NATIONAL STRATEGIC PLAN

FOR THE PREVENTION OF RE-ESTABLISHMENT OF MALARIA IN BHUTAN

2026-2030

Vector-borne Disease Control Programme
Communicable Diseases Division, Department of Public Health
Ministry of Health
Royal Government of Bhutan

August 2026

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Vector-borne Disease Control Programme, Department of Public Health
Ministry of Health, Royal Government of Bhutan
Gelephu, Bhutan
Phone: 06-251012
Email: vdcp@health.gov.bt

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ACRONYMS USED

ACD	Active Case Detection
ACT	Artemisinin combination therapy
AHB	Annual Health Bulletin
BQPCA	Bhutan Qualifications and Professionals Certification Authority
BRCS	Bhutan Red Cross Society
CAG	Community action groups
CSO	Civil society organizations
CVD	Cardiovascular disease
DHIS2	District Health Information System
DOTs	Directly observed treatment schedule
ECAMM	External Competency Assessment for Malaria Microscopists
EQA	External Quality Assurance
FYP	Five-Year Plan
GDP	Gross Domestic Product
GF	Global fund
GMC	Gelephu Mindfulness City
GNH	Gross National Happiness
GPMS	Government Performance Management System
HIV	Human Immunodeficiency Virus
ITN	Insecticide treated nets
IVM	Integrated vector management
KA	Kala azar
KPI	Key performance indicators
LLIN	Long Lasting Insecticidal Nets
M&E	Monitoring and Evaluation
MDG	Millennium Development Goals
MM	Molecular markers
MoH	Ministry of Health
MoU	Memorandum of Understanding
MSTF-CBSS	Multi-Sectoral Task Force and Community-Based Support System
NAAT	Nucleic Acid Amplification Tests

NCDs	Non-communicable diseases
NEWARS	National Early Warning Alert and Response system
NHS	National Health Survey
NKRA	National Key Result Area
NMS	National Medical services
NSP	National Strategic Plan
PACD	Proactive Case Detection
PCD	Passive Case Detection
PEN	Package of Essential NCDs
PHC	Primary Health Centre
PoR	Prevention of Re-establishment
PDCs	Private Diagnostic Centers
PPP	Public-Private Partnership
RACD	Reactive Case detection
RDT	Rapid diagnostic test
RCDC	Royal Centre for Disease Control
RGOB	Royal Government of Bhutan
SAR	Special Administrative Region
SOPs	Standard operating procedures
SDGs	Sustainable Development Goals
STEPs	Stepwise approach to non-communicable disease risk factor surveillance
TAGME	Technical Advisory Group for Malaria Elimination
TB	Tuberculosis
THE	Total Health Expenditure
UN	United Nations
UNDP	United Nations Development Programme
VBD	Vector-borne diseases
VDCP	Vector Borne Disease Control Programme
VHW	Village Health Workers
WFP	World Food Programme
WHO	World Health Organization

EXECUTIVE SUMMARY

The National Strategic Plan for Prevention of Re-establishment of Malaria in Bhutan 2026-2030 is developed focusing on obtaining World Health Organization (WHO) malaria-free certification and preventing re-establishment of malaria in Bhutan from 2026 to 2030 and beyond, as part of achieving the national vision of 'a nation with the best health'. Bhutan fulfils the WHO criteria for consideration for malaria-free certification based on interruption of indigenous transmission since 2022 and maintenance of a surveillance system capable of detecting and responding to every malaria infection.

The development of this National Strategic Plan (NSP) from 2026-2030 has been a comprehensive, evidence-based, and highly consultative process led by the Vector-borne Disease Control Programme (VDCP) under the Department of Public Health, Ministry of Health, with technical support from WHO building on the successful achievements gained over several years. Relevant reports and documents were reviewed and the findings of the external review of the malaria programme conducted in 2025 laid the foundation for the development of the strategic plan.

This NSP builds on past achievements and presents a roadmap to obtain WHO malaria-free certification and to prevent re-establishment of malaria in Bhutan in the future. It focuses on strengthening surveillance, epidemic preparedness and response, case management, targeted implementation of preventive interventions, maintaining technical expertise within the country, improved cross border collaboration and sustained political and financial commitment. Enhanced parasitological and entomological surveillance, and effective response in collaboration with currently expedited developmental activities in the country will be the backbone of the prevention of re-establishment (PoR) programme. Bhutan has already developed guidelines and standard operating procedures for surveillance and response activities. The currently implemented 1-3-7 strategy for notification and investigation of cases and response has been in operation for some time and well implemented; generated data are tracked real time through a web-based online system which ensures timely actions that are monitored regularly as part of the monitoring and evaluation (M&E) plan.

National treatment guidelines for Bhutanese and non-Bhutanese nationals have been revised recently and are used for case management; all detected malaria cases in the country will have access to quality assured diagnosis and treatment services. These guidelines will be reviewed and revised as necessary. Training of health personnel will be done regularly to ensure that their skills are up to date.

Based on findings of entomological surveillance and of case investigations, appropriate evidence-based preventative strategies including vector control will be implemented. Vector susceptibility testing will be carried out routinely and adequate stocks of WHO-prequalified insecticides for indoor residual spray (IRS) and Long-Lasting Insecticidal Nets (LLINs), based on findings of susceptibility studies, will be procured and used as necessary. In addition, vulnerable populations in high-risk areas in close proximity to the border with Assam State, India where malaria is endemic, will be protected using LLINs. IRS will primarily be used as part of response.

The VDCP will ensure quality assurance of all prevention of re-establishment of malaria activities ranging from diagnosis, treatment and implementation of preventive activities. The skills of microscopists will be assessed annually through internal and external competency testing programmes; in addition, there will be regular in-service training programmes for microscopists. Further, all positive blood smears and 10% negative blood smears will be cross checked by level 1 and level 2 microscopists. Regular training of all healthcare providers will be carried out routinely in various areas such as surveillance, case management, case investigation, and response etc. All these are being carried out to ensure that the necessary skills of healthcare personnel required for prevention of re-establishment of malaria are maintained.

All guidelines and standard operating procedures will be reviewed and revised as necessary. Although the supply chain management system is upgraded and computerized, a few gaps have been identified which will be rectified with strengthening of the system. As part of quality assurance only WHO-prequalified products will be procured for prevention of re-establishment of malaria activities.

Cross-border collaboration will comprise a major component of this strategic plan as imported cases acquired in neighbouring India where malaria is prevalent, is a challenge to the prevention of re-establishment of malaria in Bhutan. Although links have been established with agencies in the Indian side, actual sharing of data and implementation of joint programmes requires active engagement from both sides. It is proposed that cross-border collaboration will be strengthened and that regular meetings along with field visits will take place at least twice a year. It is also proposed that international agencies will coordinate this activity and dedicated funding for this be obtained.

With dwindling numbers of malaria cases in the country, both healthcare personnel and the public in general forget the threat posed by malaria. The VDCP will be

conducting sensitization sessions for healthcare providers on a regular basis. For the general public, health promotion programmes will be conducted for vulnerable population residing in close proximity to the land border with India at least twice every year; once before the potential transmission season and once during the potential transmission season.

It is proposed that the Technical Advisory Group for Malaria Elimination (TAGME) be renamed as the Technical Advisory Group for Prevention of Re-establishment of Malaria (TAGPoR). It is proposed that regular programme reviews be conducted; as currently done, the VDCP personnel engaged in prevention of re-establishment of malaria activities to meet every month. A programme review is proposed to be conducted in 2028; ideally inclusion of external reviewers is preferred, but if funding is limited, even a review by local experts is acceptable.

The success and sustainability of the prevention of re-establishment of malaria programme rests solely on political and financial commitment. The Royal Government of Bhutan has dedicatedly supported the PoR programme for malaria. This is evident by the fact that additional sources of funding have been identified for the future through the Bhutan Health Trust Fund to cover gaps that resulted from recent funding restrictions that have been imposed by donor agencies. With malaria-free certification, it is likely that the ability of country to attract funding will be further limited; hence there is an urgent need to ensure adequate sources of funding for the future. The activities related to the prevention of re-establishment of malaria in Bhutan 2026-2030 have been identified; the estimated budget is United States Dollar (USD) 8.2 million.

The prevention of re-establishment of malaria programme will have to adopt a high state of vigilance for a long time to mitigate the threat posed by endemic malaria in Assam state, India, along the border with Bhutan. During this period, it is essential to maintain a responsive system that is capable of preventing its introduction in Bhutan for which adequate funds must be ensured. The integrated activities implemented by the VDCP that have already been implemented will be continued to optimize prevention of re-establishment of malaria activities.

ACKNOWLEDGEMENTS

The VDCP, Communicable Diseases Division under the Department of Public Health, Ministry of Health, Royal Government of Bhutan, in close collaboration with its partners, has developed the National Strategic Plan for the Prevention of Re-establishment of Malaria 2026–2030. This strategic plan reflects Bhutan's continued commitment to sustaining its malaria-free status through coordinated, evidence-based, and resilient public health interventions.

At the foremost, the Ministry of Health sincerely expresses its gratitude to WHO SEARO and WHO country Office in spearheading the development of this important strategy. The Ministry of Health also expresses sincere appreciation to all stakeholders and partners for their valuable contributions throughout the development process. In particular, the Ministry acknowledges the members of the Technical Advisory Group for Malaria Elimination (Annexure 5) for their expert technical guidance and strategic inputs in finalizing the document. The Ministry further acknowledges all the individuals (Annexure 6) who contributed to the development of this NSP.

The coordination and technical input for the development of this strategic plan were led by Professor Rajitha Wickremasinghe, WHO Consultant, whose invaluable support and expertise were critical to the successful completion of this document. The Ministry of Health also acknowledges the continued financial and technical support provided by WHO and the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM), which has been instrumental in sustaining malaria elimination efforts in Bhutan.

It is envisaged that this strategic plan will serve as the overarching framework for guiding coordinated and collaborative efforts to prevent the re-establishment of malaria in Bhutan. It will also provide the basis for the development of detailed, costed operational plans aligned with national priorities and responsive to local contexts.

MESSAGE

It gives me great pleasure to present the National Strategic Plan for the Prevention of Re-establishment of Malaria 2026–2030. Bhutan's achievement of malaria-free status stands as a significant public health milestone and reflects the sustained leadership and commitment of the Royal Government of Bhutan, the dedication of our health workforce, and the strong support of our partners.

While this achievement is commendable, the risk of re-establishment of malaria remains, particularly in the context of long porous borders in the south, increasing trade and tourism, high population mobility, and the changing ecology. It is therefore imperative that we remain vigilant and continue to strengthen our surveillance, prevention, and response systems.

This Strategic Plan provides a comprehensive framework to guide the country's efforts in maintaining malaria-free status through robust surveillance, timely case detection and response, vector control, community engagement, and cross-sectoral collaboration. It emphasizes the importance of sustaining capacity at all levels of the health system while adapting to emerging challenges.

I would like to acknowledge the valuable contributions of all stakeholders, including national and field health officials, technical experts, and development partners, in the formulation of this document. I extend my sincere appreciation to the Vector-borne Disease Control Program and the Department of Public Health for their leadership and coordination in this important endeavour. I also express my gratitude to our partners, particularly the Global Fund to Fight AIDS, Tuberculosis and Malaria and the World Health Organization, for their continued technical and financial support.

I am confident that the successful implementation of this Strategic Plan will ensure that Bhutan not only sustains its malaria-free status but also safeguards the health and well-being of its people for generations to come.

Minister of Health
Royal Government of Bhutan

1. INTRODUCTION

Bhutan is on the cusp of achieving a landmark goal in public health; the country has already interrupted indigenous malaria transmission since 2022 and is now eligible to be certified as malaria-free by the World Health Organization (WHO) which is proposed to be achieved in 2026. With malaria-free certification, the whole country transitions to the prevention of re-establishment phase which the current National Strategic Plan (NSP) focuses on from 2026 to 2030 and beyond in achieving the national vision of 'a nation with the best health'.

No indigenous malaria cases have been reported in Bhutan since 2022. Even during the relatively larger number of cases detected in 2024, primarily originating from neighbouring India, detailed epidemiological analysis revealed that there were only 9 introduced cases, the rest being imported cases. This demonstrates the capacity of Bhutan's surveillance and response system to detect every malaria case promptly and prevent re-establishment of indigenous transmission. Further prevention of re-establishment (PoR) activities will require adequate programme and financial sustainability. This NSP for the prevention of re-establishment of malaria 2026-2030 outlines the activities required to obtain WHO malaria-free certification and prevention of re-establishment of malaria from 2026 to 2030 and beyond.

This NSP has been costed at approximately USD 8.2 million. The programme is funded by the Global Fund's (GF) current grant which is available until end 2027; even though funding has been curtailed by 17% given the current funding landscape, the Royal Government of Bhutan has stepped in to meet the shortfall. The government's share of malaria funding has also increased over time showing political and financial commitment of the government.

Sustaining malaria elimination and prevention of re-establishment of malaria in Bhutan is within the broader context of control of vector-borne diseases. The programme is structured as an integrated Vector-borne Disease Control Programme (VDCP) comprising dengue and leishmaniasis as well. The programme is evaluated as an integrated one.

Following GF transition, sustaining human resources, infrastructure, logistics and supplies through domestic financial support will be needed; this is facilitated through integrated work plans. Activities include optimizing surveillance and vector control to ensure cost efficiency and effectiveness, transitioning rapid diagnostic tests (RDTs) and artemisinin-combination therapy (ACTs) to Bhutan Health Trust Fund, leveraging inclusion of malaria commodities in national essential medicines/ supplies lists, strengthening surveillance and response through expanding public-

private partnership (PPP) model for migrant worker screening and foreign labour health regulation, mobilize co-financing from infrastructure projects and private partners, institutionalizing advocacy and awareness e.g. integrating awareness activities on vector borne diseases (VBDs) into local government plans and collaborating with CSOs to promote community engagement.

The benefit of malaria elimination needs to be extended to elimination and control of other endemic and emerging VBDs e.g. kala azar, dengue. Sustaining malaria-free status (within overall VBD free context) to be incorporated as an essential component in the Gelephu Mindfulness City project. This NSP primarily focuses on prevention of re-establishment of malaria as it is national priority.

The NSP for the prevention of re-establishment of malaria in Bhutan 2026-2030 is intrinsically aligned with Bhutan's overarching national development and health agendas. It is also aligned with the Ministry of Health's 13th Five-Year Plan: Healthy Drukyul Program and contributes directly to the achievement of the output: "Control and elimination of priority disease achieved." It directly supports the goals of the Royal Government of Bhutan to achieve the broader national vision of "a nation with the best health" (Ministry of Health, 2025).

Internationally, the plan adheres to the principles and targets of the WHO Global Technical Strategy for Malaria 2016–2030 (2021 Update), specifically its goals concerning malaria elimination and prevention of re-establishment. It aligns with the WHO Global Malaria Programme Operational Strategy 2024-2030, by focusing on norms and standards, stimulating new tools and innovation where relevant for PoR, promoting strategic information for impact, and providing national leadership (WHO, 2021).

