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Government of India
Ministry of Health & Family Welfare
(Department of Health & Family Welfare)

To

All States/UTs

Subject: National Vector Borne Disease Control programme – Programme objectives, strategies and guidelines – regarding.

Sir,

The National Vector Borne Disease Control Programme (NVBDCP) is an umbrella programme for prevention and control of vector borne diseases viz., malaria, lymphatic filariasis, kala azar, Japanese encephalitis (JE), dengue/dengue hemorrhagic fever (DF/DHF) and chikungunya. Under the programme, comprehensive public health activities are being implemented in the country. As these activities are being carried out in the field by the states, technical guidelines for prevention and control of each disease have been issued from time to time. A brief on the programme objectives, strategy and guidelines are hereby issued to facilitate preparation of annual plans and monitoring the implementation of activities.

Programme objectives and strategies

The vector borne diseases pose an immense public health concern and are major impediments in the path of socio-economic development. The National Health Policy - 2002 has set the goals of achieving reduction of mortality on account of malaria and other vector borne diseases by 50% by the year 2010; elimination of kala-azar by 2010 and elimination of lymphatic filariasis by 2015.

The NVBDCP strategies comprise early case diagnosis, prompt and complete treatment; integrated vector management including promotion of personal protective measures like insecticide treated bed nets including LLIN, and biological control measures like larvivorous fish; behavior change communication, capacity building through integrated training at all tiers of health care service delivery system, monitoring and evaluation. Partnership with other national health programmes, non-health sector departments, civil society organizations (Non-Governmental Organizations/Faith Based Organizations/Community Based Organizations/Self-Help Groups/Panchayati Raj Institutions), corporate sector, medical academia and professional bodies is also an integral component of the programme. The objective of the partnership is to provide uniformity in diagnosis, treatment and monitoring through a wider base in the country to maximize access to treatment and improve acceptability of appropriate and locally suitable vector control measures.

Under the NVBDCP, the Government of India (GoI) provides technical support as well as logistics as per the approved pattern. The state governments ensure the programme implementation. The centre and the states monitor the programme closely and high-risk areas are identified for focused attention.

Malaria. The programme aims to maintain Annual Blood smear Examination Rate (ABER) of over 10% by active and passive surveillance and bring down the Annual Parasite Incidence (API) to 1.3 or less by 2012.

To strengthen the treatment, prevention, control and surveillance of malaria and other vector borne diseases, the GoI is providing cash assistance under the domestic head to the states for engaging multipurpose workers (MPWs) on contractual basis in about 200 identified high endemic districts during the XI Five Year Plan period.

Provision has been made under external assistance for positioning Malaria Technical Supervisors (MTS) in high endemic areas to strengthen supportive supervision and micro-level monitoring with emphasis on malaria diagnosis, treatment and prevention and control activities including residual spray and bed net impregnation, distribution and use. Each MTS will cover a population of around 2.50 lakhs (usually 2 blocks) in selected areas of the high endemic districts.

Under NVBDCP, all fever cases suspected to be malaria are required to be immediately examined and positive cases provided prompt and complete treatment. Incentives have been considered for ASHAs for performing Rapid Diagnostic Tests (RDTs), preparation of slides and administering complete treatment to malaria patients in the community in such identified districts. She can also arrange to transport severe malaria cases to the referral centers with the expenditure borne out of funds from untied grants of NRHM. The remuneration for activities carried out by ASHAs is to be paid on performance basis. Funds available with the Village Health and Sanitation Committee (VHSC) can also be utilized for this purpose in other districts. Provision has initially been made for only the 61 most malaria endemic districts in 11 states. The norms of incentives to ASHAs are given at **Annexure – I**. Incentive to ASHAs in other high endemic districts is also being considered. The untied grants available with the VHSC may be utilized for source reduction of mosquito breeding sites.

Lymphatic filariasis. The population living in endemic districts is now covered with annual Mass Drug Administration (MDA) with the aim of interruption of transmission to achieve elimination of lymphatic filariasis in the country by 2015. The earlier strategy of administration of single dose of DEC is being replaced by the co-administration of DEC + Albendazole. The manifestations of lymphoedema remains life long, however, the home based morbidity management of patients suffering from lymphodema of limbs with simple washing will be augmented to prevent attacks of secondary bacterial infections. Patients suffering with hydrocele will be motivated for surgery. ASHAs and other volunteers, after due training, would be involved in MDA by the local health authority. Details of incentives to ASHAs and other volunteers are given at **Annexure – I**.

Kala azar. The annual incidence of kala azar will be reduced to less than 1 per 10,000 population at sub-district level with the aim of elimination of the disease in the country by 2010.

Kala azar Technical Supervisors (KTS) are being provided in the affected districts to strengthen early detection of kala azar cases and their complete treatment along with other activities for prevention and control including residual spray. This activity is being supported under the World Bank assisted project.

It is also proposed that ASHAs will be involved in identification of kala azar cases and ensuring their complete treatment. Details of incentives to ASHAs and other volunteers are given at **Annexure – I**.

