengue is a self-limiting acute disease characterized by fever, headache, muscle, joint pains, rash, nausea and vomiting. Some infections result in Dengue Haemorrhagic Fever (DHF) and its severe form Dengue Shock Syndrome (DSS) can threaten the patient's life primarily through increased vascular permeability and shock due to bleeding from internal organs. Presently, there is no specific anti-viral drug or vaccine against dengue infection. Mortality can only be minimized by early diagnosis and prompt symptomatic management of cases.

Both Aedes aegypti and Ae. albopictus are implicated in transmission. This is a day biting mosquito and prefers to rest in hard to find dark areas inside the houses. Ae. aegypti mosquitoes prefer to breed in manmade containers, viz., cement tanks, overhead tanks, underground tanks, tyres, desert coolers, pitchers, discarded containers, junk materials, etc. in which water stagnates for more than a week; while Ae.albopictus mosquitoes prefer to breed in natural habitats like tree holes, plantations (Rubber, Pine-apple, Banana, Bamboo, Coconut, Arecanut etc.). A few preferred breeding habitat of *Ae. aegypti* and *Ae. albopictus* are as shown below:

Breeding sites for *Aedes aegypti*

Bredding sites for *Ae. albopictus*

Historical Background

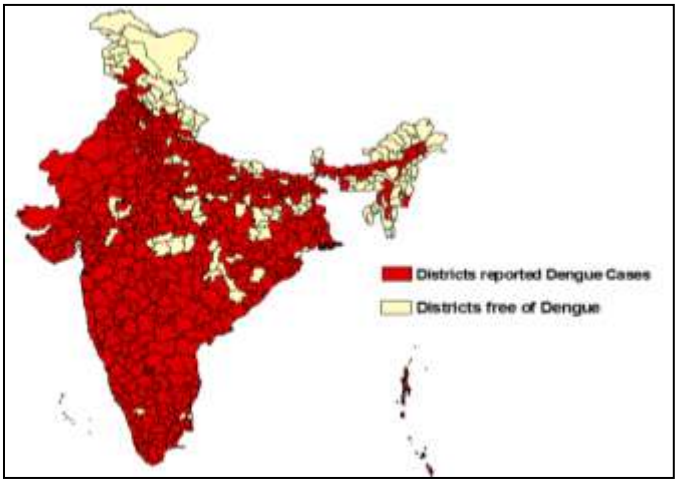
Dengue virus was first isolated in Kolkata in 1945 and Dengue fever was reported 1st time in 1956 from Vellore town of Tamil Nadu. Delhi and parts of North India experienced large number of cases of Dengue in 1996, 2003 and 2006. The disease is quite severe in young children as compared to adults.

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 and has come down to 0.6% during 2011 after circulation of Mid-Term Plan.

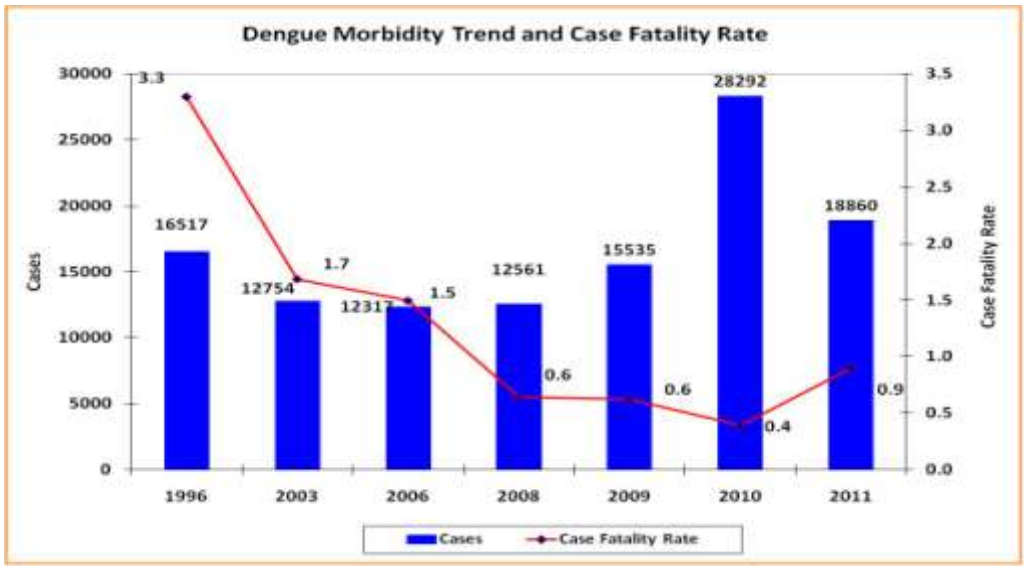
Based on the dengue transmission potential at macro and micro levels, WHO has categorized the Countries in SEARO. Till 2009, India was in Category B, grouped with Bangladesh and Maldives where cyclical epidemics are becoming more frequent, multiple virus serotypes circulating and expanding geographically within countries. However, in view of increasing endemicity, WHO in 2010 grouped India in Category A Countries with Indonesia, Myanmar, Sri Lanka, Thailand and Timor-Leste, where Dengue is a major public health problem, hyperendemicity in urban centres spreading to rural areas and multiple virus serotypes circulating (Comprehensive Guidelines for Prevention and Control of DHF –2010, WHO SEARO).

Epidemiological situation

Currently, out of 35 States/Union Territories in the country, 31 have reported Dengue cases during last two decades from 1991 to 2010. Recurring outbreaks of DF/DHF have been reported from Andhra Pradesh, Delhi, Goa, Haryana, Gujarat, Karnataka, Kerala, Punjab, Maharashtra, Rajasthan, Uttar Pradesh, Pondicherry, Tamil Nadu and West Bengal. The Dengue endemic areas are shown in map.



During 2011, 18860 Dengue cases and 169 deaths have been reported in the country. State-wise Dengue cases reported since 2008 are annexed at **Table-7**.



The risk of dengue has shown an increase in the recent years due to rapid urbanization, life style changes and improper water storage practices in urban, peri-urban and rural areas, leading to proliferation of mosquito breeding sites. Due to the man-made environmental and lifestyle changes DF/DHF has now spread to rural areas as well. Dengue is an ecological disease and the transmission is related to rainfall and temperature. Every year during the period of July-Nov there is an upsurge in the cases of Dengue/DHF. However, in the peninsular states and western parts of the Country the disease has become perennial.

Dengue in Other Countries : As per World Health Organization report, South East Asia region reported 2,92,772 cases and 1,890 deaths in 2010 (Indonesia - 1,54,180 cases and 1,345 deaths, Sri Lanka -34,150 cases and 246 deaths, Thailand–57,948 cases and 70 deaths and **India** -28,292 cases and 110 deaths).

In 2009, 2,57,882 cases and 2,031 deaths were reported (Indonesia -1,56,052 cases and 1,396 deaths, Sri Lanka 35,010 cases and 346 deaths, Thailand 25,198 cases and 2 deaths and **India** -15,535 cases and 96 deaths).

In 2008, 2,81,723 cases and 1,250 deaths were reported (Indonesia -1,55,607 cases and 940 deaths, Sri Lanka- 6,555 cases and 19 deaths, Thailand – 89,626 cases and 102 deaths and **India** -12,561 cases and 80 deaths).

Strategy: A Mid Term Plan has been developed and approved by the Committee of Secretaries under the Chairmanship of Cabinet Secretary on 26-05-11 with the following strategies (OCTALOGUE):

1. Surveillance - Disease and Entomological Surveillance
2. Case Management - Laboratory diagnosis and Clinical Management
3. Vector Management - Environmental management for Source Reduction, Chemical control, Personal protection and Legislation
4. Outbreak response - Epidemic preparedness and Media Management
5. Capacity building- Training, strengthening human resource and operational research
6. Behaviour Change Communication - Social mobilization and information Education and Communication (IEC)
7. Inter-sectoral coordination - Health, Urban Development, Rural Development, Panchayati Raj, Surface Transport and Education sector
8. Monitoring and Supervision - Analysis of reports, review, field visit and feedback

Diagnostic facility: For augmentation of diagnostic services for both Dengue and Chikungunya, Sentinel Surveillance Hospitals with laboratory support have been identified in the affected states and linked them with Apex Referral Laboratories with advanced diagnostic facilities. National Institute of Virology (NIV), Pune has been entrusted to supply the IgM ELISA test kits to the Sentinel Surveillance Hospitals and Apex Referral laboratories as per technical requirements of the states, under the guidance of Dte of NVBDCP. The cost of these kits is being borne by Govt of India. NVBDCP provides contingency grants to Sentinel Surveillance Hospitals and Apex Referral Laboratories to meet the operational cost.

Sero-surveillance: Apex Referral Laboratories are also to carry out sero-surveillance in the respective states to find out the prevalence of Dengue Virus (DENV) serotypes. During 2011, all 4 serotypes were isolated from various states.

Actions taken during 2011-12:

- Mid Term Plan for implementation was sent to states.
- National guidelines for clinical management of Dengue cases were sent to the states for circulation in all hospitals.
- Advisories were issued to the states to initiate actions before onset of season for control and prevention of the disease.
- Periodic reviews and field visits were carried out to assess the preparedness and to provide technical guidance to the states.
- 129 additional sentinel surveillance Hospitals (SSH) were established in 2011, making the total number of SSH to 311 (**Table-8).** Similarly one

Apex Referral laboratory was added to increase the total number to 14 (**Table-9)**.

- 1,849 Mac ELISA Test kits (1kit=96 tests) were provided to these SSH and Apex Labs through National Institute of Virology, Pune, free of cost. Details are mentioned in **Table-10**.
- ELISA based NS1 test was introduced in the programme for detection of Dengue cases from 1st day of disease.
- Newspaper advertisement with messages from Hon'ble Health Minister were published in national and regional dailies for community awareness.

Reviews/ Meetings

- Committee of Secretaries under the Chairmanship of Cabinet Secretary reviewed the programme on 21st January, 26th May and 10th August 2011.
- Spl. DGHS (ME) reviewed action plans and action taken by States and Govt. Hospitals for prevention and control of Dengue and Chikungunya in Delhi & NCR on 25th March 2011.
- Director NVBDCP reviewed implementation of Mid Term Plan with State Programme Officers and Regional Directors on 7th July 2011.
- Union Health Secretary reviewed the situation of 20 high endemic states with State Health Secretaries and Mission Directors on 8th July 2011.
- DGHS reviewed the status of Dengue and Chikungunya relevant activities in Delhi and NCR on 16th September, 2011.

Inter-sectoral coordination

- Ministry of Urban Development issued guidelines to Principal Secretaries - in-charge of UD/WS/Sanitations of all States Governments on prevention and control of Dengue and Chikungunya in January, 2011.
- Ministry of Panchyati Raj issued guidelines to all the Chief Secretaries of the States on prevention and control of Dengue and Chikungunya in May, 2011.
- Ministry of Rural Development issued guidelines to all State Secretaries on prevention and control of Dengue and Chikungunya in July, 2011.

Training

- Two Training workshops for capacity building of Clinicians of Public and Private Sector Hospitals of Delhi and NCR were held on 16th & 19th May 2011 at A.I.I.M.S., New Delhi on management of Dengue Fever and Dengue Hemorrhagic Fever
- A hand on Training for Microbiologists / Pathologists of Sentinel Surveillance Hospitals, Delhi was organized at NCDC on 7th & 8th June 2011.

- A hand on Training for Lab technicians of Sentinel Surveillance Hospitals, Delhi was organized at NCDC on 9th & 10th Jun 2011.
- Sensitization training programme on prevention and control of vector borne diseases including Dengue for Junior Engineers of CPWD Delhi was held on17th June 2011at the Dte of NVBDCP.

Prof. Dr Randeep Guleria, Medicine, AIIMS deliberating on clinical management of Dengue cases

Dr Navnet Wig & Dr Ashutosh Biswas, Profs Medicine, AIIMS responding to questions of participants

Outbreaks during the year 2011:

- Odisha: Outbreaks of Dengue with 1816 cases and 33 deaths. Worst affected districts were Angul (614 cases and 22 deaths), Jharsuguda (223 cases and 2 deaths), Jajpur (217 cases and Nil death), Cuttack (212 cases and 1 death) and Dhenkanal (147 cases and 1 death).
- Punjab: Outbreaks of Dengue with 3921 cases and 33 deaths. Worst affected districts were Ludhiana (1662 cases & 23 deaths), Bhatinda (862 cases and 1 death), Muktsar (405 cases and 1 death) and Faridkot (244 cases and Nil death).
- Manipur reported outbreaks of Dengue from Churachandpur district with 220 cases and nil death.

Discussing with Health care functionaries during field visits

Chikungunya

Chikungunya is a debilitating non-fatal viral illness. It resembles Dengue fever and is characterized by severe, sometimes persistent, joint pain (arthralgia), as well as fever and rash. Chikungunya re-emerged in the country in epidemic form during 2006, after a gap of almost 30 years. Chikungunya is transmitted by the Aedes mosquitoes. Both *Aedes aegypti* and *Aedes albopictus* have been implicated in transmission. Humans are considered to be the major source or reservoir of Chikungunya virus.

Historical Background

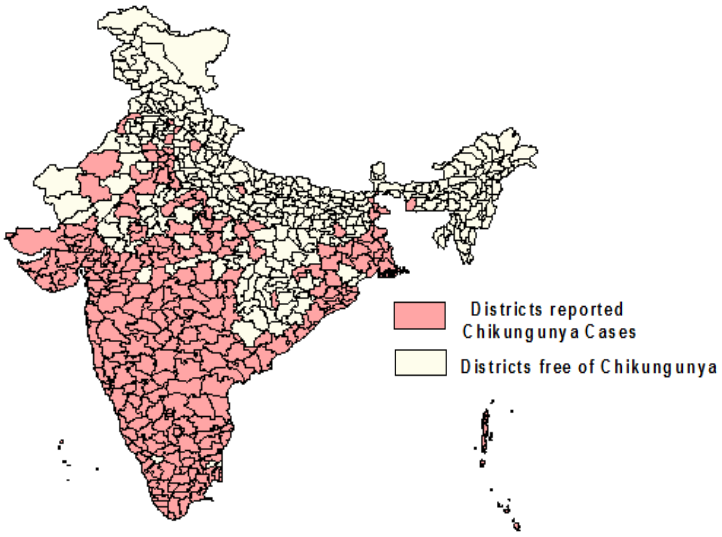
In India a major epidemic of Chikungunya fever was reported during the last millennium viz.; 1963 (Kolkata), 1965 (Pondicherry and Chennai in Tamil Nadu, Rajahmundry, Vishakapatnam and Kakinada in Andhra Pradesh; Sagar in Madhya Pradesh; and Nagpur in Maharashtra) and 1973 (Barsi in Maharashtra). Thereafter, sporadic cases also continued to be recorded especially in Maharasthra state during 1983 and 2000.

Reports of large scale outbreaks of fever caused by Chikungunya virus infection in several parts of Southern India have confirmed the re-emergence of this virus after a quiescence of three decades. Total 13,90,322 clinically suspected cases have been reported by 16 states/UTs (190 districts). All the peninsular states were affected. Maximum cases were reported by Karnataka, followed by Maharastra.

Epidemiological situation

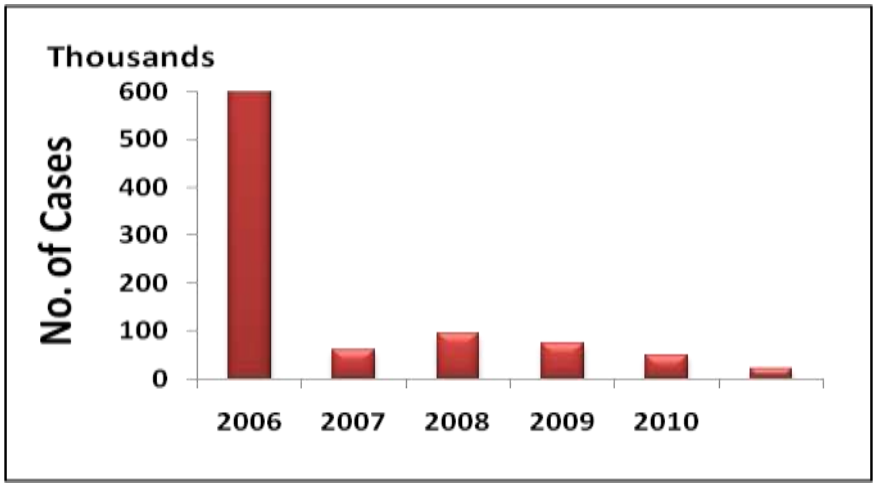
Since 2006, the cases of clinically suspected chikungunya have shown a declining trend as depicted in graph. Chikungunya cases reported in the country since 2008 are annexed at **Table-11.**

At present 23 States/ UTs are reporting cases of Chikungunya. During 2011, 20,402 clinically suspected Chikungunya cases and no death have been reported from Andhra Pradesh, Bihar, Goa, Gujarat, Haryana, Jharkhand, Karnataka,



Map showing districts with Chikungunya

Kerela, Madhya Pradesh, Meghalaya, Maharashtra, Orissa, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal, A&N Island, Chandigarh, Delhi, Puducherry. Chikungunya affected areas are shown in map.