2. METHODOLOGY

The development of this National Strategic Plan (NSP) 2026-2030 has been a comprehensive, evidence-based, and highly consultative process led by the VDCP under the Ministry of Health, with technical support from WHO building on the successful achievements gained over several years. Relevant reports and documents were reviewed and the findings of the external review of the malaria programme conducted in 2025 laid the foundation for the development of the strategic plan.

Extensive online discussions were held regularly with staff of VDCP and WHO. The NSP's planning process further involved thorough reviews of relevant WHO guidelines on PoR and malaria-free certification, ensuring global best practices were incorporated.

3. COUNTRY PROFILE

Geography

Bhutan is a landlocked sovereign country of 38,394 square kilometres in the eastern Himalayas, bordered by China to the north (approximately 477 kilometres), including a border with China's Tibet Autonomous Region, and India to the south, east, and west (approximately 605 kilometres). Its geography is defined by a mountainous terrain that ranges from subtropical foothills in the south to the high, snow-capped peaks of the Himalayas in the north, with fertile river valleys in the central region. The country's landscape is dramatic, with an area of 38,394 square kilometers and a diverse climate.

Bhutan's geography can be divided into three main physical regions as:

- **Southern Foothills:** The subtropical southern region with dense forests and fertile land.
- **Inner Himalayas:** A central zone with fertile river valleys, where most of the population lives and agriculture is prominent.
- **Northern Himalayas:** The high, northern part of the country characterized by high peaks, glaciers, and permanent snowfields.

Over 69.71 % (National Forest Inventory, State of Forest Report 2023) of the country is covered by forest, and it has a constitutional mandate to maintain at least 60% forest cover to preserve its environment.

Major river systems in Bhutan are fed by high mountain glaciers, such as the Wang Chhu, Puna-Tsang Chhu, and Dangme Chhu. These rivers are crucial for hydroelectric power generation, a major component of the country's economy, and for irrigation (WHO, 2015).

Climate

The climate varies significantly with elevation, from a humid subtropical climate in the south to severe alpine conditions in the north. There are three main geo-climatic conditions - subtropical hot and humid conditions in the southern foothills, cool temperate climate in the central valleys and virtually snowcapped mountains with cold alpine climate in the north, reaching a height of about 7500m above sea level. Elevations range from 160 meters in the south to over 7000 meters above sea level in the north

The rainfall within these three regions varies with annual precipitation of 2000-5000mm in the south, 600-800 mm in the central region to about 75-200mm

in the north. The differences in these geoclimatic features are experienced even within a short distance due to steep mountains and deep valleys. This harsh geo-climatic factor has not only resulted in unique socio-cultural diversities but also given rise to different health conditions which is unique to each locality; often the inaccessibility of these localities calls for distinct and innovative health systems and service delivery mechanisms. For example, the southern foothills remain ecologically receptive to malaria transmission and therefore require continued surveillance because of imported infections, whereas respiratory diseases are more prevalent in the cold northern region. Further, Bhutan's fragile ecosystem makes it very vulnerable to the impacts of global warming and climate change, and susceptible to natural disasters such as floods and earthquakes. It is also located in region identified as one of the global hotspots for emerging and re-emerging infectious diseases (WHO, 2015).

Administrative Divisions

Bhutan is divided into 20 administrative districts, of which 7 districts namely Chukha, Dagana, Pemagatshel, Samdrup Jongkhar, Sarpang, Samtse, and Zhemgang share borders with India and are at high risk of malaria importation. The seven India-bordering districts are located in the foothills of the southern Himalayas, bordering the Indian states of Assam and West Bengal.

Political System in Bhutan

The government of Bhutan is a democratic constitutional monarchy since 18 July 2008 with the King of Bhutan as the head of state. The executive power is exercised by the Lhengye Zhungtshog, or council of ministers, headed by the Prime Minister. Legislative power is vested in the Parliament, which consists of the Druk Gyalpo, National Council, and National Assembly. In the districts and municipalities, the Local Governments are responsible for local governance, planning, implementation of development programmes and delivery of local public services in accordance with the Local Government Act.

Socioeconomic Context

The nominal (current) Gross Domestic Product (GDP) of Bhutan is $3.41 billion (USD 3,408,000,000) as of 2025, according to the International Monetary Fund (IMF). The GDP growth rate in 2025 is 6.8%; the GDP per capita in Bhutan (with a population of 796,682 people) is $4,285 in 2025, an increase of $365 from $3,921 in 2024 representing a change of 9.3% in GDP per capita (Ministry of Health, 2025).

Guided by Bhutan's national development philosophy of Gross National Happiness, Bhutan follows a Five-Year Plan (FYP) development framework. The current FYP

is the 13th in series (2024-2029) and has 17 National Key Result Areas (NKRAs). Therefore, FYP is a guiding document for planning, monitoring and evaluation of the country's overall success and performance of the developmental activities and across sectors. The Prime Minister reviews the overall implementation of the planned activities through periodic reviews. The annual monitoring and implementation of the planned activities is done through the government performance management systems (GPMS) by signing the Annual Performance Agreement between the Prime Minister and Ministers, Ministers and Secretaries and Secretaries and departments and Divisions which are all linked to the individual performance to financial and programmatic performance systems.

The current 13th FYP (2024-2029) focuses on transitioning to a high-income economy by 2034 through transforming the agrifood sector, boosting economic growth (7-8% target), digital innovation, green development (like solar energy, sustainable transport), job creation, and public sector reform, all while maintaining environmental sustainability (carbon neutrality with 60% forest cover). This plan integrates a 10-year strategic vision, a four-cluster approach for implementation, and key performance indicators (KPIs) like reducing youth unemployment and trade deficit, supported by partners like the World Bank and UN.

The 13th Five-Year plan from 2024-2029 recognises the following key pillars and focus areas:

- Economic transformation shifting towards a high-income economy, diversifying markets, fostering innovation through private sector growth;
- Focusing on the agrifood sector aiming for growth, value chains and food security;
- Green growth emphasizing sustainable energy (solar/wind), green tourism, water management, and maintaining carbon neutrality;
- Job creation addressing youth unemployment through new industries, digital economies and fostering entrepreneurship;
- Integration with Gross National Happiness (GNH) balancing economic goals with cultural preservation, environmental protection and good governance; and
- Implementing the civil service reform for professionalism, efficiency and digital governance as part of public sector reform.

Developmental Initiatives

The Gelephu Mindfulness City (GMC) is being developed as a Special Administrative Region (SAR) with a distinct administrative and regulatory framework. On the other hand, the RGoB is driving reforms in bureaucracy (Enlightened Entrepreneurial Bureaucracy - E2B), education, laws, and economy to achieve balanced growth, address brain drain, and modernize while preserving core values.

This strategy will be implemented as a 10-year strategic framework extending beyond the usual 5-year cycle to support the 2034 high-income goal enhancing coordination and collaboration among government sectors. It is expected that a smoother transition will be established to move the country to a developed country supported by development partner countries, UN agencies such as UNDP, WFP and the World Bank group.

Hydroelectricity is a major industry in Bhutan, and many new hydroelectric projects are under construction or have been sanctioned for construction. All new projects are subject to Environmental Impact Assessment including impacts on vector-borne disease transmission. Besides, all new projects should ensure that foreign workers are screened for selected communicable diseases, and the healthcare needs of the workers are looked after with no additional burden on the RGOB. All foreign nationals who acquire malaria are treated based on national treatment guidelines.

4. HEALTH PROFILE

Non-communicable diseases now constitute the major burden of disease in Bhutan, while communicable diseases remain an important public health concern, particularly vector-borne diseases, tuberculosis and emerging infectious diseases. The common morbidity recorded in the health facilities around the country are common cold, skin infections, peptic ulcer symptoms and dental caries. Other cases like acute pharyngitis/tonsilitis, dental caries, diarrhoea, diseases of teeth and gum, and hypertension cases have also increased.

Monitoring NCDs is essential for understanding the burden of chronic illnesses and planning public health interventions. There has been an overall increase in incidence of NCDs. Alcoholic liver disease is a major NCD. Arthritis and arthrosis cases are on the rise. Diabetes cases have increased substantially as evidenced in the National Health Survey (NHS) 2023, a rise in the prevalence from 2.1% in 2019 to 5.6% in 2023. Hypertension cases also rose significantly in 2022, consistent with the NHS 2023 report (the hypertension prevalence rose from 28% in 2019 to 30.1% in 2023). Ischemic heart disease cases increased to 508 from 439 in 2022,

while rheumatic heart disease cases decreased slightly to 584 from 686 in the previous year. The NHS 2023 report also revealed an increase in cardiovascular disease (CVD) risk from 3.7% in 2019 to 5.1% in 2023, supporting the observed rise in NCD cases. These trends highlight the growing burden of chronic diseases and the need for enhanced preventive and management strategies (Ministry of Health, 2025).

NCDs pose significant public health challenges in Bhutan. Since 2009, the country has been implementing the WHO Package of Essential NCD (PEN) protocol, and from 2019 onwards, it adopted the enhanced People-Centered Care-PEN HEARTS project through the Service with Care and Compassion Initiative package. Over the past four years, major hospitals have observed a notable burden on the healthcare system from NCDs, particularly hypertension (approximately 355 cases per 10,000 population) and diabetes (223 cases per 10,000 population) in 2023 (Ministry of Health, 2023).

In 2023, mortality from alcoholic liver diseases decreased slightly from 146 cases in 2022 to 129 cases in 2023, although it remains the leading cause of death in the country. Mortality due to conditions originating in the perinatal period and hypertension also saw a slight decrease in 2023 compared to 2022. However, there was a slight increase in deaths caused by cerebrovascular diseases, pneumonia, mental health and behavioural disorders due to alcohol, stomach/gastric cancer, meningitis/encephalitis, tuberculosis, accidental falls, and epilepsy in 2023 compared to the previous year. Overall, the trends in mortality remained largely consistent with those observed in 2022 (Ministry of Health, 2023).

Bhutan's pursuit of WHO malaria elimination certification by 2025 was delayed due to an outbreak in neighbouring India in 2024 which resulted in imported infections and a limited number of introduced cases that were rapidly detected and contained, with no indigenous cases. The country has made significant strides in reducing both the incidence and the impact of malaria over recent decades, positioning itself well to meet its elimination objectives. In 2023, there were 18 reported cases, an increase from 2022's 6 cases. Among these 18 cases, 14 were imported, 4 were introduced cases, and 0 indigenous cases. Alongside its efforts to control malaria, Bhutan faced a substantial dengue outbreak in 2019, with over 5000 cases across 19 dzongkhags with six deaths. Responding decisively, the Ministry of Health implemented proactive prevention and control measures in 2020, resulting in a remarkable 95% decrease in reported dengue cases, with only 238 cases recorded. This proactive approach underscores Bhutan's commitment to safeguarding public health and mitigating the impact of vector-

borne diseases. Bhutan has made commendable progress in malaria control and elimination, yet dengue remains a growing challenge. Continued efforts to prevent re-establishment of malaria, public awareness campaigns, effective usage of bed nets, early detection and management of cases and community engagement are essential to mitigate the burden.

5. HEALTH SYSTEM

Bhutan's health system is publicly financed and managed and has evolved and grown over the past six decades; it is a three-tiered structure comprising primary, secondary and tertiary levels providing free healthcare as mandated by its constitution and guided by the principle of Gross National Happiness (GNH). It features an integrated approach to both modern and traditional medicines. Village health workers play an important role as a bridge between health services and the community to promote health. Programmes are in place to address the public health challenges facing the country.

Government revenue is the predominant source of health financing. In 2014, the total health expenditure (THE) was 3.6% of the gross domestic product (GDP). Despite the difficult geographical terrain and dispersed population settlements, access to health services has improved remarkably. Bhutan is among the top global performers in gains in life expectancy in the past 40 years. The targets of Millennium Development Goals (MDGs) 4 and 5 have been achieved and since 2010, immunization levels have been maintained over 95% (see Appendix for details). The country faces multiple burden of health challenges. Communicable diseases continue to require sustained public health attention despite successful elimination of indigenous malaria. A few other emerging, challenging issues are crime, substance dependence and suicide/other mental health problems. Variations in efficiency levels among different districts and health facilities highlight the potential for improvement in overall efficiency. Though there is good evidence of intersectoral action, it needs to be fostered further to close the existing equity gaps and achieve the Sustainable Development Goals (SDGs) (Thinley, S., Wangmo, K., Wangchuk, N. et al., 2017).

The mission of the Ministry of Health of the Royal Government of Bhutan is

- To provide quality healthcare services in both traditional and modern medicines.
- To prevent, control, eliminate and eradicate diseases.
- To rehabilitate and promote healthy living.
- To ensure sustainable, responsive, equitable, accessible, reliable and affordable health services (Thinley, S., Tshering, P., Wangmo, K., et al. 2017).

The organogram of the Ministry of Health is given in Figure 1.

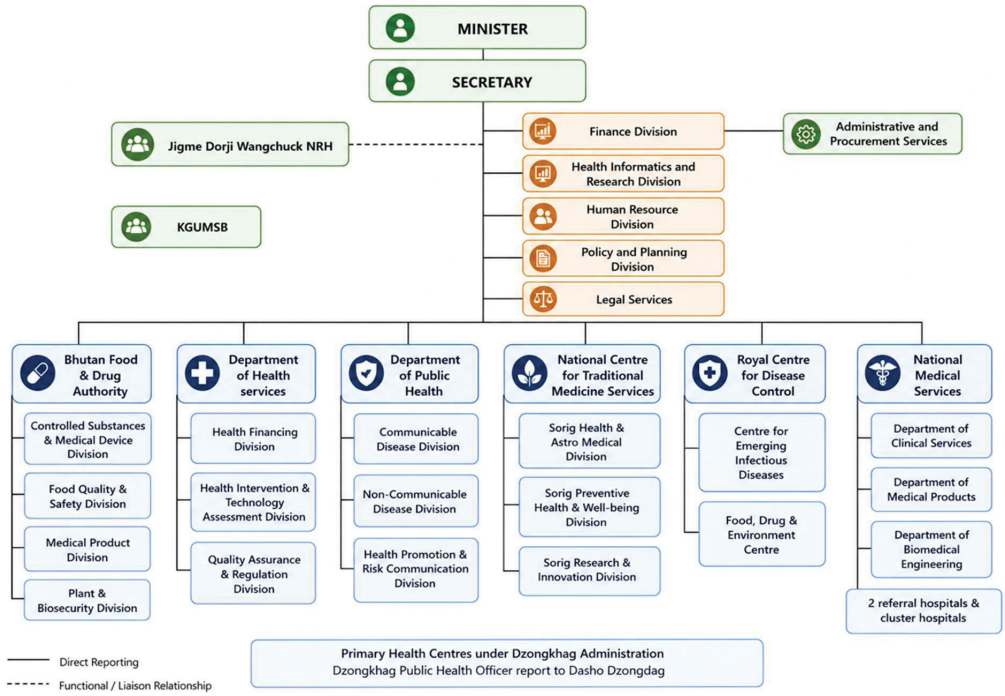

Figure 1: Overall structure of the healthcare system after Transformation 2.0 (2026)

6. VECTOR-BORNE DISEASE CONTROL PROGRAMME (VDCP)

Bhutan's VDCP focuses maintaining malaria-free status through prevention of re-establishment of malaria. It also has mandates over elimination of visceral leishmaniasis as well as managing other vector-borne diseases like dengue, using integrated strategies including mass distribution of ITNs, IRS, larval source management, and robust entomological and parasite surveillance, targeted advocacy with strong cross-border collaboration to tackle importation risks, all guided by national strategic plans to build capacity and adapt to climate change impacts.