Dengue, Japanese encephalitis and chikungunya. The prevention and control of dengue and JE are targeted at reduction of case fatality and the frequency of outbreaks. Similarly, prevention and control of chikungunya are aimed at the reduction in frequency of outbreaks. The untied funds available with the sub centres for referral of cases to district hospitals could be utilized for transportation of severe cases of dengue/JE/chikungunya to the identified referral centres.

GUIDELINES FOR PREVENTION AND CONTROL OF VECTOR BORNE DISEASES

A. MALARIA

1. Malaria is a parasitic disease transmitted by mosquitoes. Out of 4 human malarial parasites (*Plasmodium vivax, P.falciparum. P.malariae* and *P.ovale),* 2 types are common in our country; these are *Plasmodium vivax* and *Plasmodium falciparum. Plasmodium falciparum* is responsible for severe malaria resulting in death in the absence of early and appropriate treatment. The malarial parasites enter the human host when an infected female Anopheles mosquito bites the human being. Inside the human host, the parasite undergoes a series of changes as part of its complex life cycle. It infects the liver and the red blood cells and finally develops into a form that is able to infect a mosquito when the mosquito bites the infected person. The parasite undergoes changes in the mosquitoes and in about 10 to 14 days, these infected mosquitoes become capable of infecting another person. Malaria is primarily a local and focal disease. The disease distribution has been stratified in India according to the epidemiology and ecology as rural, urban, tribal, forest related, migrant malaria etc. The high malaria burden states in India are mainly the North Eastern states, Orissa, Chhattisgarh, Madhya Pradesh, Jharkhand, and parts of Maharashtra, Gujarat, Rajasthan, Andhra Pradesh, Karnataka, and West Bengal. Besides these, there are certain geographical areas in some states where malaria intensity is higher compared to other areas within the state, for e.g. in Tamil Nadu, where malaria is prevalent in urban areas, riverine pockets and coastal areas.

2. **Strategies:** The main strategies for prevention and control of malaria in India are:

Surveillance and case management

- Early Case detection (passive and active)
- Complete Treatment
- Sentinel surveillance

Integrated Vector Management (IVM)

- Indoor Residual Spray (IRS)
- Insecticide Treated bed Nets (ITNs) / Long Lasting Insecticide treated Nets (LLINs)
- Antilarval measures including source reduction

Epidemic preparedness and early response

Supportive Interventions

- Capacity building
- Behaviour Change Communication (BCC)
- Intersectoral collaboration
- Monitoring and Evaluation (M & E)
- Operational research and applied field research

An operational Manual for implementation of malaria control in India has been developed and provided to the states and union territories. The strategies are described below in brief:

Surveillance and case management:

The conventional diagnostic method of malaria through microscopy is still the gold standard; however, to provide quick treatment in difficult and inaccessible areas with

P.falciparum predominance, rapid diagnostic tests are done which immediately detect the presence of malaria cases (the Pf kits issued under the programme are specific for detection of only *Pf*) and facilitate treatment of the patient by the drug provider as per the national drug policy. The national drug policy for treatment of malaria cases provides the complete drug schedule for treatment of different species of malarial parasite in different age groups.

Integrated Vector Management covers the various methods for vector control in an integrated manner as indicated below:

- **Indoor residual Spray** (IRS) is done in areas which have been identified as high risk. Two rounds of DDT/synthetic pyrethroid or 3 rounds of malathion are done according to the insecticide policy in the area which is based on the insecticide resistance studies and epidemiological information. It is important to ensure that inside walls of all human dwellings are sprayed in the villages targeted for IRS and the sprayed walls are not mud plastered/white washed/painted for at least 10-12 weeks after each spray. Exclusively cattle sheds should not be sprayed.

  Spray operations should be carried out directly in all areas with API 2 or above. However, the priority of spray should be given by the state governments to their 'High Risk' areas with API or SPR 5 and above.

The dosage of insecticides for application is given below:

Insecticide	Suspension ratio (Kg per 10 liters)	Dose per sq. meter of active ingredient	Residual effect (in weeks)	Number of rounds per year	Insecticide requirements per million population per year (in metric ton)	Area to be covered by 10 litre of suspension (in sq. m)
DDT 50% wp	1.000	1 gm	10 -12	2	150.00	500
Malathion 25% wp	2.000	2 gm	6 - 8	3	900.00	250
Deltamethrin 2.5% wp	0.400	20 mg	10 -12	2	60.00	500
Cyfluthrin 10% wp	0.125	25 mg	10 -12	2	18.75	500
Lambdacyhalothrin 10%	0.125	25 mg	10 -12	2	18.75	500
Alphacypermethrin 5% wp	0.250	25 mg	10 -12	2	37.50	500

- **Spray Timings:** The transmission season varies in different areas of the country. It starts from mid February in the North Eastern region and states like Karnataka while in other areas it generally starts from mid May or July. Accordingly, the spray schedule in different states commences at different times from mid-February to mid-May.

- **Training of spray squads:** The training of MPWs and the supervisors should be completed two weeks prior to the start of spray operations. The hiring of spray squads should be done well in time so that training of spray squads is completed by the trained supervisors prior to the due date of spray operations. Training should cover each aspect of the spray operations.

