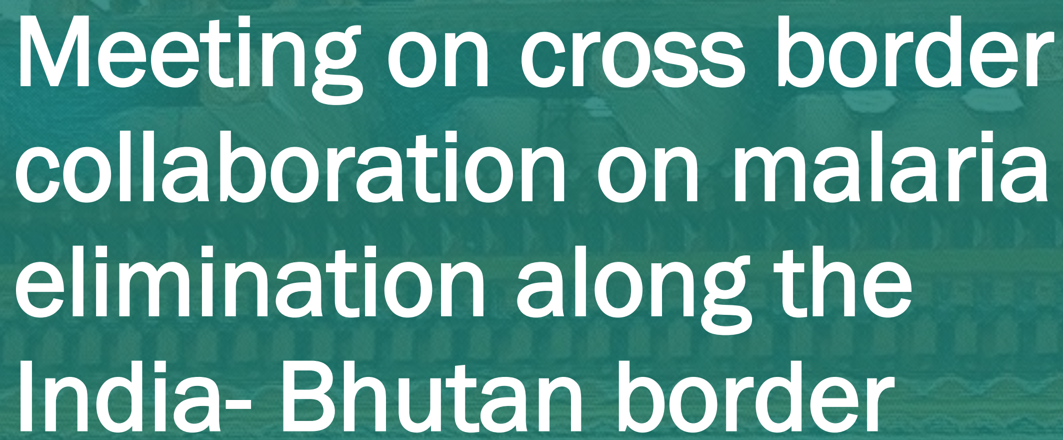

Meeting on cross border collaboration on malaria elimination along the India- Bhutan border

4-5 November 2019

Guwahati, Assam, India

World Health Organization

REGIONAL OFFICE FOR South-East Asia

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Cover page illustrates border crossing between India and Bhutan at Phuentsholing, Bhutan

Abbreviations and acronyms

ABER	annual blood examination rate
ACD	active case detection
ACT	artemisinin-based combination therapy
AMO	Assistant Malaria Officer (India)
ANM	auxiliary nurse midwife (India)
API	annual parasite incidence
APLMA	Asia-Pacific Leaders Malaria Alliance
ASHA	accredited social health activist (India)
BCC	behaviour change communication
BHU	Basic Health Unit (Bhutan)
BPHC	Block Primary Health Centre (India)
BSC	blood slide collection
BSE	blood slide examination
BTAD	Bodoland Territorial Area Districts
BTC	Bodoland Territorial Council
CAG	Community Action Group (Bhutan)
CMO	Chief Medical Officer
CHC	community health centre (India)
D3	Day 3
DDT	dichloro diphenyl trichloroethane
DEO	data entry operator
DHIS2	District Health Information Software 2
DHO	District Health Offices (Bhutan)
DMO	District Medical/Malaria Officer (India)
DMS	District Malaria Supervisor (Bhutan)
DOT	directly-observed therapy
EDCT	early diagnosis & complete treatment
GMS	Greater Mekong Subregion
GoI	Government of India
GTS	Global Technical Strategy 2016-2030
HMIS	Health Management Information System

HQ	Headquarters
HW	health worker
iDES	integrated Drug Efficacy Surveillance
IEC	information, education and communication
IPPI	Intensified Pulse Polio Immunization Programme
IRS	indoor residual spraying
Jt. DHS	Joint Director of Health Services (India)
LLIN	long lasting insecticidal net
LT	laboratory technician
M&E	monitoring & evaluation
MI	Malaria Inspector (India)
MoH&FW	Ministry of Health and Family Welfare
MPW	Multipurpose Health Worker (India)
MS	Medical Superintendent
MTS	Malaria Technical Supervisor
NEWARS	National Early Warning, Alert and Response Surveillance (Bhutan)
NFME	National Framework for Malaria Elimination in India (2016-2030)
NSP	National Strategic Plan
NVBDCP	National Vector Borne Disease Control Programme
Pf	Plasmodium falciparum
PHC	primary health centre
POR	Prevention of re-introduction
PQ	Primaquine
Pv	Plasmodium vivax
RACD	reactive case detection
RAI2E	Regional Artemisinin Initiative2-Elimination
RC	Regional Committee
RDSP	WHO Regional Data Sharing Platform
RDT	rapid diagnostic test
RGoB	Royal Government of Bhutan
RoH&FW	Regional Office for Health and Family Welfare
SDH	Sub-District Hospital (India)
SEA	South-East Asia
SEAR	South-East Asia Region
SEARO	WHO Regional Office for South-East Asia

SI	Surveillance Inspector (India)
SPR	slide positivity rate
SW	surveillance worker (India)
TPR	test positivity rate
UT	Union Territory (India)
VBD	Vector-borne diseases
VBDC	Vector-Borne Disease Consultant
VDCP	Vector-borne Disease Control Programme
WHO	World Health Organization

Executive summary

A two-day meeting on cross-border collaboration on malaria elimination along the India-Bhutan border was organized in Guwahati, Assam, India, on 4–5 November 2019 in collaboration with the WHO Country Office for India. The meeting was a step forward to translate various recommendations from previous meetings/consultations and to operationalize the 2017 Ministerial Declaration on Accelerating and Sustaining Malaria Elimination in South-East Asia to a mutually agreeable strategic "roadmap" with special emphasis on a border-relevant package of interventions at the subnational (district) level. The meeting was also aligned with the Regional Action Plan 2017–2030 "Towards 0. Malaria-Free South-East Asia Region", as well as India's Framework for Malaria Elimination (2016–2030) and National Strategic Plan for Malaria Elimination (2017–2022) and Bhutan's National Strategic Plan for Malaria Elimination (2020–2023).

Bhutan aims to achieve elimination by 2023; whereas efforts are ongoing in India to reduce the malaria burden and at the same time prevent local transmission of malaria in areas where it has been eliminated, as part of a phased elimination strategy, and achieve national malaria-free status by 2030. Bhutan faces a distinct threat of missing the set elimination target and reintroduction of malaria in hitherto malaria-free areas due to cross-border issues.

General objective

To strengthen cross-border collaboration between India and Bhutan to achieve malaria elimination.

Specific objectives

- To review and share updates on malaria elimination with special focus on border districts of Bhutan and India; and
- To develop a roadmap for cross-border collaboration in malaria elimination in the districts of India and Bhutan sharing a border for the next three years.

The participants included: Joint Secretary, MoH&FW; Director and Deputy Director from National Vector Borne Disease Control Programme (NVBDCP) of the Government of India (GoI) and Directors concerned, Regional Office for Health & Family Welfare (RoH&FW) of the Government of India; state and district teams from Arunachal Pradesh, Assam, Sikkim and West Bengal, all bordering Bhutan; representatives from the Bodoland Territorial Area (BTA) districts; as well as the Bhutan Vector-borne Disease Control Programme (VDCP) and teams from Bhutanese districts bordering India; besides WHO (Country Office for India, the South-

East Asia Regional Office, and headquarters). The total number of participants was 42, including 10 participants from Bhutan.

During the opening session, delegates from the MoH&FW and NVBDCP, GoI, and VDCP, Royal Government of Bhutan, and WHO addressed the participants and emphasized comprehensive interventions within national boundaries along the international border and the criticality of effective cross-border collaboration for complementary responses through district-wise microplans tailored to the context. Micro-stratification and analyses of data at local level was emphasized. Best practices from the Greater Mekong Subregion (GMS) were also shared. The criticality of regular follow-up was stressed. It was underscored that the WHO support has been commendable and should continue.

The technical sessions started with presentations and discussions relating to key messages from recent cross-border meetings and the WHO operational framework for cross-border collaboration to accelerate malaria elimination in the WHO South-East Asia (SEA) Region. This was followed by country presentation by India on malaria situation and progress to elimination with special emphasis on actions taken along the international border. The Indian states and districts bordering Bhutan presented the overall profile, health systems profile and malaria situation over recent years, especially with reference to malaria along border areas and possible actions at local levels towards malaria elimination along the Indo-Bhutan border. Thereafter, Bhutan presented the overall country situation report followed by detailed district-wise profile and malaria information along the India border.

Salient recommendations were as under:

1. For countries:

- Sharing of malaria data at district-to-district level through identified focal points: [real time (within 24/48 hours)] including complete case history that would commence with such platforms/modes as – Whatsapp, Dropbox, e-mails, phone, etc.
- District-to-district coordination meetings (quarterly) for joint review and planning.
- Synchronized implementation of interventions like LLIN distribution, IRS by districts on both sides of the border as much as possible.
- Diagnosis and treatment irrespective of nationality and follow up of treatment compliance.
- Strengthening of surveillance and M&E adjusted to burden reduction & elimination settings.
    - Initiation of case/focus investigation, classification & response especially in border districts of India reporting relatively few cases.
    - Screening of population coupled with IEC/BCC in identified locations (“marketplaces” on certain designated days) jointly by India and Bhutan.
    - Ensuring reporting from private sector to HMIS by India.

- Involvement of local school students, teachers, self-help groups, community leaders for early diagnosis and complete treatment (EDCT), IEC/BCC etc. in remote and difficult-to-reach areas as alternate mechanisms of service delivery in India.

- Epidemiological analysis of each border district periodically.
- Optimal cooperation and coordination between Bodoland Territorial Council (BTC)/BTAD and state NVBDCP in Assam.

2. For WHO:

- Create, facilitate and support the digital platforms for malaria data sharing between India-Bhutan border districts.
- Facilitate review of district-to-district cross-border coordination annually.
- Strengthen capacity at state, district and sub-district levels especially on epidemiological analysis as well as case and focus investigation, etc.

The meeting ended with a vote of thanks to all dignitaries and delegates by Dr Roop Kumari, Technical Officer, Malaria and VBDs, WHO Country Office, India.

1. Background

The WHO South-East Asia Region (SEAR) witnessed an appreciable decline in malaria case incidence rate and malaria mortality relative to other regions. Malaria is endemic in nine out of 11 countries of the Region, accounting for nearly 70% of all the burden outside the WHO Africa Region. Two countries contributed almost all the malaria burden in the SEA Region. India and Indonesia accounted for 68% and 21% of the reported cases and 65% and 16% of malaria deaths, respectively. In spite of being the highest burden country of the Region, India showed a 22% decline in reported cases within a year from 2016 to 2017. All countries in the SEA Region have committed to malaria elimination. Two Member States have been certified as malaria-free – Maldives and Sri Lanka; while three other Member States – Bhutan, Nepal, Timor¬-Leste, have been identified as having the potential to eliminate malaria by 2020 (of 21 countries termed as "E-2020 countries" by WHO).

India and other countries have targeted malaria elimination by 2030 at the latest. Towards that end, high-level commitments have already been made by the Ministers of Health of the Region, notably in the 2017 Ministerial Declaration on Accelerating and Sustaining Malaria Elimination in South-East Asia as well as the Regional Action Plan 2017-2030 "Towards 0. Malaria-Free South-East Asia Region" in November 2017. Among the key strategic areas, the Ministerial Declaration includes a provision for universal access to quality-assured prompt malaria diagnosis and treatment as well as effective prevention in border areas and criticality of effective cross-border collaboration and complementary responses. The Regional Action Plan emphasizes the need for cross-border actions as well. In 2018, the WHO released a publication, "An operational framework for cross-border collaboration for a malaria-free South-East Asia Region" to guide the countries to adapt and frame their own cross-border initiatives.