The VDCP, a highly committed and dedicated programme with competent staff, has been integrated for over 2 decades, with success in malaria elimination, providing excellent opportunity to eliminate / control other VBDs. The programme promotes community engagement through Village Health Workers (VHW) and Community Action Groups (CAGs) for integrated house-to-house monitoring and health education, including fever surveillance, regular clean-up and monitoring of ITN use in receptive areas.

An innovative approach is adopted through engagement of private diagnostic centres for migrant workers in routine screening of diseases (malaria, Syphilis, HIV, Hep B, Hep C, RBS, drug test, Xray for TB) for issuing work permits. Procurement of commodities required in small quantities is facilitated by a pharmacist stationed in the Royal Bhutanese Consulate in Kolkata, India. Mandatory establishment of a health facility, Primary Healthcare Centre (PHC) or District Hospital in areas of developmental projects, through public-private partnership (PPP), e.g. hydroelectricity dam construction projects are another example of private public mix in disease prevention, control and management. Progressive transition from paper-based formats to paperless digital environment is another positive feature.

Key strategies and interventions include strong leadership and commitment from MOH, a strong VDCP programme, integrated vector management combining multiple methods for cost-effectiveness and efficiency; insecticide-based methods comprising mass distribution of LLINs every few years with high coverage in high-risk areas, and two rounds of IRS annually in receptive southern districts at risk of malaria re-establishment; intensified surveillance and monitoring through continuous entomological monitoring (vector density, insecticide susceptibility), regular refresher training on malaria microscopy, and insecticide resistance monitoring; strengthened case management through expanded access to diagnosis and treatment, including ACTs for malaria; and fostering community engagement through citizen-science programmes and community clean-up campaigns for larval source reduction.

External Competence Assessment of Malaria Microscopists is being done every 2-3years through WHO to maintain the competency and quality of microscopy skills of malaria technicians.

The main targeted diseases include malaria, dengue, Japanese encephalitis and visceral leishmaniasis.

7. EPIDEMIOLOGY OF MALARIA

Bhutan has reported zero indigenous malaria cases since 2022 and zero deaths due to malaria since 2013. In 2024, 114 cases were reported of which 105 cases were imported, and nine cases were introduced with zero indigenous cases; these cases comprised 108 P.vivax cases and 6 P.falciparum cases. In 2025, 30 cases were reported of which 29 cases were imported, and 1 case was introduced, with zero indigenous cases.

The number of malaria cases and deaths due to malaria reported in the country since the inception of the malaria control programme in the 1960's is given in Figure 2. The number of cases has been increasing gradually from the 1960's onwards until about the mid-1990s, after which a gradual decline is seen; a similar trend is seen for deaths due to malaria.

The majority of cases over the years have been P. vivax cases (Figure 3); P. falciparum cases comprise less than 40% of cases except in 2023 when the proportion exceeded 50% of the cases. The distribution of cases is similar to that seen in Assam state of India which borders Bhutan.

The majority of imported and introduced malaria cases detected during the past five years occurred among adults living, working along the international border, or those who had access and means to travel to neighbouring Indian places and communities. Some migrants have also contributed to imported cases. Students, mostly studying in India, also comprise an important source of imported malaria cases. Sending army personnel on UN peacekeeping missions in Africa is another source of malaria importation.

The majority of malaria cases have been reported among adult males. However, during the increased number of malaria cases seen in 2024, there were a few cases reported among children under 5 years indicating the need for dedicated health education and protection measures for vulnerable age groups.

Border malaria along the Indo-Bhutan land border is a major constraint to malaria elimination and a threat to prevention of re-establishment of malaria in Bhutan. Malaria importation occurs primarily through movement of infected people across the international border. Cross-border movement of infected vectors may also contribute under favourable ecological conditions. Although migration across the long border is restricted to a limited number of border crossings, this by itself is sufficient to initiate and maintain transmission in Bhutan as was seen during an outbreak experienced on the Indian side that occurred in 2024.

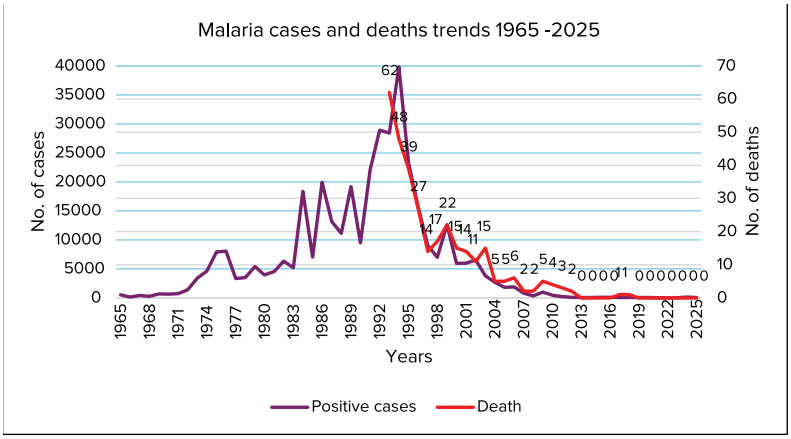

Figure 2: Malaria cases and deaths reported in Bhutan 1965-2024

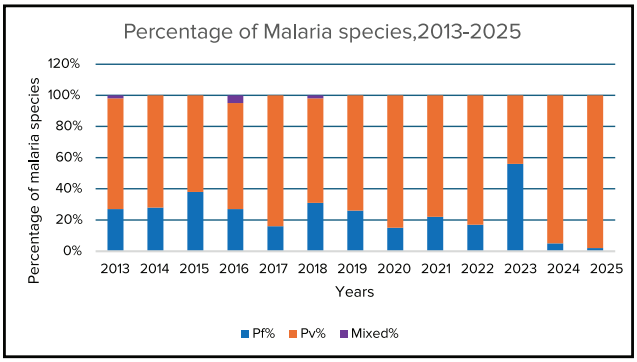

Figure 3: Percentage of Malaria cases reported in Bhutan species-wise 2013-2024

8. SURVEILLANCE

Case detection is a coordinated effort of the VDCP, the district teams, hospitals, PHC, community volunteers, outreach clinics and Private Diagnostic Centre (PDCs). Passive case detection, proactive and reactive case detection are employed with high level of vigilance, especially in areas at highest risk of malaria importation and re-establishment. VHW placed throughout the country, are trained on house-to-house fever surveillance, health education on communicable diseases, symptomatic treatment and referral. In areas with high risk of malaria, they are well-oriented on suspecting malaria cases, referrals, and education on bed net use. Additionally, these areas have CAGs composed of local stakeholders and VHWs, integrating malaria elimination activities at community level (support net distribution, IRS, community awareness, fever surveillance, elimination of breeding sites, DOTs, referral etc.). A highly commendable proactive surveillance approach is already in place near the border entry points for screening of migrant workers for malaria (and other diseases) through PDCs.

The procedure for case detection, notification, case investigation, case classification, and focus investigation, classification and response is clear and followed by staff as per the 1-3-7 approach through real time web-based reporting. Malaria is an immediately notifiable disease, and all positive cases are notified immediately through National Early Warning Alert and Response System (NEWARS) using mobile phones to communicate and ensure rapid information sharing and response. Cases are investigated and initially classified by PHC (malaria technician, health assistant) and district level staff (district malaria supervisor, chief medical officer, district public health officer). Annual trainings are conducted by the national programme for healthcare staff at these levels, especially in high-risk areas. The classification of every case is reviewed and certified by the TAGME and reclassified if necessary. Case investigations are mostly complete; where there are challenges in case classification, TAGME makes field visits for case classifications.

9. QUALITY ASSURANCE

The Royal Centre for Disease Control (RCDC) oversees the malaria diagnosis quality assurance programme. Slides are cross-checked monthly (all positives and 10% of negatives) through a paperless digital information management system, and feedback is provided to microscopists. Training and refresher training are provided for staff.

As part of the External Quality Assurance (EQA) programme, collaborations are in place with Research Institute for Tropical Medicine (RITM) for malaria microscopy, and WHO EQA scheme for Malaria Nucleic Acid Amplification Tests (NAAT) and molecular markers (MM) of antimalarial drug resistance. Regular External Competency Assessment for Malaria Microscopists (ECAMM) has been conducted with assistance from WHO: 16 L1 and 14 L2 microscopists are currently in place. National training courses on MM are conducted regularly.

The VDCP has already established a quality assurance system for its malaria programme. Activities include cross checking blood smears, conducting ECAM for microscopists, regular training of personnel and procurement of WHO-prequalified antimalarial commodities.

10. CROSS BORDER COLLABORATION, MULTISECTORAL AND PRIVATE SECTOR ENGAGEMENT

Districts share a long international border with India, with daily/short to long term population movement at designated points. Although previously, migration across the Indo-Bhutan border took place at multiple sites in an uncontrolled manner, currently, it is more regulated occurring at four crossing points as Bhutanese

security personnel are deployed along the border. Cross-border collaboration between Bhutan and India was initiated with support from WHO as well as non-government coordination mechanisms especially at local levels (district to district collaboration). Information on positive cases and responses are shared through social media platforms (WhatsApp) so as to synchronize actions, as locally feasible. Recently in 2025, a site visit by Bhutanese officials was carried out in some localities in India along the border to observe anti-malaria activities firsthand and to look at ways of synchronized actions. Periodic consultation meetings and exposure visits are held. Although a formal system exists, its functionality requires enhancement especially in relation to sharing of real time data from Assam to Bhutan for setting up organized and harmonized antimalarial activities. This mechanism needs to be strengthened and further facilitated.

Fever cases from across the border seeking health services in Bhutan are provided diagnostic and treatment free-of-charge (those without work permit/travellers return after diagnosis and treatment).

Coordination with private sector industries is promoted for diagnosis and treatment and LLIN coverage of the labour population. Private sector practitioners are not present; only PDCs are present which report to the VDCP if a positive case is detected for treatment and further follow up.

11. VECTOR SURVEILLANCE

The overall coverage of vector surveillance integrated at the central and district levels needs strengthening. Existing surveillance provides adequate information for operational decision-making. Additional longitudinal entomological monitoring is planned to further strengthen evidence-based interventions. Current entomological surveillance adequately supports prevention of re-establishment activities. Further strengthening through additional molecular tools and expanded surveillance methods will enhance programme resilience.

Anopheline Fauna in Bhutan

For the first time, the Anopheles fauna of Bhutan was surveyed from 2007 to early 2018. Adult mosquitoes were collected mainly on cattle baits and occasionally in human landing catches. Collections of immature stages were obtained from various aquatic habitats and larvae were preserved or reared to adults. Identification was based on morphological characters using available keys. A total of 30 species were identified, including nine species of subgenus Anopheles and 21 species of subgenus Cellia. Although detailed vector incrimination studies have not been carried out, Anopheles pseudowillmori is suspected to be a vector of malarial

parasites in the plains and hilly forested areas of the country because it is widely distributed and the most common species collected in human landing catches. There were morphological variations observed in An. baileyi and An. lindesayi, which differ from the type forms (Rinzin Namgay, Tobgyel Drukpa, Tenzin Wangdi, et al., 2018).

As the majority of malaria cases are reported in Sarpang district which shares a border with the state of Assam in India, a comparison of the Anopheles species in four Sarpang villages was made with published records of anopheline mosquitoes in neighboring Assam from June to July 2014. The two suspected malaria vectors in Bhutan, Anopheles culicifacies (n=189) and An. pseudowillmori (n=205), were abundant in the villages in Sarpang. However, in Assam, only An. culicifacies species B, a relatively incompetent vector, was documented. In contrast, the primary malaria vectors of Assam, An. minimus and An. baimaii, were absent in the Sarpang collections. If An. culicifacies is not a competent vector in Sarpang, the other recovered species – An. pseudowillmori and An. maculatus – may be the responsible vectors for malaria transmission in Sarpang. Nonetheless, molecular methods are required to identify members of several sibling species complexs in this region; however, adequate equipment and additional training of personnel will be necessary to address this difficulty (Rinzin Namgay, Tobgyel Drukpa, Tenzin Wangdi, et al., 2018).

An. pseudowillmori has been classified as a secondary vector in Western Thailand but is a predominant or sole vector in southern Tibet. It has been collected in outdoor traps and breeds in sunlit pools and stream margins in hilly and mountainous terrain similar to other members of the Maculatus group.

An. maculatus is an incriminated primary vector in many parts of Southeast Asia and generally exhibits zoophily and exophagy behaviour. It bites throughout the night, often peaking in the first half of the night. It breeds in a variety of water sources near hilly, forested areas including stream margins, ponds, ground pools and rice fields.

An. minimus is a highly efficient primary vector in Northeast India. It is primarily anthropophilic biting both indoors and outdoors but historically biting and resting indoors. Biting peaks between midnight and 4:00 hrs and is susceptible to IRS. It prefers breeding in slow-flowing streams with grassy and vegetated banks and river backwaters.

There are reports that An. culicifacies is present in the eastern parts of Bhutan, and An. vagus and An. minimus are present in the western part of the country.

Indirect Evidence of Malarial Vectors

Although comprehensive vector incrimination studies remain limited, available entomological evidence together with historical epidemiological data sufficiently identifies the principal vectors responsible for malaria transmission. Based on available studies on the Anopheline fauna of Bhutan, An. pseudowillmori, An. maculatus and An. minimus are potential vectors of malaria in the country given its distribution in the country corresponding to areas of previous indigenous malaria transmission in the country, the incriminated vectors of neighbouring Assam state of India where indigenous transmission is taking place and effects of the use of LLINs and IRS in Bhutan which has been able to maintain malaria transmission at elimination levels for many years. It also appears that vector control measures currently used in Bhutan is effective if interrupting further local transmission of malaria in the country. However, it is imperative that vector incrimination studies be conducted as a priority operations research project to better target interventions based on evidence.

12. SUPPLY CHAIN MANAGEMENT

The Department of Medical Products serves as the country's central procurement authority, overseeing the acquisition of all medical supplies including essential medicines for the entire nation. All procurement activities are conducted in strict accordance with the rules and regulations set forth by the Ministry of Finance.

Malaria commodities fall under this same procurement framework. To track and manage medical inventory efficiently, the country has implemented the Electronic Bhutan Medical Supplies Information System (eBMSIS), which ensures that stock levels, distribution, and utilization are monitored in a structured and transparent manner.