- **Insecticide Treated bed Nets (ITNs) / Long Lasting Insecticide treated Nets (LLINs):** The mosquitoes can be prevented from biting people by sleeping under mosquito nets (ordinary or insecticide treated/ LLINs). Most Malaria-carrying mosquitoes bite at night. Mosquito nets, if properly used and maintained, can provide a physical barrier to the mosquitoes. If treated with insecticide, the effectiveness of the nets is greatly improved, creating a chemical halo that extends beyond the

mosquito net itself. This tends to repel or deter mosquitoes from biting or shorten the life span of mosquito so that they cannot transmit malaria infection. The use of the bednets is promoted under the National Vector Borne Disease Control Programme as an effective integrated vector control strategy. Use of bednets in areas with high proportion of Pf cases and the hardcore malaria affected areas is particularly important.

- **Reduction of breeding sites:** Introduction of larvivorous fish that eat mosquito larvae controls the mosquito vector population. Use of larvivorous fish – Gambusia and Poecilia (Guppy) - is becoming increasingly important as an eco-friendly and effective bio- environmental measure for vector control. Although larvivorous fish have been used successfully in some parts of the country, it is important that their use is scaled-up substantially to achieve demonstrable positive impact. Individuals and communities can reduce mosquito breeding by the following activities:

    - Remove discarded containers that might collect water.
    - Cover cisterns (water tanks) with lids or mosquito nets.
    - Clear away or remove vegetation and other matter from the banks of streams to make the flow of water smooth and reduce breeding.
    - Eliminate the pools of water caused by leaking taps, spillage of water around pipes and wells or poor drains by repairing.
    - Use larvivorous fish in permanent water bodies with potential breeding sites

Epidemic Preparedness and Response (EPR)

Malaria is one of the epidemic prone diseases, specially in relatively low endemic areas with unstable transmission dynamics. Objectives of EPR are early identification and control of epidemic to prevent large scale morbidity and mortality. Early warning signals which include epidemiological & entomological parameters , climatic factors i.e. rain fall, temperature and humidity, operational factors i.e. inadequacy and lack of trained manpower , developmental projects with population congregation should be monitored. There should be proper linkage with Integrated Diseases Surveillance Programme (IDSP) at district level for obtaining early warning signals on regular basis. .

District should have rapid response team consisting of epidemiologist. Entomologist and laboratory technician,. The medical Officer, Health workers , supervisors , community volunteers of affected area should also be involved in epidemic response activities. All requisite logistic supports identified as buffer stock at the district level should readily be made available to the epidemic response team immediately at the time of requirement.

Supportive interventions

- **Training and capacity building:** An integrated training programme have been designed for different categories of health care functionaries in consultation with the experts from medical colleges and from the fields of vector borne diseases. This Integrated training programme aims to conduct training at three levels – tertiary, secondary and primary. The integrated training guidelines aim to standardize the training contents for each category of the health care workers as well as non health care functionaries in order to improve the quality of training and to improve in delivery of services. For this purpose integrated course curriculum has been developed for all three categories. Besides, training of Private Medical Practitioners and other inter-sectoral partners are also conducted to sensitize them about the National Strategies for VBD control. Specialized trainings for entomologists and laboratory technicians are also conducted through some identified Apex Institute having expertise on the concerned field. The capacity building at state, district and PHC level need to be

planned and continued to keep the well trained human resource available with the programme for programme implementation.

- **Behaviour Change Communication:** Behaviour Change Communication (BCC) initiative has been introduced that empowers people to take rational and informed decisions through appropriate knowledge; inculcates necessary skills and optimism; facilitates, stimulates pertinent action through changed mindsets, modified behavior and reinforces the same through peers and influencers. The activity of IEC and BCC together needs to be promoted and sustained.

- **Intersectoral Collaboration** is the key to successful programme implementation and efficient community participation. Anti Malaria Month is being observed to focus on this aspect with enhanced level of campaigning just before the peak transmission season. The collaboration so initiated is then continued on perpetual basis to achieve effective prevention and control of malaria across the country.

- **Public Private Partnership:** Partnership with private sector, Non-Governmental Organizations (NGOs), Faith Based Organizations (FBOs), Community Based Organizations (CBOs) and Local self-government (Panchayat/Village Councils/Tribal Councils, etc.) is being promoted under NVBDCP. The separate guidelines has been developed by NVBDCP and circulated to the states, however, the brief is at **Annexure-III.**

- The required amendments are also incorporated from time to time depending on the situation and response of the parasite to anti-malarial and the Vector mosquitoes to insecticides, as well as response of the community towards their involvement in utilizing Public Health services and reducing the creation of man-made mosquito breeding sites. Following innovations/modifications have been proposed to be intensified during XI Five Year Plan including the strengthening of implementation of existing strategy for prevention and control of vector borne diseases:

    - Linkage with NRHM and use of NRHM Institutions for prevention and control of VBDs
    - Early diagnosis and treatment by
        - Strengthening of human resource
        - Scaling up of Rapid Diagnostic Kit (RDK)
        - Scaling up of Artemisinin-based Combination Therapy (ACT)
    - For focused interventions, 206 districts have been identified as high malaria endemic. Of which 100 districts are with high API and Pf more than 30%. Further out of 100 districts, 61 districts are prioritized as very high malaria endemic districts.
    - Geographical Information System (GIS) mapping for focused intervention in high risk prioritized districts
    - Upscaling use of bed nets /Long Lasting Insecticide Treated Nets (LLIN)

3. **Monitoring of Drug and Insecticidal Resistance:** Therapeutic efficacy of anti-malarials is being monitored by conducting 15 studies in a year through Pf monitoring teams at ROH&FWs and NIMR in different places. Based on their report, the resistance areas are identified for changes in drug policy. Insecticide resistance is being monitored through susceptibility tests by state entomological teams and teams of NIMR. The policy for insecticide use in an area is revised based on the studies on susceptibility to particular insecticides and epidemiological impacts. These are implemented after the proposal is approved by Technical Advisory Committee (TAC) under the Chairmanship of DGHS.

4. **External Assistance.** In identified high Malaria endemic districts, the implementation of activities are being intensified and also external support is being provided for additional

inputs to strengthen the system. The externally assisted projects are being implemented under NVBDCP and activities supported by these projects are given as under:-

Global Fund Supported Project ``Intensified Malaria Control Project (IMCP)'' is being implemented in 106 districts of 10 states (Annexure-II) for a period of 5 years from July 2005 to June 2010. For areas under GFATM project the additional support is provided for 5 activities which are listed below:

- Provision of Rapid Diagnostic Kits for early diagnosis at community level, mainly through ASHAs
- Provision of Artemisinin combination therapy (ACT) for *Pf* cases
- Additional manpower for strengthening supervision and monitoring
- Provision of Insecticide Treated Nets/ LLINs for identified high endemic areas
- Treatment of community owned bednets with insecticides.

World Bank assisted National Vector Borne Disease Control Support project on Malaria Control and Kala-azar elimination is effective from 6th March 2009, though the project implementation activities has been started from August 2008 for a period of five years (2008-09 to 2012-13). The World Bank project for malaria control is being implemented in two phases in 93 districts of 10 states. Phase-I will cover 50 most malaria endemic districts in 5 states, namely, Andhra Pradesh, Chhattisgarh, Jharkhand, Madhya Pradesh and Orissa and 46 Kala-azar affected districts in three states namely Bihar, Jharkhand & West Bengal. From the 3rd year onwards, Phase-II of the programme will extend to the remaining 43 more malaria endemic districts of Chhattisgarh, Jharkhand, Madhya Pradesh, Orissa, Gujarat, Maharashtra, and Karnataka (**Annexure-IV**). The project will support the following components:

- Improving access to and use of services for control of malaria
  - Improving malaria case management
  - Strengthening malaria surveillance
  - Effective vector control

- Improving access to and use of services for elimination of kala azar
  - Improving kala azar case management
  - Strengthening kala azar surveillance
  - Effective vector control

- Policy and strategy development
  - Programme management and capacity building
  - Monitoring and evaluation

5. Staffing Pattern

At the state/district level, the staff proposed in modified plan of operation vide MOHFW letter No.T.14014/7/76-C&CD/Mal. Dated 23.11.1976 should be sustained. At the state level there should be one full time dedicated State Programme Officer of the rank of Joint Director/Deputy Director for vector borne diseases including Malaria, filariasis, kala-azar, JE, dengue and chikungunya. He should be supported with one Deputy Director, one Assistant Director and State Entomologist/Chief Entomologist. One state level central malaria laboratory for quality check and assurance should be maintained and this laboratory should be supported with microscopist/lab. Technician, Insect Collector and other support staff.

Following minimum staff requirement for each district were recommended in MPO:

- District Malaria Officer - 1

- Assistant Malaria Officer - 1 (for districts having more than 750,000 population)
- Malaria Inspector - 1 (for each block in addition to multi purpose health supervisors)
- Accountant/UDC - 2 (including data entry operator or a person well conversant with computer)
- Storekeeper - 1
- Mechanic - 1
- Van cleaner - 2
- Driver - 4
- Peon - 2
- Sweeper - 1
- Superior field workers - 2
- Field workers - 5

Zonal teams were set up with a view to have scientific data from time to time for carrying out selective spray operations and to know entomological conditions including the behaviour and susceptibility of the vector. The entomological reports generated by these zonal teams are important in taking a decision for change of insecticide. Currently there are 72 zones but their performance has been affected due to poor infrastructure and support. The pattern of staff for each zone should be as follows:

- Zonal Officer - 1
- Zonal entomologist - 8 (below the rank of state entomologist)
- Insect Collector - 2
- Laboratory Technician - 2
- Driver - 1
- Typist/L.D.C. - 1
- Peon - 1

The zonal set up should ensure the mobility support is provided to the entomological separately for performing the entomological work in the field.

Urban Malaria Scheme (UMS)

The control of malaria in urban areas was considered as an important and complementary strategy to malaria control in rural areas. The proposal to control malaria in towns was named as Urban Malaria Scheme (UMS) and was approved in 1971. The notification was issued on 8th November, 1971. This scheme is presently covering 131 towns.