Malaria elimination cannot be achieved and sustained in isolation by any country and may possibly miss the timelines set for elimination without adequate emphasis on malaria along the international border areas that witness migratory flows. Malaria in border areas poses a number of challenges due to enormous variation and complexity of epidemiology, with some countries approaching elimination while others continuing to have relatively significant malaria burden (for example, Bhutan and India). Areas with high endemicity have a high potential to spread across borders, while some low endemicity areas have the potential for outbreaks. Even in countries that had hitherto been malaria-free and those nearing elimination, there is a threat of re-establishment and resurgence.

The border areas are also fraught with complex geography and difficult settings. Health and various social/welfare services along international borders are often weaker and more poorly staffed than in more central areas, in part because some of these areas are remote, forested and/or may be chronically affected by security concerns and tensions. Moreover, many

people living in border areas are from socioeconomically vulnerable ethnic/marginalized groups, and disadvantaged in terms of access to health care and social services. In some instances they also lack citizenship rights. While universal coverage of populations is being pursued by countries within national boundaries including border areas, informal reports from the field indicate the need for enhancing access to vulnerable populations, even for those not yet having valid identification.

It is extremely important to reach out to all who remain vulnerable and at risk or who pose risk to other vulnerable populations. Real-time epidemiological data on the malaria situation in border areas is typically weak or even absent altogether. Very limited or absence of functional inter-country, cross-border cooperation and collaboration, except periodic meetings/consultations mostly involving national/state levels, has been identified as a key challenge.

India and Bhutan share friendly international borders with almost unrestricted population movement mainly for economic and sociocultural reasons. The international border between the two countries is 699 km long, and adjoins the states of Assam (267 km), Arunachal Pradesh (217 km), West Bengal (183 km), and Sikkim (32 km) and nine districts on the India side and 10 districts (Dzongkhags) on the Bhutan side although mostly seven districts in their southern borders have been reporting malaria, especially those bordering Assam. Further, in Bhutan, there are vast numbers of workers from India who work in development projects besides those who cross the border for work on daily basis (returning on the same day) or regular basis (to visit local markets on designated days, etc.). There is also close proximity of population settlements.

Both countries have seen tremendous improvements in health indicators. In similar manner, malaria indices have also declined in both countries, although at different speed. Bhutan aims to achieve elimination by 2023; whereas efforts are ongoing in India to reduce the malaria burden and at the same time prevent local transmission of malaria in areas where it has been eliminated as part of phased elimination strategy and achieve national malaria-free status by 2030.Bhutan faces a distinct threat of missing the set elimination target and reintroduction in malaria-free areas due to cross-border issues.

Both countries have expressed the critical need for functional cross-border collaboration, especially at the local level on several occasions (meetings/consultations, programme reviews), including at the WHO meeting of national malaria programme managers in March 2019 in Gurugram, India, on operationalizing the Ministerial Declaration. In August 2019, the Global Fund and Asia-Pacific Leaders Malaria Alliance (APLMA) organized a high-level peer-to-peer exchange in Bhutan on the prevention of re-establishment of malaria transmission. Key national programme staff and select stakeholders and experts from Bhutan, India, Indonesia, Malaysia, Nepal, Sri Lanka, Timor-Leste and WHO participated.

A cross-border meeting on malaria elimination was also held in Bhutan in September 2019 with participation by the National Vector Borne Disease Control Programme (NVBDCP),

select state and district officials from India, officials of the Vector-borne Disease Control Programme (VDCP), and district officials from Bhutan, along with WHO, other partners and experts. These meetings again underscored the urgent need for cross-border collaboration between the two countries.

In this background, a meeting was held between the National Vector Borne Disease Control Programme (NVBDCP) of the Ministry of Health & Family Welfare (MoH&FW), Government of India (GoI), the WHO India Country Office and the WHO Regional Office for South-East Asia (SEARO). Subsequently, the India national programme communicated to the WHO Country Office for India a request for a subnational consultation in India (at Guwahati, Assam) involving all states/districts on both sides of the border as well as those leading the malaria elimination programme at the national levels. The subnational consultation with facilitation and coordination support by WHO was envisaged as a critical step forward to establish functional cross-border collaboration between India and Bhutan towards accelerating progress for malaria elimination.

The meeting aimed to translate the commitments, recommendations from previous/recent meetings and national/international strategies and frameworks into a mutually agreeable strategic “roadmap” outlining a tailored and “border-relevant” package of interventions with special emphasis on actions at local levels (district and sub-district). The agenda of the meeting is provided in Annex 1.

The participants included: Joint Secretary, MoH&FW; Director and Deputy Director from National Vector Borne Disease Control Programme (NVBDCP) of the Government of India (GoI) and relevant directors from the Regional Office for Health & Family Welfare (RoH&FW) of the Government of India; state and district teams from Arunachal Pradesh, Assam, Sikkim, West Bengal (bordering Bhutan); representatives from the Bodoland Territorial Area Districts

(BTAD); as well as Bhutan Vector-borne Disease Control Programme (VDCP) and teams from Bhutanese districts bordering India; along with WHO (Country Office for India, SEARO and headquarters). The total number of participants was 42, including 10 from Bhutan. The list of participants is appended as Annex 2.

General objective of the meeting

To strengthen cross-border collaboration between India and Bhutan to achieve malaria elimination.

Specific objectives

- To review and share updates on malaria elimination with special focus on districts of Bhutan and India sharing border; and
- To develop a roadmap for cross-border collaboration in malaria elimination in the districts of India and Bhutan sharing a common border for the next three years.

2. Opening session

Dr Neeraj Dhingra, Director, NVBDCP, welcomed the participants and reiterated the commitments made in the 2017 Ministerial Declaration. While sharing the country's efforts that resulted in a significant decline in the malaria burden, he mentioned the multipronged strategies and interventions being undertaken towards phased elimination. He stated that cross-border collaboration is one of the key activities in the National Strategic Plan for Malaria Elimination 2017-2022.

He also stressed the need to establish and strengthen mechanisms for periodic consultations/exchange at the subnational/local levels (between focal point/staff at the local levels of the health system) and for harmonized and synchronized interventions. Such efforts would seek to minimize the international import and export of malaria cases, ensure appropriate and effective follow-up of imported cases crossing international borders and at the same time tackle malaria transmission reduction within national boundaries along international border lines and towards creating malaria-free zones. The dialogue initiated following recent meetings in Bhutan and India should be sustained.

Mr Rinzin Namgay, Chief Entomologist, VDCP, Bhutan, echoed the importance of cross-border collaboration in pursuit of the set targets for malaria elimination by both countries. Bhutan has been successful in reducing cases and deaths and is now attempting to tackle the last few cases. Imported malaria, especially from Indian states along the international border and Assam in particular, remains a major concern. Many international/national cross-border meetings have been held but tangible action at the local level was inadequate. In 2019, ground level collaboration has taken shape through identifying focal points, sharing of malaria information between local health/laboratory officials through various modes, and exposure visits to health facilities and hospitals, among others. A roadmap for contiguous would be advantageous for a joint plan of action towards malaria elimination and prevention of reintroduction.

Dr Roop Kumari, Technical Officer, Malaria and other VBDs, WHO India Country Office, welcomed the participants on behalf of WHO. She recalled the vision of a malaria-free world as envisaged in the WHO Global Technical Strategy 2016-2030. She stated that India's progress in reducing cases and deaths has been remarkable in moving towards malaria elimination by 2027. Among several areas, WHO provided technical support in the development of the India's NSP 2017-2022. Cross-border meetings were also supported in the past wherein key actions were recommended and these should be accomplished. Along the India-Bhutan border, eco-epidemiological factors remain similar and many challenges exist. Those should be overcome with appropriate interventions. It is imperative that cases

are investigated, classified and tracked and information shared through effective district-to-district collaboration.

Dr Neena Valecha, Regional Adviser for Malaria, WHO Regional Office for South-East Asia, highlighted the appreciable decline in the malaria case incidence rate and malaria mortality in the SEA Region relative to other regions. Both India and Bhutan have shown commendable progress, she said. It is extremely imperative to fully operationalize the 2017 Ministerial Declaration on Accelerating and Sustaining Malaria Elimination by each country. Cross-border collaboration is one of the key strategic areas that have been discussed at several meetings and consultations. This is an opportune moment to translate the strategies/recommendations into plans and actions at the local level. Effective collaboration on the ground would prevent and reduce cases, eliminate malaria and prevent reintroduction, she reiterated.

She also mentioned the best practices from the Greater Mekong Subregion including the establishment of a regional data-sharing platform for six countries. The platform has progressed to monthly malaria data sharing that would now include information on mobile and migrant populations. It is expected that this meeting would discuss a roadmap including such initiatives that would be beneficial to the countries. She conveyed that WHO would continue to support countries in malaria elimination endeavours including the establishment/strengthening of the cross-border component.

Ms Rekha Shukla, Joint Secretary, MoH&FW, Government of India, in her address mentioned that malaria was a multifaceted public health issue. Among various needs, tackling malaria in border areas is important and would benefit both countries. In view of the peculiar and challenging border situation including inadequate social and health services, one size does not fit all and hence practicable district-wise micro-plans with tailored approaches should be developed, she observed. Collaboration along both sides of the international border through the sharing of relevant malaria information, harmonization and synchronization of interventions, surveillance and M&E, and local-level meetings should be key elements in these microplans. Commitment, consistency and regular cooperation and follow-up of implementation of interventions is critical. India and Bhutan have cordial relations and it is India’s moral duty to support Bhutan in achieving malaria elimination by set timelines while concentrating on transmission reduction within national boundaries. At the same time, Bhutan needs to inform India regarding each imported case to ensure timely and appropriate action, she observed. WHO support is commendable and should continue, she said.

Dr Suman Wattal, Deputy Director, NVBDCP, GoI, and Dr S. Sen, Senior Regional Director, Regional Office for Health & Family Welfare (RoH&FW), from India and Mr Tenzin Wangdi, Deputy Chief Entomologist and Dr Dorji Tshering, MS, CRRH, Gelephu, from Bhutan were

nominated as rapporteurs. Dr Shampa Nag, Consultant with WHO SEARO, was named the coordinating rapporteur.

3. Session 1: Cross-border framework and malaria situation along India-Bhutan border

The technical sessions started with presentation and discussion relating to key messages from recent cross-border meetings and the WHO operational framework for cross-border collaboration to accelerate malaria elimination in SEAR. This was followed by India country presentation on malaria situation and progress to elimination with special emphasis on actions taken along international border. The districts from Arunachal Pradesh, Assam, Sikkim and West Bengal presented the overall profile, health systems profile and malaria situation over recent years, especially with reference to malaria on both sides of the border areas and possible actions at local levels. Subsequently, the VDCP, Bhutan presented malaria situation and progress to end malaria in Bhutan followed by presentations from Sarpang and Samdrup Jongkhar districts.