However, not all malaria commodities follow the standard procurement route. Certain specialized items, particularly those required in smaller quantities or demanding more technical procurement expertise are sourced through partnerships with international agencies such as the Global Fund, WHO and Royal Bhutan Consulate General office in Kolkata, India. These partnerships help bridge gaps that might otherwise be difficult to address through conventional national procurement channels.

13. REVIEW OF THE MALARIA PROGRAMME

The malaria programme has been reviewed at regular intervals to assess the achievement of objectives and the progress of the activities outlined in the NSP. The last external review of the malaria programme was conducted in 2025. The

findings of the review led to the situation analysis described below which, in turn, was the basis for the activities proposed in this NSP for prevention of re-establishment of malaria in Bhutan 2026-2030.

14. SITUATION ANALYSIS

Strengths

- An online surveillance and reporting system developed over many years using state-of-the-art features. The system is automated and has the capacity to update databases and generate epidemiological risk maps.
- There is a robust and timely response mechanism in place for outbreaks incorporating the 1-3-7 model; it is claimed that the response is 100% within the time frame but needs evidence to include in the malaria elimination report.
- A well-integrated programme that has achieved malaria elimination despite having a persistent threat of malaria importation from across the border. Despite this threat, onward transmission of malaria into the country has been minimized.
- An excellent public-private mix in screening for malaria among migrant workers by PDCs. All positive cases are mandatorily reported to the VDCP for treatment, investigation and response. This public-private mix is an example for other countries to follow.
- All development work to be carried out in the country needs high level approval; this approval requires development of health infrastructure in the targeted areas with project funds designated for such purposes. This enables adequate infrastructure to be built for including malaria elimination and prevention of re-establishment activities.
- Absence of a private health sector in Bhutan ensures that all cases are treated by the government health sector thereby eliminating the possibility of introduction of substandard counterfeit antimalarial medicines.
- Bhutan provides a free healthcare service even to temporary visitors ensuring all cases are provided with quality assured antimalarial medicines. Non-national residents in Bhutan are treated as in-patients; others are provided with malaria treatment as per national treatment guidelines and are free return to their home country.
- There is high level commitment from the government over many years that has contributed immensely to Bhutan achieving elimination status despite ongoing malaria transmission in neighbouring India.

Weaknesses

- Although cross-border collaboration discussions have been initiated with border states of neighbouring India, actual sharing of information real-time has been limited. As a result, joint implementation of interventions has been hindered. It is proposed that donor agencies and international organisations facilitate such discussions.
- Cessation of funding by various agencies has resulted in wide-scale curtailment of interventions and programme support for malaria control, elimination and prevention of re-establishment programmes. Globally, reductions in external funding have affected many malaria programmes. Bhutan has mitigated the immediate impact through increased domestic financing, although long-term financial sustainability will require continued commitment.
- Bhutan may not be directly affected by funding cuts until 2027; the current grant was reduced by about 17% but no major effects were seen primarily due to local funding on essential items. This may become a problem in the future.

Opportunities

- Screening of foreign labour by the PDCs and development of health infrastructure in development project areas are opportunities in addition to strengths to prevent re-establishment of malaria in the country.
- Sustained political and financial commitment by successive governments have been instrumental in Bhutan achieving current elimination and prevention of re-establishment of malaria targets. More efforts are required to achieve the last mile.
- Sustained funding from multilateral and donor communities and technical guidance and expertise from international organizations will be required to achieve the last mile. The already established infrastructure and processes in place are opportunities that should not be missed.
- The proposed Gelephu Mindfulness City that is being established and scheduled for opening in 2028 where a large number of foreign workers are expected to be resident provides an opportunity for the entire country to initiate country-wide prevention of re-establishment of malaria programmes; during this initiation period, prevention of re-establishment of malaria programmes are being incorporated including screening of foreign labour by PDCs.
- There is a focal point (programme officer) in the GMC coordinating rabies, dengue and malaria under the Governor's office

- Opportunity for formalized cross-border collaboration, which at present operates on an informal basis, should be established and strengthened; a dedicated budget for this purpose should be identified, possibly even with donor funding.
- Organizational structure in the VDCP is conducive to integration of control methods and can be considered both a strength and an opportunity. Even now, some activities such as entomological surveillance and vector control activities are integrated. These activities enable optimal use of scarce resources and provided opportunities for funding PoR activities.

Threats

- The biggest threat to prevention of re-establishment of malaria in Bhutan is the malaria situation in border areas of India. Given a porous border for human migration, a large Bhutanese migrant workforce seeking employment in various parts of India and contiguous villages and settlements across the border not only facilitate malaria importation from across the border but also complicates case classification for epidemiological purposes and progress and maintenance of PoR. In addition, there is a large migrant Indian population which also visits Bhutan for employment purposes.
- Keeping political and financial commitment as a priority amidst other competing interests in resource-poor settings is likely to emerge in the wake of having to justify spending on a disease where the incidence is low as experienced by countries that have experienced similar situations in the past. For Bhutan's credit, the PoR programme is linked with control of other vector-borne disease control programmes in such a way that the effects of such actions on malaria PoR itself will be minimal.
- Achievement of malaria-free certification and transitioning into the PoR phase has its own issues with donor agencies being reluctant to further fund the malaria programme. In addition to the technical transition, Bhutan will have to develop a financial transition plan during this cycle of the NSP to transition from external to local funding in a phased manner.
- Spread of drug and insecticide resistance is a major threat to smooth transition from elimination to prevention of re-establishment phases. Although, Bhutan has been shielded from these threats to a large extent due to non-existence of a private sector that may promote use of substandard and counterfeit medicines, widespread use of these in neighbouring India is a major threat that has to be dealt with.

- Climate change is a potential threat to control and elimination of vector-borne diseases primarily through its direct effects on vector bionomics ranging from the creation of breeding sites to the effects on the life cycle and eventual longevity of the vector to its effects on the maturation of the parasite in the mosquito. Climate change is likely to increase the malariogenic potential in Bhutan with warmer temperatures.
- Emergence and re-emergence of other vector borne diseases in the country and region is likely to focus the attention away from malaria. At this point in time on the verge of achieving malaria-free certification, Bhutan can ill afford to lose track of malaria as a priority.

Weaknesses and threats

- Migration of the health work force is a major weakness and a threat for re-establishment of malaria in the country. Many trained personnel are seeking better opportunities in other countries thereby reducing the health workforce engaged in early detection and prompt treatment of malaria cases.
- Although there is cross-border collaboration with India, problems exist when non-national patients need to be followed up. Some of these patients are regular visitors to the country thereby being a major threat to prevention of re-establishment of malaria. While this is a weakness of the existing system, it also is a threat to re-establishment of malaria as the same workforce, who may not have completed the prescribed treatment, repeatedly visits Bhutan for work.
- Complacency of public regarding malaria prevention shows a weakness in the system for poor awareness regarding malaria; it also indicates complacency on the part of the community when the malaria burden is low. This is also a threat to re-establishment of malaria as people tend to delay seeking treatment which would not only increase morbidity and mortality due to malaria but also increase the risk of local transmission in potential risk areas.

15. COLLABORATING PARTNERS

Over the past few years, Bhutan has been closely collaborating with many organisations including the World Health Organisation for technical support and guidance, other development partners and donor agencies such as the Global Fund to Fight AIDS, Tuberculosis and Malaria.

In addition, VDCP has been closely collaborating with the Malaria elimination programme developed by the National Center for Vector Borne Disease Control

(NCVBDC) of India through district malaria offices for cross border collaboration to combat border malaria between India and Bhutan. This collaboration may be further facilitated and extended. In addition, there is close collaboration with Indian Council of Medical Research - National Institute of Malaria Research (ICMR-NIMR). Information sharing via WhatsApp messaging takes place on a regular basis.

As part of the EQA programme, collaborations are in place with RITM (for malaria microscopy) and WHO Malaria Nucleic Acid Amplification Tests (NAAT) and molecular markers (MM) of antimalarial drug resistance EQA scheme. Regular ECAMM assessments have been conducted with assistance from WHO.

The VDCP collaborates with private diagnostic centres in screening non-nationals who come for employment in the Bhutan as a successful PPP; all positive cases are notified to the VDCP for treatment and further investigation.

The VDCP also collaborates with CAGs to enhance community surveillance; structured guidelines need to be developed to further strengthen this collaboration and optimize the community surveillance system.

Collaborations have also been established with Khesar Gyalpo University of Medical Sciences of Bhutan to train personnel in parasitology and entomology.

16. NATIONAL STRATEGIC FRAMEWORK

Vision

Sustaining a malaria-free Bhutan.

Goal

To prevent the re-establishment of malaria transmission and maintain Bhutan's malaria free status.

Mission

To sustain malaria elimination gains through integrated vector-borne disease surveillance, effective case management, targeted vector control interventions, strengthened preparedness and response capacities, and sustained commitment from the government, communities and partners.

Guiding Principles

Achievement of malaria-free certification and prevention of re-establishment proposed in this NSP are based on the following broad principles:

- Building on the achievements of the past, good practices and the lessons learned;

- On a whole-of-government whole-of -society approach at all levels;
- Forging national ownership and leadership for malaria-free certification and prevention of re-establishment of malaria through establishment of oversight commission;
- Universal access to quality malaria diagnosis, treatment and prevention with emphasis on coverage of migrant and vulnerable populations;
- Coordinated multi-sector approach through consultative planning, implementation, research, monitoring and evaluation of malaria elimination and prevention of re-establishment activities;
- Strengthen decentralized activities with district health teams taking the lead and promoting community empowerment for prevention of re-establishment of malaria;
- Collaborate and network with local institutions and leaders, neighbouring countries, international organizations and agencies; and
- Upgrade and strengthen surveillance system, conduct research and epidemiological analysis by incorporating new tools and technology

Key Assumptions

This NSP with the goal of obtaining WHO malaria-free certification and maintaining malaria-free status up to 2030 and beyond is based on the following key considerations:

- Continued political commitment by leadership at all levels to support the national strategic plan for prevention of re-establishment of malaria through provision of adequate financial and human resources;
- Continued international support in both technical and financial assistance;
- Ensuring the availability of a critical mass of qualified and competent staff at the central programme and districts for successful planning and implementation of the national prevention of re-establishment of malaria plan and activities;
- Continued cross-border collaboration, real time sharing of data and joint implementation of activities with neighbouring countries;
- Uninterrupted socioeconomic progress and development in Bhutan; and
- Availability of armamentarium to tackle new challenges such as drug and insecticidal resistance if it arises.

Objectives

1. To prevent re-establishment of indigenous malaria transmission from 2026 onward.
2. To obtain WHO malaria-free certification in 2026.
3. To prevent deaths due to malaria.

17. STRATEGIES AND ACTION PLANS

17.1 Strengthening Surveillance

An effective and responsive surveillance system is key to detecting imported malaria cases and preventing onward transmission of the disease. The malaria surveillance system in Bhutan has been developed over the years and has shown to be resilient and effective during the past few years. The case-based malaria surveillance system is part of the NEWARS system in the District Health Information System 2 (DHIS2) platform. The case investigation and response are implemented by the district with support from VDCP; the report is submitted through the DHIS2 system. Standard case notification, case and foci investigation forms have been developed and incorporated into electronic formats and reported in the DHIS2 platform. The system was piloted and rolled out in all health centres. Case classification in border areas requires detailed epidemiological investigation and review by TAGME because of the complex movement patterns across the international border. Electronic Patient Information System (ePIS) is being used across all health facilities. A module relevant to VDCP can be developed and integrated with ePIS.

Vector surveillance including insecticide resistance monitoring has been strengthened to make evidence-based decisions. Currently, there are four sentinel sites for monitoring insecticide resistance; these will be maintained during this cycle of the NSP. Entomological knowledge is key to stratification and identification of transmission risk areas; targeting and selecting appropriate vector control interventions; and monitoring their impact on vector populations. Currently, monthly entomological surveillance is conducted in all areas with high receptivity and importation risk by Malaria Technicians within their catchment areas irrespective of foci stratification.

During the cycle of this NSP, it is proposed to upgrade and maintain the system. The following activities are proposed:

17.1.1 Case Detection

Case detection comprising passive case detection (PCD) and active case detection (ACD), including both proactive (PACD) and reactive case detection (RACD), will be strengthened in all health centres in districts along the border with India and those with ongoing importation risk. All health centres and private diagnostic centres along the border with India will be provided with microscopy facilities and/or RDTs. Diagnostic facilities will be provided free to all patients presenting with fever including foreign nationals.

High-risk Groups

Where there is a strong suspicion of malaria in travellers from malaria endemic areas, these travellers may be subject to PACD tailored to the local context and targeting high-risk and vulnerable groups such as those in remote areas with poor health access, migrants who may not use or have limited access to routine health care and likely reservoir of asymptomatic infections.

Due to increase in hydropower projects and other economic developments in the country there is a huge influx of migrant worker from endemic neighbouring countries like India. This poses a serious threat of importation and re-establishment of malaria in the country, especially in areas that remain receptive. Currently, PACD is conducted at project sites, active foci and residual non-active foci. The migrant workers entering the country are screened for malaria by the health facilities and private diagnostic clinics at the border entry points. This is aimed to detect asymptomatic cases in the high-risk population and foci areas to eliminate a potential source of infection.

17.1.2 Establishing a Technical Advisory Group for Prevention of Re-establishment (TAGPoR) of Malaria

Currently, the TAGME is involved in case and foci classification, and in advising the VDCP on malaria elimination efforts. It is proposed that TAGME be renamed as Technical Advisory Group for Prevention of Re-establishment (TAGPoR) of malaria and appointed by the Minister of Health. It is proposed that the composition of the TAGPoR be reconstituted to include Ministry of Health officials, academics, epidemiologists, clinicians, entomologists, and other relevant experts; the committee may also include overseas experts on malaria elimination and prevention of re-establishment who may join meetings virtually. TAGPoR will review and classify all cases/foci based on available evidence. The case and foci classification will be based on WHO criteria and definitions. TAGPoR may meet once every month if cases are reported or less frequently if cases are reported less

frequently. At the end of the meeting, all cases will be signed off by the TAGPoR and the decisions made will be entered into the national malaria database and used for official national malaria statistics.

17.1.3 Case and foci Investigation and Classification

Each case reported, including imported malaria cases, will be considered a focus. Case investigation and response will be guided by the 1-3-7 model, where notification is carried out within 24 hours by telephone, investigation carried out within 3-days of the case being detected and response completed within 7-days of detection of a case. The case and focus investigation will comprise the following:

- Carrying out an investigation of the area to identify potential sources of infection;
- Carrying out RACD among residents within 0.5 km of the residence of the index case;
- Mapping the area of the residence of the index case;
- Conducting an entomological survey of the area and identifying potential vector breeding sites;
- Compiling data and carrying out a suitable response;
- Classify the case and focus based on available evidence;
- Follow up the community to detect and prevent further transmission as per guidelines of focus investigation and management.