The strategies include:

- Early case Detection and Prompt Treatment (EDPT) through passive surveillance institutions such as hospitals, dispensaries and malaria clinics.
- Recurrent anti-larval measures through larvicides in towns reporting malaria.
- Minor engineering methods like source reduction, canalization, de-weeding etc.
- Biological control using larvivorous fish at appropriate breeding sites.
- IEC campaigns for community awareness and their involvement.
- Space spray as emergency response to control vector mosquitoes and their rapid reduction in domestic and peri domestic situations.
- Legislative measures.

The Municipal areas are divided into wards of 25.6 sq. km area and the staffing pattern for a ward is one malaria Inspector and one insect collector. Each ward is divided into 10 sectors of 2.56 sq. km. area and the staffing pattern for each ward for regular anti-larval

operations is one superior field worker and two field workers with an additional field worker for desilting, de-weeding and minor leveling. As the urban limits have increased in recent years due to rapid construction and developmental activities, the staffing should match the expansion.

Support for the Urban Malaria Scheme is provided by supply of larvicides and insecticides for space spray. After the amalgamation of National Filaria Control Programme in the Directorate of NVBDCP (earlier known as NMEP), the budget of UMS for procurement and supply of larvicides was increased and anti-larval measures 131 towns under UMS and 206 towns under filaria control units are being met from the budget head under UMS. In the year 2009, the procurement and supply of larvicides has been decentralized which means that the states will procure themselves as per approved norms out of the cash assistance provided by Government of India.

B. LYMPHATIC FILARIASIS

1. Lymphatic filariasis is a parasitic disease caused by thread like nematode worms. The adult worms settle in lymph nodes and the female worm gives birth to millions of young ones known as microfilariae. The microfilariae circulate in the peripheral blood system of infected people and when the mosquito feeds on an infected person, it ingests the microfilariae. The ingested microfilaria grows and within 12 days it reaches a stage when it can infect another human being. When the mosquito with infective stage larva bites another person, the parasite enters and reaches the lymphatic system. In mainland India, *Wuchereria bancrofti,* the causative organism for filaria transmitted by the vector mosquito, *Culex quinquefasciatus,* has been the most predominant infection contributing to 99.4% of the problem in the country. Although the vector species breeds preferably in dirty and polluted water, it can also breed in clear water in the absence of polluted water. The infection is prevalent in both urban and rural areas. Lymphatic filariasis due to *Brugia malayi* infection is mainly restricted to rural areas due to the peculiar breeding habits of the vector associated with floating vegetation. *Mansonia (Mansonioides) annulifera* is the principal vector while *Mansonia uniformis* is the secondary vector for transmission of *B.malayi* infection. Both *W. bancrofti* and *B. malayi* infections in mainland India exhibit nocturnal periodicity of microfilaraemia. In 1974-75 diurnal subperiodic *W.bancrofti* infection was discovered among aborigines inhabiting Nicobar group of Andaman and Nicobar Islands. *Ochlerotatus (Finlaya) niveus* group of mosquitoes were incriminated as the vectors for this infection, formerly classified as *Aedes (Finlaya) niveus*.

Lymphatic filariasis leads to irreversible chronic manifestations, which are responsible for social stigma besides causing considerable economic loss and severe physical disability to the affected individuals. Acute attacks of filariasis frequently affect the patients with transient episodes of disability, often confining them to bed rest for a few days.

Indigenous lymphatic filariasis cases are reported from 15 states, namely, Andhra Pradesh, Assam, Bihar, Chhattisgarh, Goa, Gujarat, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Tamil Nadu, Uttar Pradesh and West Bengal and 5 union territories, viz., Pondicherry, Andaman & Nicobar Islands, Daman & Diu, Lakshadweep and Dadra & Nagar Haveli

The North-Western states in the country, namely, Jammu & Kashmir, Himachal Pradesh, Punjab, Haryana, Rajasthan, Uttaranchal including the union territories of Delhi and Chandigarh and the North-Eastern States, viz., Arunachal Pradesh, Nagaland, Meghalaya, Mizoram, Manipur and Tripura and Sikkim are known to be free from indigenously acquired filarial infection.

The National Filaria Control Programme (NFCP) is being implemented in the country through 206 filaria control units, 199 filaria clinics and 27 survey units in the identified population in urban areas. These units face shortage of staff and various other administrative bottlenecks. The strategies under NFCP to be implemented by these control units/clinics are:

- Detection and Treatment to the patients with anti-filarial drug
- Anti-larval work in urban areas covered under NFCP

2. This disease has been **targeted for elimination** globally by 2020. The National Health Policy (2002) of India aims to eliminate lymphatic filariasis in the country by 2015. **The strategy for elimination of lymphatic filariasis** (ELF) is to implement annual single dose (preventive) Mass Drug Administration (MDA) with anti-filarial drugs (DEC + Albendazole) to the eligible population living at the risk of filariasis and identifying people having chronic manifestations viz. lymphoedema and hydrocele for providing them with morbidity management services. This strategy is being implemented since 2004 and 250 districts in 15 States and 5 UTs have been brought under MDA. Since the implementation unit to be covered under this strategy is the whole revenue district, the work is to be undertaken by District Malaria Officer or District Vector Borne Disease Control Officer with staff and officials of NFCP who were earlier working in limited urban areas and other staff of PHCs. Detailed guidelines on activities to be conducted before and during the MDA have been circulated to the affected states and union territories. However, the major activities under ELF are listed below:

- Sensitization or training of district and state level officers at state headquarters.
- State level Task Force meeting and Technical Advisory Committee meeting to be held at state level before the instructions are issued to the district authorities.
- Sensitization/training of district level, sub-district level, PHC level and block level health/non-health officials are to be identified involved in the programme.
- Media sensitization and District Coordination Committee meeting under the chairmanship of District Collector.
- Microfilaria survey by trained technicians (especially for collection of blood in the night and its examination) before MDA in sentinel and random sites in each district.
- Identification of manifestations (lymphoedema and hydrocele), line-listing of cases and updating every year with addition or deletion on yearly basis to provide services for morbidity management.
- Identification of drug distributors/volunteers from health and non-health sectors, their training, area distribution and execution of drug distribution.
- Collection, compilation and analysis of data and feedback to state as well as the centre.
- Assessment through involvement of medical college faculty, ROH&FW and ICMR Institutions.

3. **Staffing Pattern**

- **State Level:** The NFCP is manned at the state level by the Deputy Director / Assistant Director Filaria the State Programme Officer for Vector Borne Diseases.

- **Filaria Control Unit:** The Filaria Control Units are manned by the following staff as per the population protected by each unit.

    - One biologist/medical officer for every 500,000 population
    - One technician for every 150,000 population

- One clerk for every 150,000 population
- One tin smith for every 100,000 population
- One store keepr for every 75,000 population
- One inspector for every 50,000 population
- One insect collector for every 50,000 population
- One superior field worker for every 25,000 population
- One field worker for every 5,000 population
- One peon per every gazetted officer
- One chowkidar per unit

- **Filaria Clinic:** The pattern of staff is as follows:
  - Filaria inspector - 1
  - Laboratory Technician - 1
  - Field Worker - 1
  - Driver - 1

- **Survey Unit:** The pattern of staff is as follows:
  - Biologist/Filaria officer - 1
  - Filaria inspector - 2
  - Technician - 2
  - Insect collector - 2
  - Field worker - 3
  - Clerk/Typist - 1
  - Driver - 1
  - Chowkidar - 1

Note: The existing staff in these institutions need to be brought under one umbrella of National Vector Borne Disease Control Programme and should work under the overall control of state programme officers (VBD). These staff should be utilized optimally so that the scheme functions in an integrated manner.

C. KALA AZAR

1. Kala azar has been endemic in India for a long time and the earliest outbreaks that could probably be attributed to the disease date back to the early nineteenth century. The disease used to occur in cyclic epidemics with a periodicity of 10-15 years. With the launching of extensive insecticidal spraying under National Malaria Control Programme and National Malaria Eradication Programme since 1953 and 1958 respectively, the disease declined to negligible levels due to the collateral benefit of insecticidal pressure on the vector, *Phlebotomus argentipes,* with consequent interruption of transmission. However, withdrawal of insecticidal spraying from erstwhile malaria endemic areas resulted in a gradual build-up of vector population that ultimately led to resurgence of kala azar during the seventies, initially in four districts of Bihar. Slowly, the disease spread to other areas and became endemic in entire north Bihar, parts of south Bihar and several districts of West Bengal. Sporadic incidence was also reported from Uttar Pradesh in the eighties.

   Concerned with the increasing problem of kala azar in the country, the GoI launched a centrally sponsored Kala-azar Control Programme in 1990-91. The programme brought significant decline in kala azar morbidity, but could not sustain the pace of decline. The National Health Policy - 2002, set the goal of kala azar elimination by 2010. GoI has also signed a Tripartite Memorandum of Understanding with Nepal and Bangladesh in May 2004, for elimination of kala azar from the South-East Asia region by 2015. Kala-azar is now endemic in 31 districts of Bihar, 4 districts of Jharkhand, 11 districts of West Bengal

and 2 districts of Uttar Pradesh, besides the occurrence of sporadic cases in a few areas of eastern Uttar Pradesh. An estimated 129 million population (2001 Census) is exposed to the risk of kala azar in the endemic districts of four states.

2. The Kala-azar elimination programme comprises of the following **main strategic components:**

Case detection and treatment: Case detection and treatment is done through the existing primary health care system supplemented by periodic annual active searches (Kala-azar fortnight) for case detection followed by intensive treatment campaign.

Interruption of transmission through vector control: Vector control is carried out by undertaking two rounds of DDT spray annually in PHC areas reporting kala azar incidence. *Phlebotomus argentipes*, the only kala-azar vector in the country is largely sensitive to DDT. There is evidence of effectiveness of indoor residual spraying (IRS) against kala azar vectors. The first round of IRS is carried out in February – March and second round in May – June, just before the onset of monsoon which makes majority of kala azar affected areas, particularly in Bihar, inaccessible being flood prone. The IRS is supplemented with efforts for improve sanitation. In addition, environmental measures and personal protection from sandfly bites are encouraged.