Incidence of Chikungunya in India (2006-2010)

Strategy for prevention and control of Chikungunya

Since both Chikungunya and Dengue are spread by the same *Aedes* vector, the strategies for its prevention and Control are same. The Mid-Term Plan Strategies are being implemented by the States for prevention and Control of Chikungunya as well.

Actions taken during 2011-12:

- 311 laboratories and 14 Apex Referral laboratories involved in Dengue are also proving diagnostic services for Chikungunya.
- 742 Mac ELISA Test kits (1kit=96 tests) were provided to these SSH and Apex Labs through National Institute of Virology, Pune, free of cost. Details are mentioned in **Table-10**.

Outbreaks during the year

- Jharkhand: Chikungunya was reported for first time with 816 clinically suspected cases and nil death from East Singhbhum (538), Ranchi (167), West Singbhum (88), Garhwa (9), Chatra (9), Ramgarh (3) and one each from Hazaribagh and Giridih districts.
- Bihar: Chikungunya was reported for first time with 91 clinically suspected cases from Nalanda district.
- Uttarakhand: Chikungunya was reported for first time with 18 clinically suspected cases from Dehradun district.

Japanese Encephalitis

Japanese Encephalitis (JE) is the leading cause of viral encephalitis. It mainly attacks children younger than 15 years of age. Approximately 20-25% of those infected usually die and among the survivors, about 30% develop disabilities - mental, physical or both. The children, who survive the attack, suffer various degrees of brain damages leading to disabilities. Since the first evidence of JE transmission in India in 1952 in district Vellore (Tamil Nadu), the disease has been reported from 19 states and Union Territories with repeated outbreaks reported from 12 States & Union Territories Viz. Uttar Pradesh, Andhra Pradesh, West Bengal, Karnataka, Assam, Tamil Nadu, Kerala, Bihar, Haryana, Maharashtra and Goa. Though during the last decade, 2000 to 5000 cases with case fatality of approx 25% are reported; the number of cases actually may be more, as the surveillance and diagnostic facilities in rural areas are limited.

Historical Background

Genetic studies suggest that JE virus originated from an ancestral virus in the areas of the Malay Archipelago. The virus evolved, probably several thousand years ago in different genotypes (I-IV) and spread in Asia. The history of clinical recognition and recording of JE dates to the 19th century. JE appeared as Encephalitis outbreak in the summer season. The first clinical case of JE was recorded in 1871 in Japan. A century later, also in Japan, a large JE outbreak involving > 6000 cases was documented. Subsequent outbreaks occurred in 1927, 1934 and 1935. The role of C***ulex tritaeniorhynchus*** as a vector and the involvement of wading ardeids and pigs as reservoirs hosts were demonstrated in 1938.

JE in India: First evidence of JE viral activity by Viral Research Center (NIV) was detected during a routine sero-survey for arbo-viruses in the year 1952. This was followed by the clinical confirmation of first human JE cases at Vellore, Tamil Nadu in 1955. The subsequent details of viral isolation and report of outbreaks in chronological order are given at **Table-12.**

Epidemiological Situation

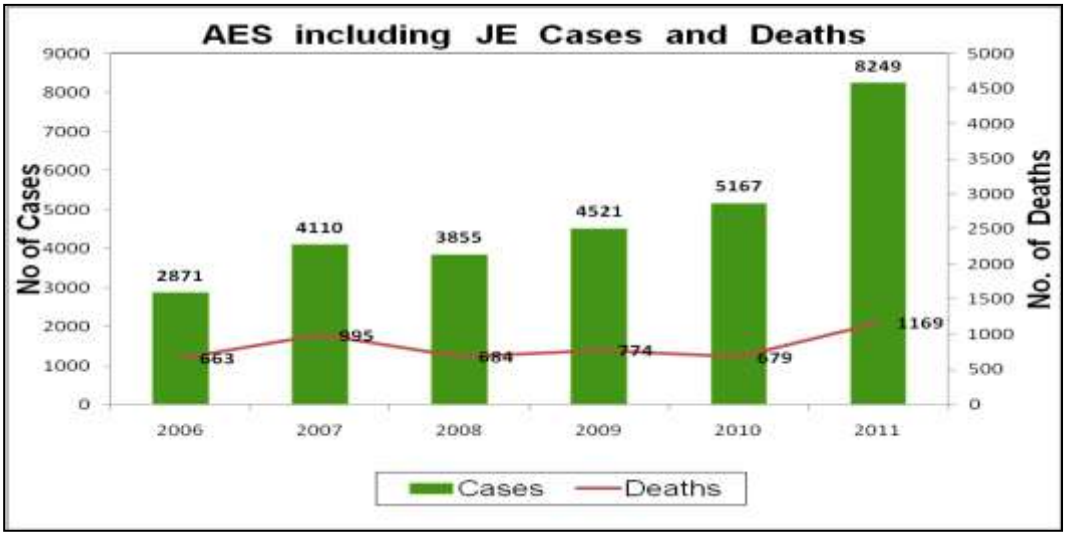
During 2011, total 8247 Acute Encephalitis Syndrome (AES)/JE cases and 1169 deaths have been reported from 17 endemic states whereas in 2010, 5167 AES/JE cases and 679 deaths were from 15 states respectively. The major endemic states affected due to AES/JE were Andhra Pradesh, Assam, Bihar, Delhi, Goa, Haryana, Jharkhand, Karnataka, Kerala, Maharashtra, Manipur Nagaland, Tamil Nadu, Uttar Pradesh and West Bengal. During 2011, due to intensified surveillance JE/AES cases were reported from Jharkhand which previously was not endemic for JE/AES. Similarly Delhi which was non-endemic

reported 5 JE cases during 2011. AES/JE cases reported in the country since 2006 presented and details below:

AES/JE Cases and Deaths in the country 2006 - 2011

Sl. No.	Affected States/UTs	2006		2007		2008		2009		2010		2011	
		C	D	C	D	C	D	C	D	C	D	C	D
1	Andhra Pradesh	11	0	22	0	22	0	49	0	139	7	73	1
2	Assam	392	119	424	133	319	99	462	92	469	117	1319	250
3	Bihar	21	3	336	164	203	45	325	95	50	7	821	197
4	Delhi	0	0	0	0	0	0	0	0	0	0	9	0
5	Goa	0	0	70	0	39	0	66	3	80	0	91	1
6	Haryana	12	6	85	46	13	3	13	10	1	1	90	14
7	Jharkhand	0	0	0	0	0	0	0	0	18	2	303	19
8	Karnataka	80	3	15	3	3	0	245	8	143	1	397	0
9	Kerala	3	3	2	0	2	0	3	0	19	5	88	6
10	Maharashtra	14	0	2	0	24	0	5	0	34	17	35	9
11	Manipur	0	0	65	0	4	0	6	0	118	15	11	0
17	Nagaland	0	0	7	1	0	0	9	2	11	6	44	6
12	Punjab	0	0	0	0	0	0	0	0	2	0	0	0
13	Tamil Nadu	18	1	42	1	144	0	265	8	466	7	762	29
15	Uttar Pradesh	2320	528	3024	645	3012	537	3073	556	3540	494	3490	579
14	Uttarakhand	0	0	0	0	12	0	0	0	7	0	0	0
16	West Bengal	0	0	16	2	58	0	0	0	70	0	714	58
	Total	**2871**	**663**	**4110**	**995**	**3855**	**684**	**4521**	**774**	**5167**	**679**	**8247**	**1169**

Graphical Presentation of AES/JE since 2006



JE in other countries : Globally, JE is reported from Bangladesh, Nepal, Sri Lanka, Thailand & Timor Leste in SEA Region and from Malaysia, Indonesia, Cambodia, Vietnam, Laos, Fiji, China and Japan in Western Pacific Region.

Name of Country	2008	2009	2010
Bangladesh	697	751	482
Nepal	1989	1503	1543
Sri Lanka	206	228	214
Thailand	359	437	409

Strategy for prevention & Control of JE

Prevention:

- Improving coverage of vaccination
- Improved habitation of Pigs / Segregation of pigs
- Vector Surveillance and Control (IRS/LLIN) and personnel protection measures

Case management

- Strengthening of early case reporting & management
- Improving surveillance
- Capacity Building

Strategy for prevention & control of AES

- Safe drinking water supply
- Provision of sanitary latrines
- Improved sanitation and hygiene
- IEC/BCC

Achievements:

Surveillance: For surveillance of JE, 64 sentinel sites have been established at district hospitals of all the endemic states. All the AES cases are to be screened for JE virus. For testing the sera/CSF samples of AES patients, the JE kits have been supplied free of costs to all the sentinel sites. In addition to the supply of JE kits financial assistance for diagnostic facility also provided by the Govt. of India. The details of sentinel sites are given at **Table-13.**

Vaccination: Subsequent to the major outbreak of JE in Uttar Pradesh during 2005, GOI decided to vaccinate children between 1-15 years. It was started in 2006. 11 districts during 2006, 28 districts during 2007, 22 districts during 2008 and 30 districts during 2009 were covered. During 2010, 20 districts were

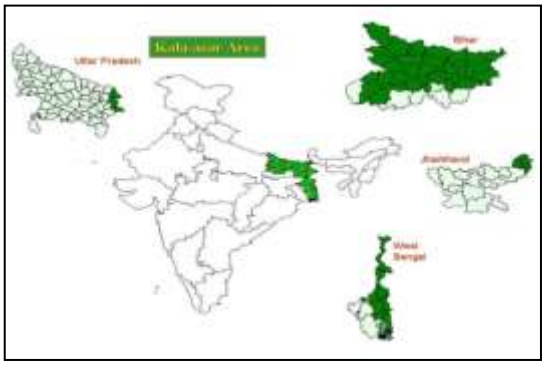
covered of which 2 districts of Assam and 7 districts of U.P. were covered second time as evaluated coverage of special campaign during 2006 was observed to be low **(Table-14).**

Meetings:

- A Meeting of Experts to discuss the proposal for adult vaccination for JE in district Sibsagar (Assam) was conducted on 11.8.2011 at NVBDCP.
- CoS meeting on video conferencing held on 14.10.2011 at MOH&FW, Nirman Bhawan, New Delhi. The Cabinet Secretary Govt. of India reviewed the JE/AES prevention and control measures undertaken by the state of Assam, Bihar, Delhi, Uttar Pradesh, and Tamil Nadu.
- Four meetings of GoM were held under the Chairmanship of Sh. Ghulam Nabi Azad, Hon'ble HFM on 21st 25th Nov, and 9th Dec, 2011 and 2nd Feb, 2012 at MOH&FW, Nirman Bhawan, New Delhi for the preparation of National Programme for AES/JE control.
- As per the advice of Hon'ble HFM, an Expert Group meeting under the Chairmanship of Secretary (DHR) & DG, ICMR was held on 28th Oct, 2011 ICMR Hqrs attended by Dr. V.K.Raina, Joint Director, NVBDCP to discuss the operational research project on AES/JE prevention and control in Eastern Uttar Pradesh.
- Follow up action of the meeting held on 28.10.2011. A meeting of Experts from VCRC, CRME, NIV Field Unit Gorakhpur etc. was organized on 14 and 15 March, 2012 to develop a operational research protocol for prevention and control of AES/JE in Eastern U.P. The meeting was attended by B.R.Thapar, Consultant (JE), NVBDCP.

Monitoring : The officers from NVBDCP visited JE endemic states to review the control measures undertaken by the states. Details of visits are annexed at **Table-15**.

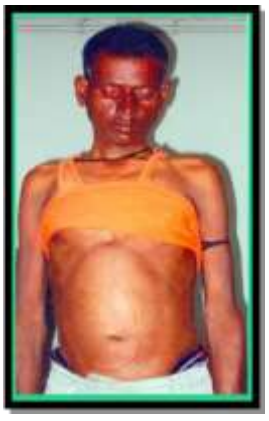
Kala-azar



The Kala-azar or Visceral Leishmaniasis is a complex disease, called leishmaniasis and is caused by the trypanosomatid parasite *Leishmania donovani*. In the Indian sub-continent, it is transmitted by the sand fly, *Phlebotomus argentipes.* The disease presents with symptoms of fever of long duration (more than two weeks) with splenomegaly, anaemia and progressive weight loss. In endemic areas, children and young adults are its principal victims. Without timely treatment the disease is fatal.

Kala-azar is seen in several countries of the world. About 5,00,000 cases occur annually. Five countries, namely India, Sudan, Nepal, Bangladesh and Brazil account for 90% of the global cases. Kala-azar affects socially marginalized and poorest communities.

In the South East Asian Region, Kala-azar occurs in India, Bangladesh, and Nepal. A small focus has also been reported from Bhutan. In the three countries of the region about 200 million people in 109 districts are "at risk". In India, 52 districts in the four States, namely Bihar, Jharkhand, West Bengal and parts of Eastern Uttar Pradesh are at present endemic for the disease. In Nepal, 12 districts, contiguous to the states of Bihar and Uttar Pradesh are endemic whereas in Bangladesh kala-azar has been reported in 45 districts. India launched the kala-azar elimination programme with effect from December 2003 with the objective of eliminating the disease by 2015. Bangladesh and Nepal are committed to kala-azar elimination programme with the target of achieving disease elimination by 2015. The political commitment for elimination of kala azar is high. In May 2005, the three countries signed a Memorandum of Understanding (MOU), in Geneva during the World Health Assembly, committing themselves to mutual cooperation towards elimination of kala-azar from their respective countries. A Regional Strategic Plan has been prepared and endorsed by the WHO SEARO Regional Technical Advisory Group (RTAG) and partners supporting elimination.



In India, once Kala-azar was endemic in Madras (Chennai), Tirunelvelli and Ramnathapuram districts of Tamil Nadu, the Mahanadi deltaic area in Orissa, Assam valley, Bengal, eastern Uttar Pradesh, Bihar, Tripura and Meghalaya has now been restricted to Bihar, West Bengal, Jharkhand and parts of eastern U.P. In the endemic states, the disease affects the poor and marginalized people.

Kala-azar is presently endemic in 31 districts of Bihar, 4 districts of Jharkhand, 11 districts of West Bengal besides occurring in sporadic form in 6 districts of eastern Uttar Pradesh. An estimated 130 million population is exposed to the risk of Kala-azar in the endemic districts of four states.

The peak annual incidence of Kala-azar was seen in 1992, when 77102 cases and 1419 deaths were reported from the endemic states. A vigorous campaign of case detection and indoor residual spraying with DDT was taken up resulting in sharp decline within a period of 2 years.

Government of India launched a centrally sponsored Kala-azar control Programme in 1990-91. The programme was intensified during the year 1991 resulting in reduction of morbidity and mortality to 22625 cases in 1995. The Programme implementation, however, could not be sustained by the concerned State Governments which resulted in slow pace of decline.

The Government of India reviewed Kala-azar Control Programme in the year 2000 and recommended feasibility of its elimination from the country. The National Health Policy (2002) envisaged kala-azar Elimination by 2010 which has now been extended by 2015. The Government of India signed a Tripartite Memorandum of Understanding with Nepal and Bangladesh in May 2005, on the elimination of kala-azar from the South-East-Asia Region by 2015. The target of Kala-azar elimination is to reduce the incidence of the disease to less than 1 case per 10,000 populations at the sub-district level in India.

Under the elimination programme the Central Government provides 100% operational costs to the State Governments, besides anti-kala-azar medicines, drugs and insecticides.

In order to achieve the goal of elimination, the following objective and strategies have been outlined:

Objectives

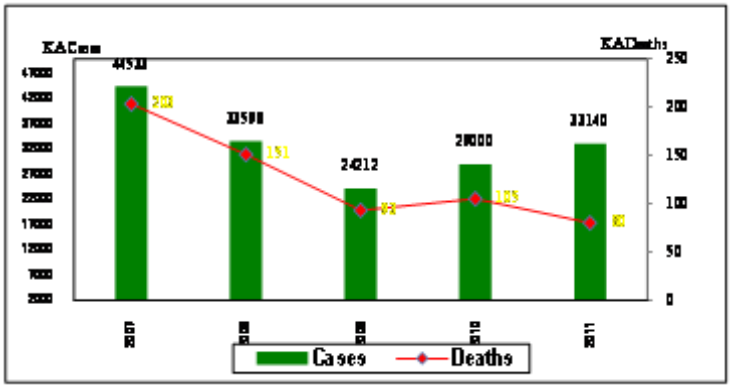
- Reducing the incidence of kala-azar in the endemic communities including the poor, vulnerable and un-reached populations
- Reducing case fatality rates from kala-azar
- Treatment of Post Kala Azar Dermal Leishmaniasis (PKDL) to reduce the parasite reservoir
- Prevention and treatment of kala-azar-HIV-TB co-infections

Strategy:

The Kala-azar Control Programme envisages the elimination of kala-azar by the year 2015. The National Strategy for the Kala-azar Elimination Programme in India is comprised of the following strategic components.