Indicators to assess the performance of the implementation of the 1-3-7 model have been included in the M&E framework.

17.1.4 Epidemiological Risk Stratification

Epidemiological risk stratification is a vital component of an effective and responsive surveillance system that enables evidence-based, cost-effective targeting of interventions. VDCP initiated geographical reconnaissance for risk stratification throughout the country using malaria case data, vectors and breeding sites distribution for implementation of targeted preventive interventions. These variables are uploaded and analysed in customized Geographic Information System (GIS) databases to produce malaria risk stratification maps. Every health facility in a district in malaria receptive areas have geo-locations of households which will be used to map buffer households around an index case for malaria case-based surveillance. The household geo-coordinates will enable health facility, districts and programme in assessing risk stratification of areas and population,

intervention coverage, impact assessment and focused interventions for malaria. The households and new settlements will be added every year, and the database will be updated every year in respective health facility level. This work will be carried out on an ongoing basis.

17.1.5 Risk Stratification and Mapping

With the transition from elimination to a prevention of re-establishment of malaria phase, an initial epidemiological risk stratification will be conducted taking into consideration importation risk of malaria, receptivity to malaria transmission and future development activities in the country that will attract foreign labour from malaria endemic regions. The risk stratification strategy will be based on mathematical models and GIS technology already developed for this purpose at gewog/chiwog levels. This procedure will be carried out every 3 years or as when required depending on the evolving epidemiology of malaria in the country.

Epidemiological risk stratification and mapping exercise will also be used to train personnel (entomologists, epidemiologists, DHOs, MTs etc.) on use of GIS tools and information technology (IT) for surveillance purposes as part of capacity development for sustained prevention of re-establishment of malaria. New modules such as report generation will be incorporated into the system and manuals and guidelines will be updated as necessary. All databases (household data, village-wise data, case data and entomological findings) will be updated at chiwog level. Health volunteers who collect data will also be introduced to the system and the importance of their role will be communicated.

For intervention purposes, epidemiological risk stratification for malaria transmission based on the epidemiology of malaria at the end of 2025 at the sub-district (Gewogs) level is defined as follows (Table 1):
No Risk – Gewogs free of malaria transmission due to high altitude and absence of vectors;

Potential/low risk – Gewogs having a receptive ecosystem and high importation risk of malaria (vector present at least during summer, presence of mega projects with high volume of migrants from malaria endemic areas) but without local malaria transmission within last three years; and

High-risk – Gewogs with high receptivity, high importation risk, evidence of local malaria transmission within the last five years and sharing a direct border with India. All gewogs with common and porous borders with malaria endemic India, lying within the mosquito flight range and have high number of population influx and reflux to and from across the border are included in this category.

The microstratification of malaria transmission in 2026 is shown in Figure 4.

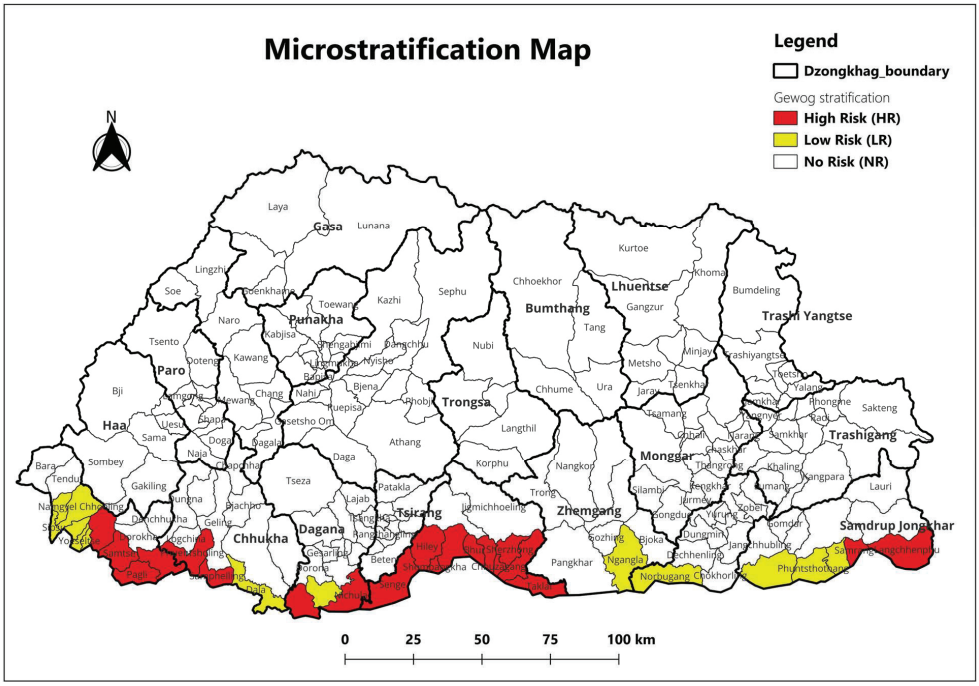

Figure 4: Risk stratification for malaria transmission in Bhutan, 2026

Table 1: Recommended interventions based on microstratification of epidemiological risk of malaria transmission in the country 2026-2030

Activities	No risk areas	Potential/low risk areas	High risk areas	Remarks
Anti-malarial	Yes	Yes	Yes	
Training on case management and diagnosis	Yes	Yes	Yes	
Follow up (Pf)	Day 3 and 28	Day 3 and 28	Day 3 and 28	
Follow up (Pv)	Day 3, 28 and 3rd month and 1 year	Day 3, 28 and 3rd month and 1 year	Day 3, 28 and 3rd month and 1 year	As per latest WHO guidelines
iDES (DOT & FU)	Yes	Yes	Yes	
PCD	Yes	Yes	Yes	
ACD	No	Yes	Yes	
Case-based Investigation (RACD)	Yes	Yes	Yes	
Foci investigation	No	Yes	Yes	

Activities	No risk areas	Potential/low risk areas	High risk areas	Remarks
Event monitoring	No	Yes	Yes	
Epidemic/Rapid Response Team	Yes	Yes	Yes	RRT exists
LLIN distribution	No	No	Yes	
IRS	No	No	Yes*	Focal in active foci and during outbreak response
Vector surveillance				
Insecticide resistance monitoring	No	No	Yes	In sentinel sites
IEC/BCC	Yes	Yes	Yes	More frequent and aggressive in high-risk areas and active foci
CAG activity	No	Yes (Selective)	Yes (Selective)	
Malaria Review Meeting	Annual	Annual	Annual	
M & E interval	Annually	Quarterly	Monthly	

17.1.6 Strengthening Entomological Surveillance

Currently, there are eight sentinel sites for monitoring insecticide resistance which will need to be continued and further strengthened to generate evidence on insecticide resistance patterns for informed decision-making by the programme. Entomological knowledge is key to stratification and identification of transmission risk areas; targeting and selecting appropriate vector control interventions; and monitoring their impact on vector populations. Currently, monthly entomological surveillance is conducted in potential/low risk and high-risk areas by malaria technicians within their catchment areas. However, the monitoring site is not specified as such, and it is very difficult to monitor the trend of vector density. Therefore, the existing surveillance system needs further review and strengthening of epi-investigation to collect adequate information for case classification according to the WHO case definition.

A review of entomological surveillance will be undertaken. Robust entomological surveillance will be strategically conducted, particularly in areas identified as having potential/low risk or high-risk for transmission. This surveillance will be conducted at a few sentinel sites (at least 4) in different ecological settings for trend observation and as part of case investigation; vector species, density, behaviour, and insecticide susceptibility profiles using standard techniques will be monitored and all data will be integrated into the digital information system to inform adaptive vector control strategies and prevent re-establishment of malaria. In addition, vector susceptibility tests to inform decisions on use of vector control methods in case of an outbreak/epidemic would be carried out. Entomological surveillance will be integrated with other vector-borne disease control programmes to optimize services. A plan to conduct integrated vector surveillance will be made at village (gewog/chewog) level.

Training on entomology and use of entomological findings in prevention of re-establishment will be provided to Malaria Technicians. The VDCP has already developed a curriculum for such a training programme (this is further expanded under capacity building). The training module will include updating knowledge on vector bionomics through comprehensive vector studies and xenomonitoring, use of the most optimal VC surveillance methods according to disease risk, e.g. adult traps, aspirators; aedes pupal productivity surveys, monitoring ITN durability; and combining ITN/IRS with unrelated modes of action. Vector surveillance data will be digitized.

There is a shortage of essential equipment for entomological surveillance activities. For Anopheline surveillance only aspirators are currently used. Integrated entomological surveillance activities require procurement of CDC light traps, cattle-baited traps, mechanical aspirators etc which will be procured. In addition, spray machines, bioassay tests and insecticide susceptibility tests for insecticide resistance monitoring will be procured. WHO pre-qualified pyrethroids for ITNs, temephos for larval control and insecticides for IRS based on susceptibility tests will be procured.

All staff will be trained on how to use new equipment and conduct integrated entomological surveillance.

Insecticide resistance monitoring

Insecticide resistance monitoring will be conducted in 8 sites. VDCP staff will be oriented on sound pesticide management practices. A central repair/maintenance facility will be established. An IVM/IRM plan within the context of the WHO GVCR strategy will be developed and implemented.

17.1.7 Strengthening Epidemic Preparedness, Forecasting and Early Warning Systems for Prevention of Re-Establishment of Malaria

The case-based malaria surveillance system was developed as an important element during the elimination phase. The notification through the NEWARS and the DHIS2 platform has enabled the VDCP to investigate cases and respond at the district level. To improve surveillance and data collection, standard case notification, case and foci investigation forms have been developed and incorporated into electronic based reporting format in DHIS2 platform. The system was piloted and rolled out in all health centres.

This system will be further improved. Additional personnel will be trained as part of capacity building. New modules will be incorporated as required and an efficient and responsive surveillance system will be in place as part of epidemic preparedness, forecasting and early warning system.
With time, modules for other diseases will be incorporated to test the applicability of the system for other vector borne diseases as well.

17.1.8 Special Events Surveillance

Special events surveillance will include monitoring of events such as unexpected population movements, construction of large developmental projects, mass community gatherings, changes in climate data, number and pattern of fever cases in communities and any events with the potential for malaria importation and transmission. This will be done through multi-sectoral collaboration and community monitoring. Entomological surveillance in the developmental projects will inform potential transmission areas and levels of receptivity. Regular meetings will be conducted among multi-sectoral stakeholders to plan and conduct special event surveillance programmes.

17.2 Strengthening Case Management

Malaria diagnosis and treatment is provided free-of-charge (to all including foreigners) as per the national treatment guidelines (Department of Public Health, 2024). Clinical staff interviewed in endemic districts were well aware of the guidelines (although not so in non-endemic districts). Doctors had easy access to a mobile application which contained treatment protocols. Diagnosis is done using microscopy and RDTs. Access to diagnosis in healthcare centers/hospitals is available 24/7. Any RDT positives are complemented with microscopy for confirmation of the diagnosis. Antimalarial medicines are available in all healthcare centers PHC level and above. IV artesunate for treatment of severe cases is available in reference hospitals.

All cases are mandatorily hospitalized for treatment completion (except foreigners who choose to go back to their home countries). All diagnosed cases (including all foreigners who stay in Bhutan and those who wish to travel back to their home country) are given the full course of treatment as per national treatment guidelines. All are followed up to ensure malaria parasite clearance as per the national guidelines (see Table 2 for details). Compliance for radical cure is ensured through DOTs.

Table 2: Mandatory and recommended activities for integrated drug efficacy surveillance

Activity	Mandatory	Recommended
Case diagnosis and case classification		
Patient classification	Imported, indigenous, induced, introduced, relapsing or recrudescent	
Diagnosis on day 0	Identification of symptoms (uncomplicated, severe) Species identification by RDT or microscopy	Parasitemia by microscopy. Gametocytemia by microscopy
Diagnosis on follow- up	Microscopy	PCR at NMRL
G6PD testing		G6PD testing for P. vivax patients
Molecular analysis		
Reinfection or recrudescence		Blood collected on day 0 and day of failure
Markers of drug resistance		Blood collected on day 0 for analysis of drug resistance.
Treatment		
DOT	Ensure all treatments are given under direct supervision	Hospitalization of patients during treatment
Treatment failure	All cases of treatment failure must receive second-line treatment and be followed up for an additional full follow-up period	Hospitalization of patients during treatment.
Patients follow up		
Follow-up of P. falciparum	Day 2 & 28 days after start of treatment with a drug with a short half-life	Day 1, 2, 28 after start of treatment
Follow-up P. vivax	Day 2, 28 and 3rd month (for relapses)	Day 1, 2, 7, 28, 3 months & Up to 1 year

Activity	Mandatory	Recommended
Information collected on days of follow-up	Clinical symptoms, temperature & parasite density microscopy result	Follow-up visits. Alternatively, clinical symptoms only may be collected by telephone and additional follow-up visits made if necessary.

The following activities are proposed:

Training of health assistants and medical doctors on case management

Health Assistants and medical doctors will be trained on case management including those stationed in non-risk and potential risk areas. Training programmes will be conducted annually primarily focusing on new recruits. The training will focus on malaria diagnosis, case management and surveillance. Case management will emphasise on national treatment guidelines.

A module on recognizing severe malaria and how to manage a suspected case of severe malaria will be included for medical doctors and specialists such as physicians, paediatricians, obstetricians and gynaecologists, etc.

Reviewing and upgrading national treatment guidelines

The national treatment guidelines will be reviewed as and when necessary to conform to WHO recommendations; the guidelines would be upgraded as necessary.

Chemoprophylaxis for high-risk travellers

Chemoprophylaxis for high-risk populations is a widely debated subject in malaria elimination and prevention of re-establishment phases. Chemoprophylaxis has benefits in specific contexts as in the case of protecting Bhutanese armed forces personnel serving in UN peace-keeping missions in malaria endemic countries such as in Africa and preventing re-establishment of malaria in the country on their return. Chemoprophylaxis is not likely to have much of an impact in preventing malaria infections in armed forces personnel stationed in outposts along the Indian border as there is perennial transmission on the Indian side of the border. With contiguous villages along the border unregulated migration across the border, it will be difficult to develop a strategy for chemoprophylaxis; the performance of the health system in preventing onward transmission of malaria in Bhutan even during an outbreak of malaria on the Indian side in 2024 and the high number of imported cases reported in Bhutan in the same year demonstrates the resilience of the Bhutanese health system

Discussions on developing a policy on chemoprophylaxis for high-risk travellers will be initiated. A suitable policy will be developed depending on the affordability and feasibility of conducting such a programme with the evolving malaria situation in the country and in neighbouring India.