Operational framework for cross-border collaboration to accelerate malaria elimination in SEA Region and key messages from recent cross-border meetings: Dr Risintha Premaratne, Technical Officer-Malaria, WHO SEARO

Salient points from the SEAR Joint Vision and Action Plan 2017-2030 was shared. This document is based on GTS 2016-2030 and defines SEAR targets & milestones, based on country NSPs, prioritizes actions, describes key interventions for different objectives and calls for national oversight and regional progress monitoring. In addition, political commitment for malaria-free SEAR by 2030 exists and all countries have signed the 2017 Ministerial Declaration on Accelerating And Sustaining Malaria Elimination in the South-East Asia Region. It was also mentioned that the SEA Regional Committee Seventy-first Session in 2018 urged the countries to operationalize the ministerial declaration through implementation of key strategic areas. The actions by the WHO include supporting countries in their efforts to achieve national targets and facilitating cross-border collaboration. He further mentioned about the endorsement of the operational framework on cross border collaboration released during the 2018 RC and the need for adaptation. The Framework is guided by the vision of achieving: a ‘Malaria-Free South-East Asia Region by 2030’ and the Sustainable Development Goals. In addition, it is in alignment with: GTS 2016-2030, Regional Action

Framework for Malaria Control and Malaria Elimination in the Western Pacific (2016-2020), GMS malaria elimination strategy and Roll Back Malaria Partnership Action for Investment to Defeat Malaria. The focus is on helping countries to: prevent and/or reduce transmission and disease burden with special emphasis on minimizing risk of importation of malaria cases; prevent, and/or rapidly respond to, and control malaria epidemics; and prevent re-establishment of malaria transmission. The objectives are to maximize: access to malaria interventions in border areas (within national boundaries); malaria surveillance and response as well as M&E in border areas; and cross- border coordination mechanisms that provide an enabling environment. He presented illustrations of different scenarios in terms of epidemiological and geographical context and the importance of prioritizing actions as per the scenarios.

Furthermore, the specifics of the WHO Regional Data Sharing Platform (RDSP) to support malaria elimination in GMS were explained. The RDSP was established in 2014 for monitoring malaria elimination efforts, detailed & customized data analysis with graphical presentation at regional, national and sub-national levels, supporting cross-border collaboration and inputs to global and regional advisory bodies. The WHO receives surveillance data from GMS countries monthly and stores them in the DHIS2-based database. The RDSP is funded by Global Fund Regional Artemisinin Initiative (RAI) 2E grant (2018-2020). All GMS countries [Cambodia, People's Republic of China (Yunnan), Lao PDR, Myanmar, Thailand and Viet Nam] are now reporting data monthly to RDSP. Few of these countries are sharing even sub district level data. The particulars captured in the RDSP Dashboard were shared as well. He mentioned that the SEARO has initiated the process of establishing a similar database. The hardware & software environment is being planned. Furthermore, he shared the key messages from recent cross-border meetings, viz. meeting of the national malaria programme managers on operationalizing the Ministerial Declaration on Accelerating and Sustaining Malaria Elimination in the South-East Asia Region, held in March 2019 in Gurugram, India; and cross border meeting on malaria elimination between Bhutan-India held in September 2019 in Gelephu, Bhutan.

Malaria situation and progress to elimination with special emphasis on actions taken along the international border: Dr Suman Wattal, Deputy Director, NVBDCP, Govt. of India

India has 1.3 billion population (in 2019) i.e. ~18% of the total world population in 29 States and 6 Union Territories and 712 districts and 649,481 villages. Historically, India had seen huge reduction in malaria cases and zero malaria deaths in the 1960s and launched national malaria eradication programme. However, due to technical, operational, financial challenges, the country witnessed resurgence in the 1970s. Later, with modified programme strategies, malaria situation showed improvement. Disease burden due to malaria in India has reduced

significantly from 2000 onwards with malaria peaks going down although certain fluctuations in the declining trend were noted due to focal outbreaks in certain years. Between 2000 and 2018, reported malaria cases have declined from 2.03 million to 0.84 million and reported malaria deaths also declined from 959 to 98. From 2010, India reported significant decline and the country malaria map is shrinking and the disease is now localized to few high transmission areas. From 2015 to 2018, India has recorded 61% and 83% decrease in cases and deaths, respectively. From 2017 to 2018, the country has reported impressive declining trend, viz. 49%, 61% and 50% reduction in case, Pf cases and deaths, respectively. From 2018 to 2019 (until June) too, declining trend in terms of 29% in cases 30% in deaths was reported. In 2018, four states accounted for 67% of total malaria [Uttar Pradesh (205), Chhattisgarh (18%), Odisha (15%), Jharkhand (13%)]. This is major shift from the state wise situation in 2017 when Odisha, Chhattisgarh, Jharkhand accounted for 69% of cases (41%, 17%, and 11%, respectively). Whilst malaria declined in Odisha, Chhattisgarh, Jharkhand in 2017 and 2018, increase was noted in Uttar Pradesh. The proportion of Pf:Pv is ~50:50 in 2018.

In line with the international strategies, timelines, and commitments at the highest leadership level in India and importantly, buoyed by the achievements of declining trend of malaria, India initiated paradigm shift from control to elimination from 2016 onwards. A National Framework for Malaria Elimination (NFME) 2016-2030, was launched in February 2016 with a vision to eliminate malaria from the country by 2030. A National Strategic Plan (NSP) for malaria elimination (2017-2022) was later launched in 2017. According to the NSP 2017-2022, the district is the operational unit considering that malaria is a local & focal problem, and all districts/reporting units have accordingly been stratified into four categories based on reported annual parasite incidence (API) for the years 2014-2016. The categorization of districts is as under: Category 0: Prevention of re-establishment phase (Districts/units historically considered to be without local transmission and reporting no case for last 3 years. Vigilance will be maintained in these districts to prevent reintroduction of malaria in view of climate change); Category 1: Elimination phase (districts/units having API less than 1 per 1000 population); Category 2: Pre-elimination phase (districts/units having API 1 and above, but less than 2 per 1000 population. These are targeted for elimination in the subsequent years); and Category 3: Intensified control phase (Districts/units having API 2 and above per 1000 population. These are positioned for elimination targeting in the subsequent years). The NSP 2017-2022 delineates the following strategies for malaria elimination: Early diagnosis and complete treatment; Surveillance and epidemic response; Prevention; Cross-cutting interventions (advocacy, communication and community mobilization, programme management and coordination, monitoring and evaluation, research and development).

A subnational malaria elimination plan with milestones and targets has been developed with following categorization: Category 1: 15 states/UTs) aiming at subnational elimination by 2022: Interruption of transmission & zero indigenous cases and deaths by 2020 in all these states; and prevention of re-establishment of transmission till 2027; Category 2: 11

states/UTs aiming at sub-national elimination by 2024: Interruption of transmission and zero indigenous cases and deaths by 2022in all these states; and prevention of re-establishment of transmission till 2027; and Category 3: 10 States/UTs aiming at elimination by 2027: Interruption of transmission and zero indigenous cases and deaths by 2024 in 5 high endemic states; prevention of re-establishment of transmission till 2027 for sub-national elimination; attaining elimination in remaining 5 states by 2027; and prevention of re-establishment of transmission till 2030.The WHO certification for malaria elimination is aimed at by 2030. In 2018, of 714 districts, 36 (5%), 615 (86%), 21 (3%), and 42 (6%) districts were in the categories, 0, 1, 2, and 3, respectively. This indicates a progressive decrease of in number of States/UTs from category 3 to 2 and from 2 to 1, and so on.

Malaria situation along areas bordering Bhutan

On the India side, there are four states, namely, Arunachal Pradesh, Assam, Sikkim, West Bengal with 0.83 million population. Overall, these states individually reported 625, 3816, 6 and 26 440 cases in 2018, which were relatively low than those reported in 2017. There are 10 districts belonging to these 04 states that have international border with India. These districts together reported 3208 cases in 2018 reflecting a 62% decline relative to 2015 level (8,381 cases). In 2018, the Pf% was 69%. Overall, each of the above-mentioned districts except Tawang district in Arunachal Pradesh and Udalguri district in Assam have reported decrease in number of cases in 2018 relative to the figures reported in 2015. From 2017 to 2018, Udalguri district in Assam and Darjeeling district in West Bengal showed increase in number of cases and Tawang district in Arunachal Pradesh reported the same number of cases (although only two cases in both years). In terms of Slide Positivity Rate (SPR) however, many districts have shown increased figures in 2018 relative to those reported in 2015. Udalguri district recorded lower SPR in 2018 (2.62%) than the figure in 2015 (3.43%). However, the SPR showed increase in 2017 & 2018 when compared with the SPR in 2016.

The challenges need to be tackled with following solutions: malaria should be made notifiable disease and cross reporting to Bhutan should be done within 24 hours; an Indo-Bhutan border malaria elimination working group comprising district , sub-district, PHC level officials should be constituted with representation from the state and central levels who would have frequent discussions within the working group reviews between the bordering districts; 100% case detection and treatment for parasite clearance and radical cure; Strengthening surveillance (100% surveillance of migrant population at entry/exit points; Mapping of all Govt. and private health facilities; Identification and mapping of hotspots and foci, characterizing and clearance; Fever surveillance & active case detection; Entomological surveillance and evidence based response); Universal coverage of at risk population with LLIN, IRS; and synchronization of anti-vector measures.

The district and state Programme Officers from India presented the malaria situation and progress to elimination with special emphasis on actions taken along international border.

Arunachal Pradesh

Tawang district: The district has three blocks and 218 villages. Of the total 49 777 people, 70% is indigenous population. The district has a 116-km-long international border with Bhutan (besides sharing border with the People's Republic of China). The public health systems comprise one district hospital, two CHCs, six PHCs and 13 subcentres. As regards private sector, only one private laboratory is mentioned. In 2018, all 03 blocks were noted under API<1 category. The number of cases was two in 2018 (Pf %: 50%).There are two PHCs within 5 km of the international border with Bhutan. The PHC Dudunghar has recorded increasing ABER from 2016 (0.8%) to 2018 (4.3%), although below the national standard set at 10%. No malaria cases have been reported in 2019 (until June). Likewise, PHC Bongkhar has reported an ABER of ~4% and nil malaria cases so far. The district does not have sanctioned positions of LT, MTS although DMO, VBDC, DEO and MPW positions are filled.

The challenges for cross-border collaboration include: remote & rugged terrain with no road connectivity except ~8 hours walking, inadequate communication, and administrative procedures. In addition, poor socio-economic condition, belief in traditional medicine, as well as deficient health systems especially skilled staff, infrastructure/laboratory equipment, inadequate funds, etc. need to be addressed. Cross-border coordination is yet to be initiated.