- Early diagnosis & complete treatment (EDCT)
- Integrated Vector Management including Indoor residual spraying (IRS)
- Advocacy, Communication for Behavioral Impact and Inter-sectoral convergence
- Capacity Building
- Supervision, Monitoring and Evaluation

Epidemiological Situation



Kala-azar cases declined from 44,533 cases in 2007 to 33,043 cases in 2011. Similarly, in 2011 the number of deaths (80 deaths) due to Kala azar has also reduced significantly in comparison with the year 2007 (203 deaths). The state of Bihar alone is contributing >75% of the total Kala azar cases reported in the country. In Bihar out of 31 KA districts, 11 districts are high KA endemic districts and these districts alone contributing > 86% of KA cases reported in Bihar. The state-wise data is indicated in **Table-16.**

The analysis of block-wise incidence revealed that the number of endemic blocks have increased from 514 in 2006 and 2007 to 584 in 2011. This could be

attributed to improved case detection. Out of these 584 blocks, 322 blocks have reported Kala-azar cases less than 1 per 10,000 population (as per 2011 data). The state-wise data is given in **Table-17.**

Vector Control

Indoor Residual Spray with DDT is the main vector control method in prevention & control of Kala-azar. Two rounds of DDT 50% is sprayed up to 6 feet height of the walls in Kala-azar endemic villages. During 2011-12, DDT spray was done in 4 endemic States and coverage of targeted population was reported to be 90% in Bihar, 65% in Jharkhand, 40.5% in West Bengal & 68% in Uttar Pradesh. The state-wise details are as under:

Sl. No.	State	Targetted Population	Covered	Coverage %
1.	Bihar	33898857	30715785	90.6
2.	Jharkhand	3251368	2115489	65
3.	West Bengal	2176267	881680	40.5
4.	Uttar Pradesh	1004270	NA	68.9
	Total	40330762	33712954	83.59

Initiatives

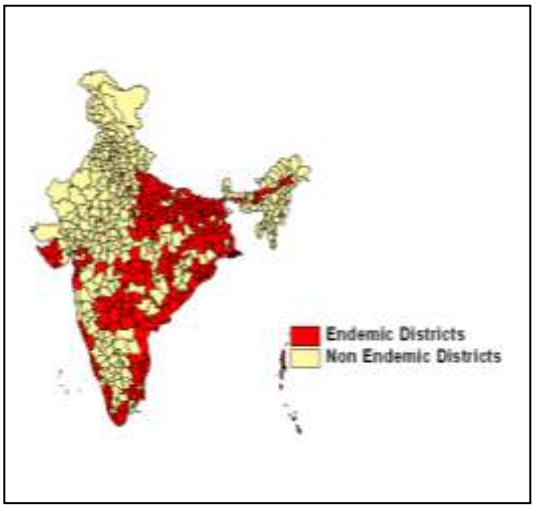
The programme has taken following initiatives realizing the goal of elimination:

1. Rapid Diagnostic Test for quick detection of Kala-azar cases and oral drug Miltefosine on Directly Observed Treatment (DOT) pattern have been introduced.
2. Active case search operations are being organized on a half yearly basis through the Kala-azar Fortnight in every endemic district.
3. Incentive to ASHAs @ Rs.200/- per case (Rs.50/ to refer suspected cases to nearest PHC and Rs.150/ for ensuring the complete treatment).
4. Incentive to the patient towards compensation for loss of wages for 28 days @ Rs. 50/- per day during the period of treatment.
5. Provision of free diet support to Kala-azar patient and one attendant.
6. Engagement of one VBD consultant in each Kala-azar district.

7. Strengthening of human resource by positioning state consultants, District VBD consultants and Kala-azar technical supervisor through World Bank Project for effective monitoring and supervision
8. Intensification of IEC/BCC activities by agency hired by NVBDCP
9. Training of PHC Medical Officers on the use of RDK for Kala-azar and oral drug – miltefosine.
10. Adequate supply of drugs, diagnostic at the peripheral level.
11. Supervision and monitoring by the central teams during IRS activities.

Elimination of Lymphatic Filariasis

Introduction



Lymphatic Filariasis (LF) is a seriously debilitating and incapacitating disease. During the early phase of infection, the infected person remains apparently healthy but serves as a source of infection for transmission. This stage usually continues for 5-7 years and can be treated with microfilaricidal drug (DEC), when detected. The transmission of filariasis is through mosquitoes mainly *Culex quinquefasciatus*. Subsequently, the infected person may develop swellings of limbs and genitals which keep on increasing and making the person incapacitated and suffering from social stigma as well. The person also suffers from frequent attacks of lymphangitis, high fever, swelling and pain. There is no cure for this stage and person is forced to live with huge swellings exposed to secondary infections. Control of lymphatic filariasis is immensely important due to personal trauma of the affected persons and associated social stigma, even though it is not fatal. The disease is endemic in 15 states and 5 UTs as shown in Map.

Lymphatic Filariasis (LF) commonly known as Elephantiasis has been targeted for elimination. However, prior to setting the target of elimination, the disease was targeted for control under National Filaria Control Programme (NFCP) which is being implemented since 1955. National Filaria Control Programme (NFCP) has the objective to control filariasis through anti-mosquito measures, to detect and treat the LF cases in known endemic areas and also to delimit the LF endemic areas through Microfilaria (Mf) survey. Filarial control units, Filaria clinics and survey units were opened in endemic states through which the activities were executed for prevention and control of breeding in urban areas. These institutions have been functioning under state budget. Immutably 206 control unit, 199 clinics and 27 Survey units were established however, some state have increased number of Control Units and Clinics and reduced number of survey units. Currently 227 control units, 224 filaria clinics and 22 filaria survey units are functioning but their functioning is not optimum due to lack of staff and infrastructure facilities. The state wise details of NFCP institutions based on information recorded from states are indicated in **Table-18.**

Elimination of lymphatic filariasis (ELF)

Global Resolution and National Goal

The World Health Assembly in 1997 adopted resolution, WHA 50.29, for Elimination of Lymphatic Filariasis (ELF) as a global public health problem by 2020. India being a signatory to this resolution set the target to eliminate LF by 2015.The same has been indicated in National Health Policy 2002.

Elimination is achieved when Lymphatic Filariasis (LF) ceases to be a public health problem, when the number of microfilaria carriers is less than 1% and the children born after initiation of elimination activities are free from circulating antigenaemia (presence of adult filaria worm in human body).

Objectives of ELF:

- To progressively reduce and ultimately interrupt the transmission of lymphatic filariasis
- To prevent and reduce disability in affected persons through disability alleviation and appropriate management

Strategy for ELF

- Annual Mass Drug Administration (MDA) of single dose of DEC (Diethylcarbamazine citrate) and Albendazole for 5 years or more to the eligible population (except pregnant women, children below 2 years of age and seriously ill persons) to interrupt transmission of the disease.
- Home based management of lymphoedema cases and up-scaling of hydrocele operations in identified CHCs/ Districts hospitals /medical colleges.

Progress towards ELF

In pursuit to achieve the elimination of LF, the Government of India launched nationwide annual Mass Drug Administration (MDA) with single dose of Diethylcarbamazine citrate (DEC) tablets in the year 2004. Various initiatives were undertaken to achieve the target of covering all the eligible population in LF endemic districts during MDA. The major initiatives taken are as below:

- Repeated dissemination of technical guidelines to the LF endemic States/UTs.
- Conducting various workshops on operational and other programme related aspects at national, regional and state levels.
- Conducting various sensitization meetings at state, district & PHC level.

- Organising training programmes for district & PHC level medical officers as well as paramedical staff.
- Massive IEC & social mobilization for improving the drug coverage during MDA.
- Involvement of Medical Colleges/Research Institutions for conducting independent assessment to provide a feedback on actual drug compliance so as to improve the drug compliance in future.
- Release of cash grant to the State for all the preparatory activities and incentives to drug distributors including ASHAs.

Progress towards MDA

- During the year 2004, states covered 202 districts only with a coverage rate of 73%. Subsequently, MDA was upscaled and 250 districts could be brought under MDA in 2007 along with co-administration of Albendazole with DEC tablets. The coverage percentage reported in subsequent years was 76% in 2005, 81% in 2006, 83% in 2007, 86% in 2008, 86.7% in 2009 and about 84% in 2010. In 2004 MDA started in the month of June which however was shifted to November as per the request of the states which are implementing agencies.
- Till 2010, Government of India (GOI) was procuring and supplying DEC. Albendazole supplied fee of cost by WHO through GSK. Since WHO could supply maximum of 300 million tablets against total request of 600 million tablets due to maximum capacity of M/s GSK, a decision was taken by Government of India (GOI), to meet the balance requirement by procuring and supply balance quantity to states. In 2009-10, the Albendazole could be procured and supplied to states but states have to stagger the dates of MDA in order to ensure the implementation of MDA with DEC+Albendazole. During 2011, vide F.No. T-14014/2/2010-VBD, dt. 21.03.2011, MOH&FW, Government of India (GOI) decentralized the procurement of DEC and Albendazole so that state can procure themselves out of cash grant. The MDA round was therefore re-scheduled in different states in order to ensure the availability of DEC and Albendazole, however it started in the month of November and 17 states/UTs could observe till April. 2012. The reports of 2010 and 2011 round of MDA are indicated in **Table-19**.

Progress towards Morbidity Management

- In pursuit to achieve disability alleviation, the strategy of home based morbidity management (washing and drying of limbs) for Lymphoedema cases and surgical operation of Hydrocele cases were initiated. To know the magnitude, Line listing of Lymphoedema and Hydrocele cases were initiated since 2004 by door to door survey in the LF endemic districts. The cases are updated every year. Till September 2011, 8,20,431

lymphoedema and 4,00,577 hydrocele cases (Total of 12,21,008 cases with clinical manifestation) have been line listed from LF endemic districts. As per reports received from states, the Home based Morbidity Management have been intensified. The initiatives taken by the state are shown in picture below:

Providing Kits of Soap, Mug, towel in Tamil Nadu

Providing Kits of Soap, Mug, towel in Madhya Pradesh

Morbidity Management in Daman

Self Practice

Progress towards Hydrocelectomy

- Surgical intervention for Hydrocele in regulary being done in states and the data compiled since 2004 reveals that total of 90137 hydrocele cases have been operated. Out of this, 16208 Hydrocele operation were conducted during 2010 and 7634 were in 2011.

Social Mobilization: Intensive social mobilization towards LF elimination was carried out by various states/ UTs involving political/ opinion leaders, decision makers, local leaders and community. The intensified IEC campaigns have improved actual drug compliance which is revealed by reduction in gap between

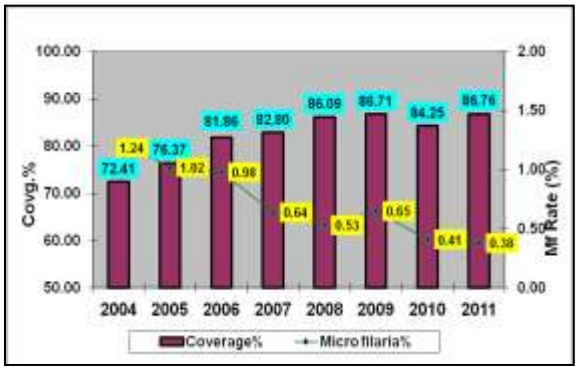
drug distribution coverage and actual drug compliance through independent assessment reports.

Monitoring and Evaluation: For monitoring and evaluation of actual drug compliance, the medical college faculties/ Research Institutions and Regional offices for Health & FW have been involved. Directorate of NVBDCP has provided funds every year. The independent assessment has been done using pretested questionnaire formats after MDA in many districts.

Achievement

The various initiatives taken toward ELF, have shown the impact as per the reported Microfilaria prevalence in endemic districts of various states/UTs.

The microfilaria survey in all the implementation units (districts) is being done through night blood survey before MDA. The survey is done in 4 sentinel and 4 random sites as per the guidelines. The sentinel sites were selected in 2004 & 2005 by the states/districts and the survey is done every year.



- The analysis of overall reports reveals that during 2004 (baseline), the microfilaria rate was 1.24% which has been brought down to 0.41% in 2010 respectively.
- Based on data of 2010, it is revealed that out of 250 filaria endemic districts, 186 districts are with Mf rate less than 1%.The state wise data is indicated in **Table-20.**

Serious Adverse Experiences (SAE)

- Large numbers of SAE were reported in 2004 when the programme was launched, however, the numbers have reduced significantly which is indirect indication of reduced microfilaraemia in the community.

Capacity Building

- Various categories of health officials have been trained on different activities of ELF. During 2010, a total of 2429800 officials were trained in ELF activities (589 state level officers, 3507 district level officers, 33192 PHC/CHC level officers, 69601 Paramedicals including 2729 LTs & 1551095 Drug distributors including ASHAs & community volunteers.

Cross Cutting Issues

Human Resource: Efforts were made to bridge the gaps especially to strengthen surveillance diagnosis and treatment to intensify the programme activities. Additional human resource of various categories was provided to high malaria endemic states on contractual basis. These categories were state and district level consultants, malaria technical supervisors (MTS), Kala-azar Technical Supervisors (KTS), Lab. Technicians (LTs) and Male Multipurpose Workers (MPWs). The externally aided projects also supported such endeavors and therefore in the states supported under World Bank and Global Fund Projects, the above mentioned categories except male MPWs were provided. The male MPWs were provided out of Govt. of India fund to high malaria endemic states. To handle the project activities and its monitoring, the human resource viz., National Consultants with support staff were also provided at central level. The expertise of these consultants was also utilized for activities supported under domestic funding as ad-hoc arrangement. However, the real need of programme in whole country needs to be addressed from domestic funding.

ASHAs were involved for diagnosis and treatment for which they have been trained. So far about 3.5 lakhs ASHAs have been trained and involved in malaria diagnosis and treatment, especially in Pf predominant areas. All other newly engaged personnel were given orientation on programme activities and specific to their job for which they were engaged. Their capacity building was taken up in addition to regular training programmes for various categories in the States.

ASHAs:

ASHAs have been recognized as very important components for field surveillance and EDCT. Presently ASHAs are involved in the diagnosis and treatment of malaria cases and bringing the Kala Azar cases to the health facilities. ASHAs perform rapid diagnostics test, prepare slides and give treatment to malaria positive cases. ASHAs are given incentive for each of these activities like Rs. 5 per RDT and slide preparation, Rs. 20 per complete treatment for *Pf* cases and Rs. 50 for radical treatment of *Pv* malaria. Presently, NVBDCP is giving such incentive to ASHAs in 257 identified high risk districts which mainly comprise of the World Bank and Global Fund supported project areas.

MPW (M):

As against the requirement of 145894 MPWs (as per NRHM data 2009 RHS), sanctioned posts are 79774 and in place are 57439. Thus there is a vacancy of 26208 MPWs. But considering the total requirement as per the population norms, there is an actual shortfall of 88483 MPWs. MPWs are essential for NVBDCP as

they are the health workers (besides ASHA) who are responsible for field surveillance and constitute an integral part of EDCT. NVBDCP has allocated 9956 MPWs contractually during the XIth Plan period in the high endemic states.

Laboratory Technicians:

There are presently 12904 LTs in place as against the sanctioned strength of 17219 leaving a vacancy of 5591(NRHM data 2009, RHS). As microscopy is still gold standard for Malaria diagnosis and crucial for EDCT, therefore the programme has provided additional support of 434 LTs in high malaria endemic states through external assistance. Programme also proposes to recruit about 12,000 LTs to intensify the diagnosis of malaria.

VBD Technical Supervisors (MTS/KTS):

Under the programme each district was having with Malaria inspector / supervisors mostly 1 per block but now there is huge vacancy of this category. To bridge the gap, NVBDCP has supported Malaria and KA technical supervisors in the high endemic areas in the project states. This has paid rich dividends as these Technical Supervisors have been proved as a very effective tool for supervision, monitoring and evaluation.

District VBD Consultants:

Like the MTS/KTS in the high endemic blocks, NVBDCP has provided District VBD Consultants in the high endemic districts of the WB/GF project states. This has improved M&E and the programme implementation aspects. Therefore, NVBDCP has planned to expand the DVBDC network to all the 640 districts in the country (one for each district) with one Data Entry Operator to facilitate the recording and reporting and mobility support.

State Level Consultants:

SPO is mostly looking after many works which affect the monitoring of programme, hence, at state level, consultants are provided under World Bank / GFATM supported projects. However, considering the importance it is proposed to provide one M&E consultant (Medical graduates with Public Health qualification), one VBD consultant (preferably entomologist) and one Finance and logistics consultant at state level.

Strengthening of ROHFW

Regional Offices in project states has been provided with one entomologist and it is proposed to have one entomologist and one epidemiologist (with medical

background) at each of these regional offices with mobility and operational support.

Capacity building

- Capacity building is an ongoing activity undertaken by NVBDCP regularly to build the technical and managerial capacity of the staff to improve overall programme implementation.

- For cascading on training Medical Colleges will be involved through NIHFW for preparing of training resource pool up to district level. This resource pool will be shared with NRHM, so that, during imparting of integrated training appropriate faculties for VBD can be drawn from this resource pool.

- The categories of manpower being trained are Community volunteers (ASHAs, AWW, FBOs, NGO, CBOs), MPWs(Male and Female), Lab technician, MO(PHC), Physicians, Dist. VBD Consultants, VBD technical supervisors, etc. Few special training programmes i.e. malariology and entomology trainings are also conducted for State Programme Officers and District Programme Officers.