17.3 Implement targeted and focused interventions including vector control

Vector control remains a key strategy in malaria control and response in prevention of re-establishment phase. In Bhutan, ITNs and IRS are the main vector control strategies used depending on the receptivity of the area; in addition, other methods such as environmental modification and larval control are used in limited settings. Guidelines for use of ITNs and IRS have been established for the elimination setting. As the programme transits into the prevention of re-establishment phase, these guidelines will be reviewed and updated, targeting high-risk areas such that vector control activities will be targeted optimally. As malaria transmission prevalent across the border is a major threat to prevention of re-establishment of malaria in Bhutan, routine vector control will remain a main strategy for PoR along the border. In addition, vector control using ITNs and IRS will be used as a major strategy as part of response to imported and introduced malaria cases.

The choice of insecticides used for vector control will be guided by results of insecticide resistance monitoring that will be conducted in 8 ecological settings. Strategies for use of insecticides for vector control will be guided by vector control guidelines that have been developed based on WHO recommendations. Vector control guidelines will be reviewed and updated as necessary.

As there is a dearth of expertise in carrying out insecticide resistance monitoring, training programmes will be explored through collaborations with academic institutions such as the KGUMSB

17.4 Quality Assurance

A major thrust for the achievements of the VDCP has been the focus on quality assurance of the programme. The VDCP proposes to further strengthen quality assurance focusing on the following key areas:

1. Quality assurance on malaria diagnosis (microscopy and RDTs)

The VDCP has been relying heavily on quality assurance of malaria diagnosis primarily focusing on microscopy which is widely used for malaria diagnosis. The VDCP proposes to strengthen this process through the following:

a. Continue cross-checking of all positive and 10% of all negative blood smears by L1 microscopists at the reference laboratory.

b. Continue panel testing of blood smears for all microscopists in institutions at least once every year. Currently, these results are archived on the DHIS2 platform.

c. Conduct training programmes for poorly performing microscopists at the reference laboratory.

d. Conduct external competency assessment of microscopists at least once in two years, if resources are available, to maintain an adequate number of L1 and L2 accredited microscopists.

2. Sustain competency of health workers including laboratory technicians through regular testing and training programmes. Newly recruited laboratory technicians will be provided with an intensive training programme and monitored.

3. Procure WHO-prequalified diagnostics, drugs and other anti-malarial commodities to ensure quality assurance.

Upgrading guidelines and SOPs

The VDCP has already developed a number of guidelines and standard operating procedures (SOPs) for antimalarial work such as national treatment guidelines, entomological surveillance and vector control etc. All these guidelines and SOPs will be reviewed and upgraded to conform with latest WHO recommendations during the prevention of re-establishment of malaria phase as applicable to the Bhutan context.

17.5 Supply chain management

e-BMSIS connects all health facilities with the central store for inventory management and submission of procurement requests and is operational reasonably well. Shipment from the central warehouse is often slow due to under-staffing and suboptimal warehouse management. Procurement of commodities required in small quantities is facilitated by a pharmacist stationed at the consulate in Kolkata.

However, central warehouse management capacity has to be strengthened to reduce delays in delivery of supplies. This required filling up vacancies and ensuring training of new recruits. Procurement of small quantities of supplies through the pharmacist stationed at the consulate in Kolkata should be monitored regularly.

The performance of the supply chain should be monitored on a monthly basis and any stockouts and delays in supplying stocks should be documented; necessary corrective action should be taken. This system is applicable to all diseases coming under the purview of VDCP and others as well.

Procurement of all antimalarial commodities should be WHO pre-qualified products. Procurements of small quantities may require the assistance of the GFATM.

17.6 Cross-border collaboration

Already established cross-border collaboration efforts will be further strengthened during this NSP cycle with the facilitation of international agencies such as the WHO. In addition to regular exchange of WhatsApp messages between officials across the borders, site visits, similar to the one organized in 2025, will be organized annually. Teams from the across the border will meet at least twice a year to discuss the following:

- Malaria situation along the border;
- Agreement to provide diagnostic and treatment facilities to citizens of both countries free-of-charge;
- Mechanisms to track malaria cases and investigate cases across the border to prevent onward transmission;
- Ensure regular exchange of real time information;
- Control measures applied;
- Challenges faced;
- Potential areas of collaboration; and
- Synchronized actions.

Funding to formalize this process will be sought from GFATM and other international donors.

17.7 Strengthen community engagement and participation through awareness raising

Community awareness has been waning over the years with the reduction in the number of reported malaria cases. As a result, people are less vigilant about malaria and do not follow and comply with advice given to residents in potential/low and high-risk areas. CAGs at local government levels have been trying to motivate communities to be more vigilant.

In this NSP cycle, it is proposed that activities of CAGs in informing communities of the risk of acquiring malaria and its further spread in the country will be strengthened especially in potential/low and high-risk areas especially during the transmission season in the summer months. Areas such as seeking early healthcare if fever develops, revealing travel history to a malaria endemic region, complying with the use of ITNs and other human-vector contact preventive measures, supporting control and response activities and elimination of vector breeding sites. A compendium of country-specific activities to be carried out and a manual including educational material in the local language to be used will be developed within the first 2 years of this planned cycle. It is proposed that this activity will be supported by the RGoB and other donor agencies.

17.8 Programme reviews

a. Monthly reviews

Regular internal monthly reviews of the malaria programme will be continued as at present to monitor progress of activities outlined in the NSP and to take necessary corrective actions as and when required.

b. Pre-certification review

It is proposed that a pre-certification review was conducted in the first quarter of 2026 to guide on activities that should be conducted prior to the main malaria-free certification review. This review was based on the country report for malaria-free certification and field visits. The responses to the recommendations and findings of this review will be assessed at the main certification review. The VDCP will be responsible for acting on the recommendations of this review.

c. Malaria-free Certification review

This review will be conducted during the 2nd quarter of 2026 and will be the final review for malaria-free certification. Obtaining malaria-free certification will be a landmark public health achievement for the country.

d. External/internal programme review

The malaria programme of Bhutan has been subject to regular external programme reviews, the last being conducted in 2025. The findings of this review formed the basis of this NSP. It is proposed that such a review be conducted during the latter part of this NSP cycle to review progress and inform future strategic plans. Although ideally an external review is recommended, and internal review may be conducted if funds are scarce.

17.9 Develop M&E framework

An M&E framework and plan has been developed separately. Indicators and their frequency of reporting have been identified. The M&E plan needs to be costed.

17.10 High level advocacy

High level advocacy will target the highest levels of government and appropriate administrative officers to keep PoR of malaria on the radar till at least regional elimination is achieved. It is heartening to note that the RGoB has committed to PoR of malaria by providing direct funds and also collaborating with other organization including Civil Society Organisations (CSOs) to mobilise funds.

Despite these assurances, it is essential that TAGPoR be regularly updated of the situation and the progress made along with the challenges faced at regular intervals. Some remedial measures may require additional emergency funding which may not be committed; mobilizing such funds will require immediate attention. For this purpose, high level advocacy will have to be continued on a regular basis. It is proposed that a group of individuals, including some members of the TAGPoR be identified for this purpose; inclusion of international experts who may be able to join virtually during the session will give more credence and recognition to the team.

17.11 Political and financial commitment in sustaining prevention of re-establishment of malaria in Bhutan

The sustainability of the prevention of re-establishment of malaria programme will depend on the challenge of maintaining continued programme activities post malaria-free certification. Key strategies for sustainability and associated plans are outlined below:

1. Sustaining HR, infrastructure and capacity building

The existing human resources for malaria services will not be affected by donor withdrawal. Staff salary, overhead cost, logistics, maintenance of all infrastructure and health supplies and any other recurrent cost for programme implementation will be borne by the RGoB as per the Constitutional mandate, that all recurrent costs have to be met by the RGoB.

To maintain an adequate skilled human resource pool, a diploma programme for medical entomology and parasitology has been initiated with prior approval from the Royal Civil Service Commission.

2. Sustaining diagnostic and treatment services.

Currently, procurement of ACTs for malaria treatment and RDTs for diagnosis are supported by GFATM. With donor withdrawal, these services will critically be affected. The Bhutan Health Trust Fund, which was established through a Royal Charter in 2000, provides an alternate financing mechanism to sustain core components of PHC through continued and uninterrupted supply of essential drugs, vaccines, and other priority PHC activities. All medicines that are used for malaria in Bhutan are listed in the national essential medicines list, which ensures that these drugs and test kits will be available even after the withdrawal of the donor funding.

3. Sustaining Surveillance and response system

Malaria diagnostic and treatment services have been well integrated into the overall health system of the country. Any importation or re-introduction of the parasite can be detected through routine fever surveillance as has been demonstrated.

As part of the PPP model, the malaria programme has been collaborating with PDCs across the country to screen foreign workers entering Bhutan for employment. This partnership will be further strengthened in the coming years through government policy support, enabling broader participation from the private sector in delivering healthcare services, including testing and diagnosis for malaria and other vector-borne diseases. The competency of healthcare workers employed by these private centres is well-regulated by the Bhutan Qualifications and Professionals Certification Authority (BQPCA), ensuring the delivery of quality services.

Furthermore, the malaria programme has already implemented a PPP model for the screening of migrant workers involved in mega hydropower and other major infrastructure projects in the country. Under the established Memorandum of Understanding (MoU), the Ministry of Health is responsible for providing technical support—including test kits, laboratory consumables, and manpower—while the project proponents are mandated to cover travel and logistical costs. In the event that Bhutan no longer receives funding support from the Global Fund, there is potential to build on the existing MoU by requiring new development projects to fully finance disease screening for their workforce. Similar funding opportunities can be explored in Gelephu, particularly with the upcoming GMC, where investors may be encouraged to contribute toward healthcare expenses for foreign workers. Additionally, the introduction of an insurance system for foreign workers in GMC is under consideration, aiming to ensure their healthcare costs are fully covered. Systematic regulations will also be put in place to mandate pre-entry screening for infectious diseases among foreign workers before they enter the country.

Malaria, dengue, and few other vector-borne diseases are listed as notifiable diseases by the RCDC. All detected cases across the country are promptly reported through the NEWARIS and DHIS2 platform, enabling rapid notification and timely response to prevent further transmission within communities. With rapid response teams established at various levels—as outlined in the National Outbreak Investigation and Response Manual—a robust and resilient system is in place to effectively address any potential re-introduction or re-establishment of malaria.

4. Sustaining Vector Control

Currently vector control through IRS and ITNs remain the core strategy for malaria elimination. Both ITNs and chemicals for IRS are procured through donor funding. Steps have been taken to foster community engagement, ownership and participation for vector borne diseases, mainly through integrated vector management (IVM). Adopting IVM strategy will reduce the dependency on chemical procurement. Additionally, as stated above, there are opportunities for new projects or private organizations to fund vector control activities as well in partnership with the RGoB based on MoUs.

5. Sustaining Advocacy and Awareness

To ensure the sustainability of prevention and control efforts for priority public health issues, the Ministry of Health has integrated these activities—including advocacy and awareness programmes—into local government plans. Local leaders and CAGs are continuously encouraged to take the lead in raising awareness and promoting preventive measures to maintain Bhutan's malaria-free status.

The Ministry of Health is also working closely with civil society organizations (CSOs) such as the Bhutan Red Cross Society (BRCS), which has a strong community presence and plays a key role in sensitizing the public on malaria and other vector-borne diseases. Additionally, the Multi-Sectoral Task Force and Community-Based Support System (MSTF-CBSS), which involves local leaders from across the country, actively collaborates on community health initiatives. The malaria programme will be able to leverage this existing structure to enhance awareness and advocacy on malaria and other vector-borne diseases at the grassroots level.

The RGoB will continue to explore international partnerships to reduce reliance on single donor funding and avoid shocks due to the abrupt shortage of funds to manage them malaria programme. Optimizing resource allocation to various activities of the malaria programme and cost efficiency of each activity implementation will be continuously improved. Emphasis will be placed on regions with high vulnerability

and receptivity to malaria transmission, to prevent resurgence and protect the gains achieved.

17.12 Operations research

Bhutan is a landlocked country characterised by the presence of high-altitude mountains in the north and plains in the south along the Indian border where malaria has been and continues to be a problem. Some of its unique country-specific features, as related to the PoR of malaria, have not been characterised as yet and need to be addressed for optimal targeting of control and response activities. Some of the activities that require attention include the following:

- Validating a method to define imported and introduced malaria cases along the India-Bhutan land border given its unique socio-cultural and geographic context. Although criteria have been reviewed, validating such classifications will be important for maintaining PoR of malaria status in Bhutan.
- Characterising the Anopheline fauna in potential/low and high-risk settings and incriminating malaria vectors. Although the Anopheline fauna in the country has been characterized in different settings in the country, vector incrimination studies have not been conducted as yet. The data generated will have direct implications on choice of insecticides for routine control and response activities.
- Pilot studies to follow up foreign nationals who acquire malaria and go back to India. Following up such individuals who are likely to return to Bhutan for work are a threat to PoR of malaria. This activity will have to be done collaboratively with malaria officers from the border districts of India.
- Conduct pilot studies to maintain awareness about malaria during the PoR of malaria phase. Other expertise from the social sciences and academia will be useful guides to conduct such research studies.
- Any other challenge encountered during implementation that needs urgent investigation.

It is proposed that a dedicated budget be allocated for this purpose; funding should be provided based on scientific merit of the proposal and the priority or importance of the findings for PoR of malaria in Bhutan.

18. POTENTIAL CHALLENGES TO POR

Malaria elimination and prevention of re-establishment can be achieved only after application of evidence-based effective methods by a dedicated workforce over an extended period of time. While Bhutan has already eliminated indigenous malaria since 2022, challenges are to be expected in prevention of re-establishment phase post malaria-free certification.

The following challenges may be encountered during the PoR phase.

Establishment of foci of P. vivax infections

P. vivax and P. ovale malaria parasites may have a dormant liver stage of the parasite during its life cycle, known as a hypnozoite, that is not a feature of other human malaria parasites; these dormant liver stages present as infections well beyond the primary infection possibly triggered by other factors. When treatment to destroy these hypnozoites are given during the primary infection, it is called radical cure. Radical cure has to be followed after testing for G6PD deficiency. However, in certain instances, these dormant forms may give rise to infections even after radical cure.

As the predominant species is P. vivax reported both in Bhutan and in neighbouring India, it is possible that foci of P. vivax infections that may be a threat to prevention of re-establishment of malaria may emerge. These foci need to be clearly monitored until they are classified as cleared to prevent onward local transmission. As the number of P. ovale infections reported is much less, the chances of foci due to P. ovale infections emerging are very less.

Maintaining skills of staff

With dwindling cases of malaria post elimination, in addition to waning motivation and interest, diagnostic skills and knowledge of treatment regimens is likely to decline with time. Furthermore, there is a likelihood of not replacing important cadres for PoR. The Ministry of Health has committed that adequate human resources with appropriate training will be maintained for PoR.

Commodities Supply and Stock management

With dwindling number of cases, it becomes difficult to estimate consumables such as antimalarial medicines and LLINs. During this period, it is necessary to maintain adequate stocks of antimalarial consumables to meet any unexpected surges in transmission. In such a situation there can be wastage of consumables such as antimalarial medicines; it is better to err on having adequate stocks than have outages when such commodities are needed. The established computerized

inventory system will be helpful in identifying available stocks and measures will be taken to redistribute commodities as and when required to prevent unnecessary wastage.

