JOINT MONITORING MISSION 2014

NATIONAL VECTOR BORNE DISEASE CONTROL PROGRAMME

Directorate General of Health Services
JOINT MONITORING MISSION

NATIONAL VECTOR BORNE DISEASE CONTROL PROGRAMME 2014
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Annexures

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In recent times India has undergone unprecedented demographic and socioeconomic changes which have well been documented. Suffice it to mention that between 1951 and 2000, the life expectancy has increased from 37 to 65 years. In the last few decades, there has been a remarkable effort in the field of health as numerous initiatives have been taken to address individual and population health. Such measures have yielded significant health outcomes like achieving polio-free status, reduction in infant mortality rate from 68 per 1000 live births in 2000 to 40 per 1000 live births in 2013, to name a few. Concerted efforts have also resulted in improvement in disease burden due to communicable diseases including vector-borne diseases. Some of these diseases are targeted for elimination like kala-azar and lymphatic filariasis. However, in spite of significant successes, all the vector-borne diseases remain to be major public health problems for the at-risk population. The Government of India launched the National Rural Health Mission (NRHM) in April 2005 that aimed to provide affordable and effective health care to all citizens, in particular to the poorer and vulnerable sections of the population. NRHM envisaged 'architectural correction' of the health sector through integration of vertical programmes and structures, decentralization of responsibility and authority and involvement of Panchayat Raj institutions. Within this context, the National Vector Borne Disease Control Programme (NVBDCP) organized its first review as 'Joint Monitoring Mission (JMM)' in 2007 through a mix of national and international experts. Recommendations were useful and provided important directions for further reducing the disease burden and its impact. The Joint Monitoring Mission 2014 was organized after a span of six years during which major policy decisions and initiatives have been taken to address the public health impact of major vector-borne diseases in India. JMM 2014 has attempted to look at the situation through a health systems lens and has looked specifically into key areas of governance/stewardship, financing and financial management, procurement and supply chain management, vector control policies and surveillance and organization of services related to vector borne diseases. This report is based on the observations, desk review of the progress, field visits, interactions with health functionaries at all levels, academic institutes, researchers, nongovernmental and other sectoral organizations and with communities in eight states co-endemic for one or more vector-borne diseases.
ACKNOWLEDGEMENTS

The Joint Monitoring Mission (JMM), 2014 was able to accomplish its mission thanks to the assistance and full collaboration of the National Vector Borne Disease Control Programme (NVBDCP) under the overall coordination of WHO Country Office for India (WCO India). The Mission members are also grateful to the Directorate of Health Services at the state level and the staff of the state and district Vector Borne Disease Control Programme in each of the states visited. It was only because of their support that team members were able to visit primary, secondary and tertiary health facilities (public and private), voluntary organizations, households and individuals affected by any of the six vector-borne diseases.

The JMM 2014 profited enormously from the insight of the senior health administrators, NVBDCP staff at national, state and district level and key stakeholders at the state, district, PHC and sub-centre level (listed in Annex 3). The team would also like to thank the community-based health workers, volunteers, families and individuals, whose experiences have greatly enriched the report.

A special thanks to all those who helped prepare background papers to aid in the Mission: C.A. Anshuman Bardhan, Cecilia T. Hugo, J.N. Joshi, National Institute of Malaria Research, Public Health Foundation of India and Vector Control Research Centre, Puducherry.

WHO Country Office for India wishes to recognise the inputs made by the external experts (listed in Annex 1) who dedicated their time and energy to visit the field, collate data and provide recommendations for strengthening the programme.

JMM is thankful to Charles Delacollette for Chairing the entire mission with the immense support of co-Chairs Allan Max Schapira and Sundararaman Thiagarajan and all the seven Team Leaders.

Lastly, a word of thanks to the writing group which helped in the preparation of the final report. These include (in alphabetical order): Asheena Khalakdina, Charles Delacollette and Saurabh Jain.
ACRONYMS

ABER  annual blood examination rate
ACT   artemisinin-based combination therapy
AES   acute encephalitis syndrome
AL    artemether-lumefantrine
ANM   auxiliary nurse midwife
API   annual parasite incidence
ASHA  accredited social health activist
AWW   anganwadi worker
BCC   behaviour change communication
CFR   case fatality rate
CHC   community health centre
CMHO  Chief Medical and Health Office
CMO   Chief Medical Officer
CRME  Centre for Research in Medical Entomology
DDHS  Deputy Director of Health Services
DDT   dichloro diphenyl trichloroethane
DEC   diethylcarbamazine citrate
DF    dengue fever
DGHS  Directorate General of Health Services
DHF   dengue haemorrhagic fever
DMO   District Malaria Officer
DSS   dengue shock syndrome
EAC   Externally Aided Component
ELISA enzyme-linked immunosorbent assay
EQAS  external quality assurance system
GFATM Global Fund on AIDS, TB and Malaria
GIS   Geographical Information System
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<tr>
<td>GoI</td>
<td>Government of India</td>
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<td>GoM</td>
<td>Group of Ministers</td>
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<td>HMIS</td>
<td>Health Management Information System</td>
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<td>ICMI</td>
<td>integrated management of childhood illness</td>
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<td>ICMR</td>
<td>Indian Council of Medical Research</td>
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<td>ICU</td>
<td>intensive care unit</td>
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<td>IDSP</td>
<td>Integrated Disease Surveillance Programme</td>
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<td>IEC</td>
<td>information, education and communication</td>
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<td>IMA</td>
<td>Indian Medical Association</td>
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<td>IRS</td>
<td>indoor residual spraying</td>
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<td>IMR</td>
<td>infant mortality rate</td>
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<td>IT</td>
<td>information technology</td>
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<td>ITN</td>
<td>insecticide treated net</td>
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<td>IVM</td>
<td>integrated vector management</td>
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<td>JE</td>
<td>Japanese encephalitis</td>
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<td>JMM</td>
<td>Joint Monitoring Mission</td>
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<td>KA</td>
<td>kala-azar</td>
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<td>KTS</td>
<td>kala-azar technical supervisor</td>
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<td>LF</td>
<td>lymphatic filariasis</td>
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<td>LLIN</td>
<td>long-lasting insecticidal net</td>
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<td>LMIS</td>
<td>Logistic Management Information System</td>
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<td>LQAS</td>
<td>lot quality assurance sampling</td>
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<td>M&amp;E</td>
<td>monitoring and evaluation</td>
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<td>MCD</td>
<td>Municipal Corporation of Delhi</td>
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<td>MDA</td>
<td>mass drug administration</td>
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<td>MDG</td>
<td>Millennium Development Goal</td>
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<td>Mf</td>
<td>microfilaria</td>
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<td>MIS</td>
<td>Management Information System</td>
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<td>MMR</td>
<td>maternal mortality ratio</td>
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<td>MO</td>
<td>Medical Officer</td>
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<td>MoHFW</td>
<td>Ministry of Health &amp; Family Welfare</td>
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<td>MoU</td>
<td>Memorandum of Understanding</td>
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<td>MPW</td>
<td>multi-purpose worker</td>
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<td>Abbreviation</td>
<td>Full Form</td>
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<td>MTS</td>
<td>malaria technical supervisor</td>
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<td>NAMMIS</td>
<td>National Anti-Malaria Management Information System</td>
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<td>NCDC</td>
<td>National Centre for Disease Control</td>
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<td>NCR</td>
<td>National Capital Region</td>
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<td>NCT</td>
<td>National Capital Territory</td>
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<td>NFCP</td>
<td>National Filaria Control Programme</td>
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<td>NGO</td>
<td>nongovernmental organization</td>
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<td>NHM</td>
<td>National Health Mission</td>
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<td>NHP</td>
<td>National Health Policy</td>
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<td>NIV</td>
<td>National Institute of Virology</td>
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<td>NRHM</td>
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<td>National Reference Laboratory</td>
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<td>NSP</td>
<td>National Strategic Plan</td>
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<td>NVBDCP</td>
<td>National Vector Borne Disease Control Programme</td>
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<td>OR</td>
<td>operational research</td>
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<td>PCD</td>
<td>passive case detection</td>
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<td>PCR</td>
<td>polymerase chain reaction</td>
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<td>Pf</td>
<td>Plasmodium falciparum</td>
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<td>PHC</td>
<td>primary health centre</td>
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<td>PIP</td>
<td>Programme Implementation Plan</td>
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<td>PKDL</td>
<td>Post kala-azar dermal leishmaniasis</td>
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<td>PPP</td>
<td>public-private partnership</td>
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<td>PRI</td>
<td>panchayati raj institution</td>
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<td>Pv</td>
<td>Plasmodium vivax</td>
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<td>QA</td>
<td>quality assurance</td>
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<tr>
<td>QC</td>
<td>quality control</td>
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<td>RCH</td>
<td>reproductive and child health</td>
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<td>RDT</td>
<td>rapid diagnostic test</td>
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<tr>
<td>RDK</td>
<td>rapid diagnostic kit</td>
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<td>RFD</td>
<td>Result Framework Document</td>
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<td>RITES</td>
<td>Rail India Technical and Economic Service</td>
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<td>RMRIMS</td>
<td>Rajendra Memorial Research Institute of Medical Sciences</td>
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RNTCP  Revised National Tuberculosis Control Programme
ROHW  Regional Office for Health and Family Welfare
RPRG  Regional Programme Review Group
RRT  rapid response team
RTAG  Regional Technical Advisory Group (kala-azar)
SC  sub-centre
SHS  State Health Society
SOE  statement of expenditure
SOP  standard operating procedure
SP  sulfadoxine-pyrimethamine
SP  synthetic pyrethroid
SSH  sentinel surveillance hospital
TAS  transmission assessment survey (for LF)
TDR  tropical disease research
TES  therapeutic efficacy study
TNMSC  Tamil Nadu Medical Services Corporation
UMS  Urban Malaria Scheme
UP  Uttar Pradesh
UT  union territory
VBD  vector borne disease
VBDC  Vector Borne Diseases Control
VCRC  Vector Control Research Centre
VHSNC  Village Health, Sanitation and Nutrition Committee
VL  visceral leishmaniasis
WCO India  WHO Country Office for India
WHA  World Health Assembly
WHO  World Health Organization
The Ministry of Health & Family Welfare (MoHFW), Government of India (GoI), in collaboration with the World Health Organization Country Office for India, organized a Joint Monitoring Mission (JMM) of the National Vector Borne Disease Control Programme (NVBDCP). The NVBDCP is the central nodal agency for implementation of programmes for prevention and control of vector-borne diseases in India. It is one of the technical departments under the Directorate General of Health Services, MoHFW, GoI. The Directorate of NVBDCP is responsible for strategic planning, policy and decision-making, providing technical guidance, monitoring and providing supportive supervision of programme implementation.