BCC and Social Mobilization:

- IEC/ BCC is one of the core activities of the programme. The support for these activities has been provided through DBS as well as from EAC. For effective development of IEC and BCC tools and implementation activities agencies have been hired under WB supported project which mainly focuses to the project areas. Under GF supported project, the IEC/BCC activities are being carried out with the partner Civil Society/ NGOs. Various activities carried out during 2011-12 are as under:

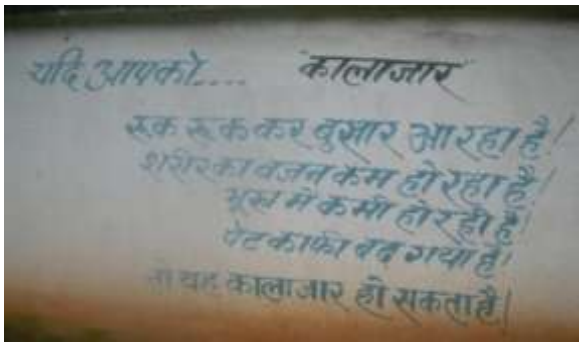
Poster display during Anti-Malaria month observance in Karnataka

Dengue Larval demonstration in School children of Tamil Nadu during Anti-Dengue month

IEC material usd for Dengue/Chikungunya and JE in Uttar Pradesh

Japanese Encephalitis (JE): Spraying activites being carried out in a JE affected villages of Tamil Nadu.

Lymphatic Filariasis – addressing the volunteers & community during MDA in Andhra Pradesh



Kala-azar IEC wall paintings in Bihar

IEC posters for Kala-azar circulated from GoI

Public Private Partnerships (PPP):

- For promoting partnerships with private sectors, NGOs, FBOs, CBOs and local self Governments, the NVBDCP has developed six schemes on PPP during the XI Plan period. These schemes have been reviewed, revised and already hosted at the website of NVBDCP. The states have not been able to get the fund for implementation of these schemes which are as under:

1. Provision of early diagnosis and prompt treatment (EDPT) –

a. **Scheme 1:** Provision of outreach services – Fever Treatment Depot (FTD)
b. **Scheme 2:** Provision of microscopy and treatment services
c. **Scheme 3:** Hospital based treatment and care of severe and complicated malaria cases

2. Integrated vector control

a. **Scheme 4**: Promotion of insecticide treated bed nets, insecticide treatment of community owned bed nets and distribution of insecticide treated bed nets in selected areas
b. **Scheme 5:** Promotion of larvivorous fish
c. **Scheme 6**: Indoor Residual Spraying (IRS)

Monitoring and Evaluation

A robust programme management and monitoring system is implemented to monitor progress towards targets and objectives and provide continuous feedback to strengthen and improve delivery mechanisms at all level. The data for different diseases are transmitted from state headquarter to central Directorate and are compiled on monthly basis for Malaria, Dengue, Chikungunya, Japanese Encephalitis and Kala-azar. However, dengue, Chikungunya and J.E. are monitored on daily basis during outbreak situation. In case of Lymphatic Filariasis, the data of NFCP units are received on monthly basis, however, the data related to elimination activities are received annually, because the Mass Drug Administration is done on annual basis.

The following strategic activities under the programme are being intensified to strengthen further the monitoring and evaluation:

- **For all VBDs** NAMMIS **will be** up-graded to **NAMMIS Plus.**
- Data of Sentinel Surveillance Sites (SSS) to be linked.
- Periodic reviews and programme evaluation.
- Infra-structure development in terms of computer/laptop etc.

- Training of the staff for correct use of recording and reporting formats

Logistics and supply

Large numbers of commodities i.e anti-malarial drugs & other drugs for vector borne diseases, insecticides, larvicides, Rapid diagnostic kits for Malaria and Kala Azar, Long Lasting Insecticidal Nets (LLINs) are being procured through agencies engaged by EPW of MOHFW. However, there is no regular procurement specialist in the Directorate. At present procurement consultants hired under EAC are assisting. In view of intense and timely procurement, its supply up to the grass-root level user facilities for managing seasonal diseases is a challenge. Some of the diagnostics and drugs are short expiry and their monitoring becomes extremely important through a mechanism of supply chain monitoring. At present a supply chain monitoring agency has been hired under WB supported project. This component has to be sustained through domestic budget.

The quality control of all commodities during pre and post supply is to be ensured, so as to ascertain good quality of commodities.

During XII FYP, the existing norms of commodity support will continue. The centralized and decentralized items are mentioned below:

Centralized procurement under NVBDCP: ACT Combi Pack (Tab. Artemesinin based + Tab. Sulphadoxine Pyremethamine) (for different age group), Injections Artesunate 150 mg, Rapid Diagnostic Test Kits for Malaria and Kala-Azar, Synthetic Pyrethroid (wdp) for project areas, Long Lasting Insecticidal Bednets (LLIN), DDT for Malaria and Capsule Miltefosine.

Decentralized Procurement: GoI is providing cash assistance in the form of Grant-in-aid for procurement of Tabs. Chloroquine, Primaquine, Qunine, DEC, Albendazole, Inj.Quinine, NS-1 Antigen kit for Dengue, larvicide (Temephos).

Decentralized items: The items like malathion 25%, Synthetic Pyrethroid (wdp), larvicide other than temephos, lab reagents, etc. are decentralized items to be procured by the State funds.

Due to lack of procurement capacity, many states could not take up the procurement process for the items under decentralized procurement and cash assistance has not been utilized. During XII plan the states will be urged to enhance their procurement capacity. Under the 12th Five Year Plan, the NVBDCP proposes to continue the existing procurement policies. The inputs currently supported from the externally aided projects (WB and GF), will be supported from the domestic budget, after the end of the projects for sustaining the gains and achievements beyond the project periods.

Reviews of NVBDCP activities

All the states and UTs are divided among the officers of Directorate of NVBDCP, each having 2-3 states. These officers visit to different states/UTs and advise the states on various technical and programme management aspects. The details of such activities in respect of officers are indicated below:

1. Dr. A.C. Dhariwal, Director

Field Visits & Reviews:

- Visited Guwahati from 6.1.2012 to 7.1.2012 to:
  a) attend Joint Planning & Review meeting of NVBDCP of NE states (GFATM states) & CARITAS India Consortium.

  b) Review & discussions with State Health officials of NVBDCP activities in NE states.

  c) Review of NVBDCP & discussions with SPOs/DHS & RDs of NE states.

- Visited Kolkata from 20.1.2012 to 21.1.2012 to review VBDs activities with focus on Kala-azar Elimination being undertaken in State of West Bengal.

- Visited Patna from 29.1.2012 to 31.1.2012 for:

  a) Review of VBDs activities with focus on Kala-azar Elimination being undertaken in State of Bihar.

  b) To accompany DGHS for review/meeting on Kala-azar and JE control activities in Bihar and discussions with State health authorities during 30^{th}-31^{st}, 2012.

- Visited Jodhpur from 23.3.2012 to 25.3.2012 to:

  a) Participate in the SAC meeting of DMRC, Jodhpur and

  b) Review other VBD control activities and discussions with District/ state health authorities.

- Visited Lucknow from 1.4.2012 to 3.4.2012 to

  a) Review prevention and control of JE/ AES in Uttar Pradesh

b) Review of other VBD control activities and discussion with state health authorities.

- Visited Lucknow from 8.4.2012 to 10.4.2012 for:

  a) Review of prevention and control JE/ AES in Uttar Pradesh & western districts of Bihar under the chairmanship of Spl. DGHS(PH)

  b) Review of other VBD control activities and discussion with state health authorities.

- Visited Kolkata from 5.5.2012 to 5.5.2012 Kolkata for:

  a) Participation in consultation meeting of Indian Institute of Health Management Research on road map of bridging gaps in Health & Hospitals, Management Research Training & Education in eastern India in Kolkata.

  b) Review of other VBD control activities and discussion with state health authorities of West Bengal.

- Visited Lucknow from 25.5.2012 to 26.5.2012 to attend meeting on Acute Encephalitis Syndrome in Lucknow.

- Visited Pune from 28.5.2012 to 29.5.2012 to review malaria control activities with state and district health officials of World Bank supported programmes of Karnataka, Maharashtra, Gujarat, Jharkhand and Chhatisgarh – meeting with Addl. Chief Secretary, Maharashtra.

- Visited Jaipur from 8.6.2012 to 9.6.2012 to:

  a) Review malaria control activities in the State for advocacy of Epidemic Intelligence Services like training Programme in India with state health authorities of Rajasthan.

  b) Review of VBD activities and discussion with state health authorities.

- Visited Ranchi from 15.7.2012 to 17.7.2012 to attend review meeting of NVBDCP with World Bank Mission at Ranchi.

- Visited Agartala- Tripura from 1.8.2012 to 3.8.2012 to

  a) attend review of Global Fund supported IMCP II in seven north-eastern states and

b) Review of VBD activities in NE states and discussion with SPOs.

- Visited Patna from 27.9.2012 to 27.9.2012 to:

  a) Attend in depth review meeting of communicable diseases with state and district officials and

  b) Review of VBD activities.

- Visited Freiburg, Germany from 8.10.2012 to 10.10.12 to participate in the Expert meeting on tools for moving forward the Visceral leishmaniasis **Elimination Programme.**

- Visited Chandigarh, Sonepat, Karnal, Ambala, Ludhiana, Ropar from 20.10.2012 to 21.10.2012 for Field review of VBD control activities in the state of Haryana & Punjab

2. Dr. O. Chattopadhyay, Addl. Director

Field Visits & Reviews:

- Visited Samastipur and Vaishali districts of Bihar for review of Kala-azar Elimination Programme from 23.5.11 to 28.5.11.
- Participated in the Inter-country Consultation of the Elimination of Kala-azar in the South-East Asia Region in Kolkata on 9.11.11 and 10.11.11.
- Visited East Champaran district of Bihar for review of Kala-azar Elimination Programme from 12.12.11 to 16.12.11. Also attended the National IEC/BCC Workshop on Kala-azar Elimination in Patna.
- Visited 24 Parganas (S) district of West Bengal for review of Kala-azar Elimination Programme from 7.3.12 to 11.3.12. Also participated in the Ownership Meeting of the World Bank supported National Vector Borne Disease Control Support Project in Kolkata.

3. Dr. G. S. Sonal, Addl. Director

- February 2nd- 3rd 2001: To attend meeting of PIP appraisal of the State of Uttarakhand state
- February 12-13, 2011: For deliberate on current challenges and new initiatives for Control malaria and other VBDs in Joint Annual Conference of Indian Association of Public Health and Indian Association of Preventive and Social Medicine being held at Wardha . Maharashtra /to Review of VBD in Wardha district.
- March 11-13, 2011: To attend meeting convened under the Chairmanship of DGHS, at Lucknow (UP)

- March 16-17, 2011: Monthly technical review meeting under the chairmanship of Health Secretary, Odisha.
- April 14-17, 2011: To review malaria situation in the state of Odisha.
- April 24-25,2011: Workshop on Treatment of malaria & NDP, Guwahati, Assam
- May 3-6, 2011: Mid-Term review of WB assisted National Vector Borne Disease Control Supported project.
- May 31 to June 3rd, 2011: Workshop in MESST, Guwahati.
- July 3-6,2011: Review of malaria situation ,Visakhapatnam
- August 10-11, 2011: Training workshop for consultant of District project units of Casritas, N E States.
- September 12-15, 2011: Visit to District Tumkur & attend district readiness meeting, Bangalore, Karnataka.
- October 13-16,2011: To attend out break meeting with State official in Kanpur, Lucknow (UP)
- November 2-3, 2011: To attend Regional training of medical college faculty. Chandigarh.
- November 9-15,2011: To attend CRM, NRHM, Jharkhand
- November 23-25, 2011: Pre World bank mission visit, Raipur, Chhattisgarh.

4. Dr. Aruna Jain, Addl. Director

Field Visits & Reviews:

- Visited Chandigarh for NVBDCP review, April 23-24, 2012.
- Visited to Haryana state to participate in CRM meeting, November 9th-15th, 2011.

5. Dr. Sanjeev Gupta, Addl. Director

Field Visits & Reviews:

- Visited Jodhpur & Chittorgarh to participate in CRM meeting, November 9th-15th, 2011.
- Visited Gorakhpur, Maharajganj & Kushinagar for JE review, January 19th-22nd, 2012.

6. Dr. R.S. Sharma, Addl. Director

Field Visits & Reviews:

- Visited Ahmedabad district to discuss NRHM PIP and Monitoring f NVBDCP activities 27.1.11 to 30.1.11
- Field visit at Mumbai from 27.3.11 to 30.3.11

- Monitoring of UMS activities and attended Joint Conference of Indian Society of Malaria & Other Comm. Diseases and the Indian Association of Epidemiologists from 14.4.11 to 17.4.11 at Bhubaneswar
- Visited Raipur district to accompanying World Bank team for Mid-term review from 03.5.11 to 6.5.11.
- Visited Vijaywada and Prakasam district, Andhra Pradesh to monitor of NVBDCP activities from 1.7.11 to 4.7.11
- Visited Patan district, Gujarat state to assess World Bank preparedness from 16.8.11 to 18.8.11
- Attended the brainstorming meeting of the Vector Science Forum from 4.10.11 to 5.10.11 at Hotel Clark Greens, Bijwasan, New Delhi
- Attended XI symposium on vectors and vector borne diseases from 15.10.11 to 16.10.11 at Jabalpur, Madhya Pradesh.
- Monitoring of UMS activities of Chennai Corporation on 29.10.11.
- Attended Regional Training course on IVM from 30-31.10.11 at VCRC, Pondicherry
- Visited Chattisgarh state 9.11.11 to 15.11.11 for CRM review
- Attended Global Fund meeting for preparation of vector control activities for India ,WHO,SEARO ,2011

International

- Attended 3rd Interim Steering Committee meeting of the Global Alliance for the development and deployment of alternatives to DDT for Disease Vector Control at Federal Ministry of Environment, Nature Conservation and Nuclear Safety at Bonn, Germany from 15-16 March, 2011.
- Attended first Global Assembly for enhanced cooperation and advocacy towards developing and deploying alternatives to DDT for disease vector control 26.04.11

7. P.K.Srivastava, Joint Director

Field Visits & Reviews:

1. January, 11-13, 2011: To participate in review of National Vector Borne Disease Control Programme by Hon'ble and Secretary at Hyderabad.
2. January, 16-19, 2011: To review NVBDCP activities in Bihar and participate in the Trg. Prog. of VBD Consultants at RMRI, Patna..
3. February,9-13, 2011: To review NVBDCP activities in Karnataka and to Bellary district as member of central team to suggest the remedial measures for outbreak containment.
4. February,14, 2011: PIP appraisal of Tamil Nadu, Puducherry, A&N Island at Chennai.
5. February,15, 2011: PIP appraisal of Andhra Pradesh at Hyderabad.

6. April,14-17,2011: For oral presentation on ELF status in India at 8th Joint Annual Conference of Indian Society for Malaria & other Communicable Diseases at, Bhubaneswar on 15.4.11 and to review & monitor ELF activities in Orissa on 16.4.11.
7. July,1-4, 2011: To review of VBD situation in Mumbai & Maharashtra state.
8. July,14-17, 2011: To review NVBDCP activities in Jharkhand and sensitization of district level officials on Elimination of Lymphatic Filariasis.
9. August,16-17, 2011: Oral presentation on ELF progress in India at "National workshop and field based demonstration meeting of ICMR at Chennai.
10. October,28-30, 2011: To review preparedness of Mass Drug Administration for ELF in Tamilnadu and Puducherry & as trainer in training workshop at VCRC Puducherry.
11. January,22-25, 2012: To review preparedness of ELF activities and observance of MDA in Karnataka and visited districts Mangalore and Udupi of Karnataka
12. January,26-28, 2012: To review preparedness of MDA in Dadra & Nagar Haveli.
13. February,5-6, 2012: To review NVBDCP activities and preparedness of ELF activities in Tamil Nadu at Chennai.
14. February,7, 2012: To review NVBDCP activities and preparedness of ELF activities in Puducherry
15. February,8-10, 2012: To review NVBDCP activities and preparedness of ELF activities in Assam at Guwahati. Districts Nalbari & Baksa of Assam were visited for monitoring of spray activities and other NVBDCP activities.
16. February,15-18, 2012: To review and monitor the IRS spray in Saran district of Bihar and to review ELF & NVBDCP activities in the district.
17. February,27, 2012: To review NVBDCP activities in Karnataka state at Bangalore in a meeting under chairmanship of Mission Director as Ownership Meeting with special focus on districts supported under World Bank Project.
18. March,12-14, 2012: To review preparedness of ELF activities in Varanasi of Uttar Pradesh.

International visits:

- Invited as panelist to co-chair a session on **Race to 2020 and NTD Elimination : will we make it and what will it take**.
- Co-chaired the session on **stopping MDA: moving Lymphatic Filariasis towards elimination** at a Symposium organized by American Society of Tropical Medicine and Hygiene at Philadelphia, USA during 4-8th December,2011.
- Participated in **8th Meeting of Lymphatic Filariasis Programme Managers of South East Asia Region** and **8th Meeting of Regional Programme**

Review Group (RPRG) for Elimination of Lymphatic Filariasis in South East Asia Region from 26-27 & 28-29th April, 2011 respectively at Colombo, Sri Lanka. During RPRG meeting performed as temporary advisor.