West Kameng district: The district has 04 blocks and 264 villages. Of the total 84,106 people, 69% is indigenous population. The district has long international border with Bhutan. The public health systems comprise 01 District Hospital, 04 CHCs, 05 PHCs and 26 Sub centres. As regards private sector, only 01 private hospital and 24 private laboratories are mentioned. In 2018, all 04 blocks were under API<1 category. The number of cases declined from 85 in 2015 & 2016 to 24 cases in 2018 (Pf%: 46%). In 2019 (until June), the reported number of cases was eight. The district recorded an ABER of 6%-8% during 2015-2018 below the national standard set at 10%, except in 2016, when the ABER was reported as 10%. During this period, the API showed an increase in 2016 (1.24 per 1000 population) relative to that in 2015, although declining trend is noted thereafter. The API was 0.24 per 1000 population in 2018. The TPR showed declining trend from 2015 to 2016 but increasing to 2.7% in 2017 before drastically declining to 0.92% in 2018.There is 01 PHC within 5Km of the international border with Bhutan. The PHC Balemu has recorded unusually high ABER during 2016-2018 period (range: 44%-91%), which needs to be examined, much higher than the national standard set at 10%. Although malaria cases increased from 2015 (06 cases) to 2017 (16 cases), the number declined to only 03 cases in 2018. No malaria case has been reported in 2019 (until June). The district has VBDC, DEO, LT, & Field Worker. The MTS positions are vacant (03 in number) besides 01 LT position.

The challenges for cross-border collaboration include: difficult terrain, deficient health systems, power supply, population movement (Bhutanese population cross Balemu frequently for pilgrimage to Tawang and tourism – picnic purposes). The mobile and migrant populations also comprise: daily/weekly commuters from both India and Bhutan who come for selling meat, vegetables; daily labour mostly from Dhekiajuli, Orang (Darrang/Sonitpur districts), Rowta, Udalguri (Udalguri district) from Assam, who are engaged in construction work; and seasonal labour who are engaged in cultivation of vegetables during March to September period. Cross-border issues could be addressed through coordination meetings and sharing/cross checking of information regarding indigenous cases. However, cross-border coordination is yet to be initiated.

Assam

Baksa district: The district has nine blocks and 822 villages. Of the total 1 015 030 people, 40% is indigenous population. The district has a 90 km-long international border with Bhutan (Zhemgang and Nanglam Dzongkhags). The public health systems comprise one district hospital, five CHCs, six PHCs and 157 subcentres. As regards the private sector, there are four private hospitals and seven private laboratories, and three private practioners. In 2018, all blocks were noted under API<1 category. The number of cases declined from 692 in 2015 to 59 cases in 2018 (Pf%: 32%). In 2019 (until June), the reported number of cases was 06. The district recorded an ABER of 10%-12% during 2015-2018 comparable to the national standard set at 10%. During this period, the API showed a declining trend. The API was 0.05 per 1000 population in 2018. The TPR showed declining trend from 2015 (0.69%) to 2018 (0.06%). There are 05 PHCs within 5 km of the international border with Bhutan. The PHC Niz-Kaurbaha has recorded slightly declining ABER during 2015-2018 period, although remained above the national standard set at 10%. The malaria cases decreased from 2015 (155 cases) to 2018 (19 cases). Only two malaria cases have been reported in 2019 (until June).

The PHC Tamulpur has recorded declining ABER during 2015-2018 period (range: 8.5%-7.7%) that also remained below the national standard set at 10%. The malaria cases decreased from 2015 (715 cases) to 2018 (21 cases). The PHC Mushalpur has recorded slight dip in ABER (9.2%) in 2018 as compared with those recorded in previous years which were akin to the national standard set at 10%. The malaria cases decreased from 2015 (77 cases) to 2018 (09 cases). Only 01 malaria case has been reported in 2019 (until June).During 2015-2018, the PHC Jalah has recorded slightly higher ABER than the national standard set at 10% (range: 12%-13%). The malaria cases decreased from 2015 (63 cases) to 2018 (07 cases). No malaria case has been reported in 2019 (until June). During 2015-2018, the PHC Golagaon has recorded slightly higher ABER than the national standard set at 10% (range: 13%-16%). The malaria cases decreased from 2015 (25 cases) to 2018 (3 cases). Only 01 malaria case has been reported in 2019 (until June).

The challenges for cross-border collaboration include: inaccessible and forested areas, poor socio-economic condition, language barriers and deficient IEC/BCC. Cross-border issues could be addressed through engagement of local community for fever screening as well as IEC/BCC; enhancement of awareness amongst multi-sector stakeholders; and dedicated resources. The district has initiated information exchange through telephone and planned coordination meeting with Samdrup Jongkhar district of Bhutan. However, cross-border coordination is yet to be initiated for mapping of districts/health facilities, mapping of key & vulnerable populations (viz. mobile and migrant populations having temporary residence/daily labour/seasonal labour/project-based labour), stakeholder mapping &analysis, context-specific surveillance, supervision and monitoring, capacity building, etc.

Chirang district: The district has 02 blocks and 946 villages. Of the total 542,286 people, 46% is indigenous population. The district has a 70-km-long international border with Bhutan (Sarpang Dzongkhag). The public health systems comprise one district hospital, two CHCs, two PHCs and 86 subcentres. As regards private sector, there are two private hospitals and nine private laboratories, and 32 private practitioners. Of these, all private hospitals, 56% private labs, 13% private practitioners are reporting to HMIS.

In 2018, all blocks were noted under API<1 category. The number of cases declined from 1,189 in 2015 to 252 cases in 2018 (Pf%: 75%). In 2019 (until June), the reported number of cases was 39. The district recorded an ABER of 10%-15% during 2015-2018 comparable to the national standard set at 10%, although showing slightly declining trend. During this period, the API showed a declining trend. The API was 0.47 per 1000 population in 2018. The TPR showed declining trend from 2015 (1.58%) to 2018 (0.47%). There are two PHCs within 5 km of the international border with Bhutan. The PHC Sidli has recorded slightly declining ABER during 2015-2018 period, although remained above the national standard set at 10%. The malaria cases decreased from 2015 (1075 cases) to 2018 (247 cases). In 2019 (until June), 34 malaria cases have been reported.

The PHC Ballamguri has recorded declining ABER during 2015 to 2018 period (from 17% to 10%) although those were either higher than or akin to the national standard set at 10%. Overall, the malaria cases decreased from 2015 (114 cases) to 2018 (05 cases), except an increase was noted in 2016 relative to 2015. Only 05 malaria cases has been reported in 2019 (until June). The district has most of the sanctioned HR in position (DMO, AMO, DVBDC, DEO, MI excepting a few vacant LT, SI, SW positions.

The challenges for cross-border collaboration could be addressed by: information exchange by Bhutan regarding imported cases so as to initiate focus investigation, classification and response; screening and management of malaria for mobile and migrant populations at entry/exit points by establishing health posts; and considering relaxation of restriction entry of health authorities to Bhutan after 2PM. In addition, intensified implementation of interventions in Lungsung area of Kokrajhar district that witness population movement for livelihood and which is a hot spot of malaria besides considering research topics to support initiation of malaria elimination. The district has initiated mapping of health facilities along international

border, and information exchange through Whatsapp and telephone with Bhutan counterparts. A resolution has also been taken to conduct quarterly meeting with Sarpang district of Bhutan [that started with in Oct. 2019 in presence of Jt. DHS, NVBDCP staff of Chirang district and malaria officials of Bhutan at Bhutan border (Dadgiri)].

Planning is ongoing for surveillance, supervision and monitoring, capacity building as well as mapping of stakeholders (viz. contractors, etc.). Until now, no imported malaria case from Chirang has been reported by Bhutan. A line listing of malaria cases of Sarpang district, Bhutan (2019) has been received in Oct. 2019 that did not show any case from Chirang. However, cross-border coordination is yet to be initiated for mapping of key & vulnerable populations (viz. mobile and migrant populations having temporary residence/daily labour/seasonal labour/project-based labour), stakeholder mapping & analysis, context-specific surveillance, supervision and monitoring, capacity building, etc.

Kokrajhar district: The district has 04 blocks and 1,046 villages. Of the total 991,959 people, 28% is indigenous population. The district has a 40 km-long international border with Bhutan [(Lhamoizingkha) Dagana and Sarpang Dzongkhags]. The public health systems comprise one district hospital, one SDH, three CHCs, four PHCs and 149 subcentres. As regards private sector, there are 01 private hospitals and 47 private laboratories, and 44 private practitioners. In 2018, all blocks were noted under API<1 category. Overall, the number of cases declined from 1584 in 2015 to 151 cases in 2018 (Pf%: 71%), although an increase in number of cases was noted in 2017 (1540) relative to 2016 (469). In 2019 (until June), the reported number of cases was 82. The district recorded an ABER of 10%-13% during 2015-2018 comparable to the national standard set at 10%, although showed slightly declining trend over the years. During this period, the API showed a declining trend. Overall, the API was 0.15 per 1000 population in 2018. However, there were 04 PHCs /that reported API>1 per 1000 population. The TPR showed declining trend from 2015 (1.22%) to 2018 (0.16%). There are 02 PHCs within 5 km of the international border with Bhutan.

The PHC Dotma has recorded slightly declining ABER during 2015-2018 period, although remained above the national standard set at 10%. The malaria cases declined from 2015 (60 cases) to 2017 (07 cases) before recording an increase to 20 cases in 2018. In 2019 (until June), malaria cases has again slightly increased (26 in number). The Pf% has decreased over the years from 85% in 2015 to 31% in 2019. The district has vacant positions at district level.

The challenges for cross-border collaboration include: difficult-to-reach & forested areas; undocumented/illegal settlements within forest areas; language barriers; poor socio-economic condition; lack of awareness and IEC/BCC. Engaging local community (community leaders, student organizations, political parties) and other sectors for IEC/BCC for mass awareness and training select persons for fever screening, etc. are considered as solutions for which additional resources are needed. The district has initiated information exchange through Whatsapp; strengthening of supervision and monitoring within national boundaries. This district has a health post at the Indonesia-Bhutan border. However, cross-border coordination

is yet to be initiated for mapping of districts/health facilities, mapping of key & vulnerable populations (viz. mobile and migrant populations having temporary residence/daily labour/seasonal labour/project-based labour), stakeholder mapping &analysis, context-specific surveillance, capacity building, etc.