The Mission was conducted from 01 to 10 March 2014. A key objective of the Mission was to review the country’s progress towards the malaria-related Millennium Development Goals and targets defined in the National Strategic Plan, Result Framework Document (RFD) and National Health Policy (NHP) 2002. JMM 2014 was expected to provide inputs on strategic approaches and innovative mechanisms for achieving the key targets of the Twelfth Five-Year Plan. JMM was also tasked to provide recommendations on pathways to address major challenges for vector-borne diseases in India.

The methodology of the JMM 2014 was rigorous. An in-depth review of the programme was undertaken at all levels—national, state, district, health centre and community. Fourteen teams with seven international experts and 65 nationals from multidisciplinary fields were engaged in the monitoring mission. Seven states—Assam, Bihar, Karnataka, Odisha, Tamil Nadu, Uttar Pradesh and West Bengal were selected for field visits. A five-day field visit was undertaken in two districts in each selected state. In addition, a short visit of Delhi was also undertaken to study urban linkages in the prevention and control of vector-borne diseases, with special focus on dengue.

Data was collected using standardized, pre-designed tools to examine records, observe activities, conduct focus group discussions and interview key informants. Interviews were conducted at national, state and district level with policy planners, programme managers, health staff in government hospitals, other health-care providers, representatives of voluntary civic organizations and patients.

Two approaches were adopted for the review— one was from a disease control perspective (vertically driven) and the other was from a health systems perspective (primary health-care system). Based on this, the Mission addressed the following key issues for each of the six vector-borne diseases:
• disease trends, epidemiology and current status in India
• strategic planning and management
• case management including microscopy services
• vector prevention and control
• communication
• health systems
• surveillance, monitoring and evaluation
• operational research
• cross-border collaboration
• technical assistance needs.

Additionally, cross-cutting issues impacting the prevention and control of each vector-borne disease were studied as a whole. These included:

• health systems
• stewardship and governance
• procurement and supply chain management
• financing and financial management
• communication
• operational research.

Recommendations were formed based on the observations during field visits, interviews of key informants at state and district level and discussions of the working groups. These recommendations have been listed as action points for programmatic areas of each of the six VBDs and the cross-cutting issues.

The action points of JMM 2014 re-emphasize some of the recommendations made in the previous review held in 2007. Additionally, new action points have been proposed on both the strategies and policies and on delivery mechanisms to help improve access by marginalized populations to the best available disease control options. Action points are meant to stimulate leadership in states that have not been performing well, to consolidate the achievements in states that are on track and to help the best performing states go beyond the current targets.

The reports of field visits to the states of Assam, Bihar, Karnataka, Odisha, Tamil Nadu, Uttar Pradesh and West Bengal and to the Municipal Corporation of Delhi illustrate in detail the challenges and accomplishments in the prevention, management and control of the programme at the district level.

As the way forward, a roadmap needs to be finalized based on the findings of this report. Priority activities have to be highlighted and supported for immediate action in consonance with the Twelfth Five-Year Plan. Ideally, the next JMM should take place in 2016 in articulation with the Thirteenth Five-Year Plan. The planning exercise for the review in 2016 should start in early 2016.
SUMMARY

Background
The Ministry of Health and Family Welfare (MoHFW), Government of India (GoI), in collaboration with the World Health Organization Country Office for India (WCO India), organized a Joint Monitoring Mission (JMM) of the National Vector Borne Disease Control Programme (NVBDCP). The Mission was conducted from 01 to 10 March 2014. This was in response to the need to assess the progress made against national targets, to acknowledge results and identify the potential remaining challenges to achieve targets outlined in the national Twelfth Five-Year Plan and international Millennium Development Goals (MDGs). This was also in line with the World Health Assembly (WHA) Resolution WHA 64.17 on malaria and other vector-borne diseases (VBDs). The resolution urges Member States to regularly undertake comprehensive reviews of programmes to update strategic and operational plans in order to achieve and maintain universal access to and coverage of evidence-based VBD interventions. The last review mission was undertaken in 2007.

Various commitments and policies at the global and national level emphasize on the prevention and control of VBDs, MDG 6 aims to reduce morbidity and mortality on account of HIV/AIDS, malaria and other diseases. At the national level, the GoI in its National Health Policy of 2002 set the goal of reducing mortality on account of malaria, dengue and Japanese encephalitis (JE) by 50% by 2010, elimination of kala-azar (KA) by 2010 (which was revised to 2015, after an MoU signed with Bangladesh, India and Nepal) and elimination of lymphatic filariasis (LF) by 2015.

The NVBDCP is the central nodal agency for implementation of programmes for prevention and control of VBDs in India. It is one of the technical departments under the Directorate General of Health Services (DGHS), MoHFW, GoI. The Directorate of NVBDCP is responsible for strategic planning, policy, decision-making and providing technical guidance, monitoring and supportive supervision of programme implementation. Since health is a state subject in India, the implementation of the programme is the primary responsibility of states/union territories (UTs). The NVBDCP has been subsumed under the National Rural Health Mission (NRHM), which has been expanded to the National Health Mission (NHM) (including the urban health mission) to help improve the availability and accessibility of health-care services to vulnerable groups such as those residing in rural areas, the poor, women and children and marginalized populations in urban areas.

As a follow-up of the review in 2007, the NVBDCP, under the umbrella of the NRHM, has taken action to address the key issues in all technical and cross-cutting domains. The JMM members acknowledge the substantial efforts made by MoHFW to update guidelines, develop training
material, conduct training programmes and mobilize partners to deliver cost-effective services impacting on the disease burden. Essential issues such as strengthening the performance of the health system have been addressed. The numbers and the capacity of the health workforce to deliver essential services, especially in the peripheral areas, have been increased. Substantial reduction of malaria, LF, KA, dengue and Japanese encephalitis (JE) has been achieved during the last 10 years. Nevertheless, dengue and JE have been expanding geographically.

The current review (JMM 2014) re-emphasizes some of the recommendations made in the previous review of 2007. It proposes additional action points on both the strategies and policies and on delivery mechanisms to help improve access by marginalized populations to the best available disease-control options. Action points are meant to stimulate leadership in states that have not been performing well, to consolidate the achievements in states that are on track and to help the best performing states go beyond the current targets. The country brief prepared by the NVBDCP and thematic documents on key topics provide a comprehensive summary of the situation of all VBDs in the country, the major initiatives undertaken and the progress made in enhancing the performance of the health system in India by integrating the VBDs under the NHM.

**Methodology**

An in-depth review of the programme was undertaken at all levels—national, state, district, health centre and community. Fourteen teams with seven international experts and 65 nationals from multidisciplinary fields were engaged in the monitoring mission (list of members of the JMM is attached as Annex 1). States and districts were selected for field visits on the basis of disease endemicity, immunization coverage and health system performance (e.g. infant mortality rate, maternal mortality rate and coverage of antenatal care). Seven states namely, Assam, Bihar, Karnataka, Odisha, Tamil Nadu, Uttar Pradesh and West Bengal were selected. A 5-day field visit was undertaken in two districts in each selected state. In addition, a short visit of Delhi was also undertaken to study urban linkages in the prevention and control of vector-borne diseases with special focus on dengue. Data was collected using standardized, pre-designed tools to examine records, observe activities, conduct focus group discussions and interview key informants. Interviews were conducted at national, state and district level with policy planners, programme managers, health staff in government hospitals, other health-care providers, representatives of voluntary civic organizations and patients. Observations and outcomes from field visits were presented in the plenary session and were further discussed in smaller working groups. Inputs and action points by working groups were then synthesized and consolidated in the final report. The key action points for consideration of NVBDCP are given below.