Research Students Guided

1. Guide for Ms.Priyanka Kardam for **summer training course on Elimination of Lymphatic Filariasis and its status in Madhya Pradesh** during her Post-graduate programme in hospital & health management at International Institute of Health Management Research, New Delhi. (Period: From 4th April– 30th May,2011).
2. Guide for Dr. Shahina Yasmeen for summer training course on **assessment of progress towards morbidiy management, Lymphoedema & hydrocele patients in Barabanki district of U.P**. during her MBA in Hospital & Health Management at Faculty of Management Studies and IT, Jamia Hamdard University, Hamdard Nagar, New Delhi.
3. Guide for Dr.Mayank Kumar for summer training course on **Elimination of Lymphatic Filariasis in Barabanki district of UP** during his MBA in Hospital & Health Management at Faculty of Management Studies and IT, Jamia Hamdard University, Hamdard Nagar, New Delhi

Dr. Kuldip Singh Gill, Joint Director

Field Visits & Reviews:

- Visited Chandigarh from 8-2-2011 to 10-2-2011 to attend sub-group meeting of PIP for Action Plan of Punjab and Haryana states.
- Visited Chandigarh again from 16-2-2011 to 18-2-2011 to deliver lectures on Integrated Vector Management (IVM) and Drug Policy for Malaria for the medical officers of the state.
- Visited Jammu from 28-2-2011 to 1-3-2011 to review and discuss the PIP of J & K state.
- Visited Shimla on 15-3-11 to 16-3-11 to discuss the PIP of HP State under the chairmanship of JS (PH).
- Visited BSA, Jaipur Golden & SGMH hospitals in Delhi to assess the real load of Dengue/CHK and Malaria cases in the community on 16-9-11.
- Visited Chennai and Pondicherry from 28-30th Oct, 2011 to participate in regional training on IVM by WHO at VCRC, Pondicherry.
- As a member of 5th Central Review Mission (CRM) visited Jalaun distt of UP to review various activities under NRHM from 9-15th Nov, 11.
- Visited Bombay from 28th Nov to 1st Dec, 2011 for the WHO training on surveillance of VBD for Pest Control Officer of MCGM, Bombay.

8. Dr. V.K.Raina, Joint Director

Field Visits & Reviews:

- 28th – 29th January, 2011:- To participate in a review and Action Plan meeting held under the chairmanship of Hon'ble Minister of Health & FW, Govt. of UP at Kushinagar & Gorakhpur.
- 14th – 15th February. 2011:- To participate in a review meeting on AES/JE at Dibrugarh, Assam.
- 23rd – 24th February, 2011:- To participate in SAC meeting and to review JE/AES situation at Gorakhpur.
- 11th to 12th March, 2011:- To participate in review meeting of VBDs being held under the chairmanship of Dr. R.K.Srivastava, DGHS, GOI, at Lucknow.
- 21st May, 2011:- To assess the Action Taken by the state/district health authorities with regard to the meeting held under his chairmanship on 12th March, 2011 at Lucknow.
- 23rd – 27th July, 2011:- Central team to visit district Alappuzha and Kollam of Kerala for JE outbreak investigation.
- 6th August, 2011:- To participate in a workshop being convened under the chairmanship of vice-chairman of National Disaster Management Authority at Gorakhpur.
- 13th – 15th October, 2011:- To participate in a review meeting on AES/JE at Guwahati, Assam.
- 9th – 16th November, 2011:- To participate in Common Review Mission, NRHM at Guwahati and Nagaon.
- 21st – 23rd November, 2011:- To participate as faculty in Social Mobilization workshop at Gorakhpur.
- 31st Jan – 4th February, 2012:- To review AES/JE situation in District Dibrugarh and Sivsagar including upgradation of AMCH.
- 10th – 12th April, 2012:- To review AES/JE situation and Action Plan for 2012-13 at BRD Medical College Gorakhpur.
- 1st – 4th May, 2012:- Visit to district Maharajganj & Deoria to assess preparedness of the districts towards prevention & control of JE/AES.
- 15th – 18th May, 2012:- TOT on Social Mobilization for prevention and control of AES/JE district Maharajganj, Deoria and Kushinagar.
- 24th – 26th May, 2012:- Workshop on perspective surveillance of JE/AES project field at Lucknow, U.P.
- 26th – 28th May, 2012:- To assess the field situation and the existing infrastructure for taking up perspective surveillance under NCDC, NVBDCP and GDDIC project at Kushinagar and Gorakhpur.
- 11th – 13th June, 2012:- The team visited Muzaffarpur and Gaya districts and also attended meeting with state health authorities on the reported outbreak of encephalitis in Muzaffarpur.

- 24th – 28th July, 2012:- Central Team visited Nagpur division to investigate an outbreak of Chandipura and Japanese Encephalitis.
- 21st – 24th August, 2012:- Visit to Nasik to attend meeting chaired by DHS Maharashtra of VBD problematic districts of Maharashtra.
- 28th – 30th August, 2012:- Visit to Ranchi to attend review meeting of district VBD officers.

International Visits:

- 30th May – 1st June, 2011:- Bi- Regional Workshop on Japanese Encephalitis Prevention and Control, Vientiane, Laos.

9. Dr. S.N Sharma, Joint Director

Field Visits & Reviews:

- Visited Patna, Vaishali and Muzaffarpur to review NVBDCP activities during 23-27 May, 2011.
- Visited Bhubaneswar, Orissa to review NVBDCP activities during 29-31 Aug, 2011.
- Visited Yamuna Nagar, Haryana to review NVBDCP activities during 15-16 Sept, 2011
- Visited Vishakhapattinam and East Godawari to review NVBDCP activities during 5-8 September, 2011
- Visited Ranchi and Gumla Jharkhand to review NVBDCP activities during 12-14 Dec., 2011

10. Dr. R.K. Das Gupta, Joint Director

Field Visits & Reviews:

- 17th Feb. 2011: Bihar to attend meeting related to PIP of Bihar at Patna
- 22nd to 23rd Feb. 2011: Orissa to attend orientation meeting cum review meeting on malaria at Bhubaneswar
- 31st March to 2nd Aprl 2011: Mizoram to review of GFATM Rd 9 project at Aizwal
- 2nd to 8th May, 2011: Jharkhand visit to Godda district for review with World Bank Mission Team and Bihar : Meeting at Patna with State officials with WB Mission team
- 23rd to 29th June 2011: Mizoram to visit to Lunglei district for IRS supervision
- 28th to 30th July: Orissa: 2 days review meeting of 17 erstwhile GFATM (now under WB) at Bhubaneshwar
- 4th to 7th Aug. 2011: Andhra Pradesh visit to Adilabad district to assess the district readiness and to review WB status with state official at Hyderabad

- 22 to 27th August: Madhya Pradesh:visit to Dhar district for district readiness of phase II, review of action plan of 10 additional districts at SPO office, Bhopal and enquiry charges against Sh DK Mishra, LA.II, ROH&FW, Bhopal office
- 13th to 15th Oct. 2011: Bihar to review of Kala-azar programme at Patna with DMOs & VBD Consultant of 31 districts & meeting with MD, NRHM on Kala-azar elimination
- 20th to 22nd Oct. 2011: Jharkhand for Two days training on supply chain management by SAMS for DMOs, VBD and support staff of Jharkhand state at Ranchi & review of KA and malaria programme implementation with DMOs
- 8th to 11th Nov. 2011: West Bengal for KA elimination workshop under WHO at Kolkata
- 14th to 18th Nov. 2011: Bihar visit to Patna for WB pre mission visit to Kathiar district
- 23rd Nov. 2011: Bihar visit to Patna for implementation meeting on vector management, case management on VL at RMRI, Patna

11. Kalpana Baruah, Joint Director

Field Visits & Reviews:

- 8th to 9th Feb 2011 visited Bhubaneswar, Odisha to review the status NVBDCP and implementation of programme strategies in the state
- 5 & 6th April 2011 visited Bangalore, Karnataka, to participate in a training Workshop for strengthening Laboratory Surveillance for AES/JE in the country
- 13th to 17th April 2011 visited Bhubaneswar, Odisha to review and monitor Dengue and Chikungunya activities in the state and functioning of the diagnostic centers.
- 12th to17th August 2011 visited Angul, Odisha to investigate the outbreak and provide technical guidance to the state in containment measures
- 4th to 9th Sept 2011 visited Ranchi, Hazaribg and Jamsedpur (Jharkhand) to review the district readiness for phase II World Bank supported programme and activities for prevention and control of Dengue and Chikungunya
- 15- 17th October 2011 visited Jabbalpur , MP, to review the functioning of the Apex Referral Laboratory and to participation in 12th Symposium Academy of VBD
- 31st Oct to1st Nov 2011 visited Panjim, Goa to programme and activities for prevention and control of Dengue and Chikungunya in the state and to attend Kalyani workshop
- 30th Sep to 3rd Oct 2011 visited Kalahandi (Odisha) to investigate reported outbreak of febrile illness in Kesinga town & other areas of Kalahandi district

- 9th to 14th Nov 2011 visited Hyderabad and Guntur (Andhra Pradesh) Common review meeting (CRM) under NRHM
- 15th December 2011 visited, Chandigarh to participate in the hands on training for laboratory teams of Sentinel Surveillance Hospitals of Haryana State.
- 6 & 7th January 2012 visited Guwahati, Assam review of implementation of GFATM supported project in NE states and service delivery by CARITAS, India

International visits:

- 4-7th April 2011– Canberra , Australia to present a paper on Dengue: A public health challenges in 21st century India -presented in Communicable Disease control Conference organised by Public Health Association of Australia

National Conferences/Workshops

- Participated in the First Expert Group Meeting for establishment and Strengthening of public Health Laboratories in India held in NCDC, 18th - 19th Oct 2011
- Participated in the First Kalyani workshop for Stakeholders held 31st Oct to 1st Nov 2011organized by Prasar Bharati, Doordarshan, Min of I&B, GOI

Research Students Guided:

- Guide for Ms Sikha Gupta for **summer training course on Prevention and Control of Dengue in Delhi**, during her Post-graduate programme in Hospital & Hospital Management at International Institute of Health Management Research, New Delhi. (Period: From 4th April– 30th May,2011).
- Guide for Ms Ghazala Afrin for **summer training course on How NVBDCP manages Dengue during epidemic condition in Delhi**, during her MBA in Hospital & Health Management at Faculty of Management Studies and IT, Jamia Hamdard University, Hamdard Nagar, New Delhi (Period: From 30th May- 8th July 2011)

Publications:

- Kalpana Baruah, Sinha Pankaj, Mohalia MM and Dhariwal AC - A study on dengue outbreak during 2009 in Bhopal and Indore districts of Madhya Pradesh, India (2010). Journal of Communicable Diseases , Vol 40(4): 273-279
- Dutta AK, Biswas Ashutosh, Baruah Kalpana and Dhariwal AC - National Guidelines for diagnosis and management of Dengue Fever /Dengue Haemorrhagic Fever and Dengue Shock Syndrome (2011) . Journal of the Indian Medical Association, Vol 109(01):30-35

- Kalpana Baruah and Dhariwal AC (2010)- Epidemiology of Dengue, its prevention and control in India(2011) . Journal of the Indian Medical Association, Vol 109(02): 82-86

Papers presented in International and National Conferances

- Dengue: A public health challenges in 21st century India -presented in Communicable Disease control Conference - Science and Public Health organised by Public Health Association of Australia held at Canberra, Australia from 4-6 April 2011
- Dengue an emerging challenge in India - 8th Joint Annual conference of ISMOCD and IAE held in 15-17 April 2011
- Current Scenario of Vector Borne Diseases in Delhi with special focus on Dengue in IPHA- DSB held on 6th August, 2011 at VMMC & SJH, New Delhi 2011.
- Dengue disease burden and trend in India : an update - XI symposium on vector and vector borne diseases at Jabalpur on 15-17 Oct 2011

12. Sh. B.R.Thapar, Joint Director

Field Visits & Reviews:

- Visited Orissa to review financial issues during 12–16 April, 2011.
- Visited Muzaffarpur, Bihar for investigation of encephalitis outbreak along with central team during 21 – 24 June, 2011.
- Visited to review of VBD situation of Jodhpur zone and functioning of UMS Jodhpur during 5 – 8 July, 2011.

13. Dr. Sher Singh Kashyotia, Assistant Director

Field Visits & Reviews:

- March 28 to April 3: To review NVBDCP activities in Raipur, Kanker, Bilaspur Districts of Chattisgarh State
- August 3 to 6: To review NVBDCP activities in Kanker, Surguja Districts of Chattisgarh State
- August 23 to 26: To review NVBDCP activities in West Medinapur District of West Bengal State
- September 23 to October 6: To review NVBDCP activities in North Sikkim, East Sikkim, South Sikkim districts of Sikkim State during earthquake
- November 9 to 16: To review Bihar State as member of 5th Central Review Mission(CRM) team for NRHM in Kishanganj and Begusarai district
- March 27to April 4: To review NVBDCP activities in Sidhi & Singrauli Madhya Pradesh
- March 27 to April 4: To review NVBDCP activities in Betul Madhya Pradesh and to attend the Review meeting of DMOs.

14. Dr. Rishi Kumar Jaiswal, Assistant Director

Field Visits & Reviews:

- 16th to 18th Feb 2012 visited district Gaya, Bihar to assess the JE vaccination coverage.

Visitors to Directorate

During year 2011 following eminent persons visited the Directorate NVBDCP Delhi.

Dr. Robert Newman, Director, Global Malaria Programme, WHO

World Bank Review Mission May 2011

Regional Advisor, SEARO, WHO

Special DGHS

Table-1

Epidemiological Situation and Indicators for Malaria in India (2000-2011)

Year	Population in crores	Blood Smear Examined	Positive cases	Pf Cases	Pf %	ABER	API	SPR	SFR	Deaths
2000	97.02	8,67,90,375	20,31,790	10,47,218	51.54	8.94	2.09	2.34	1.21	932
2001	98.45.	9,03,89,019	20,85,484	10,05,236	48.20	9.18	2.12	2.31	1.11	1005
2002	101.39	9,16,17,725	18,41,229	8,97,446	48.74	9.04	1.82	2.01	0.98	973
2003	102.71	9,91,36,143	18,69,403	8,57,101	45.85	9.65	1.82	1.89	0.86	1006
2004	104.09	9,71,11,526	19,15,363	8,90,152	46.47	9.33	1.84	1.97	0.92	949
2005	108.28	10,41,43,806	18,16,569	8,05,077	44.32	9.62	1.68	1.74	0.77	963
2006	108.28	10,67,25,851	17,85,129	8,40,360	47.08	9.95	1.66	1.67	0.79	1707
2007	108.75	9,49,28,090	15,08,927	7,41,076	49.11	8.73	1.39	1.59	0.78	1311
2008	111.96	9,73,16,158	15,26,210	7,75,523	50.81	8.69	1.36	1.57	0.80	1055
2009	115.01	10,33,96,076	15,63,574	8,39,877	53.72	8.99	1.36	1.51	0.81	1144
2010	116.73	10,86,79,429	15,99,986	8,34,364	52.15	9.31	1.37	1.47	0.77	1018
2011	119.49	10,89,69,660	13,10,656	6,65,004	50.74	9.12	1.10	1.20	0.61	753

ABER: Annual Blood Examination Rate

API: Annual Parasite Incidence SPR: Slide Positivity Rate SFR: Slide Falciparum Rate

Table-2

API wise Distribution of Districts in Year 2009, 2010 and 2011

States	2009					Total 2009	2010					Total 2010	2011					Total 2011
	>10	5 to 10	2 to 5	1 to 2	<= 1		>10	5 to 10	2 to 5	1 to 2	<= 1		>10	5 to 10	2 to 5	1 to 2	<= 1	
Andaman & Nicobar	1	0	1	1	0	3	1	0	2	0	0	3	1	0	0	1	1	3
Andhra Pradesh	0	0	0	3	20	23	0	0	1	2	20	23	0	0	2	3	18	23
Arunachal Pradesh	9	1	4	0	1	15	9	3	1	1	1	15	6	4	3	1	1	15
Assam	4	2	3	5	13	27	4	1	3	2	17	27	3	1	2	3	18	27
Bihar	0	0	0	1	37	38	0	0	0	0	38	38	0	0	0	0	38	38
Chandigarh	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0	1	1
Chattisgarh	5	3	0	3	5	16	8	2	3	0	5	18	8	2	2	1	5	18
Dadra & Nagar Haveli	1	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0	1
Daman & Diu	0	0	0	0	2	2	0	0	0	1	1	2	0	0	0	1	1	2
Delhi	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0	1	1
Goa	0	0	1	1	0	2	0	0	0	2	0	2	0	0	0	0	2	2
Gujarat	0	0	1	6	26	33	0	0	2	13	18	33	0	0	10	9	15	34
Haryana	0	1	4	1	15	21	0	0	2	2	17	21	0	1	3	4	13	21
Hiamchal Pradesh	0	0	0	0	10	10	0	0	0	0	10	10	0	0	0	0	10	10
Jammu & Kashmir	0	0	0	0	12	12	0	0	0	0	12	12	0	0	0	0	12	12
Jharkhand	7	6	7	2	2	24	5	10	4	1	4	24	3	8	7	2	4	24
Karnataka	0	1	4	5	23	33	2	0	4	3	25	34	0	0	3	2	29	34
Kerela	0	0	0	0	14	14	0	0	0	0	14	14	0	0	0	0	14	14
Lakshadweep	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0	1	1
Madhya Pradesh	1	1	9	15	22	48	0	2	7	17	22	48	0	1	7	16	24	48
Maharashtra	0	1	1	3	31	36	0	2	0	5	29	36	1	0	1	6	28	36
Manipur	0	0	1	1	10	12	0	0	2	0	10	12	0	0	1	0	11	12
Meghalaya	4	1	1	1	0	7	3	1	2	0	1	7	3	2	0	1	1	7