Udalguri district: The district has three blocks and 929 villages. Of the total 909,442 people, 55% is indigenous population. The district has 80 km-long international border with Bhutan (Samdrup Jongkhar Dzongkhag). The public health systems comprise 01 District Hospital, 09 SDH, 04 CHCs, 10 PHCs and 153 Sub centres. As regards private sector, there are 01 private hospital and 02 private laboratories, and 17 private practitioners. In 2018, all blocks were noted under API<1 category. Overall, the number of cases declined from 1584 in 2015 to 151 cases in 2018 (Pf%: 71%), although an increase in number of cases was noted in 2017 (1,540) relative to 2016 (469). In 2019 (until June), the reported number of cases was 82. The district recorded an ABER of 10%-13% during 2015-2018 comparable to the national standard set at 10%, although showed slightly declining trend over the years. During this period, the API showed a declining trend. Overall, the API was 0.15 per 1000 population in 2018. However, there were 04 PHCs /that reported API>1 per 1000 population. The TPR showed declining trend from 2015 (1.22%) to 2018 (0.16%). There are 02 PHCs within 5 km of the international border with Bhutan. The PHC Dotma has recorded slightly declining ABER during 2015-2018 period, although remained above the national standard set at 10%. The malaria cases declined from 2015 (60 cases) to 2017 (07 cases) before recording an increase to 20 cases in 2018. In 2019 (until June), malaria cases has again slightly increased (26 in number). The Pf% has decreased over the years from 85% in 2015 to 31% in 2019. The district has vacant positions at district level.

The challenges for cross-border collaboration include: difficult-to-reach & forested areas; undocumented/illegal settlements within forest areas; language barriers; poor socio-economic condition; lack of awareness and IEC/BCC. Engaging local community (community leaders, student organizations, political parties) and other sectors for IEC/BCC for mass awareness and training select persons for fever screening, etc. are considered as solutions for which additional resources are needed. The district has initiated information exchange through Whatsapp; strengthening of supervision and monitoring within national boundaries. This district has a health post at the Indonesia-Bhutan border. However, cross-border coordination is yet to be initiated for mapping of districts/health facilities, mapping of key & vulnerable populations (viz. mobile and migrant populations having temporary residence/daily labour/seasonal labour/project-based labour), stakeholder mapping & analysis, surveillance, capacity building, etc.

Sikkim

East district: The district has 11 blocks and 288 villages. Of the total 227,559 people, 11% is indigenous population. The district has 32 km-long international border with Bhutan. The

district has international border with China (220 km) and Nepal (98 km) as well. The public health systems comprise 01 District Hospital, 01 CHC, 06 PHCs and 43 subcentres. Regarding the private sector, there are 01 private hospital and 12 private laboratories, and eight private practitioners, all of whom are reporting to the HMIS. In 2018, all blocks were noted under API<1 category. Overall, the number of cases declined from 27 in 2015 to only 6 cases in 2018 (Pf%: 33%). In 2019 (until June), no malaria case has been reported. The district recorded an ABER of 4%-5% during 2015-2018 much below the national standard set at 10%.

During this period, the API showed a declining trend. Overall, the API was 0.02 per 1000 population in 2018. The TPR showed declining trend from 2015 (1.16%) to 2018 (0.14%). Malaria is no more considered a threat. There are two PHCs within 5 km of the international border with Bhutan. The PHC North Regu and PHC South Regu that have not recorded malaria case during 2015-2018 period, although surveillance too seems to be absent. The district does not have dedicated VBD Officers. District Surveillance Officer is acting as Nodal Officer in the district.

The challenges for cross-border collaboration include: forested, difficult-to-reach areas. Overall, population movement is almost non-existent although the trekkers are identified as population at risk. Cross-border collaboration is yet to be initiated.

West Bengal

Alipurduar district: The district has 06 blocks and 559 villages. Of the total 1,592,205 people, 21% is indigenous population. The district has a 79 km-long international border with Bhutan. The public health systems comprise one district hospital, nine SDH, six CHCs, 13 PHCs and 236 subcentres. Regarding the private sector, there are 19 private hospitals and 132 private laboratories, and 59 private practitioners. About 80% of these private providers are reporting to the HMIS. In 2018, all blocks were noted under API<1 category. Overall, the number of cases declined from 365 in 2015 to 136 cases in 2018 (Pf%: 33%), although an increase in the number of cases was noted in 2017 (1404) relative to 2016 (335). In 2019 (until June), the reported number of cases was 105. The district recorded a progressive increase in ABER from 20% to 33% during 2015-2018 much higher than the national standard set at 10%.

During this period, the API showed a declining trend overall except an increase in 2017. Overall, the API was 0.09 per 1000 population in 2018. The TPR showed a decline from 2015 (0.12%) to 2018 (0.03%). No malaria case has been reported in 2019 (until June). There are two PHCs within 5 km of the international border with Bhutan. The PHC Totopara has recorded very high and fluctuating ABER (range: 33%-57%) during 2015-2018 period relative to the national standard set at 10%. In 2015, there was only one malaria case which became nil in 2016. However, 87 malaria cases were reported in 2017 before drastically declining to two cases in 2018. In 2017, one death was also reported. The PHC Jaigaon has recorded very low ABER (~4%) during 2015-2018 period relative to the national standard set at 10%. In

2015, there was only two malaria cases which became nil in 2018. No malaria case has been reported in 2019 (until June). The district has very few vacant positions (four LT).

The challenges for cross-border collaboration include: no formal documentation of the Bhutanese citizens residing at Jaigaon to enable routine surveillance although Bhutanese citizens access health care at the Phuentsholing hospital; no routine sharing of weekly/monthly data of communicable diseases that have outbreak potentials and sharing of information remains restricted to outbreak situations when the DHO, Phuentsholing of Chukha district is informed and no interaction with Samtse and Sarpang district authorities; no formal coordination meetings on health related matters at regular intervals; huge movement of population across the porous Indo-Bhutan border at Jaigaon that has better health care infrastructure; no health post at the Indo-Bhutan borders at Jaigaon in Chukha district, Gomtu, Pagli Bhutan and Kalapani in Samtse district and Kalikhola in Sarpang districts of Bhutan. Some discussion has been initiated on vector control measures, insecticide susceptibility status, etc. These issues need to be acted upon besides strengthening IPD bed strength with services at Jaigaon hospital. The district has initiated information exchange through Whatsapp, coordination meetings, and even surveillance but only restricted to Phuentsholing city for Dengue besides mapping of HFs. The mobile and migrant populations are the Bhutanese citizens residing temporarily in rented premises in Jaigaon; daily labour, seasonal labour and project-based labour in Samtse, Chhukha & Sarpang districts of Bhutan. Mapping and enumeration of Bhutanese citizens residing temporarily in rented premises in Jaigaon has been done. There is a health post for cross-border vaccination under Intensified Pulse Polio Immunization (IPPI). However, cross-border coordination is yet to be initiated for comprehensive stakeholder mapping and analysis, supervision & monitoring, capacity building, etc.

Darjeeling and Kalimpong districts: Darjeeling district has 09 blocks and 432 villages. Of the total 1,928,420 people, 2% is indigenous population. The district has a 29-km-long international border with Bangladesh & Nepal. Previously, the Kalimpong block having international border with Bhutan was part of Darjeeling district but now has been accorded a district status in 2018. The Kalimpong district has three3 blocks and 194 villages. Of the total 1 928 420 people, 2% is indigenous population. The public health systems within 5 km of Bhutan border comprise one district hospital, three BPHCs and 52 subcentres. There is one private hospital and two private laboratories, and <50 private practitioners. Only the hospital is reporting to the HMIS. In 2018, all blocks were noted under API<1 category. Only 01 malaria case has been reported in this new district in 2018. The district recorded an ABER of 15% in 2018 - higher than the national standard set at 10%. No malaria case has been reported in 2019 (until June).

There are two PHCs within 5 km of the international border with Bhutan. The PHC Kalimpong-II has not recorded any malaria case from 2015 to 2018. The ABER was 12% in 2018 that was higher than the national standard set at 10%. No malaria case has been reported in 2019 (until June). Likewise, PHC Gorubathan reported 01 malaria case in 2015 and none

thereafter. The ABER improved progressively from 7% in 2015 to 10% in 2018.The district has very few vacant positions.

The challenges for cross-border collaboration include: patient records do not reflect proper address and contact number and there is no system to identify patients coming from Bhutan. There is a need to identify dedicated manpower for tracing/tracking of such patients and appropriate recording/reporting. Country specific drug policy and antimalarials need to be made available in each health facility along the border. Cross-border collaboration is yet to be initiated. Coordination between the two countries should be initiated with at least quarterly meetings.

Jalpaiguri district: The district has 07 blocks and 2,639 villages. Of the total 2,542,987 people, 21% is indigenous population. The district has a 45 km-long international border with Bhutan. The public health systems within 5 km of the Bhutan border comprise one district hospital, one SDH, seven CHCs, 25 PHCs and 301 subcentres. As regards private sector, there are 31 private hospitals and 106 private laboratories, and 59 private practitioners. None are reporting to the HMIS. In 2018, all blocks were noted under API<1 category. The number of cases declined from 154 in 2015 to 47 cases in 2018 (Pf%: 11%). Slight increase in number of cases was noted in 2016 (164) relative to 2015 (154) before the number came down in 2017 (119). In 2019 (until June), the reported number of cases was 16. The district recorded an ABER of 15%-18% during 2015-2018 that was higher than the national standard set at 10%. During this period, the API showed a declining trend. The API was 0.02 per 1000 population in 2018. The TPR showed declining trend from 2015 (0.006%) to 2018 (0.001%). There are two PHCs within 5 km of the international border with Bhutan. The PHC Dhupguri has recorded slightly higher ABER (range: 14%-17%) during 2015-2018 period relative to the national standard set at 10%. In 2015, the number of malaria cases were 15 which came down to 07 in 2018. In 2019 (until June), only two cases were reported. The PHC Nagrakata has recorded very high ABER in 2015 (70%) that came down in later years. In 2018, the ABER was 28% that was still relatively high than the national standard set at 10%. In 2015, the number of malaria cases were eight and this came down to two in 2018. In 2019 (until June), only one malaria case was reported. The district has very few vacant positions at district level although at Sub centre level, 239 out of 301 positions are vacant.

The challenges for cross-border collaboration include: difficult-to-reach areas and associated ones. Attempts have been initiated to overcome the challenges by training and assigning ASHAs for conducting RDTs, Blood Slides and treatment; weekly pulse cleaning activities and awareness generation through IEC/BCC activities supported by materials (leaflets etc.) by ASHAs and ANMs; house-to-house survey for anti-larval measures to combat the vector density. An assessment of effectiveness of DDT (50%) spray activities is planned through pre and post spray besides entomological survey for female Anopheles. The district has completed mapping of health facilities. Within national boundaries, surveillance, supervision and monitoring, capacity building, etc. are regularly done. However, cross-border

collaboration in terms of information exchange or coordination meetings, stakeholder mapping/analysis is yet to be initiated.

The RDTs and anti-malarials are made available up to ASHA level. Regular monitoring and analysis of BSC is done. Other measures include: daily fever reporting and immediate reporting of malaria positive patient by phone; IEC cum mobile malaria service camps from April to November every year; visit to individual positive cases and mass Survey around the case; weekly pulse cleaning by ASHA and ANM; DDT Spray around each case twice in a year covering 85% of targeted households; LLIN distribution done in vulnerable areas in 2018 with 95% usage percentage. Recently, entomological survey is done in malaria prone areas before and after DDT Spray. It was mentioned that separate registers were being maintained for migrant population in border areas without any occupational details.