**Action points**

**Malaria**

There is a declining trend of malaria cases since 2001 and of deaths since 2010. In 2013, only 881,730 cases and 440 deaths were recorded compared to more than 1.8 million cases and 973 deaths in 2002. The surveillance system in most states only captures a fraction of the cases and an even lower fraction of malaria deaths. This is because a majority of the cases in remote locations are managed by private providers or are simply undetected or unreported. Therefore, following the more conservative estimations reported, the real number of cases could be about six times higher and
malaria attributed deaths about 20 times higher than the figures recorded by the NVBDCP malaria surveillance system. There is, however, no reason to doubt that substantial reduction in the malaria burden has taken place even if the exact magnitude is not clear.

**Case management**

Documentation of Plasmodium falciparum (PF) resistance to sulfadoxine-pyrimethamine (SP) shows that the combination does not really protect from the development of resistance against artesunate-derived compounds. Further, there is a steadily increasing risk of importation of artemisinin-resistant malaria from the neighbouring Greater Mekong sub-region. It is therefore recommended to initiate the replacement of artesunate-sulfadoxine-pyrimethamine combination by an alternative, quality-assured World Health Organization (WHO)-approved artemisinin-based combination therapy (ACT) in peninsular India in order to minimize the risk of emergence or importation of artemisinin resistance. To increase adherence, attention needs to be paid to the design of packaging of co-formulated ACT blisters to meet the needs of various end-users' profile.

**Malaria microscopy**

The current manual of operations followed for the quality assurance (QA) system includes components outlined in the WHO QA manual. However, the programme needs to strengthen existing systems to ensure that QA is followed according to standard operating procedures (SOPs). This may include an external accreditation of institutes responsible for capacity building such as National Reference Laboratory (NRL), National Institute of Malaria Research (NIMR) or NVBDCP.

All laboratory facilities at district level must be properly equipped with trained staff for microscopy diagnosis. This means that all district laboratories must be supported or supervised by a state level QA laboratory (either public or private) to ensure that QA and external quality assurance system (EQAS) procedures are in place and followed. The role of the NVBDCP is to provide strategic guidance to promote and support practices such as strengthening of and adherence to SOPs.

Bivalent rapid diagnostic tests (RDTs) have proven reliable, with high sensitivity and specificity, and are easy to use. Therefore, quality-controlled rapid tests should now be the method of diagnosis in routine clinical and surveillance services, except where microscopy is of an assured and documented high quality and where results can be provided on the same day. This will require an ambitious scaling up of supplies and additional training and procedures to check the quality of RDTs, both as part of the procurement process and once they are deployed in the field.

Given the dominant role played by the private sector in providing health care to all sections of the Indian population, effective engagement of private practitioners is essential to achieve the goals on case detection and rational use of drugs and diagnostics. The existing public–private partnership (PPP) guidelines prepared for malaria is not useful for engaging the private health-care sector and therefore needs to be revised. In addition to the guidelines, a specific sub-programme for this purpose should be designed and implemented. Among other elements, this programme should include regulation, training, provision of RDTs and ACTs, and reporting on agreed upon criteria including notification of cases.
Vector prevention and control
In rural areas, in general, either indoor residual spraying (IRS) or distribution of long-lasting insecticidal nets (LLINs) should be implemented. In high-risk areas where the annual parasite incidence (API) is greater than 2, coverage with these interventions should be greater than 80%. The choice between IRS and LLIN should depend mainly on operational factors such as population acceptance, which should be rapidly assessed in each locality. Entomological factors, available infrastructure and capacities of local staff should also be taken into consideration to implement these interventions according to standards on quality of operations, resistance to insecticide, equipment, supervision and reporting.

In very high-burden areas (where API is greater than 10) and under special circumstances such as epidemics, LLIN and IRS should be combined. For instance, combination of these interventions is indicated if satisfactory reduction of incidence has not been achieved through high coverage by LLINs, or if effective LLIN coverage is limited because people sleep outside and vectors are still endophilic. A combination of interventions should be the exception rather than the norm, and the effectiveness monitored so as to increase the evidence base for their use.

In urban areas, anti-larval measures are generally the main intervention. However, successful intervention requires intersectoral collaboration and legislative support.

Surveillance
Irrespective of the endemicity level, strengthening of surveillance, both collection/collation of data and analysis/use will improve programme operations and impact. Appropriate engagement of private providers and other sectors is a priority.

Towards a malaria-free India
According to the 2012 surveillance data, 492 out of a total of 648 (75.9%) districts across India had reached an API of less than 1. In this context, the JMM recommends the following actions:

- An elimination plan should be prepared for districts that have achieved an API of less than 1. This plan should be based on the results of an assessment study on the feasibility of malaria elimination in the district.
- A pre-elimination phase needs to be implemented before the elimination phase. If surveillance is strong, a feasibility study for implementing the pre-elimination phase can be undertaken. The pre-elimination phase may start when the test positivity rate is below 5%. During the pre-elimination phase, several stringent actions need to be designed and implemented based on WHO guidelines. These include strengthening the surveillance system including compulsory detection and reporting from the private sector (i.e. notification), quality-assured microscopy, detection of asymptomatic carriers, rapid interruption of transmission in each focus area and prevention of re-introduction of the disease by increasing attention paid to migrant populations from endemic areas.

Health system (human resources) (see also section on “Health systems” below)
Case detection, case management and prevention activities are important components of the intervention package for malaria and all other VBDs. Successful implementation of these
interventions depends on the availability of skilled staff. The programme within the NRHM has to ensure that the VBD workforce is in full strength at the primary health-care level and is trained on a periodic basis to follow recommended practices and complete, accurate and timely reporting. Vector control interventions such as IRS and/or LLINs might not be part of the duties of the primary health-care staff. These interventions require additional permanent or temporary staff to ensure proper planning, correct implementation and accurate reporting of specific measures.

To address the challenge of human resources, each state has to finalize a human resource plan. Such a plan should specify the required number of VBD staff at each level with clear terms of reference and managerial lines including reporting and regular feedback mechanisms. Sustaining the workforce is essential, including limiting staff turnover. This can be achieved by better integrating practices such as case management, laboratory services, communication and surveillance into general primary health care tasks. The section on health systems further elaborates on this topic.

**Procurement**
See section on "Health systems" below.

**Lymphatic filariasis**
The National Filaria Control Programme (NFCP) was launched in the country in 1955 with the objective of undertaking control measures in endemic areas and train personnel for the Programme. The key objective of the Programme is to progressively reduce and ultimately interrupt transmission of lymphatic filariasis (LF), which is slated for elimination by 2015 according to the Twelfth Five-Year Plan. Overall, the NFCP is progressing well towards its set targets with appropriate intervention, namely mass drug administration (MDA) of anti-filarial drugs, except in a few districts with sub-optimal coverage. The impact of the mass interventions in the last decade is clearly visible from the following indicators:

a) Coverage of MDA has improved from 73% in 2004 to 86% in 2012.
b) The microfilaria (Mf) rate has declined from 1.24% in 2004 to 0.45% in 2012.
c) The phasing out of MDA has started in 50 districts. Forty-three districts are in the pre-TAS phase and seven districts have qualified for TAS in 2014.

**MDA and transmission assessment surveys (TASs)**
- In districts that report more than 1% Mf, efforts should focus on improving coverage of MDA, especially in poorly performing PHCs. In these districts, MDA should be supplemented with vector control based on integrated vector management (IVM) strategies.
- In districts that report less than 1% Mf, TAS should be conducted in order to stop MDA rounds. The Indian Council of Medical Research (ICMR) and WHO can provide technical support.

**Case management**
- Under the National Health Mission (NHM), lymphoedema management services should be provided at PHCs and hydrocele operations should be expanded to district hospitals and/or community health centres (CHCs).
- Communication activities need to be strengthened to raise awareness in the population.
• Morbidity management of existing cases needs to be continued even after MDA has been stopped.

**Surveillance**
In order to provide evidence that transmission of LF has successfully been interrupted, the national programme should conduct repeated survey activities in implementation units that have stopped MDA. WHO currently recommends that at least two TASs be repeated every two to three years. Further, effective diagnostic tools and strategies are required to monitor and evaluate interruption of LF. For example, use of antifilarial antibody test, which helps in identifying areas of residual endemicity and alternative entomological monitoring strategies such as xenomonitoring should be explored. The “hot-spots” (areas with persistently high case burden) should be kept under intensive surveillance for treatment and interventions.

**Monitoring and evaluation**
Reporting to the Regional Programme Review Group (RPRG) should be timely and accurate to ensure necessary global support for LF elimination.

**Kala-azar**
Kala-azar (KA) or visceral leishmaniasis (VL) is endemic in four states, 54 districts and 587 blocks, with an estimated 130 million population at risk. More than 80% of the cases are from Bihar, where nine districts contribute 65–70% of the country’s disease burden.