IEC and Intersectoral convergence: IEC is to be carried out for behavioral impact and intersectoral convergence is to be implemented through various approaches at all levels.

Diagnosis: The new diagnostic tool i.e., Rapid dip-stick test - rK39 has been introduced in the programme for the detection of kala azar cases at the PHC level. Suspected cases as per the standard case definition are referred for clinical examination and tested with rK39 for confirmation of kala azar to start treatment.

Treatment: As per the drug policy of GoI, Sodium Stibo Gluconate (SSG) is the first line of treatment for kala azar. Amphotericin - B is used as second line of treatment for cases which do not respond to SSG. The oral drug, Miltefosine has been introduced on a pilot basis in 10 districts of three states namely Bihar (6), Jharkhand (2) and West Bengal (2).

Vector Control: IRS with DDT 50% is undertaken to control transmission of kala azar.

- **Selection of the areas to be sprayed:** The criteria for selection is that all villages within a PHC which reported kala azar cases in the past five years; all villages which reported cases during the year of spray.

- **Dosage:** The dosage of DDT application is 1g/m^2 of the wall surface. The inside walls of huts and cattle sheds, up to a height of 6 feet, are to be sprayed with the insecticide. Cattle sheds and kala-azar positive and suspected houses are to be treated on priority.

- **Spray Timings:** Spraying is usually started to coincide with the buildup of vector populations and before the onset of the kala azar transmission season. The build up in the sandfly vector population starts in March and peak kala azar transmission season is from June to October. The effectiveness of DDT lasts for about 10 weeks. Therefore, two rounds of DDT are done, the first in February - March and the second in May – June, to control the vector population and for providing protection during the entire transmission season.

- **Training of spray squads:** Hiring of squads should be done well in time so that training of spray squads is completed prior to the due date of spray operations. The training of the MPWs and the supervisors should be completed two weeks prior to the

start of the spray operations. Training should cover each aspect of the spray operations.

- **Community Awareness:** The community should be informed about the spray programme and its benefit so as to improve the acceptance and coverage.

Measures needed to achieve the goal of kala azar elimination

- Expansion of new tools i.e. rapid diagnostic kit and the oral drug miltefosine to improve diagnosis and increase the compliance to treatment.
- Free diet to the patient and one attendant and incentive to patient @ Rs. 50/- per day towards loss of wages during the treatment period.
- Incentive to kala azar activists including ASHAs for identification of the case and ensuring completion of treatment. The activist / ASHA will get incentive for identification of cases @ Rs.50/- per case and for follow up and ensuring complete treatment, the incentive would be @ Rs.150/- per case.
- Intensifying kala azar case search through kala azar fortnight.
- Focused intervention especially IRS under strict supervision.
- Introduction of patient coding scheme.

D. JAPANESE ENCEPHALITIS (JE)

1. Japanese Encephalitis (JE) is caused by a virus and is transmitted through mosquitoes. The transmission dynamics of the disease are very complex as the virus is maintained in nature by ardeid birds most of which are migratory, and by pigs which are the amplifier hosts. JE outbreaks occur in areas where there is a close interaction between these animals and human beings. Man is an accidental host and does not play a role in JE virus transmission. Children below 15 years are mostly affected. JE is an outbreak prone viral infection having a cyclic trend with seasonal phenomenon. Outbreaks of JE usually coincide with the monsoons and post monsoon period when the density of mosquitoes increases. The Case Fatality Rate (CFR) ranges from 20% to 30%. The vectors of JE breed in large water bodies such as paddy fields. The vector mosquitoes rest outdoors and therefore vector control measures such as IRS are not very effective and hence not recommended for prevention and control of JE.

2. **Strategies**

Early Diagnosis and Case Management

- Strengthening of referral services for laboratory diagnosis and management of cases
- Proper and speedy case management
- Management of sequelae
- Epidemic preparedness and rapid response

Vaccination of children between 1-15 years of age

Integrated Vector Management

- Fogging during outbreak periods
- Larviciding in limited areas wherever feasible
- Use of bednets

Supportive interventions

- Training and capacity building
- Behaviour Change Communication (BCC)
- Supervision and monitoring

Early Diagnosis and Case Management

- **Strengthening of referral services:** Referral support should be available at district/sub-district levels.

- **Proper case management:** There is no specific anti-viral drug for JE and cases are managed symptomatically. Prompt and effective case management needs improved care by medical and paramedical health care providers, improved laboratory facilities for diagnosis and sufficient availability of drugs and equipment in treatment centres. Standard Operating Procedures and guidelines for management of cases which have already been circulated by Directorate of NVBDCP to all endemic states, should be available and followed at District/CHC/PHC levels.

- **Management of sequelae:** Sequelae management by drugs, orthopedic and rehabilitation measures should be available at all district hospitals, medical college hospitals and specialist hospitals in JE endemic areas.

- **Epidemic preparedness and rapid response:** A rapid response team should be constituted in all JE endemic districts to monitor the JE situation and outbreaks in their areas.