Malaria situation and progress to end malaria in Bhutan: Mr. Tenzin Wangdi, Deputy Chief Entomologist, VDCP, Govt. of Bhutan

The country has a population of 727 145 persons living in 20 districts (dzongkhag), and 205 village blocks (Gewogs). Malaria case trend shows that the country has remarkably transitioned from very low number of cases in 1960s to very high number of cases in 1990s before recording more or less progressive decline in number of cases from 2000. The malaria situation from 2010 to 2018 showed drastic decline in cases from 448 to 54. The API declined from 0.85 in 2010 to 0.03 in 2018 indicating 94% reduction through this period. Deployment of RDTs and ACTs down to Basic Health Unit (BHU) level and large-scale LLIN campaign with two-rounds of focal IRS since 2006, has resulted into marked reduction in the number of malaria cases, and by 2010 the country embarked on malaria elimination.

Of the total 54 cases in 2018, 34 cases were imported, 14 cases were introduced (introduced cases were reported from 2017) and 06 cases were classified as indigenous. Although deaths were not reported from 2013 to 2016, one death was reported in 2017 & also in 2018.Of the total, 31 and 23 cases were identified as Bhutanese and non-Bhutanese, respectively. Of the 34 imported cases, 23 were Indians. The country has stratified the districts in to: malaria-free, malaria seasonal and malaria perennial ones. Besides, the malaria risk stratification map of 2017 depicts low transmission, potential transmission and malaria-free Gewogs. Bhutan has adopted 1-3-7 strategy for surveillance and response for malaria elimination through real-time reporting using web based DHIS2 Malaria Tracker System in addition to different preventive and curative interventions. RACD around index case 1 Km radius is done.

The challenges include: high proportion of imported cases; almost all transmission areas are reported from villages along the international border with India; unstable transmission foci; and re-introduction of malaria in districts that have been already certified malaria free.

Possible solutions are: mandatory malaria screening of all migrant workers entering the country and staying for work; free case detection and treatment for people across the border; proactive case finding in project areas and construction sites; distribution of LLINs for migrant workers; ACD during peak transmission season; core vector control interventions maintained even in malaria free districts; heightened surveillance activities; revamping Community Action Groups; regular advocacy with stakeholders; immediate vector control measures and mass screening to prevent re-establishment; and cross-border collaboration.

The proposal for collaboration entails: establishing network for sharing malaria information across the border with identified focal person at the border health centers for rapid response; frequent coordination meeting between malaria centers at the local and national levels (quarterly monthly at the local level & once in a year at the national level); harmonization and synchronization of malaria cross border activities (LLIN/IRS) by initiating joint routine interventions; joint surveillance and research across the border; and cross-referral of patients & follow-up by contact hospital or focal person (real-time).

Malaria situation along areas bordering India

On the Bhutan side, there are eight districts (Dzongkhags) that share border with India. The names of Bhutan districts & sub district units along the India border and number of malaria cases and deaths in 2018 were shared. In 2018, cases were reported from Sarpang, Samdrup Jongkhar, Chukha, Samtse, Zhemgang bordering Indian districts as well as other districts in Bhutan not having international border with India. In 2019, total reported cases were 30, of which nine were indigenous, 12 were imported (3 Bhutanese and 9 Indians), and three cases were introduced. The origin of imported cases from India was Assam (07 cases) and Uttar Pradesh (02 cases).

Select District Officers from Bhutan presented the malaria situation and progress to end malaria in Bhutan.

Sarpang District

The district Sarpang with 45,636 population shares international border with Chirang and Kokrajhar districts of Assam [with Saralpara (Ultapani) and Sarpang Tar in south- western region of Sarpang district; with Hatisar and Gelephu in south-central region of Sarpang District; and with Baghmara and Umling and Tareythang in south-eastern region of Sarpang District]. The district has 12 village blocks (or Gewogs). Sarpang recorded less than 50 cases in recent years. The number of cases was136 in 2008 that increased to 605 in 2009 before

declining from 248 cases in 2010 to 23 cases in 2018 (thereby contributing 43% of cases reported by Bhutan in 2018). Although the decline is impressive yet slight increase in number of indigenous cases was noted in 2015 (47) relative to that in the preceding year-2014 (18). Likewise, similar increase in number of cases was noted in 2018 (23) relative to the number recorded in 2017 (11). Also, one death was reported in 2017. A major focus of the elimination activities includes case management by admitting all malaria patients in the hospital ward for 3 days. DOT is ensured by nurse (on duty) during the in-ward period. Pv cases are treated with Chloroquine and Primaquine and Pf cases are treated with ACT (Coartem) and Primaquine single dose on D3. Repeat microscopy blood examination on D3 is done before discharging to see parasitic clearance and drug response. A DOT provider is identified for Pv cases and DOT is ensured. Each case is followed up by health provider (for Pf: Day 7, Day 14 and Day 28; and for Pv: Day 7, Day 14, Day 28, Day 42 and then after 6-months). It was informed that all fever cases even though coming from across the border are tested and if found positive for malaria patients are admitted for 03 days in Sarpang Hospital charging only nominal admission fee. Treatment is given free of cost. In 2018, 04 patients were diagnosed with Pv malaria and treated in Sarpang hospital. All of them came from across the border. In 2019, 07 Pv and 01 Pf malaria cases diagnosed and managed. All cases including imported ones are notified to VDCP through online reporting system. Follow-up of patients coming from across the border is not yet done. LLINs are provided to all people residing in endemic areas, and IRS is done yearly. In addition, community engagement, through the creation of Community Action Groups (CAGs), is seen as an important way to maintain support for malaria elimination. Case investigation includes: immediately notifying VDCP and to NEWARS through online reporting system besides filling up case notification form. Reactive case investigation is done within 48 hours of diagnosis. All individuals residing within 1Km radius is screened with RDT. Vector surveillance is carried in terms of larva and adult mosquito collection. It was also mentioned routine screening of immigrant workers are carried out. Further, various sample data collection/reporting forms were shared, viz. Malaria case follow-up and drug efficacy surveillance form, DOT form, DOT form is filled up after identifying the DOT provider for PV malaria, Malaria case notification form, Malaria case investigation and classification form, Malaria focus investigation form. In addition, examples of reporting form for verification of positive cases by Level I and II Technicians were also shared.

The challenges for cross-border collaboration include: very limited cross border communication and collaboration until recently. With the current meeting and another one recently held in Gelephu, Bhutan, cross-border actions are being initiated.

Samdrup Jongkhar District

The district Samdrup Jongkhar with 40,766 population shares international border with Udalguri district of Assam and West Kameng district of Arunachal Pradesh. The district has 11 village blocks (or Gewogs). The public healthcare delivery system comprises 02 DHs, 10

BHUs, 12 ORCs and 03 Sub-posts. There are 02 private laboratories although reporting mechanism to HMIS does not exist. Although the number of malaria cases is very low, fluctuating trend is noted from 2015-2019. Whilst malaria cases declined from 10 in 2015 to only 02 in 2016, an increase was noted in 2017 (5 cases) and further in 2018 (8 cases). In 2019, 04 cases have been reported so far. Of the total cases reported in 2018, six cases (75%) were imported ones and one case each was classified as indigenous and introduced. In 2019, three cases were reported as indigenous, which need further review by concerned Committee and one case as introduced. Besides, the district reported one death in 2018. The decline in malaria cases is due to the high coverage of LLINs and IRS, intensified surveillance and early diagnosis and treatment.

As regards solutions to key challenges like high proportion of imported cases, it was mentioned that Bhutan ensures mandatory malaria screening of all migrant workers entering the country for work and stay, free case detection and treatment for all including those coming from across the border, proactive case finding in project areas and construction sites, and free distribution of LLINs for all including migrant workers. Since almost all transmission areas are at the villages along the international border, such interventions are implemented, viz. ACD during peak transmission season, maintenance of core vector control interventions even in malaria free districts and initiation of cross-border collaboration. Heightened surveillance activities and revamping of community action groups are being considered for unstable transmission foci.

In order to overcome the re-introduction of malaria in districts that are already certified malaria-free, regular stakeholder advocacy, strengthened surveillance and immediate vector control measures and mass screening are envisaged. It was mentioned the district would nominate permanent focal person or contact person at the border health centers for rapid response for establishment of network for sharing malaria information across the border. Coordination meetings between identified officials would be held quarterly at the local level and once in year at the national level. Joint planning would be done for harmonized and synchronized activities (LLIN/IRS) besides joint surveillance and research initiatives. For cross referral/cross notification of patients & follow-up, focal person would be identified.

Discussions:

- Each district in India needs to have two-dimensional epi analysis, review and planning: one for the areas along the international border and the other for rest of the areas including border areas with other Indian states. Some districts as well as in CHC/PHC/subcentres within a district in India the number of cases have declined considerably. Hence, each case should be investigated, classified and if clustering is noted focus investigation, classification should be initiated for appropriate response.

- Amongst districts sharing border with Bhutan, currently Udalguri district of Assam seems to be the most problematic. This district has number of tea gardens large tea-tribe populations. While coordination, reporting, mass survey has been initiated that has shown results, continued interventions are needed. Whilst focus should be on other districts as well, East Sikkim and Tawang districts of India currently do not pose any cross-border issue unlike others.
- A major focus should be on key and vulnerable populations viz. indigenous groups, mobile and migrant populations, jhum cultivators, etc. Tea gardens exist on both sides of the border and it is difficult to motivate the workers for appropriate health seeking behavior and EDCT, contributing to ongoing transmission. Coordination with tea garden authorities should be strengthened to address the issues. In Kokrajhar district, the intervention package should be customized for settlements within forest areas.
- In four districts of Assam in India, the BTC is responsible for peripheral manpower. Hence, cooperation and collaboration between the BTC and NVBDCP should be optimal. The BTC have close connect with the community and therefore, local solutions through involvement of community volunteers need to be explored.
- It is extremely important that the frontline HWs in India viz. MPWs and MIs should be continuously motivated and monitored for surveillance, EDCT, IEC/BCC in the field. For enhancing community awareness and participation, local champions including school children should be identified and capacitated for IEC/BCC activities.
- The peculiar low-high-low trend in number of cases in recent years was noted in some districts in India besides others. It is imperative that capacity at district and sub district is built to analyse trends as well as prepare for case and focus investigation, etc. to progress towards zero malaria and sustaining the same. The WHO should support & facilitate such capacity building exercise. Bhutan may also consider re-programming of the Global Fund grant for trainings/re-trainings. Experience sharing by Bhutan with India is desirable especially since the country has been successful in reducing the malaria cases drastically.
- Malaria data should be collected/reported on real-time basis (within 24/48 hours). The timing, location, frequency, etc. are important. Data quality (timeliness, correctness, completeness) needs to be ensured through regular review. Bhutan should consider transfer of knowledge to India counterparts especially relating to surveillance in elimination settings. The forms being used by Bhutan for case, focus investigation, case notification, etc. could be shared with Indian states/districts for harmonization of information sharing subsequent to context specific adaptation.
- Some districts in India shared that reporting from private sector laboratory has been initiated. This needs to be strengthened and private hospitals/various other providers should be brought under the ambit of compulsory case notification.
- It was noted that many states especially north eastern states of India are conducting both RDT and slides and if RDT is negative, the slides are sent to laboratory for examination.