The target for elimination is to reduce the annual incidence of KA to less than one case per 10,000 population at block level by the end of 2015. Sixty seven per cent of blocks have less than one case per 10,000 population (as per reported figures of 2013). Despite an ambitious time-bound target for elimination, the programme continues to operate in a routine rather than in an intensified manner.

**Programme stewardship towards KA elimination**
• To achieve the target of elimination by 2015, the programme should accelerate evidence-based quality operations at all levels. The programme needs to adopt an approach on the lines of the successful polio eradication programme in India. This requires strong commitment by the government and intensive interventions at the community level by both the Central and state governments of the four states where KA is endemic. To ensure stewardship and ownership by the four state governments, high-level advocacy activities need to be conducted.
• NVBDCP should have a greater role in providing technical assistance in strategic planning, capacity building, implementation, monitoring and evaluation (M&E) of programme activities.
• An annual external assessment of the progress of KA elimination needs to be undertaken.
• The memorandum of understanding (MoU) signed between Bangladesh, India and Nepal on 18 May 2005 was for five years and expired in 2010. The next MoU is for the period 2014–2019 and proposes to include Bhutan and Thailand, as sporadic KA cases have been reported from these countries as well. The renewed MoU for these countries extends the target for KA elimination as a public health problem to 2017. Countries should be encouraged to follow the recommendations of the Regional Technical Advisory Group (RTAG) on harmonization of technical interventions.
Policy and strategy
A single comprehensive and updated strategic guideline outlining SOPs for KA elimination needs to be finalized. To ensure use of the guideline at the field level, it should be adapted for different healthcare levels and disseminated widely. Training on use of the guideline should also be conducted and supportive supervision provided.

Case management
• Recommendations made by the RTAG should be followed. This includes revising the current treatment guidelines to include new treatment regimens that are more effective, shorter, safer and ensure better treatment compliance. Further, the use of single-dose liposomal amphotericin B should be scaled up in the attack phase and, as needed, combination regimens can be administered in the maintenance phase.
• There is a need to strengthen monitoring of completion of treatment, assessment of outcome of treatment and pharmacovigilance for KA.
• A dedicated KA supervisor should be posted at the block level. The supervisor should be made responsible for managing the implementation of all activities related to the KA programme, and not just those related to providing technical assistance. Terms of reference for the supervisor need to be specified.
• The selection criteria for VL RDT kits have to be updated to increase accuracy and usability in field conditions (including thermostability and usability with whole blood).
• Regular training programmes for laboratory technicians should be conducted to establish and maintain quality microscopy at the district level hospitals.

Vector control
• Though this JMM has evaluated vector control operations, an in-depth external assessment of current vector control operations for KA (essentially IRS with dichloro diphenyl trichloroethane [DDT]) is required as part of accelerated KA elimination. The resistance of the KA vector to DDT is unclear and has to be evaluated urgently. The external assessment should provide recommendations on cost-effective vector control operations, including use of other insecticides.
• Monitoring and supervision of IRS activities with appropriate feedback to higher levels should be strengthened according to NVBDCP guidelines.
• Activities on the source reduction of the vector should be strengthened through improvement of environmental conditions such as cemented houses, proper drainage and sanitation. Inter-sectoral activities with key ministries such as the Ministry of Rural Development are critical for promoting existing good practices and discouraging practices contributing to persisting transmission.

Communication
• A long-term communication strategy and plan outlining the information, education and communication (IEC) activities as well as behaviour change communication (BCC) approaches to be implemented during the elimination and post-elimination phases needs to be finalized. Effective implementation of the communication plan should be ensured.
• Encourage coordination with different partners and local authorities to strengthen community engagement and consolidate best practices on prevention and control of KA. The documentation of best practices and their impact should be used as an advocacy tool to convince decision-makers and stakeholders to maintain or expand their support.

Surveillance
• Active case finding for KA and post kala-azar dermal leishmaniasis (PKDL) with appropriate diagnostic criteria should be strengthened at the peripheral level. To further improve surveillance for PKDL, collaboration with other programmes such as leprosy should be strengthened.
• KA cases continue to be treated outside the public health facilities and many untreated cases remain within the community. There is a need to develop and validate feasible methods to estimate under-reporting so that the true disease burden can be ascertained. Approaches need to be developed to ensure that these missed cases are identified and treated.
• Surveillance in new foci, such as in Assam where cases have been newly reported, needs to be established to better document the disease burden and local transmission patterns.
• The reporting system for KA should be standardized to maximize the capture of new cases of KA and PKDL as well as to provide information on the key indicators of the elimination programme (KA incidence by block, treatment completion and death rate).
• Geographical Information System (GIS) technology to monitor spatial patterns of vectors and case distribution over time should be used and results of analysis applied to strengthen case identification and programme management.

Cross-border collaboration mechanisms
The NVBDCP and/or the MoHFW should facilitate cross-border collaborations, particularly between states. This collaboration should focus on harmonizing and sharing surveillance data (including mapping of cases) across neighbouring states, and if possible, across neighbouring countries. Health management information systems (HMIS) at the national and state level should be strengthened. IRS activities across the border in different countries need to be synchronized and coordinated.

Technical assistance
Criteria for verification of KA elimination needs to be defined by WHO.

Dengue and chikungunya
The number of cases of dengue fever (DF) is increasing in states such as Assam, Bihar, Delhi, Jammu & Kashmir, Gujarat, Karnataka, Kerala, Maharashtra, Rajasthan and West Bengal. Dengue is also becoming more prevalent in rural areas and is not confined to urban centres. The case fatality rate (CFR) is, however, showing a decline over the years. The CFR is currently at 0.2%, which is much below the national target of 1%. All four dengue serotypes are prevalent. There has been a decrease in chikungunya cases countrywide during the past five years. Currently, there are 394 sentinel surveillance sites and 14 apex laboratories to proceed with identification of dengue/other viruses and pathogens.
Case management

- Strengthen training at all levels for clinicians and nursing staff, including staff from private health-care institutions, especially to manage severe forms of the disease. A majority of the states (except some like Delhi and Tamil Nadu which have adequate capacity as is reflected by a low CFR) do not have adequate capacities in clinical diagnosis and management of dengue.
- Strengthen triage, case management and referral mechanisms for critical cases at primary and secondary health-care levels.

Laboratories

- Strengthen diagnostic facilities at least at district level as outlined in the Twelfth Five-Year Plan.
- Improve QA of laboratory procedures at all levels in the laboratory network.
- QA/EQAS programme for sentinel surveillance hospitals (SSHs) should be implemented.
- Develop online reporting systems across the country to enable rapid response.
- Expand the laboratory network to reach the targets set by the Twelfth Five-Year Plan and Committee of Secretaries.
- Continue to build epidemiologic and laboratory capacity to support surveillance and epidemic response.

Vector control

Current vector control measures such as use of larvicides in the breeding sites to target the vectors at larval level and space sprays to target the adult vectors show limited impact on transmission of dengue. Therefore, there is a need to engage all sectors involved in city development and management during the planning stage. Key sectors include city municipalities, panchayati raj institutions and departments of drinking water and sanitation, woman and child development, social justice and empowerment, housing and urban poverty alleviation, human resource development and roads and buildings.

Surveillance, epidemic detection and control

- Surveillance should be active and provide early warning of epidemic transmission.
- Develop a communications network using new technology to allow community health workers to report increased fever cases in real time.
- Comprehensive guidelines for outbreak preparedness and response at state/district levels should be integrated into the Integrated Disease Surveillance Programme (IDSP) across states and be supported by rapid response teams (RRTs) under the IDSP.
- Establish robust contingency plans for epidemic response in urban hospitals.
- The case definition specified in the guidelines should be strictly adhered to while reporting at all levels. It affects the way dengue cases are collected, reported and eventually analysed.
- Surveillance data should be disseminated electronically at all levels (local, state, regional and national).
- Develop the capacity of medical colleges as well as of laboratories to diagnose dengue and other pathogens to inform decision-makers and health personnel.
- Dengue should be made a notifiable disease across the country. The private sector has to be involved in epidemic detection, proper case management and regular reporting.
• The JMM does not recommend the use of rapid diagnostic kits (RDKs) for laboratory confirmation of dengue. The programme might consider discouraging the use of such products from the market.

Programme implementation
For effective programme implementation, more efficient inter-ministerial collaboration is required in framing by-laws for each corporation and/or municipality, with a severe penalty clause to ensure enforcement of laws.

Communication
• Evaluate and promote appropriate strategies for risk communication among the public.
• Facilitate OR on behavioural change and implement appropriate measures.

Acute encephalitis syndrome (AES)/Japanese encephalitis (JE)
The disease is endemic in about 171 districts across 20 states and UTs. There is growing recognition that JE as a viral disease represents only 10 to 15% of all AES cases. As a result of increased involvement of the MoHFW in JE control, the CFR has decreased from 25% to 10–15%.

Case management
• Strengthen control and management of AES in the integrated service delivery set-up by strengthening the capacity of intensive care units (ICUs) as well as referral mechanisms. This will reduce the delay between recognition of danger signs and their management, and improve the quality of first medical assistance provided to the patient so that fatalities are minimized.
• Accelerate establishing or strengthening existing rehabilitation centres at district hospitals.