Vaccination

- Vaccination in high risk areas and population has been initiated since 2006 with single dose live attenuated SA-14-14-2 vaccine to children between 1-15 years of age under Universal Immunization Programme in a phased manner. Vaccination is however, not recommended as an outbreak control measure.

Integrated vector Management

- The role of vector control is limited in JE due to the outdoor resting habits of the vector. Vector control by fogging with technical Malathion for outdoor is recommended during outbreaks for immediate killing of infected mosquitoes. Anti-larval operations may be considered in areas with limited vector breeding. Personal protective measures for using insecticides treated bed nets and curtains, wearing full sleeve clothes during evening hours etc., and biological control using larvivorous fishes should be promoted wherever possible.

Supportive interventions

- **Training and capacity building:** Capacity building and manpower development should be done in JE endemic districts through training of clinicians and nurses in case management and laboratory technicians and laboratory in - charge/microbiologists in all sentinel laboratories in diagnosis by MAC ELISA method in a phased manner.

- **Behaviour Change Communication (BCC):** BCC activities should be carried out for promoting early case reporting and early referral of patients, increasing awareness of clinical signs, personal protection including segregation of pigs away from human population and mosquito proofing of pigsties etc.

- **Supervision and monitoring:** Supervision and monitoring is done through periodic reviews/reports and field visits for proper monitoring for JE.

E. DENGUE FEVER / DENGUE HAEMORRHAGIC FEVER

1. Dengue fever is an outbreak prone viral disease, transmitted by *Aedes aegypti* mosquitoe which breeds in a wide variety of containers around human dwellings such as discarded tyres, earthen pots, cemented tanks, flower pots, old water drums, discarded utensils, water storage vessels and plastic containers etc. The disease tends to follow a seasonal pattern. In recent years, mosquitogenic conditions have increased due to rapid developmental activities, urbanization and life style changes and consequent to this, the risk of spread of dengue in newer areas has increased. Due to this reason, the disease has also spread to rural areas.

   A focused attention for prevention and control of Dengue was initiated to reduce the risk of transmission following a dengue outbreak in 1996. There is no specific anti-viral drug or vaccine for the disease and the mortality can only be minimized by early diagnosis and prompt symptomatic management of the cases.

2. **Strategies:** The main strategies for prevention and control of dengue are highlighted below:

   Early Case reporting and management
   - Disease surveillance through grass roots level Health workers, sentinel surveillance sites with laboratory support
   - Case management including early referral of cases
   - Epidemic preparedness and rapid response

   Integrated Vector Management
   - Larval surveys – Entomological surveillance
   - Source reduction
     - Anti-larval measures - Source reduction, use of chemical larvicides / biocides, larvivorous fish and environmental management
     - Anti-adult measures - Personal protection measures and indoor space spraying with Pyrethrum extract (2%) and fogging during outbreaks
   - Personal protection

   Supportive interventions
   - Capacity building through training
   - Behaviour Change Communication (BCC)
   - Intersectoral coordination
   - Supervision and monitoring
   - Legislative support

   To implement the above strategies, Directorate of NVBDCP brought out the Strategic Action Plan which was circulated to various States/UTs. The following points were emphasized in the strategic action plan:

   - The suspected cases should be referred at the earliest for diagnosis and its proper management.
   - Strengthening the surveillance through identified Sentinel Surveillance Hospitals (SSHs) and Apex Referral Laboratories (ARLs). The diagnostic kits are supplied by National Institute of Virology (NIV), Pune – an Institute of ICMR for which the cost is borne by NVBDCP.
   - Monitoring of larval density of Aedes mosquitoes in urban and rural areas regularly.

- Involvement of NRHM institutions viz, Rogi Kalyan Samitti for facilitating the emergency cases in referral and transportation and Village Health & Sanitation Committee for improvement in sanitation and reduction in breeding cites. ASHA should also be involved in educating the community for avoiding the stagnation of stored water kept open in and around the houses.

F. CHIKUNGUNYA

1. Chikungunya is a viral disease caused by the Chikungunya virus. The disease resembles dengue fever and is characterized by fever, rash and severe, sometimes persistent, joint pain. It is a debilitating disease which is rarely life threatening. This disease reemerged in the country during 2006 after a gap of almost three decades.

   Chikungunya is spread by the bite of female *Aedes mosquitoes* primarily *Aedes aegypti*. The *Aedes aegypti* mosquitoes breed in a wide variety of man-made containers around human dwellings such as discarded tyres, earthen pots, cemented tanks, flower pots, old water drums, discarded utensils, water storage vessels and plastic containers. Human beings are considered to be the major source or reservoir of the chikungunya virus for mosquitoes. Chikungunya outbreaks typically result in a large number of cases. The disease is prevalent in both urban and rural areas. The infection provides life long immunity.

   Since this disease is transmitted by the same vector which transmits dengue, the prevention and control against the vector mosquitoes remains the same. The implementation of the strategies should be in an integrated manner for optimal utilization of the resources in a cost effective manner. There is no specific anti-viral drug for chikungunya and the cases are managed symptomatically.

2. **Strategies and innovations:** The strategies and innovations for prevention and control are same as that for dengue/dengue haemorrhagic fever described above.

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