Another likely scenario is the possibility of not having suppliers for small quantities of commodities. Suppliers may be reluctant to quote small quantities of consumables as the profit margins may not be economically attractive. In such a situation, it is recommended that the WHO or other donor agency establishes a pooled procurement system to ensure availability of adequate stocks.

Funding limitations

It has become increasingly difficult to campaign for funds when the disease burden is decreasing. Already, donor funding has been reduced by about 17% but the RGoB has stepped in and bridged the shortfall. It is essential that the most cost-effective methods will have to be used to prevent re-establishment of malaria in Bhutan.

Success of cross border collaboration

Bhutan is plagued by malaria importation across the land border with neighbouring India. International cross-border collaboration is an enabling factor that needs to be strengthened. Bhutan and India should work on the collaborations already established and the goodwill that exists between the two countries. Ideally all antimalarial activities should be harmonized and coordinated across the borders with a genuine effort on the part of officials of both countries to share real time data. Both countries should consider it an advantage to eliminate malaria. Facilitation of this process by international partners and attaching a dedicated budget for cross-border collaboration is proposed.

Another pandemic

The COVID pandemic had severe effects globally; it led to severe morbidity and loss of life and had devastating economic and social impacts that impoverished countries, communities, families and individuals. In addition to causing health impacts by itself, it also disrupted routine healthcare services targeting other disease control programmes such as communicable and non-communicable diseases and maternal and child health programmes. Malaria was one such programme that was affected.

Although we are now more prepared to deal with a pandemic with the experience we gained in the recent past and the enhancement of emergency-preparedness program, if another wave of infection with extensive lockdowns result, there is no doubt that healthcare delivery is going to be affected.

Emergence of resistant strains

The introduction of ITNs, RDTs and ACTs in the 1990s and their global scale up in this century renewed interest in malaria elimination but the gains in success have somewhat remained static over last few years. As in the past, resistance of parasites to anti malaria medicines and resistance of vectors to insecticides have always plagued malaria control programmes generally delaying or halting progress in disease burden reduction.

Introduction of resistant parasite and vector strains to Bhutan and areas of malaria transmission along the India Bhutan land border is likely to be a major threat to prevention of re-establishment of malaria in Bhutan. Today, Bhutan is somewhat shielded by not having a private sector for procurement of drugs which ensures that WHO pre-qualified drugs are available in the country. Routine integrated drug efficacy surveillance and insecticide resistance monitoring should be carried out to ensure that adequate tools are available in case of an unexpected outbreak of malaria.

Climate change

Climate change is here to stay and affect all countries and communities. Whilst having adverse impacts on environmental and climatic conditions globally, climate change has the potential to severely impact on communicable diseases, especially VBDs, and disease control programmes through numerous ways including creation of breeding sites for vectors and affecting the maturation and life cycles of microorganisms. In the case of malaria in Bhutan, the malariogenic potential is likely to increase, thereby being a threat to prevention of re-establishment of malaria. Constant vigilance and close monitoring of vector bionomics and changing disease patterns will be required to predict and prevent climate driven impact on malarial transmission in the future.

Waning awareness and interest of the community

As the reported malaria cases decrease, awareness and interest of the community also decrease. This results in poor compliance to preventive measures, especially among the risk populations. CAGs are engaged in regular monitoring and advising the public; it is proposed that this activity is strengthened during this NSP as long as there is transmission across the border.

19. RISK MANAGEMENT AND MITIGATION STRATEGY FOR POR

A proactive approach to identifying, assessing, and mitigating potential risks is essential for the successful implementation of this NSP and for safeguarding Bhutan's zero indigenous malaria cases status and malaria-free status once achieved in 2026. This underpins the successful achievement of all objectives. A detailed Risk Assessment and Mitigation Matrix will be maintained and regularly updated (see Appendix 4). Key strategic risks identified in the Malaria Program Review 2025, such as funding shortfalls, complacency, attrition of expertise, cross-border importation, and emerging biological threats are prioritized. Mitigation strategies involve robust surveillance and response systems, the financial sustainability plan outlined above, continuous advocacy, and adaptive programme management capable of responding to unforeseen challenges. Regular risk reviews will be integrated into annual planning and review cycles.

The success of the comprehensive implementation framework will depend on the synergistic application of these governance, resource management, communication, and risk mitigation strategies, underpinned by unwavering national commitment and strong partnerships.

This Risk Assessment and Mitigation Matrix provides a structured overview of the key challenges anticipated during the implementation of the NSP 2026-2030 for PoR in Bhutan. It is intended to be a practical tool for programme managers and stakeholders to guide proactive planning, resource allocation for risk mitigation, and continuous monitoring. The successful management of these risks, particularly those related to sustainable financing and maintaining unwavering vigilance, will be critical to ensuring Bhutan sustains its hard-earned malaria-free status. Regular review and adaptation of this matrix will be essential throughout the NSP lifecycle.

20. IMPLEMENTATION FRAMEWORK

The transition from malaria elimination to prevention of re-establishment has already taken place in Bhutan; the challenge now is to prevent re-establishment of malaria post malaria-free certification expected to be achieved in 2026. As outlined in this document, this requires a well-defined and robust implementation framework. This framework outlines the essential governance structures, resource management strategies (including financial planning and human capital development), communication approaches, and risk mitigation protocols that underpin all PoR activities. This framework is based on the gains made in the past, lessons learned and the recommendations made during the Joint External Malaria Program Review 2025.

The national malaria governance structures which were effective during the elimination and in the recent PoR phases will be continued by the VDCP under the Ministry of Health, RGoB. The TAGME will be renamed as TAGPoR which will function as per the terms of reference (ToR) developed in line with the revised objectives of the programme. TAGPoR will continue to provide ultimate strategic oversight, ensure sustained political commitment, facilitate inter-sectoral collaboration essential for addressing importation risks and wider determinants, and champion resource mobilization for PoR.

Subnational governance through district and local government bodies in collaboration with CSOs will be crucial for translating national PoR strategies into context-specific local action plans, coordinating implementation efforts, and ensuring community engagement and accountability. The VDCP under the Ministry of Health, will maintain its central role as the lead technical agency, responsible for developing and disseminating PoR operational guidelines; managing the national MIS platforms; providing technical support and capacity building to subnational levels; spearheading PoR-related monitoring, evaluation, operational research; and providing stewardship for the harmonious operations of all partners.

21. ESTIMATED BUDGET

The proposed activities included in this NSP for these activities and the breakdown of the estimated budget of USD 8 173 055 ≃ 8.2 million are given in Table 3.

Table 3: Proposed activities outlined in the National Strategic Plan for the prevention of re-establishment of malaria in Bhutan 2026-2030 and proposed budget

Sl. No.	Strategic Activities	Estimated budget in USD in					Total
		2026	2027	2028	2029	2030	
1. Strengthening Surveillance							
1.1	Case detection (HR salaries and operational cost	990 000	1 019 700	1 020 591	1 051 209	1 082 745	5 164 245
1.2	Operational cost of the facilities (telephone/ Internet/ electricity and maintenance)	86 000	86 000	86 000	86 000	86 000	430 000
1.3	High risk groups mapping	3 700	3 700	3 700	3 700	3 700	18 500
1.4	Establishing TAGPoR	6 750	6 750	6 750	6 750	6 750	33 750
1.5	Case and foci investigation and classification	9 250	9 250	9 250	9 250	9 250	46 250
1.6	Epidemiological risk stratification	2 025	2 025	2 025	2 025	2 025	10 125
1.7	Risk stratification and mapping	0	0	0	0	0	0
	TOTAL	**1 097 725**	**1 127 425**	**1 128 316**	**1 158 934**	**1 190 470**	**5 702 870**

Sl. No.	Strategic Activities	Estimated budget in USD in					Total
		2026	2027	2028	2029	2030	
2. Strengthening Entomological Surveillance							**0**
2.1	Review entomological surveillance	0	6 750	0	6 750	0	13 500
2.2	Integrate with entomological surveillance of other diseases	5 550	5 550	5 550	5 550	5 550	27 750
2.3	Training of personnel	18 000	18 000	18 000	18 000	18 000	90 000
2.4	Procurement of equipment (lump sum)	30 000	0	0	30 000	0	60 000
2.5	Insecticide resistance monitoring	14 208	14 208	14 208	14 208	14 208	71 040
	TOTAL	**67 758**	**44 508**	**37 758**	**74 508**	**37 758**	**262 290**
3. Strengthening Epidemic Preparedness, Forecasting and Early Warning Systems							**0**
3.1	Training and stimulation on disease outbreak response	22 500	22 500	22 500	22 500	22 500	112 500
3.3	Procurement of early warning monitoring equipment	0	10 000	0	10 000	10 000	30 000
	TOTAL	**22 500**	**32 500**	**22 500**	**32 500**	**32 500**	**142 500**
4. Special Events Surveillance (Lump Sum Yearly)							**0**
4.1	Awareness and exhibitions during the events	5 000	5 000	5 000	5 000	5 000	25 000
4.2	Case finding and fever screening	2 500	2 500	2 500	2 500	2 500	12 500
4.3	Transportation and logistics cost	10 000	10 000	10 000	10 000	10 000	50 000
	TOTAL	**17 500**	**17 500**	**17 500**	**17 500**	**17 500**	**87 500**

Sl. No.	Strategic Activities	Estimated budget in USD in					Total
		2026	2027	2028	2029	2030	
5. Strengthening Case Management							**0**
5.1	Training of health assistants	13 500	13 500	13 500	13 500	13 500	67 500
5.2	Reviewing national treatment guidelines	0	6 750	0	0	6 750	13 500
5.3	Discuss chemoprophylaxis for travellers	6 750	0	0	6 750	0	13 500
5.4	Procurement of test kits	33 000	33 000	33 000	33 000	33 000	165 000
5.5	Upgrade eBMSIS (Lump sum)	0	30 000	0	0	0	30 000
5.6	Monitoring and follow up of activities	13 320	13 320	13 320	13 320	13 320	66 600
	TOTAL	**66 570**	**96 570**	**59 820**	**66 570**	**66 570**	**356 100**
6. Targeted, Focused Interventions Including Vector Control							**0**
6.1	ITNs	0	0	360 000	0	0	360 000
6.2	IRS	80 000	80 000	80 000	80 000	80 000	400 000
6.3	Review guidelines	6 750	0	6 750		6 750	20 250
6.4	Training on insecticide resistance monitoring	0	13 500	0	13 500		27 000
6.5	5% LLIN & IRS attrition	4 000	4 000	22 000	4 000	4 000	38 000
	TOTAL	**90 750**	**97 500**	**468 750**	**97 500**	**90 750**	**845 250**

Sl. No.	Strategic Activities	Estimated budget in USD in					Total
		2026	2027	2028	2029	2030	
7. Quality Assurance							**0**
7.1	Cross checking of blood smears (shipment lump sum)	1 000	1 000	1 000	1 000	1 000	5 000
7.2	Assessment of microscopists	3 330	3 330	3 330	3 330	3 330	16 650
7.3	Training of microscopists	13 500	13 500	13 500	13 500	13 500	67 500
7.4	Conduct ECAMM	3 240	0	3 240	0	3 240	9 720
7.5	Procure WHO-prequalified antimalarial commodities (lump sum)	10 000	10 000	10 000	10 000	10 000	50 000
7.6	Upgrading guidelines and SOPs	0	6 750	0	6 750	0	13 500
	TOTAL	**31 070**	**34 580**	**31 070**	**34 580**	**31 070**	**162 370**
8. Supply Chain Management							**0**
8.1	Procurement of WHO pre-qualified Malarial drugs	15 000	15 000	15 000	15 000	15 000	75 000
8.2	Monitoring of drugs quality and equipment	7 400	7 400	7 400	7 400	7 400	37 000
	TOTAL	**22 400**	**22 400**	**22 400**	**22 400**	**22 400**	**112 000**
9. Strengthen Cross-Border Collaboration							0
9.1	Conduct at least 2 meeting per year	12 000	12 000	12 000	12 000	12 000	60 000
9.2	Ensure timely data sharing	0	0	0	0	0	0
9.3	Collaborate in implementing interventions	3 700	3 700	3 700	3 700	3 700	18 500
	TOTAL	**15 700**	**15 700**	**15 700**	**15 700**	**15 700**	**78 500**

Sl. No.	Strategic Activities	Estimated budget in USD in					Total
		2026	2027	2028	2029	2030	
10. Strengthen Community Engagement							**0**
10.1	Liaise with CAG	10 000	10 000	10 000	10 000	10 000	50 000
10.2	Develop health promotion material (lump sum)	15 000	0	0	15 000	0	30 000
10.3	Conduct health promotion activities in high-risk areas	10 000	10 000	10 000	10 000	10 000	50 000
10.4	Involve CAGs in health promotion activities (tools kits, lump sum)	0	20 000	0	0	20 000	40 000
	TOTAL	**35 000**	**40 000**	**20 000**	**35 000**	**40 000**	**170 000**
11. Programme Reviews							**0**
11.1	Monthly reviews	0	0	0	0	0	0
11.2	Pre-certification review	6 750	6 750	0	0	0	13 500
11.3	Certification review	10 125	10 125	0	0	0	20 250
11.4	External/internal programme review	0	0	10 125	0	0	10 125
11.5	Develop M&E plan	11 250	0	11 250	0	11 250	33 750
11. 6	Six monthly data validation monitoring and QA monitoring	14 800	14 800	14 800	14 800	14 800	74 000
	TOTAL	**42 925**	**16 875**	**21 375**	**0**	**11 250**	**92 425**

Sl. No.	Strategic Activities	Estimated budget in USD in					Total
		2026	2027	2028	2029	2030	
12. High Level Advocacy, Political and Financial Commitment							**0**
12.1	Target highest level of government officials and administrators	0	22 500	0	22 500	0	45 000
12.2	Involve all stakeholders	11 250	11 250	11 250	11 250	11 250	56 250
	TOTAL	**11 250**	**33 750**	**11 250**	**33 750**	**11 250**	**101 250**
13. Operations Research (Lump Sum)		**20 000**		**20 000**		**20 000**	**60 000**
	TOTAL	**20 000**	**0**	**20 000**	**0**	**20 000**	**60 000**
	GRAND TOTAL	**1 541 148**	**1 579 308**	**1 876 439**	**1 588 942**	**1 587 218**	**8 173 055**

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23. ANNEXURES

Annexure 1: Sustainable Development Goal 3 and the corresponding national health indicators in Bhutan as of 2024