Prevention of AES and JE
• Strengthen JE vaccination through routine immunization programmes.
• Improve environmental conditions to reduce breeding sites. Increase sanitation facilities and access to safe water to prevent enteroviral infections that contribute to AES.
• The GoI has initiated intersectoral collaboration to boost JE control. The sectors involved are drinking water and sanitation, woman and child development, social justice and empowerment, housing and urban poverty alleviation, human resource development, municipalities, panchayati raj institutions and roads and buildings. While acknowledging the intersectoral collaboration, JMM members recommend that the collaboration should be better implemented and evaluated.

Advocacy, IEC/BCC
See section on “Health systems” below.

Surveillance
• NVBDCP must join hands with the National Centre for Disease Control (NCDC) to implement an integrated surveillance system to investigate and control AES cases with unknown etiology.
• NCDC should take a leadership role to investigate AES cases with unknown etiology and identify pathogens that may be potentially involved.
• Epidemic preparedness and rapid response must be improved to help in early detection and control of any epidemics. Epidemic preparedness should also include a risk mitigation plan in conjunction with the media.

**Health systems**

**Human resources**
Fostering human resources and building their capacities regularly are important components of the NVBDCP. Inadequacies were observed in the numbers, skill mix, allocation of responsibilities and prioritization of tasks by health staff at all levels of health care. These include the frontline workers, facility-based services providers as well as supervisors and managers at the mid and senior levels. The JMM recommends the following measures to overcome the gaps:

• Terms of reference and SOPs need to be clearly defined for existing as well as new staff. All staff should be provided with training material and supported by regular training sessions on how to implement and monitor activities on prevention and control of VBDs as well as on supportive supervision.
• Every officer appointed in a leadership position at state or district level must undergo an induction programme with certification. The programme could be made available on an e-learning platform.
• A systematic training programme needs to be conducted for all mid-level managers and supervisors on management and supervision principles and skills. The content of the training should include problem-solving exercises and case studies drawn from real life situations to enable the managers to meet the challenges at ground level. Training through e-learning could be explored for this purpose.
• Clear guidelines on task allocation for accredited social health activists (ASHAs), auxiliary nurse midwives (ANMs) and multi-purpose workers (MPWs) need to be developed. The work priorities and schedules should depend on three criteria:
  – areas with high disease endemicity
  – areas with endemicity earlier but now in surveillance mode
  – areas where elimination has been achieved or where the disease was never endemic.

The sub-centre (SC) will be responsible for work allocation. District officers must be able to use state-level guidelines to allocate work to peripheral staff as well as review their performance annually.

• Gradually regularize the position of male health workers in every SC. Clearly define the skill sets required to perform the duties of the male health worker and outline his functions. A technical supervisor should be appointed at block level for all high-endemic districts.
• Ensure parity of payment across different programmes. Instead of defining the payment for each vertical programme such as Reproductive and Child Health, Revised National Tuberculosis Programme, NRHM and NVBDCP at the Central level, allow states to fix remuneration. This would ensure parity across different programmes being implemented at the state level.
• Provide incentives to staff willing to work in hard-to-reach or remote locations.
• Pool entomologists into entomology surveillance units. Each unit should cover a cluster of districts. Link each unit to national institutes of excellence in entomology like Vector Control Research Centre (VCRC), Puducherry and Centre for Research in Medical Entomology (CRME), Madurai. Both these institutes are permanent institutes of the ICMR. This would provide technical mentorship, constant skill reinforcement and certification to the staff working in these units.

Financing and finance management
• Finances to support the programme are inadequate. There is poor absorption of funds that are allocated due to problems of fund flow and utilization of funds.
• Ensure adequate and timely release of funds preferably in a maximum of two instalments from the Centre to states and from states to districts.
• Ensure resource transfer from Centre to states and from states to districts using the minimum number of budget lines. Sub-budget lines are to be used only for justifying requirements and not for audit or expenditure statements. There should be flexibility within the budget. An assurance of the requisite number of outputs should be insisted upon.
• Where fund flow is sub-optimal and utilization is affected, examine the causes and fix responsibility.
• Ensure development of skills and capacities in states and districts for financial management.

Integration of delivery of intervention and services
• Ensure continuity of vector control services across the rural–urban divide. Place special emphasis on small urban areas and municipalities where a different set of control measures are required.
• Establish continuity between preventive and curative services. One way to achieve continuity would be to ensure that local communities and elected leaders are informed on cases identified in tertiary and secondary centres. This would further help in initiating community mobilization and preventive action by local health workers and vector control teams.
• Establish continuity of care across primary and secondary centres. This requires availability of secondary services within the district and establishment of feedback mechanisms to ensure follow-up care by primary health-care providers.
• Integrate information and services across the private and public sectors. This would enable diseases seen in the private health-care settings to be given follow-up care and to initiate preventive action.
• PPP guidelines should be developed to facilitate the process of building local partnerships. The current PPP framework addresses only the malaria programme.
• Ensure that health-care providers such as paediatricians, health workers and ASHAs, and ancillary services such as blood transfusion, dietary services, ambulance services, laboratory services and bio-waste management, which have been established under different vertical programmes, are available for providing integrated services for all diseases including VBDs.
• Ensure accreditation of laboratories in both the public and the private sector. The latter would help in using private sector capacities for laboratory services based on mutually agreed SOPs.
**Procurement**

Procurement accounts for 56% of the total programme costs. Consistent failures of procurement over the last three years have seriously compromised programme implementation and absorption of funds. Even where commodities have been procured, there have been problems in establishing a responsive distribution system. To strengthen procurement, the JMM recommends the measures below.

- Encourage and support states to develop a system of procurement and distribution of commodities that is benchmarked to the best practice in the area, such as the Tamil Nadu Medical Services Corporation (TNMSC). The hallmarks of such a system should be:
  - effectiveness in ensuring that procurement is timely and secures the best rates
  - transparency in procurement
  - QA
  - sub-district distribution systems to facilities that ensure that supplies are responsive to utilization and that there are no facility-level stock-outs.
- Provide autonomy to states to either tender the three key commodities—LLINs, drugs like ACT and artemether-lumefantrine (AL), rapid diagnostic kits (RDKs)—and other commodities on their own rates, or use the national rate contracts for procurement. In turn, the states should ensure that they adhere to stipulated timelines and quality assurance parameters.
- If delays are encountered in rate contracting, the programme could explore mechanisms like Global Fund for AIDS, TB and Malaria (GFATM) or United Nations Children's Fund (UNICEF) as transient procurement agencies to keep the procurement of commodities uninterrupted.
- Support and provide stewardship to promote indigenous manufacture of quality goods such as LLINs, ACTs, bivalent RDTs and Rk39 test kits both for public procurement and for private markets.

**Communication (advocacy, IEC, BCC)**

IEC and BCC strategies that are currently in place are not informed by the determinants of health behaviour. There is also no information on the effectiveness of current IEC/BCC approaches. Further, there is no coordination between the different communication activities. It was observed that IEC activities were fragmented, inadequate and mainly focussed on distributing print material. Recommendations in this regard are as follows:

- Develop an overarching and integrated VBD control strategy for advocacy, communication and social mobilization. Such a strategy should target both care providers and end-users and should be based on the needs of the community. The strategy should employ mass media, new media, interpersonal media and traditional media. It should be customized to address local factors such as language, dialect, culture, literacy levels and socio-demographic factors. Interactive tools such as use of community radio should be explored.
- Rather than developing communication outputs centrally for all states, emphasize on evidence based, innovative communication outputs which are locally relevant and address key areas.
- Support operational research (OR). Develop M&E tools to improve effectiveness of current IEC/BCC activities and pilot innovative approaches.
- Ensure implementation of communication activities by incorporating them in annual district plans. Earmark a proportion of the programme budget (3–5%) for advocacy and IEC/BCC work.
• Focus on bottom-up, interactive communication. Communication approaches should focus on dialogue and inter-personal communication with patients and communities and social mobilization using front-line workers.

• Advocacy in general and development of strategic advocacy materials for NVBDCP has to be an integral part of NHM.

• Ensure that demand generation for services is matched with increased availability of services.

• Build capacity at district level to develop communication material based on local contextual factors.

Governance

Power and accountability go together. This principle is the key to defining the relative roles of the general administration and the technical leadership at all levels, and the separation between the governance/oversight function and the executive function.

• At the district level the executive accountability, and therefore powers, must be vested in the district programme office led by the chief medical and health officer (CMHO) to whom the vector control team reports. The general administration (i.e. district magistrate) should play an oversight function.

• At the state and national levels, where functions like procurement cannot be handed over to the directorates to execute themselves, accountability must lie with the general administration or special agencies like the TNMSC and Rail India Technical and Economic Service (RITES), the current procurement agency of MoHFW and NVBDCP. The officers in charge of these institutions should be held accountable to complete the procurement in time.

• Appointments to key positions, especially those in senior management positions at the district and state level, should be based on a combination of qualifications, experience and past performance and should be supported by regular capacity building. Arbitrary appointments to key leadership positions, which do not take these issues into account, would affect the fund flow process at state and district level (irrespective of whether the funds flow through the treasury route or through the society route).