Mizoram	4	1	2	2	0	9	5	0	1	2	1	9	3	2	0	1	3	9
Nagaland	1	2	4	4	1	12	0	2	3	4	3	12	0	0	4	2	6	12
Odisha	12	5	3	4	6	30	12	5	3	4	6	30	10	3	6	4	7	30
Puducherry	0	0	0	0	4	4	0	0	0	0	4	4	0	0	0	0	4	4
Punjab	0	0	0	0	20	20	0	0	0	0	20	20	0	0	0	0	20	20
Rajasthan	0	0	2	3	28	33	1	0	2	2	28	33	0	0	3	3	27	33
Sikkim	0	0	0	0	4	4	0	0	0	0	4	4	0	0	0	0	4	4
Tamil Nadu	0	0	1	1	40	42	0	0	2	0	40	42	0	0	2	0	40	42
Tripura	2	0	1	1	0	4	2	0	1	1	0	4	1	1	0	1	1	4
Uttar Pradesh	0	1	1	4	65	71	0	1	1	4	65	71	0	0	2	3	66	71
Uttarakhand	0	0	0	0	13	13	0	0	0	0	13	13	0	0	0	0	13	13
West Bengal	1	0	1	3	15	20	1	0	0	3	16	20	0	1	0	0	19	20
Grand Total	**52**	**26**	**52**	**70**	**442**	**642**	**54**	**29**	**46**	**69**	**447**	**645**	**40**	**26**	**58**	**64**	**458**	**646**

Table-3

Comparative Epidemological status of Malaria in 2010 and 2011 in India

States	Year	Pop'n	BSE	PV	PF	Cases	PF%	ABER	API	SPR	Deaths
Andhra Pradesh	2010	76869	9120643	10134	23259	33393	69.65	11.87	0.43	0.37	20
	2011	77608	9368740	10860	24089	34949	68.93	12.07	0.45	0.37	5
Arunachal Pradesh	2010	1263	190063	12532	5412	17944	30.16	15.05	14.21	9.44	103
	2011	1288	197626	9094	4856	13950	34.81	15.34	10.83	7.06	17
Assam	2010	31530	4309287	20023	48330	68353	70.71	13.67	2.17	1.59	36
	2011	32031	4130216	12690	34707	47397	73.23	12.89	1.48	1.15	45
Bihar	2010	103230	133757	975	933	1908	48.90	0.13	0.02	1.43	1
	2011	103483	167561	1370	1273	2643	48.16	0.16	0.03	1.58	0
Chattisgarh	2010	24802	3426558	32129	120080	152209	78.89	13.82	6.14	4.44	47
	2011	25386	3444641	29427	107472	136899	78.50	13.57	5.39	3.97	42
Goa	2010	1483	459861	2093	275	2368	11.61	31.01	1.60	0.51	1
	2011	1483	418722	1052	135	1187	11.37	28.23	0.80	0.28	3
Gujarat	2010	59048	10689221	52772	13729	66501	20.64	18.10	1.13	0.62	71
	2011	59359	10967041	73652	16112	89764	17.95	18.48	1.51	0.82	127
Haryana	2010	24737	2340573	18157	764	18921	4.04	9.46	0.76	0.81	0
	2011	25186	2907380	32268	1133	33401	3.39	11.54	1.33	1.15	0
Hiamchal Pradesh	2010	5217	393203	208	2	210	0.95	7.54	0.04	0.05	0
	2011	5328	367499	245	2	247	0.81	6.90	0.05	0.07	0
Jammu & Kashmir	2010	5361	473268	759	43	802	5.36	8.83	0.15	0.17	0
	2011	5407	484704	1046	45	1091	4.12	8.96	0.20	0.23	0
Jharkhand	2010	32187	3383496	110485	89357	199842	44.71	10.51	6.21	5.91	16
	2011	32928	3441614	90351	70302	160653	43.76	10.45	4.88	4.67	17
Karnataka	2010	55637	9281666	36383	7936	44319	17.91	16.68	0.80	0.48	11
	2011	55863	9205620	21589	2648	24237	10.93	16.48	0.43	0.26	0
Kerela	2010	34566	2143497	2028	271	2299	11.79	6.20	0.07	0.11	7
	2011	32870	2153277	1722	271	1993	13.60	6.55	0.06	0.09	2
Madhya Pradesh	2010	73045	9230400	56073	31092	87165	35.67	12.64	1.19	0.94	31
	2011	74786	9900131	59911	31940	91851	34.77	13.24	1.23	0.93	109
Maharashtra	2010	114308	16118905	106811	32387	139198	23.27	14.10	1.22	0.86	200
	2011	114440	16098563	75176	21401	96577	22.16	14.07	0.84	0.60	118
Manipur	2010	2970	117986	460	487	947	51.43	3.97	0.32	0.80	4
	2011	2723	120615	400	314	714	43.98	4.43	0.26	0.59	1
Meghalaya	2010	3023	437167	2268	39374	41642	94.55	14.46	13.78	9.53	87
	2011	3057	391397	1125	24018	25143	95.53	12.80	8.22	6.42	53
Mizoram	2010	1001	334991	930	14664	15594	94.04	33.47	15.58	4.66	31
	2011	1033	213149	488	8373	8861	94.49	20.63	8.58	4.16	30
Nagaland	2010	1981	182804	3082	1877	4959	37.85	9.23	2.50	2.71	14
	2011	1981	205520	2413	950	3363	28.25	10.37	1.70	1.64	4

Odisha	2010	42599	5240458	45223	350428	395651	88.57	12.30	9.29	7.55	247
	2011	42276	4650799	27391	281577	308968	91.13	11.00	7.31	6.64	99
Punjab	2010	27775	3140465	3406	71	3477	2.04	11.31	0.13	0.11	0
	2011	28341	3120544	2629	64	2693	2.38	11.01	0.10	0.09	3
Rajasthan	2010	69163	8732582	48614	2331	50945	4.58	12.63	0.74	0.58	26
	2011	68621	8591970	51321	2973	54294	5.48	12.52	0.79	0.63	45
Sikkim	2010	184	6526	35	14	49	28.57	3.55	0.27	0.75	0
	2011	189	6969	37	14	51	27.45	3.69	0.27	0.73	0
Tamil Nadu	2010	68516	7838638	16463	623	17086	3.65	11.44	0.25	0.22	3
	2011	72525	7841899	21246	925	22171	4.17	10.81	0.31	0.28	0
Tripura	2010	3671	330608	2685	21254	23939	88.78	9.01	6.52	7.24	15
	2011	3671	288076	605	13812	14417	95.80	7.85	3.93	5.00	12
Uttar Pradesh	2010	188015	4066059	63224	1382	64606	2.14	2.16	0.34	1.59	0
	2011	194373	4110871	55111	1857	56968	3.26	2.11	0.29	1.39	0
Uttarakhand	2010	10373	214763	1489	183	1672	10.94	2.07	0.16	0.78	0
	2011	10373	246641	1154	123	1277	9.63	2.55	0.13	0.52	1
West Bengal	2010	84908	5440313	110102	24693	134795	18.32	6.41	1.59	2.48	47
	2011	98922	5044278	55510	10858	66368	16.36	5.10	0.67	1.32	19
Andaman & Nicobar	2010	388	121760	1681	803	2484	32.33	31.38	6.40	2.04	0
	2011	491	97946	1311	607	1918	31.65	19.95	3.91	1.96	0
Chandigarh	2010	1060	98930	345	6	351	1.71	9.33	0.33	0.35	0
	2011	1060	75368	573	9	582	1.55	7.11	0.55	0.77	0
Dadra & Nagar Haveli	2010	337	65104	3460	2243	5703	39.33	19.32	16.92	8.76	0
	2011	354	58949	3068	2082	5150	40.43	16.65	14.55	8.74	0
Daman & Diu	2010	219	25502	144	60	204	29.41	11.64	0.93	0.80	0
	2011	234	31856	207	55	262	20.99	13.61	1.12	0.82	0
Delhi	2010	16753	503926	250	1	251	0.40	3.01	0.01	0.05	0
	2011	16753	377122	412	01	413	0.24	2.25	0.02	0.11	0
Lakshadweep	2010	64	440	6	0	6	0.00	0.69	0.09	1.36	0
	2011	65	578	8	0	8	0.00	0.89	0.12	1.38	0
Puducherry	2010	1077	86009	175	0	175	0.00	7.99	0.16	0.20	0
	2011	1120	241778	190	6	196	3.06	21.59	0.18	0.08	1
Grand Total	2010	1167360	108679429	765622	834364	1599986	52.15	9.31	1.37	1.47	1018
	2011	1194901	108969660	645652	665004	1310656	50.74	9.12	1.10	1.20	753

Table-4

PER MAN HOUR DENSITY OF MALRIA VECTORS (DISTRICT-WISE) DURING 2011

District	*A.culicifaceis*	*A.stephensi*	*A.fluviatilis*	*A.annularis*
Andra Pradesh				
East Godavari	1.43			9.7
Westgodavari	2.43		0.75	
Krishna	1.31	0.75		0.74
Warangal	1			2.55
Karimnager	0.12			
VSP	0.63	0.22		2.43
Srikakullam	0.82		0.25	2.9
Guantur		0.4		
Khamam	1.54			2.9
Vizianagarm	0.87		0.24	3.18
Adilabad	0.87			
Prakasam	0.66			
Nellore				
Rangareddy				
Nalgond	7.8			0.33
Arunachal Pradesh				
Changlang	0.15			
Papumpare*	0.68			
Goa				
North Goa	0.14	0.18		
South Goa		0.09		
Assam				
Kamrup				0.04
Udalguri*				-
Chirang				0.7
Haryana				
Rohtak	0.5	1.5		
Mewat	1.46	2.06	0.5	
Himachal Pradesh				
Kangra	4.48		2.5	
Gujarat				
Vadodara	4.31	0.85		
Narmdha	5.2			
Dang	8.28			
Gandhinager	4.29	1.86		
Sabarkantha	5.5			
Valsad	15.33	0.33		
Surat	5.22			
Navsari	10.35			
Tapi	5.82			
Ahemdabad	0.66	1.79		
Surandernager	0.33	0.66		
Anand	0.99	1.12		
Dahod	4.79			

District	*A.culicifaceis*	*A.stephensi*	*A.fluviatilis*	*A.annularis*
Panchmhal	6.69			
Mehsana	3.5	2.71		
Kheda	1.05	0.49		
Bharuch	3.18			
Patan	6.5			
Banaskantha	7.8	2		
Kerala				
Alappuzha			2	1.5
Trivandrum	5			
Patnamthitta	2.25			
Thrissur	2			2.5
Kannur	0.5			
Kozhikode	1	3		
Maharashtra				
Arungabad	2.98			
Mumbai		2		
Hingoli	2.06			
Parbhani	3			
Gadchiroli	7.5			1.23
Thane	35.18			
Jalna	1.63			
Punjab				
Sangrur	2.57	0.77		1.44
Jalandar	6.92	0.24		
SBS Nager	2.22	0.35		0.5
Bhatinda	19.33	1.5		-
Ferozepur	20.66	0.72		-
Ludhiana	6.03	0.27		0.61
Tarantaran	10.1	2		
Mukatsar	20.13	1.73		
Faridkot	19.7	1.6		
Amritsar	21	2		
Rajasthan				
Chittorgarh	3.12			
Kota	2.05			
Jalore		2.35		
Sirohi		3		
Barmer		3.76		
Pali	0.8	3.2		
Udaipur	2.3			
Budi	1.75			
Bikaner		2.39		
Bara	5.08			
Jaipur	2.58	2.5		
Rajsamband	3			
Jodhpur	1.67	2.78		
Jaisalmer	0.5	3.73		
Tamil Nadu				

District	*A.culicifaceis*	*A.stephensi*	*A.fluviatilis*	*A.annularis*
Vellore	0.16			
Pudukottai		0.35		
Kanyakumari		0.13		
Thoothukudi		0.66		
Ramnathapuram	1.92	0.1		
Virudhunager	8.75			
Dharamapuri	3.1	1.99		
Nagapattinam	0.52			
Salem	2.4			
Dindigul	0.66			
Cuddalore	0.7	0.66		
Magercoil	0.23			
Sankarankoil		0.66		
Thiruvarur	7.99			

** A.Phillippinesis* with 0.26 and 0.5 PMHD was recorded respectively in Arunachal Pradesh and Assam.

Table-5

SUSCEPTIBILITY TESTS ON ADULT MOSQUITOES DURING 2011

District	Mosquito species	Percentage Mortality %				Cyfluthrin 0.15 %	Lambdacyhalothrin 0.05%	Permethrin 0.75	Bifenthrin 0.1
		DDT 4%	Malathion 5%	Alphacypermethrin 0.0025 %	Deltamethrin 0.05%				
Gujarat									
Vadodara	*A.culicifacies*					76.66			
Dahod	*A.culicifacies*					80.7			
Gandhinager	*A.culicifacies*	42.5	70.33	68.33		90			
Sabarkantha	*A.culicifacies*		70	30	86.66	95			
Valsad	*A.culicifacies*			16.5	62.5				
Ahemdabad	*A.culicifacies*	60							
S-nager	*A.culicifacies*	75							
Mehsana	*A.culicifacies*		69.99		83	90			
kheda	*A.culicifacies*			91		80	90		
Patan	*A.culicifacies*				89.33	90			
Narmada	*A.culicifacies*					80			
Banaskantha	*A.culicifacies*		70	80		90			
Punjab									
Patiyala	*A.culicifacies*			100	100				
Sangrur	*A.culicifacies*	100	100					100	
Jalandar	*A.culicifacies*		100						
Tarantaran	*A.culicifacies*	23	100		100				
Ropar	*A.culicifacies*		100	100	100				
SBS Nager	*A.culicifacies*		100					100	100
Andhra Pradesh									
East godavari	*A.culicifacies*		65						
West godavari	*A.culicifacies*	70	60						
krishna	*A.culicifacies*		55						
Nalgonda	*A.culicifacies*	65							
Nalgonda	*Cx.vishnui*	80	85						
VSP	*A.culicifacies*		82.5						
Srikakullam	*A.culicifacies*		80						
Vizianagarm	*A.culicifacies*		85						
krishna	*An.stephensi*		40						
Rangareddy	*Cx.vishnui*	75	90						
Rangareddy	*A.culicifacies*	75							
Madhya Pradesh									
Dhar	*A.culicifacies*	55	93.33	77.5					
Gwaliar	*A.culicifacies*	66.7		83.3			100		100
morena	*A.culicifacies*	50		62.5			87.5	100	
Ratelam	*A.culicifacies*			100					
Jabelpur	*A.culicifacies*	30	70		80			100	
Guna	*A.culicifacies*		80	70	100				90
Ashiknagar	*A.culicifacies*	30			100			100	100
Jhbua	*A.culicifacies*			100					
Maharashtra									
Gadchiroli	*A.culicifacies*	19.1	52.1	36.1	90.81	94.1	41.1		
Thane	*A.culicifacies*	15.9	26		87	83	77.7		
Jaisalmer	*An.stephensi*	30							
Meghalaya									
E.khasi hills	*An.philippinensis*	96.3							
E.khasi hills	*An.annulalris*	98.8							
Ri-Bhoi	*An.philippinensis*	100							

Table-6

SPECIES-WISE MOSQUITO BLOOD MEAL ANALYSIS DURING THE YEAR 2011

S. No.	Species	Total No. of samples processed	Total No. of samples positive	No. of Samples positive for				NRS	HBI (%)
				Human	Bovine	Pig /Other	Mixed		
1	An. culicifacies	1990	1199	16	1161	--	22 (H+B)	791	1.3
2	*An. Fluviatilis*	32	28	0	28	--	0	4	0.0
3	*An. Minimus*	3	1	1	0	--	0	2	100
4	*An. Stephensi*	*6*	1	0	1	0	0	5	0.0
5	*An. Annularis*	11	8	0	7	--	1(H+B)	3	0.0
6	*An. philippinensis*	20	18	10	8	--	0	2	55.5
7	*An. Subpictus*	14	8	0	8	--	0	6	0.0
8	*Anopheles (other species)*	15	1	0	1	0	0	14	0.0
9	*Cx. Vishnui*	15	9	0	5	3	1 (B+P)	6	0.0
10	*An. Vagus*	16	1	0	1	0	0	15	0.0
11	*An. barbirostris*	3	0	0	0	--	0	3	0.0
12	*An. Maculates*	58	35	1	32	--	2 (H+B)	23	2.8
13	*Cx. pseudovishnui*	23	11	1	5	3	2 (H+P)	12	9.0
14	*Cx. tritaeniorhynchus*	85	52	0	15	13	24 (H+P), (B+P)	33	0.0
15	*J.E. vector*	5	3	0	2	1	0	2	0.0
16	*Aedes aegypti*	11	7	6	1	--	0	4	85.7
17	*Cx. quinquefasciatus*	260	112	62	33	2	15 (H+B)	148	55.3
	Total	**2567**	**1494**	**97**	**1308**	**22**	**67**	**1073**	**6.49**