SDG Target	SDG Indicator	National Indicator SDGI	Current Status	Source
SDG 3. Ensure healthy lives and promote well-being for all at all ages				
3.1 By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births	3.1.1 Maternal mortality ratio (Per 100,000)	3.1.1 Maternal Mortality Ratio (Per 100,000)	53	NHS 2023
	3.1.2 Deliveries attended by skilled health worker (%)	3.1.2 Deliveries attended by skilled health worker (%)	98.5	NHS 2023
		Institutional delivery (%)	98	NHS 2023
3.2 By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births	3.2.1 Under-5 mortality rate (Per 1000)	3.2.1 Under-5 mortality rate (Per 1000)	19.5	NHS 2023
	3.2.2 Neonatal Mortality Rate (Per 1000)	3.2.2 Neonatal Mortality Rate (Per 1000)	6.9	NHS 2023
3.3 By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, waterborne diseases and other communicable diseases	3.3.1 Number of new HIV infections per 1,000 uninfected population, by sex, age and key populations	Total new cases	85	NACP 2024
	3.3.2 Tuberculosis incidence per 100,000 population	Total new cases	48	NACP 2024
	3.3.3 Malaria incidence per 1,000 population	Total new cases (female)	37	NACP 2024
		Total new cases of HIV among Young adults (15-24)	9	NACP 2024
		Total TB cases detected	920	NTBCP 2024

SDG Target	SDG Indicator	National Indicator SDGI	Current Status	Source
By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being.	3.4.2 Suicide mortality rate	Suicide mortality rate per 100,000 population	2.3	NHS 2023
3.5 Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol		Percentage of population aged 15-75 years who ever used drugs/ substance to get high		NHS 2023
3.6 By 2030, halve the number of global deaths and injuries from road traffic accidents	3.6.1 Death rate due to road traffic injuries (per 100,000 population)	The road crash fatality rate (per 10,000 vehicles)	11.05	BCTA, MOIT
3.7 By 2030, ensure universal access to sexual and reproductive health- care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes	3.7.1 Proportion of women of reproductive age (aged 15–49 years) who have their need for family planning satisfied with modern methods	Contraceptive prevalence rate (aged 15-49)	74.2	NHS 2023
		Unmet need for family planning	8.5	NHS 2023
3.8 Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all	3.8.1 Coverage of essential health services (defined as the average coverage of essential services based on tracer interventions that include reproductive, maternal, newborn and child health, infectious diseases, non-communicable diseases and service capacity and access, among the general and the most disadvantaged population)	Percentage of population within 2 hours to the nearest health facility	96.8	NHS 2023
3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination	3.9.2 Mortality rate attributed to unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services)	Percentage of death due to illness	78.1	NHS 2023
	3.9.3 Mortality rate attributed to unintentional poisoning	Number of death due to unintentional poisoning	0.5	NHS 2023

SDG Target	SDG Indicator	National Indicator SDGI	Current Status	Source
3.a Strengthen the implementation of the World Health Organization Framework Convention on Tobacco Control in all countries, as appropriate	3.a.1 Age standardized prevalence of current tobacco use among persons aged 15 years and older	The prevalence of current use of any tobacco product among 15-69 years population	31.4	NHS 2023
		Population aged 15-69 years who are current smoker [percent]	14.2	NHS 2023
3.b Support the research and development of vaccines and medicines for the communicable and non-communicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines, in accordance with the Doha Declaration on the TRIPS Agreement and Public Health, which affirms the right of developing countries to use to the full the provisions in the Agreement on Trade Related Aspects of Intellectual Property Rights regarding flexibilities to protect public health, and, in particular, provide access to medicines for all	3.b.1 Proportion of the target population covered by all vaccines included in their national programme	Crude childhood immunization coverage	99.4	NHS 2023
	3.b.1 Proportion of the target population covered by all vaccines included in their national programme	Proportion of 1 year-old children immunized against measles (MR1)	99.4	NHS 2023
		BCG	100	NHS 2023
		Penta/DTP-HipB1	100	NHS 2023
		Penta/DTP-HipB2	100	NHS 2023
		Penta/DTP-HipB3	100	NHS 2023
		OPV0	97.8	NHS 2023
		OPV1	100	NHS 2023
		OPV2	100	NHS 2023
		OPV3	100	NHS 2023
	3.b.3 Proportion of health facilities that have a core set of relevant essential medicines available and affordable on a sustainable basis	Proportion of essential medicines available in all health facilities at any point of time	97	NMS

SDG Target	SDG Indicator	National Indicator SDGI	Current Status	Source
3.c Substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries, especially in least developed countries and small island developing States	3.c.1 Health worker density and distribution	Doctors' density per 10,000 population	5.29	
		Pharmacists' density per 10,000 population	0.62	
		Health Assistants density per 10,000 population	7.39	
		Indigenous Physicians density per 10,000 population	0.95	
		Sowa Menpa density per 10,000 population	2.52	
		Distribution of health facilities per 10,000 population	3.91	
		Ratio of beds per Nurse	1.05	
		Ratio of Nurses per Doctor	4.59	
Goal 6. Ensure availability and sustainable management of water and sanitation for all				
6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for al	6.1.1 Proportion of population using safely managed drinking water services	Proportion of population using improved drinking water sources (%)	99.7	NHS 2023
6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations	6.2.1 Proportion of population using safely managed sanitation services, including a hand washing facility with soap and water	Proportion of population using an improved sanitation facility (%)		NHS 2023
		Proportion of population using safely managed sanitation services (%)		NHS 2023
		Proportion of population having a handwashing facility on premises		NHS 2023
		Proportion of population having a handwashing facility on premises with soap and water available (basic handwashing facility)		NHS 2023

Source: *Ministry of Health (2025). Annual Health bulletin 2025. Royal Government of Bhutan*

Annexure 2: Selected health indicators in Bhutan and their trends 2020-2024

Indicator	2020	2021	2022	2023	2024	Source
Proportion of population using improved drinking water sources (%)	99	99	99	99.67	99.67	STEPS, NHS 2023
Proportion of population using an improved sanitation facility (%)		94.6	94.6	99.3	99.3	STEPS, NHS 2023
Deliveries attended by skilled health personnel (%)	99.3		98.4	98.5	98.5	BMIS, 2010; MoH, PHCB2017, HMIS, NMS 2023
Institutional deliveries (%)	94.5	94.5	97.5	98	98	HMIS, MoH; BMIS, 2010; MoH, NHS 2023
Number of health facilities providing VCT/PIHCT services	235	237	53	178	178	NACP (DoPH), MoH
Number of health facilities providing comprehensive PMTCT package	49	51	53	178	178	NACP (DoPH), MoH
Tuberculosis (all forms of TB) notification rate (per 100,000 population)	126		105.1	112.16		NTCP (DoPH), MoH
Neonatal mortality rate		21	21	6.9	6.9	NHS 2012, NHS 2023

Source: *Ministry of Health (2025). Annual Health bulletin 2025. Royal Government of Bhutan*

Annexure 3: Health workforce indicators and their trend over the past 5 years in Bhutan (2020-2024)

Indicator	2020	2021	2022	2023	2024	Source before 2023	Source for 2023 data
Number of Doctors and [density per 10,000 population]	336 [4.62]	354 [4.64]	354 [5.34]	401 [5.2]	411 [5.29]	HRM, MoH	HRD, NMS
Number of Nurses and [density per 10,000 population]	1517 [20.9]	1608 [21.07]	1533 [23.11]	1617 [20.99]	1572 [20.22]	HRM, MoH	HRD, NMS
Number of Pharmacists and [density per 10,000 population]	42 [0.6]	46 [0.6]	45 [0.68]	45 [0.58]	48 [0.62]	HRM, MoH	HRD, NMS
Number of HA and [density (per 10,000 population]*	650 [8.9]	683 [8.95]	647 [9.75]	580 [7.53]	574 [7.39]	HRM, MoH	HRD, NMS
Number of Drungtshos (Indigenous Physicians) and [density per 10,000 population]	52 [0.7]	59 [0.77]	79 [1.19]	58 [0.753]	74 [0.95]	HRM, MoH	
Number of sMenpas (Sowa Menpas) and [density per 10,000 population]	137 [1.9]	146 [1.9]	175 [2.64]	141 [1.83]	196 [2.52]	HRM, MoH	HRD, NMS
Number and [distribution of health facilities (per 10,000 population)]	289 [4.0]	289 [3.85]	291 [4.39]	294 [3.82]	303 [3.91]	HMIS, MoH	HMIS, MoH

*Includes Clinical Officer (CO) and BHW. There is no BHW category from 2019 as all were upgraded to HA.

Annexure 4: Risk Assessment and Mitigation Matrix

Risk ID	Risk Description	Potential Impact	Likelihood	Severity	Overall Risk Level	Mitigation Strategies	Responsible Party/ Entities (Broad)	Monitoring Indicator(s)
01	Reduced or unpredictable external funding and insufficient domestic resource mobilization	Compromised ability to implement essential PoR activities (surveillance, response, procurement of commodities), leading to potential resurgence and failure to maintain certification.	High	High	Critical	• RGoB already committed to meet shortfall. Implement robust resource mobilization strategy focusing on diversified and increased domestic funding • Cost-optimization via integration of disease control programmes (already implemented).	MoH, RGOB	• Annual domestic budget allocated & expended for PoR. • % of PoR budget covered by domestic funds. • Number of active innovative financing mechanisms.
02	Sustained Importation Pressure of malaria cases (including drug-resistant strains) from across the border.	Increased risk of introduced transmission, localized outbreaks, potential re-establishment of indigenous transmission, and spread of drug resistance. Jeopardizes malaria-free status.	High	High	Critical	• Maintain highly sensitive surveillance at Points of Entry (PoEs) and in high-risk populations/areas. • Strengthen 1-3-7 strategy for rapid detection, investigation, and containment of all imported cases. • Formalize and enhance cross-border collaboration (data sharing, joint response. • Conduct iDES for imported cases.	MoH, Private diagnostic centres	• Number and origin of imported cases. • Proportion of imported cases leading to onward transmission. • Timeliness of investigation & response to imported cases.

Risk ID	Risk Description	Potential Impact	Likelihood	Severity	Overall Risk Level	Mitigation Strategies	Responsible Party/ Entities (Broad)	Monitoring Indicator(s)
03	Complacency and waning vigilance among health workers and communities as malaria becomes rare.	Delayed case detection, inadequate investigation/ response, reduced adherence to preventive measures, leading to increased risk of outbreaks and re-establishment.	Medium	High	High	• Implement targeted and sustained campaigns emphasizing PoR vigilance, travel history reporting, and prompt care-seeking. • Continuous training & refreshers for health staff on PoR protocols. • Maintain community engagement through CAGs.	MoH, district level authorities, CAGs	• % of febrile cases appropriately tested for malaria in receptive areas. • Community KAP survey results on PoR awareness and practices in foci. • Timeliness of care-seeking for fever.
04	Attrition of specialized malaria expertise and insufficient PoR-specific capacity (e.g., diagnostics, epidemiology, entomology).	Weakened capacity for effective surveillance, accurate diagnosis, timely response, and strategic PoR program management.	Medium	High	High	• Implement HR development and retention plan for PoR (already initiated). • Regular PoR-specific training and competency assessments (microscopy EQA, MRRT drills) (already in place). • Integrate malaria expertise within broader public health roles where feasible (already initiated in an integrated VDCP). • Maintain already established National Reference Laboratory capacity.	MoH, Training Institutions	• Number of trained & active PoR specialists (by cadre). • Microscopy EQA pass rates. • MRRT functionality scores.

Risk ID	Risk Description	Potential Impact	Likelihood	Severity	Overall Risk Level	Mitigation Strategies	Responsible Party/ Entities (Broad)	Monitoring Indicator(s)
05	Emergence or spread of new biological threats (e.g., increased insecticide resistance, drug resistance	Reduced efficacy of preventive tools and treatments, increased risk of severe disease and transmission, complicating PoR efforts.	Medium	High	High	• Maintain robust entomological surveillance for vector behaviour and insecticide resistance • Continue iDES for early detection of antimalarial drug resistance. • Adapt vector control and treatment guidelines based on surveillance data (SOPs need to be reviewed and revised if necessary).	MOH, National Reference Lab, Research Institutions	• Insecticide resistance profiles in key vectors. • Molecular markers of drug resistance in imported cases.
06	Weaknesses in cross-border collaboration.	Delayed response to cross-border threats, inefficient resource use, missed opportunities for integrated PoR actions, hindering overall PoR effectiveness.	Medium	Medium	Medium	• Formalize and actively implement bilateral/ multilateral agreements for cross-border PoR. • Promote joint planning and activities with neighbouring countries and relevant national sectors.	MoH, Officials of border provinces	• Number of active cross-border MoUs/ agreements. • Frequency & outcomes of inter-sectoral/ cross-border meetings. • Number of joint PoR activities implemented.

Risk ID	Risk Description	Potential Impact	Likelihood	Severity	Overall Risk Level	Mitigation Strategies	Responsible Party/ Entities (Broad)	Monitoring Indicator(s)
07	Environmental changes and climate change impacting vector ecology and receptivity.	Potential increase in vector breeding sites, altered transmission seasons/windows, increased receptivity in previously low-risk areas, new challenges for vector control.	Low-Medium	Medium	Medium	• Integrate climate change considerations into PoR risk stratification and planning. • Strengthen entomological surveillance to monitor changes in vector distribution and behaviour. • Develop adaptive vector control strategies responsive to environmental changes.	MoH, Ministry of Environment,	• Regular updates to PoR risk maps incorporating climate variables. • Documented shifts in vector ecology.

Annexure 5: List of TAGME Members

Sl. No	Name	Designation	Agency
1	Dr. Thinley Dorji (Chair)	Medical Specialist	CRRH
2	Dr. Thinley Yangzom (Vice-Chair)	Tropical Medicine Expert	JDWNRH
3	Dr. Lobzang Dorji	NPO	WHO Country Office
4	Dr. Ripa Chakma	Associate Professor	FNPH
5	Dr. Tshering Yangden	GDMO	RBA Pelrithang
6	Dr. Rebecca Subba	Paediatrician CRRH	CRRH
7	Dr. Jigme Jamtsho	Pathologist	CRRH
8	Dr. Yeshi Dorji	CMO	Sarpang Hospital
9	Mr. Jit Bdr. Dharnal	Sr. Clinical Officer	RCDC
10	Mr. Kesang Wangchuk	DC Laboratory Officer	RCDC
11	Mr. Ugyen Norbu	Sr. CO HPRCD	MoH
12	Mr. Rinzin Namgay	Chief Entomologist	VDCP
13	Mr. Ugyen Dorji	DPHO	Sarpang Dzongkhag
TAGME Secretariat			
1	Mr. Tobgyel	Program Analyst	VDCP
2	Mr. Tenzin Wangdi	Chief Entomologist	VDCP
3	Mr. Loday Zangpo	DCPO	VDCP
4	Mrs. Ugyen Pelmo	SPO	VDCP
5	Mrs. Karma Chedon	GIS Tech	VDCP

Annexure 6: List of Contributors

Sl.No	Name	Designation	Agency
1	Dr. Bhim Nath Subady	CMO	Gidakom Hospital
2	Dr. Dorji Tshering	CMO	Phuntsholing Hospital
3	Dr. Sangay Wangchuk	Medical Specialist	CRRH
4	Mr. Jangchup Peljor	Dy. Chief Pharmacist	JDWNRH