• Policy leadership needs to be guided by technical leadership. Capacity of technical leadership needs to be enhanced.

• Another major concern of good governance is to be sensitive and responsive to equity concerns. Vulnerability mapping and its link to disease incidence must be made mandatory. Increased allocation of financial and human resources and technical and managerial support should be provided to areas that are highly vulnerable due to ethnic, caste or geographical barriers.

• Develop and articulate a governance strategy for high endemicity in conflict areas.

• Identify ways in which urban and rural local bodies can contribute and provide oversight for prevention and control of VBDs. Regular feedback on disease outbreaks and involvement in epidemic response will improve system accountability.

• The stewardship role of the government can play an important part in ensuring intersectoral collaboration among sectors that have a relevance to vector control. For example, infrastructure development and construction works must have minimum mandatory vector source reduction measures in place and should be backed by stringent public health legislation. The government should also ensure that the legislation is enforced.
• The government also needs to play a stewardship role in providing and ensuring availability of quality health-care providers as well as manufacturers and retailers of quality diagnostics and medicines.

**Monitoring, evaluation, research and technical assistance**

- **Enhance skills** of supervisors and mid-level managers in M&E.
- **Ensure adequate mobility** support for the programme, including providing vehicles as appropriate, to facilitate monitoring and supervision.
- **Develop a database of information** from surveillance and monitoring of programme activity at block, district and state levels. Build capacity of managers at each level so they can analyse and use this information to enhance programme implementation.
- **Enhance use of lot quality assurance sampling (LQAS)** for programme management.
- **Conduct an external evaluation** of information technology (IT) systems to assess their use and efficacy. To begin with, initiate an evaluation of the National Anti-Malaria Management Information System (NAMMIS). Use learnings from this evaluation to develop more functional IT systems that are commensurate with the institutional capacity at district and sub-district levels.
- **Evaluation should be seen as part of OR and as an integral part of the programme to generate information** that can be applied for programme improvement.
- **Identify agencies/institutions** that can provide support on OR, evaluation or other forms of technical assistance for each district and each state. These agencies could be university departments, medical colleges, research institutions or NGOs. An investment in capacity building for technical assistance agencies may be required.

**State-level reports**

The reports of field visits to the states of Assam, Bihar, Karnataka, Odisha, Tamil Nadu, Uttar Pradesh and West Bengal, and of the Municipal Corporation of Delhi illustrate in detail the accomplishments and the challenges outlined above. Each state-level report describes the programme at the district level. Recommendations emerging from the observations and interviews of key informants at state and district levels inform the action points to be taken in the programmatic areas of the six VBDs and the cross-cutting issues.

**Way forward**

Based on the above findings, a roadmap has to be finalized in consonance with the Twelfth Five-Year Plan. Priority activities have to be highlighted and supported for immediate action. The next JMM can take place in 2016 in articulation with the planning exercise for the National Thirteenth Five-Year Plan, expected to start in 2016.
INTRODUCTION

1.1 Background
1.1.1 Disease profile
Malaria
Malaria is endemic in the country with 95% of the population living in areas at risk of the disease. Annual Parasite Incidence (API) was 1.30 per thousand in 2010. Of the total number of malaria cases reported, the percentage of Pf cases was 50% in 2012. The numbers of reported cases have declined from 1.6 million in 2010 to 1.06 million in 2012, with about a thousand deaths reported annually. Since 2005, the programme introduced Pf-specific RDTs in hard-to-reach areas to improve availability of quality diagnostics. ACT was approved for treatment of Pf cases in the country in 2005. More recently, in 2013, bivalent RDTs for falciparum and vivax have been introduced.

Lymphatic filariasis (LF)
There are 250 (presently 255 due to division) LF endemic districts across 21 states/UTs with a population of approximately 600 million at risk for LF in the country. MDA was launched in 2004 and was scaled up to all the 250 LF endemic districts in 2007. Since 2009, all LF endemic states implement an annual MDA. Under this annual MDA regimen, single doses of diethylcarbamazine citrate (DEC) and albendazole are administered over a period of 5 years or more to the eligible population (except pregnant women, children below 2 years of age and seriously ill persons) to interrupt transmission. The achievement of the programme to date is significant in terms of population coverage with preventive chemotherapy and reduction in the Mf rate. During 2012–13, Goa, Puducherry and one district in Tamil Nadu had successfully completed a TAS and qualified for MDA stoppage.

Kala-azar (KA)
Commonly known as visceral leishmaniasis, KA has remained endemic in parts of the country like Bihar, Jharkhand, West Bengal and Uttar Pradesh. There has been a significant decrease in the number of KA cases (33%) and deaths (20%) in just one year from 2012 to 2013. In 2012, a total of 20 600 KA cases and 29 deaths were recorded as compared to 13,869 cases and 20 deaths in 2013.

Dengue
Dengue has emerged as a major public health problem with massive outbreaks reported in 2005, 2010 and 2012. There are about 50 000 cases and approximately 200 deaths annually. The disease is almost perennial in southern and western parts of the country and seasonal in the central, eastern
and northern parts of the country and Delhi. There is no specific anti-viral drug for dengue and mortality can only be minimized by early diagnosis and prompt symptomatic management of the cases. Deaths per 100 cases or the CFR due to dengue was 3.3% in 1996. In 2013, despite the upsurge in the number of cases, the CFR was 0.23%, indicating improved case management.

Chikungunya
In 2006, a total of 1.39 million clinically suspected chikungunya cases were reported from 16 states/UTs in the country. The southern and western parts of the country were the worst affected. Though the number of cases is decreasing since 2006, transmission is spreading to newer geographical areas. In 2013, 25 out of 35 states/UTs were affected.

Japanese encephalitis
JE has been established in a focalised form. i.e. it is restricted to particular areas. At present, 20 states report JE and AES cases in the country. The states of Uttar Pradesh and Assam contribute 81% of the total JE burden in the country.

1.1.2 Policy framework
The GoI in its 2002 National Health Policy had set goals to:
— reduce mortality by 50% on account of malaria, dengue and JE by 2010
— eliminate KA by 2015, and
— eliminate LF by 2015.

1.1.3 Organizational and institutional framework
Central level
At the Central level, the NVBDCP is the central nodal agency for implementation of programmes for prevention and control of VBDs in India. It is one of the technical departments under the DGHS, MoHFW, GoI. The NVBDCP is responsible for:
— framing technical guidelines and policies to guide the states in the implementation of programme strategies
— budgeting and planning the logistics pertaining to the Central sector
— monitoring of implementation through regular reports
— evaluation of programme implementation and providing financial and commodity assistance to states for programme activities as per the approved pattern.

Regional level
At the regional level, the GoI has 19 Regional Offices for Health and Family Welfare (ROHFW), located in 19 states. Each ROHFW has one or more states under its jurisdiction. The ROHFWs provide a linkage between the NVBDCP and the states. Some of the tasks performed by ROHFWs on the request of NVBDCP are:
— conducting monitoring activities for NVBDCP
— implementing entomological studies (in collaboration with the states)
— conducting therapeutic efficacy studies
— cross-checking blood slides for (QC)
— building capacity at the state level and monitoring and supervising VBDs.
State level
At the state level, a VBD control unit exists under the state Department of Health and Family Welfare. Since health is a state subject in India, the main responsibility of programme implementation and monitoring lies with states. The states are responsible for implementing the programme activities including monitoring in accordance with the national guidelines. The state programme is headed by the State Programme Officer, who is responsible for day-to-day management. Each state has a State Health Society (SHS) at the state level and a District Health Society at the district level through which the funds are released.

District level
At the district level, the VBD control programme is managed by the District Malaria Officer (DMO). The states have been requested to re-designate this post as District Vector-Borne Disease Officer in order to synchronize the prevention and control activities for the six VBDs covered under the programme. The district-level officers are led by the District Health Officer who is designated differently in different states. Within the district, programme activities are implemented at the block, PHC, SC and village levels through the wide network of the PHC system. The institutions created under NHM like Village Health and Sanitation Committees and personnel such as ASHAs are involved in prevention and control of VBDs at the grass-roots level. The programme is monitored under the NHM through the district health societies.

1.1.4 Financing of NVBDCP
The NVBDCP, which is under the NRHM, is financed by domestic budgetary support by the GoI, the state governments and an externally aided component. NVBDCP budget trend of the last 17 years shows an increase in the NVBDCP plan budget of the GoI at a compounded annual growth rate of 6.38%.


Under NRHM, there has been an increase in financing on the disease control programmes from US$ 135 million (INR 8333.48 million) in 2007–08 to US$ 181 million (INR 11173.04 million) in 2009–10.

External aid support to the programme is provided through the World Bank and the Global Fund. The budget estimate in the externally aided component (EAC) under NVBDCP during the period from 2007–08 to 2011–12 was US$ 150.43 million (INR 9327.00 million).

State governments support the human resource and administration of the state malaria offices through their non-plan budget. Many state governments also have their own schemes in NVBDCP. For example, in Assam there are some special programmes like distribution of free bed nets to families living below the poverty line with a budget provision of around US $4.86 million (INR 300 million).