There is a need to assess the positive cases reported from such BSE, although it has been reported that the results are mostly found to be negative only. The RDTs are used at the peripheral areas in view of several constraints regarding microscopy facilities; hence such interventions may need to be re-assessed.

- Chemoprophylaxis as a possible option was discussed for at risk populations. Although chemoprophylaxis has been and are being used in some countries for security Forces/troops considering the risk of infection/difficulties in implementation interventions, yet this might not be a plausible in the absence of appropriate option for general population.
- New drug options other than the 14-day PQ needs to be explored for treatment compliance in Pv cases.
- In Bhutan, Sarpang, Samdrup/Jongkhar, Chukha remain problematic districts reporting majority of cases. Bhutan mentioned about getting imported cases not only from adjoining districts that have frequent population movement but also from other states like Chhattisgarh, Jharkhand, UP. Bhutan needs to share details of all cases on real time basis with identified India counterparts with information to the national/state programmes so as to ensure timely and appropriate actions & prevent possible outbreaks and re-establishment of transmission especially in areas reporting nil cases. Bhutan is ensuring hospitalized treatment for all malaria cases. Likewise, India districts especially those with minimal number of cases need to consider such strategy or need to follow up at residence especially along the border areas. Mapping and tracking of each case is crucial.
- Logistical support should be augmented for cross-border activities. In order to address preventive interventions for imported cases, the Global Fund agreed to distribute 6000 LLINs to villages on the Assam side adjoining Bhutan. Distribution through Indo-Bhutan friendship Association was considered too. However, due to procedural hindrances, the same could not be initiated. An institutional mechanism should be explored for the purpose. India mentioned that a vast number of LLINs have already been distributed in all northeastern states including Assam with the GF support. Bhutan should coordinate with the NVBDCP, GoI, regarding such exercise to cover to populations in border areas and or to address any gap/challenge. LLIN distribution along the border areas should be prioritized and its use should be promoted. The list of targeted villages should be shared with the concerned state as well as the NVBDCP. Further, it was discussed that illegal and mobile/temporary settlements along the border including in forested areas are known. Deliberations are urgently needed to identify them for coverage by LLINs since they are at risk and also pose risk to others.
- LLINs played an important role in reduction of cases from 2015 to 2017. Increase in malaria cases in 2018 could be due to LLIN efficacy; hence the LLINs need to be replaced as soon as possible. Emphasis should be on identifying gaps in LLIN & IRS coverage. Knowledge of vector bionomics is important on both sides for appropriate interventions. Such endeavor could be considered in operational research mode.

- Both countries should continue to ensure quality coverage by EDCT, preventive interventions as well as strengthened surveillance and M&E per epidemiological/geographical context. Various options like DOT, follow-up for treatment compliance especially in Pv cases, and iDES (in appropriate settings) could be considered that would cut down transmission.
- Chemoprophylaxis as a possible option for risk populations was discussed. Chemoprophylaxis has been and are being used in some countries for security Forces/troops considering the risk of infection/difficulties in implementation interventions, yet this might not be plausible at this juncture for general population. Coordination with security forces should be strengthened.
- New drug options other than 14 day PQ needs to be explored for Pv cases.

4. Sessions 2 and 3: Group work - Roadmap for cross-border collaboration (2020-2021)

On Day 2, Dr Roop Kumari, Technical Officer, Malaria and VBDs, WHO Country Office, India presented the summary of Day 1 proceedings. Later, technical sessions entailing group work was conducted followed by presentations and discussions.

Introduction to group work on strategic areas and roadmap for cross-border collaboration: Dr Shampa Nag, Consultant, WHO SEARO

Thereafter, the group work focused on:

- Priority actions to address malaria along international border and possible options for cross-border collaboration; and
- Development of roadmap (2020-2021) for cross-border actions at district level and preparation of presentations

Attention of the groups was drawn to the objectives of the WHO operational framework for cross-border collaboration (2018):

- To maximize cross-border coordination mechanisms that provide an enabling environment (with focus on synchronization of malaria interventions, work plans and activities on both sides of a border; initiation of Whatsapp/email groups/working groups/district-level coordination committees, with the aim of creating an enabling environment for local action; joint capacity building & implementation research for new models of cross-border interventions; collaboration with nongovernmental organizations and sectors.
- To maximize access to malaria interventions in border areas with focus on universal access to quality-assured malaria diagnosis, treatment and prevention for all those at risk irrespective of their national origin or status, and with emphasis on equity (e.g. migrant and mobile populations and other key and vulnerable populations).
- To maximize malaria surveillance and response as well as M&E in border areas (with focus on periodic local situation analyses; transition to/inclusion of case-based surveillance to allow timely identification of imported cases and sources of transmission; notification and exchange of information at different levels (regular/event based - outbreaks, increases in vulnerability/receptivity, etc.); participation in cross-border malaria data-sharing platform in response to active transmission across borders, including harmonization with the existing ones; inclusion of cross-border component in M&E framework; review progress on cross-border collaboration for malaria elimination by the district/state elimination committees or task forces, as applicable.

In the beginning, individual roadmaps were prepared separately by each district team that especially focused on Objective 3: to maximize cross-border coordination mechanisms. They were supported by respective state team members as well as by the national programme officials and RoH&FW. Each group was assigned facilitators from WHO as well. Subsequently, adjoining Indian and Bhutanese districts were identified and convene together. When one district from a country had international border with more than one district of the neighbouring country, the group was expanded accordingly. Each group selected a rapporteur for making a presentation in the plenary.

Three groups presented the cross-border roadmap for 2020-2021. The groups prioritized following key areas for cross-border coordination and collaboration.

1. Information sharing: Starting from January 2020, immediate notification to the concerned district when imported cases are detected would be initiated. Information on case management and follow-up, reactive case detection and case/foci investigations would be shared. Such available and easy modes/platforms as, Whatsapp, Dropbox, as well as electronic mail, phone call would be utilized for malaria information sharing. Already, a Whatsapp group has been created by the WHO for posting cross-border initiatives and ready communication about cases (especially imported cases being seen by Bhutan), deaths, any unusual upsurge, and intervention. Admin rights have been provided to identified India and Bhutan officers. A Dropbox has also been created for reference materials as well as posting line listing of cases for use by and benefit for the local levels, whilst national level discussions are initiated/advanced so that there is no hindrance in malaria data sharing by/at local levels. A simple step-by-step guidance would be posted on Whatsapp to support use of Dropbox by the WHO. Other platforms such as Google group and Facebook may be considered in future.

2. Joint coordination/collaboration meetings: From the first quarter of 2020, joint collaboration meetings are proposed in each quarter at identified sites. For example, Gelephu, Chirang District HQ, Kokrajhar District HQ and Sarpang were identified as meeting places in the first, second, third and fourth quarters, respectively by one group). The personnel attending the meetings in India would comprise Jt. DHS, DMO, VBDC, AMO, surveillance workers, multipurpose health workers and ANMs from the India side. Those attending the meetings in Bhutan would comprise Jt. DHS, DMO, VBD consultant, AMO. From Bhutan, the DHO, MS, CMO, DMS and malaria technicians from Sarpang district would attend such meetings in Bhutan and all but malaria technicians would attend the meetings to be held in India. [Other groups also echoed the same].

   The key areas for discussion and actions as reflected in the roadmaps would include but not limited to, review of local malaria situation analysis in each bordering district and prepare mutually agreeable package cross-border collaborative quarterly/monthly action plan with interventions (directed at intensified control, elimination, or prevention of re-establishment tailored to the local context) viz. synchronized LLIN distribution, IRS, IEC/BCC; and sharing of information (adjacent/non-adjacent border areas) on real time basis; case & focus investigations, vector surveillance, operational research, etc.Periodic/seasonal screening of population of both countries visiting identified marketplaces on certain designated days besides effective, appropriate follow-up of and response to individual malaria cases crossing international borders would be prioritized. Involvement of civil society and community networks, non-health/private sector would be considered for supporting EDCT, IEC/BCC. Appropriate communication materials would be discussed and designed jointly as well.

Meeting on cross border collaboration on malaria elimination along the India- Bhutan border

3. Capacity building: Joint trainings of district and subdistrict-level personnel from India and Bhutan are proposed in 2020 [DMO, AMO, VBD Consultants, surveillance workers, MPW, ASHAs and select self help groups/community influencers/leaders from India; and DHO, MS, DMS, DMO and malaria technicians from Bhutan]. Bhutan expressed that the Global Fund support could be explored for trainings of Bhutan personnel.
4. Access to malaria interventions; strengthening of surveillance and M&E: Efforts would be made to maximize access to malaria interventions; and malaria surveillance and response as well as M&E along the border areas. Epidemiological analysis of each border district with granular data would be done periodically. Through such exercise, "epidemiological clusters/blocks and geographical context" or "special intervention zones" on: adjacent/contiguous sides of border (high-high, high-low, low-low) and remote (non-adjacent borders) would be identified and updated periodically. Mapping of populations along the border areas and key & vulnerable populations like mobile and migrant populations/indigenous groups as well as various stakeholders would be attempted annually. Information exchange; participation in data-sharing platforms and harmonization with the ones country HMIS as and when functional; would be considered.
5. Designation of focal point: Each district from India and Bhutan identified a focal point for cross-border collaboration and shared the contact details. It was discussed that the list would be uploaded on the Whatsapp group and Dropbox. Any change would also be informed through these modes and in consultation with the respective higher authorities.

The roadmap proposed by both countries mentioned about continued joint collaboration meetings and information sharing through 2021 and re-orientation trainings of personnel in that year.

Meeting on cross border collaboration on malaria elimination along the India- Bhutan border

5. Conclusion

The closing session included concluding remarks by Dr Neena Valecha, RA-Malaria, SEARO, followed by comments from India and Bhutan. Overall, it was generally concluded that tackling malaria along international border areas remains a priority, especially to stay on course/accelerate the pace towards elimination and each district in India and Bhutan should initiate/further consolidate efforts particularly focusing on local levels (district and subdistrict levels in consultation with higher authorities) while processes/platforms such as the establishment of a regional database, etc. are formalized. The meeting provided a platform for experience sharing and exchange of information on the malaria situation and challenges and solutions regarding advancing the cross-border collaboration. Salient cross-border actions at local levels included in the Roadmap 2020-2021 are: data sharing through identified focal points including details of line listing of cases reflecting complete history; periodic meetings for coordination and collaboration; joint review and planning for interventions like LLIN distribution, IRS; case/focus investigation & response; diagnosis and treatment irrespective of nationality and follow up of treatment compliance. Gaps in coverage (LLIN, IRS) should be reviewed periodically and addressed. Capacity building especially at district & sub district levels through trainings would be crucial and need to be prioritized. The WHO needs to continue technical support to the countries for these endeavours.