NRS : Non Reactive Samples, H – Human, B – Bovine, P - Pig

Table-7

STATE-WISE DENGUE CASES AND DEATHS IN THE COUNTRY

Sl. No.	State	2008		2009		2010		2011	
		Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
1	Andhra Pd.	313	2	1190	11	776	3	1209	6
2	Assam	0	0	0	0	237	2	0	0
3	Bihar	1	0	1	0	510	0	21	0
4	Chhattisgarh	0	0	26	7	4	0	313	11
5	Goa	43	0	277	5	242	0	26	0
6	Gujarat	1065	2	2461	2	2568	1	1693	9
7	Haryana	1137	9	125	1	866	20	267	3
8	Himachal Pd.	0	0	0	0	3	0	0	0
9	J & K	0	0	2	0	0	0	3	0
10	Jharkhand	0	0	0	0	27	0	36	0
11	Karnataka	339	3	1764	8	2285	7	405	5
12	Kerala	733	3	1425	6	2597	17	1304	10
13	Madhya Pd.	3	0	1467	5	175	1	50	0
14	Meghalaya	0	0	0	0	1	0	0	0
15	Maharashtra	743	22	2255	20	1489	5	1138	25
16	Manipur	0	0	0	0	7	0	220	0
17	Nagaland	0	0	25	0	0	0	3	0
18	Orissa	0	0	0	0	29	5	1816	33
19	Punjab	4349	21	245	1	4012	15	3921	33
20	Rajasthan	682	4	1389	18	1823	9	1072	4
21	Sikkim	0	0	0	0	0	0	2	0
22	Tamil Nadu	530	3	1072	7	2051	8	2501	9
23	Uttar Pradesh	51	2	168	2	960	8	155	5
24	Uttrakhand	20	0	0	0	178	0	454	5
25	West Bengal	1038	7	399	0	805	1	510	0
26	A&N Island	0	0	0	0	25	0	6	0
27	Chandigarh	167	0	25	0	221	0	73	0
28	Delhi	1312	2	1153	3	6259	8	1131	8
29	D&N Haveli	0	0	0	0	46	0	68	0
30	Puducherry	35	0	66	0	96	0	463	3
TOTAL		**12561**	**80**	**15535**	**96**	**28292**	**110**	**18860**	**169**

Table-8

State wise Sentinel Surveillance Hospitals for Dengue and Chikungunya*

Sl. No.	State	2010	2011
1	A & N Island	1	3
2	Andhra Pradesh	10	25
3	Arunachal Pradesh	0	1
4	Assam	2	8
5	Bihar	1	3
6	Chandigarh	0	1
7	Chattishgarh	2	2
8	Delhi	33	33
9	Daman & Diu	0	1
10	Dadra & Nagar Haveli	0	1
11	Goa	3	3
12	Gujarat	10	16
13	Harayana	6	10
14	Himachal Pradesh	0	2
15	Jammu	1	7
16	Jharkhand	2	4
17	Karnataka	17	19
18	Kerala	10	20
19	Lakshadweep	1	1
20	Madhya Pradesh	12	15
21	Maharashtra	15	23
22	Manipur	1	2
23	Meghalaya	0	3
24	Mizoram	0	1
25	Nagaland	0	2
26	Odisha	3	4
27	Puducherry	2	4
28	Punjab	6	10
29	Rajasthan	9	19
30	Sikkim	0	2
31	Tamil Nadu	13	27
32	Tripura	0	1
33	Uttar Pradesh	10	22
34	Uttarakhand	2	4
35	West Bengal	10	12
	Total	**182**	**311**

***** For details of state wise names of the laboratories log on to www.nvbdcp.gov.in

Table-9

APEX REFERRAL LABORATORIES

1. All India Institute of Medical Sciences, New Delhi.
2. National Center for Disease Control (former NICD), Delhi.
3. National Institute of Virology, Pune.
4. Post- Graduate Institute of Medical Sciences, Chandigarh.
5. National Institute of Mental Health & Neuro-Sciences, Bangalore.
6. ICMR Virus Unit, National Institute of Cholera & Enteric Diseases, Kolkata.
7. Sanjay Gandhi Post-Graduate Institute of Medical Sciences, Lucknow.
8. King's Institute of Preventive Medicine, Chennai.
9. Institute of Preventive Medicine, Hyderabad
10. Defence Research Development and Establishment, Gwalior
11. B J Medical College, Ahmedabad.
12. State Public Health Laboratory, Thiruvananthapuram, Kerala
13. Regional Medical Research Centre (ICMR), Dibrugarh, Assam.
14. Regional Medical Research Centre for Tribals, (ICMR) Jabalpur, Madhya Pradesh

Table-10

Dengue and Chikungunya IgM test kits supplied in 2011 by NIV, Pune

S.No.	State	Dengue	Chikungunya
1	Andhra Pd.	154	30
2	A & Nicobar	32	26
3	Assam	17	6
4	Bihar	7	5
5	Chandigarh	18	8
6	Chhatisgarh	2	0
7	Daman & Diu	0	0
8	Dadra & Nagar Haveli	0	0
9	Delhi	273	84
10	Gujarat	154	35
11	Goa	32	26
12	Haryana	31	5
13	J & Kashmir	11	0
14	Jharkhand	14	14
15	Karnataka	153	106
16	Kerala	177	86
17	Lakshadweep	1	0
18	Maharashtra	177	114
19	Madhya Pd.	49	17
20	Manipur	5	0
21	Meghalaya	3	0
22	Mizoram	0	0
23	Nagaland	3	0
24	Orissa	51	16
25	Puducherry	22	6
26	Punjab	61	0
27	Rajasthan	41	23
28	Sikkim	0	0
29	Tamil Nadu	207	96
30	Tripura	0	0
31	Uttar Pradesh	79	6
32	Uttarakhand	7	0
33	West Bengal	68	33
	Total	1849	742

Table-11

Clinically suspected Chikungunya cases in the Country

Sl. No	Name of the States/UTs	2008	2009	2010	2011
1	Andhra Pd.	5	591	116	99
2	Bihar	0	0	0	91
3	Goa	52	1839	1429	664
4	Gujarat	303	1740	1709	1042
5	Haryana	35	2	26	215
6	Jharkhand	0	0	0	816
7	Karnataka	46510	41230	8740	1941
8	Kerala	24685	13349	1708	183
9	Madhya Pd.	0	30	113	280
10	Meghalaya	0	0	16	168
11	Maharashtra	853	1594	7431	5113
12	Orissa	4676	2306	544	236
13	Punjab	0	0	1	0
14	Rajasthan	3	256	1326	608
15	Tamil Nadu	46	5063	4319	4194
16	Uttar Pradesh	11	0	5	3
17	Uttrakhand	0	0	0	18
18	West Bengal	17898	5270	20503	4482
19	A&N Island	0	0	59	96
20	Chandigarh	0	0	0	1
21	Delhi	14	18	120	110
22	Puducherry	0	0	11	42
Total		**95091**	**73288**	**48176**	**20402**

Table-12

Historical account of JE occurrence and subsequent outbreaks in India

1952	First evidence of JE viral activity by VRC(NIV)
1955	First human case in Tamil Nadu
1958	Virus isolation from JE case
1973	First outbreak in Bankura and Burdwan district of West Bengal
1976	Outbreak in Burdwan district of West Bengal
1979	Major outbreak in districts Thirunveli and Vellore in Tamil Nadu
1987	Major outbreak in district Lakhimpur, Jorhat, Sibsagar, Dibrugarh, Nagaon in Assam
1995	Outbreak in districts Cuddalore, Perambalur in Tamil Nadu
1997	Major outbreak in Anantpur, Guntur, Prakasam, Kurnool, Nalgonda, Mahaboobnagar, Warngal in Andhra Pradesh
1999	Outbreak in Anantpur, Kudappa, Prakasam, Kurnool, Warngal in Andhra Pradesh,
2000	Outbreak in Anantpur, Chitoor, Prakasam, Cudappa, Kurnool in Andhra Pradesh
2000	Major outbreak in Nawada district in Bihar
2000	Major outbreak in district Golaghat, Jorhat, Sibsagar, Dibugarh and Tinsukia in Assam
2005	Major outbreak in, Gorakhpur ,Kushinagar and Maharajganj Basti, Deoria district in Uttar Pradesh
2007	Outbreak in district Gaya in Bihar
2008	Outbreak in district Dibrugarh and Sibsagar in Assam
2008	* Outbreak in district Muzaffarpur in Bihar
2011	Outbreak district Gaya in Bihar
2011	**First time** cases reported from Jahangirpuri, Bawana, Inderpuri J.J.Cluster in **Delhi**

*AES Outbreak

Table 13

List of 76 existing JE Sentinel Sites

Sl. No.	Name of the States	No. of Sites	Year of Establishment	Name of Sentinel sites/ Institutes
1	Andhra Pradesh	6	2007-08	1. Medical College, Kurnool
				2. Veterinary Biological Research Institute, Hyderabad
				3. Govt. Medical college, Guntoor
				4. MGM Hospital, Warangal
				5. Institute of Preventive Medical , Hyderabad
				6. King George Hospital Andhra Medical College, Vishakhapatnam
2	Assam	9	2007-08	1. Assam Medical College, Dibrugarh
				2. Sivsagar Civil Hospital , Sivsagar
				3. Jorhat Civil Hospital, Jorhat
				4. Lakhimpur Civil Hospital, Lakhimpur
				5. GolaGhat Civil Hospital (IDSP), Golaghat
				6. Guwahati Medical college, Guwahati
				7. Baptil Mission Hospital, Tezpur
				8. Barpeta Medical College, Barpeta
				9. Silchar Medical College, Silchar, Cachar
3	Bihar	3	2007-08	1. Patna Medical college & Hospital, Patna
				2. Sri Krishana Medical College & Hospital, Muzaffarpur
				3. Anugreh Narain Magadh Medical Hospital,Gaya
4	Delhi	11	2011-12	1. Babu Jagivan Ram Hospital, Jahangirpuri
				2. Dr. Bheem Rao Ambedkar Hospital, Rohini
				3. Maharishi Balmiki Hospital, Bawana
				4. Lok Nayak Hospital, Delhi Gate
				5. GTB Hospital, Dilshad Garden
				6. Chacha Nehru Bal Chikitsalaya, Shahadara
				7. Lal Bahadur Shashtri Hospital, Mayur Vihar
				8. Hindu Rao Hospital, Bara Hindu Rao
				9. Deen Dayal Upadhaya Hospital, Hari Nagar
				10. Pt. Madan Mohan Malviya Hospital , Malviya Nagar
				1. Sanjay Gandhi Memorial Hospital, Mangol Puri
5	Goa	3	2007-08	1. Goa Medical College, Goa
				2. North Goa District Hospital, Goa
				3. South Goa District Hospital, Goa
6	Haryana	3	2007-08	1. General Hospital Sector-6, Panchkula
				2. State Laboratory, Karnal
				3. Civil Hospital, Ambala City
7	Jharkhand	3	2011-12	1. Rajendra Inst.of Medical Science (RIMS), Ranchi
				2. MGM Hospital, Jamshedpur

				3. Patliputra Medical college Hospital, Dhanbad
8	Chandigarh	1	2007-08	1. PGI Chandigarh,
9	Karnataka	5	2007-08	1. VIMS, Bellary
				2. District Surveillance Unit, Kollar
				3. Public Health Institute, Bangalore
				4. Karnataka Institute of Medical Science, Hubli
				5. Manipal Institute of Virus Research, Manipal
10	Maharashtra	5	2007-08	1. District Hospital, Bhandara
				2. District Hospital, Gondia
				3. Indira Gandhi Medical College, Nagpur
				4. District Hospital, Wardha
				5. District Hospital, Gadchiroli
11	Manipur	1	2007-08	1. J.N. Hospital Poompat, Imphal
12	Nagaland	1	2007-08	1. Civil Hospital, Dimapur
13	Tamil Nadu	5	2007-08	1. King Institute of Preventive Medicine, Guindy, Chennai.
				2. Madurai Medical College, Madurai.
				3. District Hospital, Thanjavur
				4. KAP Viswanathan Medical College, Annal Gandhi Memorial Government Hospital, Puthur, Trichy.
				5. Government Medical College, Villupuram.
14	West Bengal	3	2007-08	1. School of Tropical Medicine, Kolkata
				2. Burdwan Medical College, Burdwan
				3. North Bengal Medical College hospital, Darjeeling
15	Kerala	1	2007-08	1. District Hospital, Kottayam
16	Uttar Pradesh	17	2007-08	1. District Hospital, Siddharthnagar
				2. District Hospital, Maharajganj
				3. District Hospital, Kheri
				4. District Hospital, Basti
				5. District Hospital, S. Kabir Nagar
				6. District Hospital, Saharanpur
				7. District Hospital, Gorakhpur
				8. BRD Medical College, Gorakhpur
				9. District Hospital, Bahraich
				10. District Hospital, Kushinagar
				11. District Hospital, Gonda
				12. District Hospital, Balrampur
				13. District Hospital, Sultanpur
				14. District Hospital, Deoria
				15. KG Medical College, Lucknow
				16. District Hospital, Raibareli
	Total	76		

Apex Referral Laboratories

- National Institute of Mental Health & Neuro-Sciences, Bangalore.
- Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow.
- Post Graduate Institute of Medical Sciences, Chandigarh.
- All India Institute of Medical Sciences, Delhi.
- National Institute of Cholera & Enteric Diseases, Kolkata.
- Regional Medical Research Centre(ICMR),Dibrugarh.
- Kings Institute of Preventive Medicine, Chennai.
- Institute of Preventive Medicine, Hyderabad.
- National Institute of communicable Diseases, Delhi
- National Institute of Virology, Pune
- B.J. Medical College, Ahmedabad, Gujarat
- State Institute of Virology, Allepy, Kerala.

Table-14

JE VACCINATION COVERAGE DURING 2006 - 2010

Sl. No	Year	No. of States Covered	No. of Districts Covered	Targeted Children (1-15 yrs)	Total Vaccinated Children	Total Percentage Coverage
1.	2006	4	11	10531554	9308698	88.39%
2.	2007	5	28	21008249	18431087	87.73%
3.	2008	1	21	20040262	16881941	84.24%
4.	2009	1	30	27170604	18097182	66.61%
5.	2010	4	18	16996546	15121734	88.97%
Total		**15**	**109**	**95747215**	**77840642**	**81.30%**

TABLE 15

Details of the visit of the Hon'ble Ministers and senior officers from MOH&FW, Govt. of India to different states for JE/AES during 2009-10, 2010-11 and 2011-12

Sl. No.	Name & Designation of officer	Period of Visit	Place & Purpose of the Visit
Uttar Pradesh			
1.	Dr.RK Srivastava, DGHS, GOI	14-04-09	Gorakhpur: To review AES/JE situation in Eastern UP
2	Dr.VK Raina, Joint Director	20-06-09	Gorakhpur: To review the preparedness of the seven most JE sensitive districts in light of the ensuing transmission season at district and field levels
3.	Dr.RK Srivastava, DGHS, GOI	29-07-09	Lucknow: To review AES/JE situation in Eastern UP
4.	Dr.VK Raina, Joint Director	31-July to 2nd Aug, 2009	Gorakhpur: To review the preparedness of the seven most JE sensitive districts in light of the ensuing transmission season at district and field levels
5.	Smt. Shakuntala Gamlin, JS, MOH&FW, Dr.VK Raina, Dr.Anil Kumar (Imm. Dept)	7-8 Sept. 2009	Gorakhpur: To review AES/JE Situation and also to prepare 7 most sensitive districts for Spl. JE vaccination campaign
6.	Dr.VK Raina, JD	10-12 Oct,09	Gorakhpur: For organizing TOTs training on AES/JE case mgmt.
7.	Dr.RS Shukla, JS, MOH &FW,Dr.PL Joshi, Dir. NVBDCP, Shri Arun Baroka, Director VBD and Dr.V.K Raina, JD,NVBDCP	13-14 Feb,10	Gorakhpur: For reviewing AES/JE situation in 7 most sensitive JE districts and also for preparation of micro action plan towards prevention & control of AES/JE
8.	Dr. P.L. Joshi, Director, NVBDCP, Mr. Arun Baroka and Dr. V K Raina, JD	15-02-10	Lucknow. For reviewing VBDCP in the state of UP
9.	Dr.P.L. Joshi, Director, NVBDCP, Sh Arun Baroka, Director VBD, MOH&FW	24-02-10	Visited Allahabad, to participate in a review meeting organized by the state under CS of Hon'ble Health Minister of the state
10.	Dr.VK Raina, Joint Director	22-25 June,10	Gorakhpur: To review the preparedness of the seven most JE sensitive districts in light of the ensuing transmission season at district and field levels as well as finalization of the micro action plan as advised by JS(PH) in the February meeting.

