

SRCMF Webinar Series No. 3

Integrated Vector Management to support Cross-border interventions to eliminate malaria, 27 January 2023

A Report

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OPENING REMARKS

The opening session started with welcome address by Dr. Dipanjan Roy, moderator/Resource Person SRCMF Secretariate. He extended warm welcome to the distinguished speakers, representatives from National Malaria elimination programmes from members countries, Resource persons, partners and all other participants of the third SRCMF webinar in spite of their busy schedule. He highlighted that Integrated Vector Management (IVM) is one of the pillars of malaria elimination and it should be one of the key strategies for vector control in international cross-border areas as cross-borders can pose a major obstacle to achieving malaria elimination in the countries that have committed to this goal. Therefore, malaria is one of the diseases where cross-border interventions are of utmost importance. He then introduced the four eminent speakers of the webinar following which he requested Dr. Triwibowo Ambar Gardjito, Researcher MoH, NIHRD, Indonesia to take up the first session on Integrated Vector Management in Malaria Elimination - A Regional Perspective

1. INTEGRATED VECTOR MANAGEMENT IN MALARIA ELIMINATION—A REGIONAL PERSPECTIVE

Dr. Triwibowo Ambar Gardjito shared the current malaria situation in Indonesia:

- a) 358 districts/cities -have malaria elimination certifications
- b) 26 districts/cities - high malaria endemic areas
- c) 17 districts/cities -moderate malaria endemic areas
- d) 113 districts/cities-low malaria endemic areas

Indonesia contains many endemic and unique wildlife with various habitats and ecosystems

- a) A total of 457 species of mosquitoes are reported in Indonesia

He highlighted following problems and challenges of malaria vector control in Indonesia:

- a) At least 27 of 90s Anopheles species have been confirmed as malaria vectors
 - o High variation of malaria vector species
 - o Different -bionomic vector for each species, in biting preferences, breeding habitats and distribution with impact on vector control methods, planning and interventions
- b) The existence of the Anopheles species complex (especially in malaria-endemic areas which are still difficult to eliminate)
- c) He shared the National policy includes integrated vector management malaria control and prevention in Indonesia and includes:
 - o A combination of national policies, local-specific, habitat-specific approached for effective malaria vector control in Indonesia in coastal area, swamp area and paddy field.
 - o A combination of national policies, local-specific, habitat-specific and community participation approaches for effective malaria vector control in Indonesia in hilly, forest and plantation areas
- d) Operational research on vector control to answer the question:
 - o The species composition /cryptic species and how they contribute to transmission?
 - o How do human and mosquito behaviour impact control intervention effectiveness?
 - o When and where the transmission occurs?
 - o What intervention method LLIN, IRS, LSM, Spatial repellent, tropical repellents, treated clothing, space spraying etc is most appropriate to apply?

He shared success stories of species sanitation in controlling malaria vectors in:

- a) The northern coast of Java
- b) Indonesia and community participation in larvae survey and control management in south Halmahera, North Maluku in 2007.
- c) Malaria vector control strategy in the paddy field area through LLIN & IRS on the wall with max 1m, cattle barriers approach and irrigation management and Mina padi.

- d) malaria vector control strategy in the hilly and forest areas with a combination of vector control with early diagnosis & prompt treatment (EDPT) by active case detection.

He touched upon malaria transmission in the forest in Jambi, progress on malaria control efforts in Indonesia and current malaria elimination targets by the islands:

- a) Java Bali by 2022
- b) Sumatra, Sulawesi, West Nusa Tenggara by 2025
- c) Kalimantan, North Maluku by 2027
- d) Maluku, East Nusa Tenggara by 2028
- e) Papua and west Papua by 2029 and
- f) National elimination certificate by 2030

He highlighted Challenges of malaria vector control in countries and Region:

- a) Mapping the receptivity of malaria risk areas
- b) Insecticide resistance status in malaria vectors
- c) Community participation on larvae control management
- d) Existence of Anopheles complex species
- e) Outdoor malaria transmission
- f) Malaria transmission in forest and hilly areas
- g) Malaria control in country/province/district border areas
- h) Change of malaria vector behaviour
- i) Land use change
- j) Existence of Anopheles complex species challenge for effective malaria vector control
 - o Morphology identification is still an important way of identifying Anopheles, especially species that act as a vector
 - o Several experiences and obstacles encountered during survey or entomology studies of malaria vector.