1.1.5 Monitoring of the programmes for VBDs—JMM 2007
In 2007, the GoI led the first JMM by key stakeholders to assess the impact of the programmes. Since 2007, there have been changes in not only the policies and strategies for prevention and control of VBDs but also in the overall health system in India.
1.1.6 JMM 2014
The JMM 2014 was organized by the World Health Organization Country Office for India (WCO India) on the request of the NVBDCP. With the beginning of the Twelfth Five-Year Plan (2012–2017) and the approaching target dates for elimination for some of the diseases, it was necessary to review the progress of the NVBDCP for mid-course corrective measures. It was also an opportune time to inform national strategies.

1.2 General objectives of the JMM 2014
i. To review technical policies and strategies in light of global policies and best practices
ii. To assess the programme implementation against targets defined in the National Strategic Plan (NSP), RFD and NHP 2002
iii. To assess the effectiveness of NVBDCP strategies on control, elimination and/or reduction in disease burden
iv. To formulate recommendations in order to move towards achieving the targets envisaged in NHP 2002 and MDGs by 2015 and sustain these in the post-2015 agenda.

1.3 Specific objectives of the JMM 2014
The review of the NVBDCP was conducted with the following objectives:

i. To assess the access and organizational coverage of VBD-related services in diverse settings, specifically PHC vis-à-vis specialized care, preventive vis-à-vis curative, public vis-à-vis private, formal vis-à-vis informal, and referral systems

ii. To assess VBD programme implementation within the health systems and service delivery structure of the country and identify challenges from the health systems perspective (referral systems, epidemic preparedness and response capacity, human resources, procurement, financing, resource allocation and utilization, medical supplies, technologies and infrastructure)

iii. To review the epidemiology of VBDs in the country with particular focus on disease burden, vector situation, parasitic prevalence, risk areas and factors and population

iv. To assess the extent to which the VBD programme succeeded in reducing the burden of VBDs and mortality (against targets)

v. To assess the robustness of surveillance and health information systems capturing information from the public including line departments like railways, industries vis-à-vis private (for-profit and not-for-profit) as well as informal health providers

vi. To assess the status and level of coordination of the programme within health sector and other stakeholders in pluralistic health system and also with other non-health sectors

vii. To look into the status of community action and participation in terms of community-based monitoring and health/VBD services-seeking behaviour

viii. To assess the stewardship and leadership role of the VBD programme and the VBD Directorate's capacity in evidence-based policy formulation, regulation, human resource development, monitoring and evidence generation (basic and OR)

ix. Formulate recommendations to help achieve the objectives of NHP 2002 and MDGs and sustain the gains into the post-2015 health agenda
1.4 Expected outcomes of the JMM 2014
The expected outputs of the JMM review were:
   i. Review of the programme thematic areas
   ii. State and district level short reports
   iii. Summary recommendations
   iv. Debriefing for senior government functionaries and partners
   v. Detailed programme review report.

1.5 Participants
Fourteen teams with seven international experts and 65 nationals from multidisciplinary fields were engaged in the monitoring mission. Participants included national and international experts from technical agencies, development agencies, national research institutes, civil society, medical colleges and nongovernmental organizations (NGOs) partnering with NVBDCP.

1.6 Mission duration
The mission was organized from 01 to 10 March 2014 with a 2-day visit conducted in Delhi on 27–28 February 2014. The mission included a briefing session to all participants, five days of field visits to the states, two days of deliberations among the experts and concluded with a debriefing meeting on 10 March 2014 during which mission findings were disseminated.

Preparatory activities for the mission started in August 2013 and included resource mobilization, identification of both in-country and external experts, seeking prior consent from the experts for participation, team formation, desk reviews and logistics arrangements.

1.7 Methodology
1.7.1 Thematic areas
Two approaches were adopted for the review – one was from a disease control perspective (vertically driven) and the other was from a health systems perspective (based on a PHC system model). The thematic areas of focus were as follows:
Planning, management and budgeting
   • Planning at Central, state and district level
   • Financing; basis for resource allocation
   • Costing and financial management
   • Procurement and supply chain management
   • Human resource management
   • Legislative measures, stewardship and governance
   • Accountability, transparency, integration
   • Coordination structures – intra- and intersectoral.

Communication
   • Advocacy, IEC for behaviour change
   • Community participation and health-seeking behaviour
   • Role of the community health volunteer
   • Programme advocacy materials and documentation.
Organization of resources and services
- Diagnostic and laboratory services
- Treatment, regimens, curative services and referral
- Drug resistance, pharmacovigilance
- Epidemic preparedness and response
- Involvement of NGOs, private sector and others
- Home-based approaches.

Preventive measures
- Entomology/vector control
- Integrated vector management
- Environmental management
- Special risk groups/vulnerable populations – travellers, pregnant women, children
- VBD-specific preventive measures.

Surveillance, monitoring, evaluation and research
- Disease trends, epidemiology, seasonality
- Risk mapping, urban malaria, vulnerable population
- Quality data management, reporting, recording – public versus private sectors
- Entomological surveillance, laboratory-based surveillance, drug resistance surveillance, etc.
- Monitoring mechanisms, community-based monitoring, QA and QC
- Best practices and innovative approaches
- Operational and implementation research.

1.7.2 Study design
States were ranked according to health systems performance and disease endemicity indicators. Some states are co-endemic for more than one VBD. Maternal and child health indicators were taken as proxy indicators for the performance of health systems – full immunization and antenatal coverage as output indicators and infant mortality rate and maternal mortality ratio as outcome indicators were chosen. Seven states and two districts within each state were selected based on disease endemicity, programme performance, and the above-mentioned indicators. The selection was also based on feasibility and safety of travel to the locations. One state, Andhra Pradesh identified initially was replaced with Tamil Nadu for administrative reasons.

States and districts selected are given in Table 1.1.
Table 1.1: States and districts selected

<table>
<thead>
<tr>
<th>S.No.</th>
<th>State</th>
<th>Districts</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Assam</td>
<td>Nalbari, Golaghat</td>
<td>Malaria, JE, LF</td>
</tr>
<tr>
<td>2.</td>
<td>Odisha</td>
<td>Ganjam, Rayagada</td>
<td>Malaria, LF</td>
</tr>
<tr>
<td>3.</td>
<td>Karnataka</td>
<td>Mangalore, Mysore</td>
<td>Dengue, chikungunya, malaria</td>
</tr>
<tr>
<td>4.</td>
<td>Tamil Nadu</td>
<td>Kanchipuram, Madurai</td>
<td>Malaria, LF, dengue, chikungunya, JE</td>
</tr>
<tr>
<td>5.</td>
<td>Bihar</td>
<td>Vaishali, Purnea</td>
<td>KA, malaria, LF</td>
</tr>
<tr>
<td>6.</td>
<td>West Bengal</td>
<td>Malda, Bankura</td>
<td>KA, malaria, LF</td>
</tr>
<tr>
<td>7.</td>
<td>UP</td>
<td>Gorakhpur, Bahraich</td>
<td>JE, LF</td>
</tr>
</tbody>
</table>

JE – Japanese encephalitis; LF – lymphatic filariasis; KA – kala-azar; – Uttar Pradesh

Linkages in the prevention and control of VBDs with special focus on dengue. Data were collected through the following sources:

- At the district level, data were collected from all levels of health facilities. These included a medical college (tertiary) and one district hospital (secondary).
- From each district, two PHCs and from each PHC, two SCs were also randomly selected.
- In each selected SC, one of the adjoining villages was selected for the study. Of these, one village was randomly selected based on disease endemicity and the other village was selected taking into account the farthest village where cases were occurring.
- A purposive random sample of 20 households was selected from each village taking into account (i) number of positive cases for specific VBDs, and (ii) follow-up cases (under treatment or completed treatment) of specific VBDs. The sample of the households was identified from the records available at the selected SC. The study design is depicted in Figure 1.1.

1.7.3 Tools for data collection

- Data were collected through primary and secondary sources. National briefing meetings were held to apprise the team members of the overall situation of the six VBDs. Participants were also handed thematic papers developed for this specific purpose.
- State visits were organized from 02 to 06 March 2014. Each state team was divided into two groups, each of which visited one district identified for review in each state. The teams were joined by state and district officials of the visiting states. Each state visit started with a briefing and ended with a debriefing meeting. Senior health officials at the state and district level were present at these meetings. These included the Secretary (Health), Director General (Health Services), District Collector and District Chief Medical Officer.
- Focus group discussions and interviews using pre-designed standardized questionnaires were conducted with key informants. These included district VBD officers, staff at health facilities and representatives from voluntary organizations, ANMs, ASHAs, multi-purpose health workers, laboratory technicians, private health-care providers, communities and patients.
- Participants reviewed documents at all levels – records, reports and statements of expenditure.
- Data were also collected through observation of health facilities and household conditions using pre-designed checklists.
Fig. 1: Selection of samples for the Mission

The subsequent pages describe the detailed findings and action points to be taken for further strengthening of the programme. The findings are particularly useful as they come at a time when the importance of including neglected tropical diseases and VBDs in the sustainable development goals in the post-2015 health agenda is being emphasized.