11.	Dr. VM Katoch, Secy. Dept. of HR and DG ICMR, Dr.Lalit Kant, Sr. DDG, ICMR and Dr.VK Raina, JD,NVBDCP	22-23 July,10	Gorakhpur: To review disease situation and also assure full ICMR support for the research proposals of BRD Medical college and also to follow advice on certain vaccination and epidemiological issues
12.	Dr.VM Katoch, Secy. Dept. of HR and DG ICMR and Dr.VK Raina, Joint Director, NVBDCP, Delhi	24 Sept,2010	Gorakhpur: To participate in a meeting to address peripheral workers on special JE vaccination campaigns in Basti & Gorakhpur divisions held under the chairmanship of Hon'ble Minister of Health & FW, Govt. of UP.
13.	Dr. RK Srivastava, DGHS, Dr. AC Dhariwal, Director, NVBDCP & Dr.V. K Raina, Joint Director, NVBDCP	11 Dec, 2010	Kushinagar & Gorakhpur: To review AES/JE situation in Kushinagar district and to prepare model Action Plan for district.
14.	Sh. Dinesh Trivedi, Hon'ble MOS, MOHFW	15 Dec. 2010	Dumaryaganj and Kail Hospital, Basti to assess JE/AES situation
15.	Dr. AC Dhariwal, Director, NVBDCP & Dr.V.K Raina, Joint Director, NVBDCP	28-29 Jan,2011	Kushinagar & Gorakhpur: To participate in a review and Action Plan meeting held under the chairmanship of Hon'ble Minister of Health & FW, Govt. of UP.
16.	Dr.VM Katoch, Secy. Dept. of HR and DG ICMR and Dr.VK Raina, Joint Director, NVBDCP, Delhi	23-24 Feb. 2011	Gorakhpur: To participate in SAC meeting and to review JE/AES situation.
17.	Dr. R.K.Srivastava, DGHS, GOI, Dr. A.C.Dhariwal, Director, NVBDCP Dr. V.K.Raina, Joint Director, NVBDCP	11th to 12th March, 2011	Lucknow: To participate in review meeting of VBDs being held under the Chairmanship of Dr. R.K.Srivastava, DGHS, GOI
18.	Dr. R.K.Srivastava, DGHS, Dr. V.K.Raina, Joint Director, NVBDCP	21st May, 2011	Lucknow: To assess the Action Taken by the state/district health authorities with regard to the meeting held under his Chairmanship on 12th March, 2011at Lucknow.
19.	Dr. A.C.Dhariwal, Director, NVBDCP, Dr. V.K.Raina, Joint Director, NVBDCP	6th Aug, 2011	Gorakhpur: To participate in a workshop being convened under the Chairmanship of Vice-Chairman of National Disaster Management Authority at Gorakhpur on 6th Aug, 2011
20.	Sh. B.R.Thapar, Consultant (JE)	5-9 Sept. 2011	Gorakhpur and Maharajganj: To review JE/AES situation
21.	Shri Ghulam Nabi Azad, Hon'ble Minister of Health & Family Welfare, Dr. R.K.Srivastava, DGHS, Dr. R.S.Shukla, JS(PH), Dr. Rashmi Arora, Sr. DDG (ICMR) & Dr. A.C.Dhariwal,	20th -21st Oct, 2011	Gorakhpur and Siddarthnagar, to review JE/AES situation.

	Director, NVBDCP		
22.	Dr V.K.Raina Joint Director NVBDCP	21st -23rd Nov,2011	Gorakhpur: To participate as faculty in social mobilization workshop at Gorakhpur
23.	Dr. A.C.Dhariwal, Director, NVBDCP	1st Dec, 2011	Lucknow: To discuss the matter related to establishment of ICU at district hospitals
24.	Shri. B.R.Thapar, Consultant (JE)	3rd Jan – 7th Jan, 2012	Gorakhpur, Maharajganj, Kushinagar, Lucknow: To review the AES/JE situation and control measures in eastern UP.
25.	Dr. Sanjeev Gupta, Addl. Director, NVBDCP, Shri B.R.Thapr, Consultant (JE)	19th –22nd Jan, 2012	To review and plan prevention and control JE/AES in Eastern Uttar Pradesh.
26.	Dr. S.Y.Kothari, Spl. DGHS, GOI, Dr. A.C.Dhariwal, Director, Dr. Sanjeev Gupta, Addl. Director, Dr V.K.Raina Joint Director NVBDCP	10th – 12th April, 2012	To review AES/JE situation and Action Plan for 2012-13 at BRD Medical College, Gorakhpur.
27	Dr V.K.Raina Joint Director, NVBDCP	1ST to 4TH May,2012	Visit to district Maharajganj & Deoria to assess preparedness of the districts towards Prevention & control of JE/AES.
28	Sh. B.R.Thapar, Consultant, NVBDCP	12th – 16th May, 2012	TOT on Social Mobilization for prevention and control of AES/JE district Siddarthnagar, Basti and S.K.Nagar
29	Dr V.K.Raina Joint Director, NVBDCP	15th -18th May, 2012	TOT on Social Mobilization for prevention and control of AES/JE district Maharajganj, Deoria and Kushinagar.
30	Dr. A.C.Dhariwal, Director, Dr. Sanjeev Gupta, Additional Director, Dr V.K.Raina Joint Director, Sh. B.R.Thapar, Consultant, NVBDCP	24th – 26th May, 2012	Workshop at Lucknow, Uttar Pradesh.,
31	Dr V.K.Raina Joint Director, Dr. Dipesh Bhattacharya, Additional Director, NCDC and other CDC experts	26th – 28th May, 2012	Visited Kushinagar and Gorakhpur districts to assess the field situation and the existing infrastructure for taking up prospective surveillance under NCCDC-NVBDCP and GDDIC project.
Bihar			
1.	Dr S.K.Jain, Joint Director, NCDC and Shri B.R. Thapar Consultant, NVBDCP	21st -24th June 2011	Visited Muzaffarpur District Bihar For inv of encephalitis outbreak
2.	Dr S.K.Singh, Addl. Director, NCDC, Shri B.R.Thapar, NVBDCP	17th -19th Sept. 2011	Visit to Gaya and Patna

3.	Dr Sher Singh, NVBDCP	9-16 Oct, 2011	Patna & Kishanganj: To participate in Common Review Mission, NRHM
4.	Dr S.K.Amir, RD, Patna, Shri B.R.Thapar Consultant, NVBDCP	15-17 Oct, 2011	Visited district Gaya for investigation of JE in district Gaya.
5.	Dr Jagvir Singh, NCDC, Dr H.Chellani, Safdarjung Hospital and Shri B.R.Thapar, Consultant, NVBDCP	18th -21st Nov,2011	visited district Gaya for investigation of JE in district Gaya
6.	DGHS, Dr. A.C.Dhariwal, Director, NVBDCP, RD , Patna	28-31 Jan, 2012	Gaya & Patna for review JE/AES.
7.	Dr. Sanjeev Gupta, Addl. Director and Dr. V.K.Raina, Joint Director, NVBDCP	11th – 13th June, 2012	The team visited Muzaffarpur and Gaya districts and also attended meeting with state health authorities on the reported outbreak of encephalitis in Muzaffarpu.
8.	NCDC team headed by Dr. Himashu Chauhan, Assistant Director, NCDC, Accompanied by Sh. B.R.Thapar, Consultant (JE), NVBDCP	12th – 23rd June, 2012	To establish definite clinico-epidemiological linkage to identify source of infection for Acute Encephalitis Syndrome (AES) in district Muzaffarpur.
9.	NCDC team headed by Dr. Himashu Chauhan, Assistant Director, NCDC,	6th -10th Aug, 2012	To establish definite clinico-epidemiological linkage to identify source of infection for Acute Encephalitis Syndrome (AES) in district Muzaffarpur.
Assam			
1.	Dr. V.K.Raina, Joint Director, NVBDCP	14-15 Feb, 2011	To participate in a review meeting on AES/JE at Dibrugarh, Assam.
2.	Dr. V.K.Raina, Joint Director, NVBDCP	October 2011	To participate in a review meeting on AES/JE at Guwahati, Assam.
3.	Dr A.C. Dhariwal, Director, NVBDCP	28-29 Oct, 2011	To review AES/JE at Guwahati & Goalpara, Assam.
4.	Dr. V.K.Raina, Joint Director, NVBDCP	9-16 Nov, 2011	Guwahati and Nagaon, Assam: To participate in Common Review Mission, NRHM.
5.	Dr. V.K.Raina, Joint Director, NVBDCP	31st Jan - 4th Feb, 2012	To review AES/JE situation in District Dibrugarh and Sivsagar including upgradation of AMCH.
6.	Sh. B.R.Thapar, Consultant (JE), NVBDCP	27th -8th Aug, 2012	To review JE situation and control measures in Chirang district of Assam.
Karnataka			
1.	Dr. P.K.Srivastava, Joint Director NVBDCP	10-13 Feb,2011	Visited district Bellary, Karnataka for outbreak investigation of malaria and review of AES/JE.

2.	Dr. Munish Joshi	11 & 12 Sept.2011	Gulbuga & Bengluru Karnataka: To review VBD including JE/AES
Kerala			
1.	Dr.R.Balasubramanian Scienctist, NIV Alappuza	19th April, and 07th June 2011	Investigation of one JE confirmed case reported in Alappuza Distt
2.	Dr.R.Balasubramanian Sciencetist NIV Alappuza	20th April 2011	Investigation of Two JE confirmed cases reported in Alappuza Distt
3.	Dr.B.Anukumar and Dr.R.Balasubramanian Sciencetist NIV Alappuza	28th April 2011	Investigation of Two JE confirmed cases reported in Alappuza Distt.
4.	Dr.R.Balasubramanian Sciencetist NIV Alappuza	03rd May 2011	Investigation of Two JE confirmed cases reported in Alappuza Distt.
5.	Drs. V.K.Raina Joint Director NVBDCP, P. Khasnobis and Naveen Gupta, NCDC	23rd -27th July,2011	Central team to district Alappuzha and Kollam District of Kerala for outbreak of JE
Maharashtra			
1.	Central Team 5 member led by Dr. V.K.Raina, Joint Director, NVBDCP	24th – 28th July, 2012	Central Team visited Nagpur division to investigate an outbreak of Chandipura and Japanese Encephalitis.
2.	Dr. V.K.Raina, Joint Director, NVBDCP	21st – 24th Aug, 2012	To attend meeting to be chaired by DHS Maharashtra of VBD problematic districts of Maharashtra planned at Nasik.
Tamil Nadu			
1.	Sh.B.R.Thapar, Consultant (JE), NVBDCP	10th- 17th Aug, 2012	To review VBD including JE situation and control measures in state of Tamil Nadu.
Jharkhand			
1.	Dr. V.K.Raina, Joint Director, NVBDCP	28th - 30th Aug, 2012	Visit to Ranchi to attend review meeting of district VBD officers.
Chandigarh			
1.	Dr. V.K.Raina, Joint Director	2nd – 4th Sept, 2012	To Participate in CME organised by PGIMER at Chandigarh
Goa			
1.	Dr. V.K.Raina, Joint Director, NVBDCP	3rd - 5th Nov, 2012	To Participate in CME organised by IMA Goa

Table-16

State-wise Kala-azar cases and deaths

State	2007		2008		2009		2010		2011	
	C	D	C	D	C	D	C	D	C	D
Bihar	37819	172	28489	142	20519	80	23084	95	25222	76
West Bengal	1817	9	1256	3	756	0	1482	4	1962	0
Jharkhand	4803	20	3690	5	2875	12	4305	5	5960	3
UP	69	1	26	0	17	1	14	0	11	1
Uttarakhand	2	0	0	0	2	0	1	0	0	0
Assam	0	0	98	0	26	0	12	0	5	0
Sikkim	0	0	4	1	5	0	3	0	7	0
Madhya Pradesh	0	0	1	0	0	0	0	0	0	0
Himachal Pradesh	0	0	0	0	0	0	6	1	1	0
Imported	23	1	34	0	12	0	92	0	19	0
Total	**44533**	**203**	**33598**	**151**	**24212**	**93**	**29000**	**105**	**33187**	**80**

C=Cases, D=Deaths, P= Provisional.

Table-17

State-wise and Year-wise endemic blocks of Kala-azar

State	No. of Endemic distrits	No. of Endemic Blocks	Year	<1	1 5	5 10	>10
Bihar	31	339	2006	149 (45%)	100 (29%)	59 (17%)	31 (9%)
			2007	136 (40%)	122 (36%)	50 (15%)	31 (9%)
			2008	163 (48%)	144 (34%)	37 (11%)	25 (7%)
			2009	178 (53%)	118 (35%)	32 (9%)	11 (3%)
			2010	152 (45%)	134 (40%)	37 (11%)	15 (4%)
		413	2011	203 (49%)	142 (34%)	45 (11%)	23 (6%)
Jharkhand	4	35	2006	3 (9%)	8 (23%)	7 (20%)	17 (49%)
			2007	4 (11%)	11 (31%)	8 (23%)	12 (34%)
			2008	3 (9%)	12 (34%)	9 (26%)	11 (31%)
		30	2009	5 (17%)	10 (33%)	8 (27%)	7 (23%)
			2010	4 (13%)	5 (17%)	5 (17%)	16 (53%)
			2011	1(3%)	6 (20%)	3 (10%)	20 (67%)
West Bengal	11	128	2006	115 (90%)	11 (9%)	2 (2%)	0
			2007	118 (92%)	9 (7%)	1 (1%)	0
			2008	119 (93%)	9 (7%)	0	0
			2009	120 (94%)	8 (6%)	0	0
			2010	111 (87%)	15 (12%)	2 (1%)	0
			2011	105 (82%)	15 (12%)	6 (5%)	2 (2%)
Uttar Pradesh	4	12	2006	12 (100%)	0	0	0
			2007	12 (100%)	0	0	0
			2008	12 (100%)	0	0	0
			2009	12 (100%)	0	0	0
			2010	12 (100%)	0	0	0
		13	2011	13 (100%)	0	0	0

Table-18

NFCP Institutions in the country

S. No	State/U.T.	Filaria Control Units	Survey Units	Filaria Clinics
1	Andhra Pradesh	29	2	4
2	Assam	1	1	0
3	Bihar	23	2	28
4	Jharkhand	7	0	7
5	Goa	4	0	6
6	Gujarat	8	0	9
7	Karnataka	8	1	25
8	Kerala	16	2	9
9	Madhya Pradesh	9	2	2
10	Maharashtra	16	6	34
11	Orissa	15	0	15
12	Tamil Nadu	47	1	43
13	Uttar Pradesh	29	0	34
14	West Bengal	9	4	3
15	Puducherry	2	0	2
16	Daman & Diu	2	0	2
17	Lakshadweep	1	0	0
18	A & N Islands	1	1	1
	Total	**227**	**22**	**224**

Table-19

Population Coverage during Mass Drug Administration (MDA)

During 2010 & 2011

Sl. No.	LF endemic States	No. of districts	2010		2011	
			Eligible Population (in lakh)	% coverage against eligible	Eligible Population (in lakh)	% coverage against eligible
1	Andhra	16	549.72	92.50	549.70	92.74
2	Assam	7	101.85	76.08	102.23	76.75
3	Bihar	38	921.17	78.61	921.17	Not Done
4	Chhattisgarh	9	152.96	92.99	152.96	Not Recd.
5	Goa	2	14.55	94.63	14.46	96.21
6	Gujarat	9	192.33	98.33	194.71	97.66
7	Jharkhand	15	234.82	63.64	240.22	71.55
8	Karnataka	8	125.55	91.46	127.51	91.81
9	Kerala	11	285.44	81.91	286.67	89.62
10	Madhya	11	159.97	90.74	163.24	89.27
11	Maharashtra	17	280.79	89.38	281.31	89.28
12	Orissa	20	260.70	90.63	260.70	90.12
13	Tamil Nadu	20	268.53	**ND**	268.53	93.58
14	Uttar Pradesh	50	1211.90	82.27	1182.26	80.45
15	West Bengal	12	546.21	**ND**	564.04	79.23
16	Puducherry	1	10.67	96.92	10.97	97.14
17	A & N Islands	1	4.38	77.12	4.43	90.15
18	Daman & Diu	1	2.16	92.04	2.24	90.89
19	D & Nagar	1	2.76	96.20	3.12	98.51
20	Lakshadweep	1	0.60	85.00	0.60	73.94
	Grand Total	250	**5338.21**	**71.22**	**5342.18**	**55.09**
Note for MDA coverage			**4523.47**	**84.25**	**3393.75**	**86.73**

Note: *20 districts in Tamil Nadu and 12 districts in west Bengal could not do MDA 2010, and if the population is excluded, the effective coverage against the targeted population in 18 States/UTs is 84.25%*

Table-20

Microfilaria rate (%) in the states

Sl. No.	States/UTs	2004	2010	2011 (Provisional)
1	Andhra Pradesh	1.36	0.35	0.21
2	Assam	**ND**	1.06	0.17
3	Bihar	1.50	0.94	NR
4	Chhattisgarh	**ND**	0.35	NR
5	Goa	0.11	0.01	0.00
6	Gujarat	0.22	0.46	0.52
7	Jharkhand	ND	0.82	0.64
8	Karnataka	1.87	0.89	0.83
9	Kerala	0.68	0.17	0.14
10	Madhya Pradesh	0.83	0.19	0.23
11	Maharashtra	1.13	0.53	0.51
12	Orissa	2.60	0.40	0.43
13	Tamil Nadu	0.04	0.07	0.09
14	Uttar Pradesh	1.77	0.29	0.24
15	West Bengal	4.74	0.44	0.57
16	A&N Islands	1.40	0.10	0.12
17	D & N Haveli	1.96	0.95	1.79
18	Daman & Diu	0.47	0.06	0.07
19	Lakshadweep	1.19	0.00	NR
20	Puducherry	0.42	0.00	0.00
	Total	**1.24**	**0.41**	**0.37**