He concluded his presentation by highlighting the following points:

- a) IVM by combination of national policies, local-specific and habitat-specific approaches can lead to effective malaria vector control
- b) Malaria vector control in areas of high and moderate transmission and in areas of low endemicity but stagnant for more than 5 years is a priority for malaria vector control
- c) challenges of malaria vector control need to be targeted, resolved and prioritised to support the acceleration of malaria elimination.

Dr Dipanjan Roy thanked Dr. Triwibowo Ambar Gardjito for a wonderful presentation and emphasised the importance of implemented of effective methods of targeting vectors for protecting health of people. He then invited the second speaker Md. Khalilur Rahman, Ex. Chief Entomologist, NME&ATD CP, CDC, DGHS, MoH&FW, Bangladesh for his presentation on Lessons Learned in addressing gaps in Integrated Vector Management in Bangladesh

2. LESSONS LEARNED IN ADDRESSING GAPS IN INTEGRATED VECTOR MANAGEMENT IN BANGLADESH

Mr. Md Khalilur Rahman started his presentation by highlighting integrated vector management as a rational decision-making process for the optimal use of resources for vector control and to contribution to the prevention and control of vector-borne diseases.

He shared objectives of the National IVM Policy:

- a) IVM guidelines to prevent or minimize the negative impacts of natural resource development on vector borne diseases.
- b) Establish appropriate legislative and regulatory regimes for public health insecticides; promote judicious use, safeguard for health & environment, effective management of insecticide resistance.

- c) Establish inter-sectoral coordination mechanism to ensure empowerment and active involvement of all stakeholders, including the private sector
- d) Identify and build at all levels, relevant capacities including essential physical infrastructure, technical human competencies, and empowered communities for an effective management of vector borne diseases.
- e) Promote cross-border vector borne disease control initiatives aimed at harmonizing and coordinating interventions across the border areas with neighbouring countries (i.e. India, Myanmar, etc.).
- f) Foster a rational decision-making process in the choice, diversification, and deployment of vector control interventions.

Further she touched upon key elements of IVM of Bangladesh:

- a) Advocacy, social mobilization and legislation
- b) Collaboration within the health sector and with other sectors
- c) Integrated approach
- d) Evidence-based decision making
- e) Capacity-building

He shared Integrated Vector Management Components:

- a) Indoor residual spraying
- b) Long lasting insecticide treated bed-net
- c) Environmental management
- d) Biological control
- e) Personal protection
- f) Insect repellents
- g) Insecticidal wall painting
- h) Fogging

He highlighted following Gaps (overall including cross border areas):

- a) Information Gap – Epidemiology & Entomology and Vector Control Interventions
- b) Vector Surveillance and Entomological and Epidemiological information
- c) Limited Engagement and Mobilizing communities in IVM
- d) Basic and Applied Operational research and innovation
- e) Infrastructure and Institutional capacity
- f) Collaboration between program and research institute/Universities
- g) The program is focussed mainly on LLIN
- h) Indoor residual spray(IRS) done on adhoc basis only in some high burden/hotspot villages and in peak season
- i) Environmental management/clean-up is not practiced
- j) Limited use of Insect repellents
- k) Limited use of Personal protection
- l) Biological control is lacking
- m) Insecticidal wall painting is yet to be initiated
- n) Fogging not practiced

Initiatives of Integrated Vector Management in Bangladesh:

- a) Vector Control Need Assessment done
- b) Development of IVM Guideline and IVM Operational Manual for Bangladesh.
- c) Cross Border Meeting (Bordering Districts)
- d) Piloting of IVM completed in Cross Border Sub-district, Haluaghat, Mymensingh

He shared the following Challenges of IVM in Bangladesh:

- a) Intra- and Inter-section linkage and collaboration
- b) Inadequate human resources entomologist
- c) Coordination and co-operation between bordering countries

- d) Lack of appropriate policies on vector control, limitations to the effectiveness of interventions due to operational practices and development of insecticide resistance
- e) Absence of a substantive and unified vector control department within the MoH to coordinate and harmonize cross-cutting vector control efforts.
- f) Uncontrolled use of pesticide in Agriculture
- g) Absence of a functional mechanism for intra-sectoral (within MoH) and inter-sectoral (outside MoH) action on vector control.
- h) Need to further harness the full potential of communities for vector borne diseases control.
- i) Need to proactively prevent and manage the development of resistance to WHOPEs approved insecticides in local disease vector populations.
- j) Inadequate national capacity for eco-epidemiological and entomological assessments to support decision making and evaluate outcomes and impact of vector control.
- k) Inadequate capacity for program monitoring and evaluation.
- l) Inadequate fund allocation for conducting regular entomological surveillance and insecticide resistance monitoring for all VBDs

He concluded his presentation by underling Cross Border issue on IVM:

- a) Need regular entomological Information sharing
- b) Based on mosquito species (Vector) distribution and bionomics, need to implement same intervention in bordering areas.
- c) Coordinated approached should be established
- d) Exchange of knowledge by both countries to build capacity in vector borne disease control
- e) Sharing of information of Foci investigation and Foci management as most cases are imported
- f) Join monitoring team formation in Bordering districts

The moderator thanks Mr Khalilur Rahman for a very insightful presentation and then invited Dr. Kalpana Baruah, Ex. Additional Director, Consultant NCVBDC, India for her presentation on Gaps in Integrated Vector Management in India and Lessons Learned

3. GAPS IN INTEGRATED VECTOR MANAGEMENT IN INDIA AND LESSONS LEARNED

Dr Kalpana Baruah shared current malaria situation in cross-border areas by API and state categorisation for the year 2021

States	API 2021
Assam	0.005
Bihar	0.005
Meghalaya	0.13
Mizoram	6.51
Tripura	2.58
Uttar Pradesh	0.05
West Bengal	0.29

She touched upon the strategies for control of malaria:

- a) Parasite elimination and disease management
 - Early case detection and complete treatment:
 - Active surveillance through MPWs
 - Passive surveillance by using RDT-through volunteers like ASHA and CHVs at village level
 - Sentinel surveillance in identified hospitals
 - Strengthening microscopy services at PHC s

- Case based surveillance
- Strengthening of referral services:
 - Use of referral mechanism under NHM
 - Identified sentinel sites/CHCs for management of severe cases
- Epidemic preparedness and rapid response:
 - Surveillance, monitoring and district RRT
- b) Integrated vector management for transmission risk reduction:
 - Indoor Residual Spraying (IRS) in selected high risk areas
 - Use of long-lasting insecticidal nets (LLINs)
 - Use of Larvivorous fish
 - Minor environmental engineering
 - Entomological surveillance -state & through zones and institutions
- c) Supporting interventions:
 - Behaviour change communication (BCC/IEC)
 - Human Resource development through capacity building
 - Strengthening of supervision through VBDC and MTS
 - Monitoring and evaluation
 - Drug Resistance monitoring
 - Insecticide Resistance monitoring
 - Inter-sectoral collaboration
 - NGO partnership/PPP

She touched upon following points on Integrated Vector Management (IVM):

- IVM is a process for managing vectors, essentially aims to reduce or interrupt transmission of diseases based on the biology of local vector, transmission dynamics and inter-sectoral collaborations
- Effective vector control envisages use of different cost-effective interventions (separately or in combination) the reducing reliance on single intervention
- Most interventions are insecticides based
- Insecticide resistance, cost, environmental concerns are associated factors
- Impact depends on availability of skilled HR for implementation of the strategies and evaluation for taking any course correction.