The meeting ended with a vote of thanks for participants offered by Dr Roop Kumari, Technical Officer, Malaria and VBDs, WHO Country Office, India.

6. Recommendations

The meeting concluded with key recommendations following a general consensus by both India and Bhutan. The salient recommendations were as under:

1. For country:

- Sharing of malaria data at district-to-district level through identified focal points: [real time (within 24/48 hours)] including complete case history that would commence with such platforms/modes as – Whatsapp, Dropbox, e-mails, phone, etc.
- District-to-district coordination meetings (quarterly) for joint review and planning.
- Synchronized implementation of interventions like LLIN distribution, IRS by districts on both sides of the border as much as possible.
- Diagnosis and treatment irrespective of nationality and follow up of treatment compliance.
- Strengthening of surveillance and M&E adjusted to burden reduction & elimination settings.
  - Initiation of case/focus investigation, classification & response especially in border districts of India reporting relatively few cases.
  - Screening of population coupled with IEC/BCC in identified locations ('market places' on certain designated days) jointly by India and Bhutan.
  - Ensuring reporting from private sector to HMIS by India.
  - Involvement of local school students, teachers, self-help groups, community leaders for EDCT, IEC/BCC etc. in remote and difficult-to-reach areas as alternate mechanisms of service delivery in India.
- Optimal cooperation and coordination between Bodoland Territorial Council (BTC)/BTAD and state NVBDCP in Assam.

2. For the WHO:

- Create, facilitate and support the digital platforms for malaria data sharing between India and Bhutan.
- Strengthen capacity at state, district and sub district levels especially on epidemiological analysis, as well as surveillance and M&E with special emphasis on case and focus investigation, etc.
- Facilitate review of district-to-district cross-border coordination annually.

Annex-1: Agenda of the meeting

Meeting on cross border collaboration on malaria elimination along the India-Bhutan Border
4-5 November 2019, Hotel Vivanta by Taj (Joysagar 1 Hall), Guwahati, Assam, India

PROVISIONAL AGENDA

Day 1: Monday, 4 November 2019		
08:30 – 09:30	Registration	
Opening Session		
09:30 - 09:40	Welcome and objectives of the meeting	Dr. Neeraj Dhingra, Director, NVBDCP, MoH & FW, Govt. of India
09:40 – 09: 50	Address	Mr. Rinzin Namgay, Deputy Chief Entomologist, Vector-borne Disease Control Programme, Dept. of Public Health, MoH, Govt. of Bhutan
09:50 – 09:55	Address	Dr. Roop Kumari, Technical Officer, Malaria and VBDs, WHO Country Office-India
09:55 – 10:00	Address	Dr. Neena Valecha, Regional Adviser (Malaria), WHO South-East Asia Regional Office
10:00 – 10:05	Address	Dr. Chittaranjan Pathak, DHS cum State Programme Officer, NVBDCP, MoH & FW, Govt. of Assam
10:05 – 10:15	Address	Ms. Rekha Shukla, Joint Secretary, MoH & FW, Govt. of India
10:15 – 10:30	Address	Mr. Samir Sinha, Principal Secretary (Health), MoH & FW, Government of Assam
10:30 – 10:40	Self-introduction of participants	All participants
10:40 – 10:45	Nomination of Rapporteurs Administrative announcements	Dr. Roop Kumari, Technical Officer, Malaria and VBDs, WHO Country Office, India
10:45 – 11:00	*Group Photograph followed by coffee/tea break*	
Session 1:	***Cross-border operational framework and malaria situation in along India-Bhutan border***	
11:00 – 11:30	Key messages from recent cross-border meetings and WHO operational framework for cross-border collaboration to accelerate malaria elimination in SEAR	Dr Risintha Premaratne, Technical Officer, WHO South-East Asia Regional Office
11:30 – 13:00	Malaria situation and progress to elimination with special emphasis on actions taken along international border	- Country presentation: - Dr. Suman Wattal, Deputy Director & Dr. Neeraj Dhingra, Director, NVBDCP, MoH & FW, Govt. of India - India District Malaria/VBD Officers -Arunachal Pradesh (Tawang, West Kameng) -Assam (Baksa, Chirang, Kokrajhar, Udalguri)
	Discussion	Moderator: Dr. Leonard I. Ortega, Team Leader, Technical Support and Capacity Building, WHO HQ
13:00 – 14:00	*Lunch break*	

Day 1: Monday, 4 November 2019		
14:00 – 15:00	Malaria situation and progress to elimination with special emphasis on actions taken along international border	- Country presentation (Contd.) - India District Malaria/VBD Officers ○ Sikkim (East Sikkim - 01 district) ○ West Bengal (Jalpaiguri, Darjeeling. Alipurduar - 03 districts)
	Discussion	Moderator: Dr. Suman Wattal, Deputy Director, NVBDCP, Govt. of India
15:00 – 15:30	*Coffee / tea break*	
15:30 – 17:30	Malaria situation and progress to end malaria in Bhutan	– Country presentation (Contd.) – Mr. Rinzin Namgay, Deputy Chief Entomologist, VDCP, Department of Public Health, Ministry of Health, Bhutan – Bhutan District Programme Officers ○ Sarpang ○ Samdrup Jongkhar
	Discussion	Moderator: Dr. Risintha Premaratne, Technical Officer, WHO South-East Asia Regional Office

Day 2: Tuesday, 5 November 2019		
09:30 – 09:45	Summary of Day 1 proceedings	Dr. Roop Kumari, Technical Officer, Malaria and VBDs, WHO Country Office, India
Session 2:	***Prioritization of strategic areas to address malaria along international border***	
09:45 – 10:00	Introduction to group work on strategic areas and roadmap for cross-border collaboration	Dr. Shampa Nag, Consultant, WHO South-East Asia Regional Office
10:00 – 11:00	Priority actions to address malaria along international border and possible options for cross-border collaboration	Group Work (individually for each district of India & Bhutan)
11:00 – 11:30	*Coffee / tea break*	
Session 3:	***Roadmap for cross-border collaboration for 2020-2021***	
11:30 – 13:00	Development of roadmap (2020-2021) for cross-border actions at district level and preparation of presentations	Group Work (India & Bhutan)
13:00 – 14:00	*Lunch break*	
14:00 – 15:00	Working groups on development of roadmap for cross-border actions	Group presentations (India & Bhutan)
	Discussion	Moderator: Dr Satyajit Sen, Sr. Regional Director, RoH&FW, Govt. of India
15:00 – 15:30	*Coffee / tea break*	
Session 4:	***Conclusions and closing***	
15:30 – 15:45	Conclusions and recommendations	Dr. Leonard I. Ortega, Team Leader, Technical Support and Capacity Building, WHO HQ
15:45 – 16:15	Closing	– Dr. Neena Valecha, Regional Adviser (Malaria), WHO SEARO – Mr. Rinzin Namgay, Deputy Chief Entomologist, VDCP, Govt. of Bhutan – Dr. Neeraj Dhingra, Director, NVBDCP, Govt. of India
	Vote of thanks	Dr. Roop Kumari, WHO Country Office, India

Annex-2: List of participants

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Annex-3: Recommendations of "Cross border meeting on malaria elimination between Bhutan-India, 2 & 3 September 2019, Gelephu: Bhutan"

1. Recognizing the importance of collaboration at the local level in malaria elimination on both sides of Bhutan and India border, the meeting recommended to issue joint executive order from Delhi and Thimphu to formalize and facilitate information sharing at the field level at the earliest possible (*Responsible organization: VDCP, Bhutan and NVBDCP, India*).
2. Towards further strengthening the cross-border collaboration and coordination, the meeting discussed the importance of a periodic joint meeting to review the progress between the two malaria programs of India and Bhutan. Towards this end and recognizing the challenges being mainly posed by the four districts in Assam (Baksa, Chirang, Kokrajhar and Udalguri) that share direct border with Bhutan, the meeting agreed and recommended to organize a first follow up joint meeting involving these four districts of Assam and VDCP Bhutan by November 2019 and thereafter on a six monthly interval (*Responsible organization: VDCP Bhutan and NVBDCP, India*).
3. In order to further strengthen the cross border collaborative initiatives for malaria elimination, the meeting agreed to explore re-appropriation of unspent funds from the Global Fund grant to step up border malaria interventions, as well as explore avenues for joint projects between the countries through SDF and other funding agencies (*Responsible organization: VDCP, Department of Public Health, Bhutan and NVBDCP, India*).
4. In order to strengthen and formalize information sharing mechanism between bordering districts of India and Bhutan, the meeting recommended following steps to be taken;
   - This information sharing mechanism shall be operationalized after the executive order is issued by both the government (*VDCP, Bhutan and NVBDCP, India*)
   - The concerned national program in Bhutan and India agreed to identify and share designation of a focal person at the national, state and sub-focal points at the district level (*VDCP, Bhutan and NVBDCP, Assam, India*)
   - The directory of focal points from both countries should be updated and remain dynamic by way of sharing information of any change in the focal points to each national programs by the respective national program (*VDCP, Bhutan and NVBDCP, Assam, India*)
   - The national program to conduct mapping of border villages and health facilities located along the border (*VDCP, Bhutan and NVBDCP, Assam, India*)
   - Both the counterparts shall notify every malaria case to each other as soon as possible (within 24hours) after the case is detected with following information through WhatsApp and telephone using a suitable data sharing format (To be developed and

shared) – Name, age, sex, occupation, postal address, mode of diagnosis, malaria species, past and current treatment details and travel history (*VDCP/ concerned DHO, Bhutan & PHC unit, Assam, India*).

- The line list of all malaria cases occurring in the border villages and health centers identified in the joint mapping shall be shared by Indian counterpart on monthly basis through email (*NVBDCP, Assam, India*).

5. Recognizing the importance of harmonization and synchronization of vector control interventions (IRS, LLIN distribution) between two bordering areas of Bhutan and India, the meeting agreed to share action plans for implementation of vector control interventions with the counterpart before the plan is executed in the field with mutual discussion (*Responsible organization: VDCP, Bhutan and NVBDCP of Assam and West Bengal, India*).

6. The meeting acknowledged the critical role of operational research to augment the malaria elimination process, but however recognizing the immediate need and importance of sharing the already available data to each other for effective implementation of malaria control interventions, it was agreed that programs in both countries shall begin with a focus on information sharing instead of planning and conducting new research (*Responsible organization: VDCP, Department of Public Health, Bhutan and NVBDCP, India*).

7. As the current epidemiological information for malaria case classification as per WHO case definition may not be adequate to prove the origin of malaria case beyond reasonable doubt, the VDCP Bhutan is recommended to strengthen epidemiological case investigation of all malaria case to demonstrate epidemiological linkage of all malaria cases for classification into Indigenous, Introduced and Imported (*Responsible organization: VDCP, Department of Public Health, Bhutan*)