The findings have been divided into three sections: the six VBDs, the thematic issues and the reports from the seven states and Delhi.

It is expected that the JMM recommendations will be used by NVBDCP and partners to coordinate and guide policies and programme planning and implementation for more effective control of VBDs in India.
2. Malaria
2.1 Background
2.1.1 Epidemiological situation
About 95% of the population in India resides in malaria-endemic areas. Malaria is particularly entrenched in low-income, remote, rural areas of eastern and north-eastern states, but important foci are also present in the central and more arid western parts of the country. Malaria surveillance is based mainly on passive case detection by village volunteers, PHCs, malaria clinics, CHCs and other health facilities (about 60% of cases).

The malaria situation reflected in surveillance data from 2000 to 2013 is shown in Table 2.1. From 2000 to 2012, API declined from 2.09 per 1000 to 0.88 per 1000. Annual reported Pf cases decreased from 1.05 million to 0.46 million. The number of reported deaths fluctuated around 1000 per year, until it started declining from 2010. However, the actual burden is expected to be much higher, because many patients go to private health providers, who do not report the cases to the programme, or do not seek care at all. The annual blood examination rate (ABER) has remained around 8–10% from 2001 to 2012. This suggests that the trends indicated by the surveillance data are reliable.

<table>
<thead>
<tr>
<th>Year</th>
<th>Population (in thousands)</th>
<th>Positive cases</th>
<th>Pf cases</th>
<th>Pf %</th>
<th>ABER</th>
<th>API</th>
<th>SPR</th>
<th>SFR</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>970275</td>
<td>2031790</td>
<td>1047218</td>
<td>51.54</td>
<td>8.94</td>
<td>2.09</td>
<td>2.34</td>
<td>1.21</td>
<td>932</td>
</tr>
<tr>
<td>2001</td>
<td>984579</td>
<td>2085484</td>
<td>1005236</td>
<td>48.2</td>
<td>9.18</td>
<td>2.12</td>
<td>2.31</td>
<td>1.11</td>
<td>1005</td>
</tr>
<tr>
<td>2002</td>
<td>1013942</td>
<td>1841229</td>
<td>897446</td>
<td>48.74</td>
<td>9.04</td>
<td>1.82</td>
<td>2.01</td>
<td>0.98</td>
<td>973</td>
</tr>
<tr>
<td>2003</td>
<td>1027157</td>
<td>1869403</td>
<td>857101</td>
<td>45.85</td>
<td>9.65</td>
<td>1.82</td>
<td>1.89</td>
<td>0.86</td>
<td>1006</td>
</tr>
<tr>
<td>2004</td>
<td>1040939</td>
<td>1915363</td>
<td>890152</td>
<td>46.47</td>
<td>9.33</td>
<td>1.84</td>
<td>1.97</td>
<td>0.92</td>
<td>949</td>
</tr>
<tr>
<td>2005</td>
<td>1082882</td>
<td>1816569</td>
<td>805077</td>
<td>44.32</td>
<td>9.62</td>
<td>1.68</td>
<td>1.74</td>
<td>0.77</td>
<td>963</td>
</tr>
<tr>
<td>2006</td>
<td>1072713</td>
<td>1785129</td>
<td>840360</td>
<td>47.08</td>
<td>9.95</td>
<td>1.66</td>
<td>1.67</td>
<td>0.79</td>
<td>1707</td>
</tr>
<tr>
<td>2007</td>
<td>1087582</td>
<td>1508927</td>
<td>741076</td>
<td>49.11</td>
<td>8.73</td>
<td>1.39</td>
<td>1.59</td>
<td>0.78</td>
<td>1311</td>
</tr>
<tr>
<td>2008</td>
<td>1119624</td>
<td>1526210</td>
<td>775523</td>
<td>50.81</td>
<td>8.69</td>
<td>1.36</td>
<td>1.57</td>
<td>0.8</td>
<td>1055</td>
</tr>
<tr>
<td>2009</td>
<td>1150113</td>
<td>1563574</td>
<td>839877</td>
<td>53.72</td>
<td>8.99</td>
<td>1.36</td>
<td>1.51</td>
<td>0.81</td>
<td>1144</td>
</tr>
<tr>
<td>Year</td>
<td>Population (in thousands)</td>
<td>Positive cases</td>
<td>Pf cases</td>
<td>Pf %</td>
<td>ABER</td>
<td>API</td>
<td>SPR</td>
<td>SFR</td>
<td>Deaths</td>
</tr>
<tr>
<td>------</td>
<td>--------------------------</td>
<td>----------------</td>
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<td>-------</td>
<td>------</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>--------</td>
</tr>
<tr>
<td>2011</td>
<td>1194901</td>
<td>1310656</td>
<td>665004</td>
<td>50.74</td>
<td>9.12</td>
<td>1.1</td>
<td>1.2</td>
<td>0.61</td>
<td>754</td>
</tr>
<tr>
<td>2012</td>
<td>1211580</td>
<td>1067824</td>
<td>533695</td>
<td>49.98</td>
<td>9</td>
<td>0.88</td>
<td>0.98</td>
<td>0.49</td>
<td>519</td>
</tr>
<tr>
<td>2013</td>
<td>1211640</td>
<td>881730</td>
<td>463846</td>
<td>52.61</td>
<td>9.26</td>
<td>0.72</td>
<td>0.78</td>
<td>0.41</td>
<td>440</td>
</tr>
</tbody>
</table>

ABER – annual blood examination rate; API – annual parasite incidence; SPR – Slide Positivity Rate; SFR – Slide Falciparum Rate Source: Monitoring and Evaluation Division, NVBDCP

Figure 2.1 shows the decline in malaria cases from 2001 to 2013. The graph shows that a marked decrease in reported mortality was only observed after 2010.

**Fig. 2.1 Epidemiological status of cases of malaria, Pf & Pv and deaths due to malaria (2001 to 2013)**

2.1.2 Geographical distribution and API wise distribution

**Geographical distribution**
Malaria is particularly entrenched in the seven north-eastern states, Andhra Pradesh, Chhattisgarh, Madhya Pradesh, Jharkhand, Odisha, Gujarat, Maharashtra, Karnataka and West Bengal. The topography of these areas—hilly tracts, rivulets and forests—provides ideal ecological conditions for malaria transmission.
Box 1. Reported malaria cases, Pf cases and deaths by state in India

90% of malaria cases are reported by 12 states: Odisha, Jharkhand, Chhattisgarh, Maharashtra, Madhya Pradesh, Gujarat, West Bengal, Uttar Pradesh, Assam, Rajasthan, Andhra Pradesh, and Haryana

90% of Pf cases are reported by 8 states: Odisha, Chhattisgarh, Jharkhand, Assam, Madhya Pradesh, Andhra Pradesh, Meghalaya, and Maharashtra

90% of deaths are reported by 9 states: Odisha, Maharashtra, Madhya Pradesh, Meghalaya, Assam, Rajasthan, Gujarat, Chhattisgarh, and Mizoram

API-wise distribution
In India, areas are classified by sub-centre (SC) coverage area (usually 3000–10 000 persons) for vector control. Since the 1970s, areas with an API above 2 per 1000 per year have been classified as high risk and thereby eligible for vector control

Table 2.2 Distribution of states/UTs based on API

<table>
<thead>
<tr>
<th>API</th>
<th>2006</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Name of states /UTs</td>
<td>No. of states/UTs</td>
</tr>
<tr>
<td>&gt;10</td>
<td>Arunachal Pradesh, Dadra and Nagar Haveli, Meghalaya, Mizoram</td>
<td>4</td>
</tr>
<tr>
<td>5-10</td>
<td>Andaman and Nicobar Islands, Chhattisgarh, Jharkhand, Odisha, Tripura</td>
<td>5</td>
</tr>
<tr>
<td>2-5</td>
<td>Assam, Goa, Haryana</td>
<td>3</td>
</tr>
<tr>
<td>1-2</td>
<td>Gujarat, Karnataka, Madhya Pradesh, Manipur, Nagaland, Rajasthan, West Bengal</td>
<td>7</td>
</tr>
<tr>
<td>&lt;1</td>
<td>Andhra Pradesh, Chandigarh, Daman and Diu, Maharashtra, Sikkim, Uttar Pradesh, Uttaranchal, Tamil Nadu</td>
<td>8</td>
</tr>
<tr>
<td>&lt;0.1</td>
<td>Bihar, Delhi, Himachal Pradesh, Jammu and Kashmir, Kerala, Lakshadweep, Puducherry, Punjab</td>
<td>8</td>
</tr>
</tbody>
</table>
The API-wise distribution of states/union territories in the year 2006 and 2012 in Table 2.2 shows that the total number of states/UTs with API less than 1 has increased from 16 in 2006 to 21 in 2012, out of which 6 have an API of less than 0.1. The number of states with API greater than 10 has decreased from 4 in 2006 to 1 in 2012. The high-endemic states receive additional support from the World Bank and the Global Fund to control malaria.

The discrepancy between Pf burden and death burden by state probably reflects major differences in the response of the health system in the respective states, including the ability to capture information on malaria deaths.

The maps in Figure 2.2 show the API-wise distribution of the districts from 2000 to 2012.