Steps in IVM planning, implementation, M&E

- a) Disease situation, epidemiological assessment, vector assessment, stratification, local determinants of disease
- b) Selection of vector control methods
- c) Needs and resources
- d) Implementation
- e) M&E

She shared following challenges for vector control:

- a) Challenges during COVID-19 pandemic
 - Implementation of interventions, surveillance & monitoring
- b) Reaching the outreach
 - LLINs being loaded in boats to transport to hard-to-reach areas by land like Malkangiri
 - Reaching destination by boat
 - LLIN distribution to community

She spoke on critical lessons in vector control interventions:

Adult control:

- a) Traditionally used for rural areas
- b) Two core interventions-IRS & LLLIN
- c) Both reduces Malaria incidence but do not protect outdoor transmission
- d) Threat of Insecticide resistance warrants newer molecules for rotation of insecticides
- e) Not suitable for urban areas
- f) Impact depends on community behaviour/acceptance
- g) Vector diversity and bionomics (due to intervention pressure)
- h) Logistic intensive
 - o HR- availability and skill
 - o Situational analysis
 - o Implementation gap
 - o Monitoring
 - o Supply chain-timely replacement
- i) Expansion of slum areas with dense population but dwellings are not suitable for any core intervention

Larval control:

- a) Traditionally used for urban areas
- b) Core interventions-Larviciding
- c) Effective when breeding habitats are fixed, few, findable
- d) Rural to urban transformation-increasing number of cities and populations but no change in malaria control setup
- e) Change of land use pattern -invasion/succession of newer vector to urban ecotype
- f) Dealing with the diverse breeding habitats of rural origin warrants renewed strategy and planning
- g) Slum areas dense population with improper sanitation & water supply-larviciding remains an issue
- h) Logistic supply-as per original urban limits
- i) Adjunct intervention-use of larvivorous fish
- j) Depends upon community engagement & ownership

Major Challenges:

- a) Diverged eco-epidemiology
- b) Transmission dynamics
- c) Multiple vectors
- d) Lack of community acceptance
- e) Socio-cultural practices
- f) Changing vector bionomics
- g) Inadequate trained manpower
- h) Advancements made in vector control methodology/tools
- i) High efficiency of certain vectors
- j) Multiple vector transmission
- k) Prolonged transmission season
- l) Vector resistance to insecticides
- m) Changing bio-ecology
- n) Abiotic factors (climate change)
- o) Operational research
- p) Large scale & uncontrolled population movement

She concluded her presentation by highlighting:

- a) entomological surveillance and control are key components in disease control programme and success of which depends on trained entomological human resource, knowledge of technique adopted, appropriate use of insecticides and monitoring.
- b) vector control concepts have been changing from time to time depends upon changing bio-economics, global climate change, transmission dynamics of diseases and advancement made in methodology /tool.
- c) vector control needs to be strengthened in cross-border areas

The Moderator thanked Dr. Kalpana Baruah for his elaborate presentation and invited the last speaker from Bhutan Mr Rinzin Namgay, Chief Entomologist, VDCP, MoH, Bhutan for his presentation on Bhutan's Lessons Learned in Integrated Vector Management to Eliminate Malaria and way forward

4. BHUTAN'S LESSONS LEARNED IN INTEGRATED VECTOR MANAGEMENT TO ELIMINATE MALARIA AND WAY FORWARD

Mr Rinzin Namgay shared Malaria is at the verge of elimination with only one indigenous case in 2022. Dengue fever was first reported in 2004 and is confined to only a few urban towns. Chikungunya was first reported in 2012 and there is no case after that. Kala-azar a few sporadic cases from out of malaria areas are seen and Japanese encephalitis only 2-3 cases recorded in the past

Evolution of IVM in malaria vector control in Bhutan

1964-1993: IRS with DDT

1994- 1996: IRS with Pyrethroids + Larviciding (Coverage very much compromised)

1997- 2006: IRS + Net impregnation + Larviciding + fogging + vector surveillance

2007- 2022: Focal IRS + LLIN (with help of GF) + IPVM (CAG) + Focal larviciding+Regularized vector surveillance

He highlighted following important points in IVM implementation:

- a) Knowing your area and type of residents/communities for planning:
 - For easy delivery of services
 - Plan logistic supply
 - Plan surveillance and supervisory visits
 - Knowing the Head of the community always eases your implementation work
- b) Vectors:
 - Vector or suspected vectors biology to target control
 - Know Prevailing types of species in your areas
 - Seasonality to target control and timely awareness among public
 - Insecticide susceptibility status
- c) Vector control:
 - Always maintain high coverage
 - Ensure control quality
 - Persistent /repeated public awareness
 - Community involvement
 - Apply tools and know collateral benefits of malaria control on other VBDs

He concluded his presentation by highlighting that if we maintain 100 percent LLIN use it justifies to phase out IRS. He underlined the need to optimise use of resources and tools for vector control to reduce and interrupt transmission of malaria. He underlined the need for strengthening surveillance systems and implement entomological surveillance systems in cross-border areas to accelerate progress towards elimination.

FOLLOWING RECOMMENDATIONS WAS RECEIVED BY PARTICIPANTS FOR INTEGRATED VECTOR MANAGEMENT TO SUPPORT CROSS-BORDER INTERVENTIONS TO ELIMINATE MALARIA

- a) strengthen vector control in cross-border areas through increased capacity, improved joint surveillance, focussed monitoring, better coordination and integrated action across diseases
- b) Neighbouring countries need to have regular dialogues on entomological issues like species prevalence and vector control to strengthen capacity for integrated vector surveillance and vector control, and to improve their preparedness for emerging VBDS.
- c) evidence based decision making and designing interventions based on local context
- d) collaboration within health and other sectors and strengthening channel of communication among key stakeholders
- e) advocacy of IVM with all relevant agencies, organisations, civil society and engaging and empowering of communities and strengthen vector control response

CLOSING SESSION

In the closing session, Dr Dipanjan Roy thanked all the speakers for excellent presentations and all the participants for their active participation and valuable contributions. The moderator formally closed the meeting at 12:00 pm IST.

Agenda

SRCMF Webinar Series No. 3

Integrated Vector Management to support Cross-border interventions to eliminate malaria

27 January 2023 from 10:30 am - 12:00 noon IST

Time	Session	Responsible Person (s)
10:30-10:35	Introduction to Webinar and Welcome remarks by moderator	Dr Dipanjan Roy
10:35-10:55	1. Integrated Vector Management in Malaria Elimination - A Regional Perspective -Discussions	Facilitator/ Moderator: Dr. Dipanjan Roy Presenter: Dr. Triwibowo Ambar Gardjito Researcher MoH, NIHRD Indonesia
10:55-11:15	2. Lessons Learned in addressing gaps in Integrated Vector Management in Bangladesh -Discussions	Facilitator/ Moderator: Dr. Dipanjan Roy Presenter: Mr Khalilur Rahman Entomologist, Bangladesh
11:15-11:35	3. Gaps in Integrated Vector Management in India and Lessons Learned -Discussions	Facilitator/ Moderator: Dr. Dipanjan Roy Presenter: Dr. Kalpana Baruah Ex. Additional Director Consultant NCVBDC, India
11:35-11:55	4. Bhutan's Lessons Learned in Integrated Vector Management to Eliminate Malaria and way forward -Discussions	Facilitator/ Moderator: Dr. Dipanjan Roy Presenter: Mr Rinzin Namgay Chief Entomologist, VDCP, MoH, Bhutan
11:55-12:00	Conclusion a) Summary of the discussions/recommendations b) Open house for any other recommendations	Dr Dipanjan Roy

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