

**MASTER OF PUBLIC HEALTH
(IMPLEMENTATION SCIENCE)**

PRACTICUM REPORT

**Implementation Challenges and Facilitating Factors of Malaria Screening in Health
Desks of Nepal-India Boarder of Lumbini Province, Nepal**

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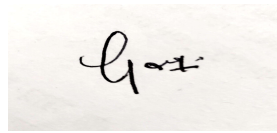
This is to certify that the dissertation titled **“Implementation Challenges and Facilitating Factors of Malaria Screening in Health Desks of Nepal-India Boarder of Lumbini Province, Nepal ”** is a record of Research work undertaken by Ms. Ganga Marasini ,Enrollment No. IIHMR-U/16/2022-24/0005 in partial fulfilment of the requirement for award of degree Master of Public Health (Implementation Science) from IIHMR University, Jaipur, under my guidance and supervision and his/ her approach to research study has been sincere, scientific and analytical.

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This is to certify that the Practicum Project titled **“Implementation Challenges and Facilitating Factors of Malaria Screening in Health Desks of Nepal-India Boarder of Lumbini Province, Nepal ”** submitted by me, **“Ganga Marasini ”**with Enrollment No. **IIHMR-U/16/2022-24/0005**, under the supervision of **Dr. Nutan P. Jain** for award of Master of Public Health (Implementation Science) conducted between **October 2023 and October 2024** is entirely my own and has not been submitted as the basis for any degree, diploma, fellowship, associate membership, title, or equivalent at this or any other university or institution of higher education.

Signature :

A rectangular box containing a handwritten signature in black ink. The signature appears to be 'Ganga' followed by a stylized flourish.

Ganga Marasini

MPH (IS) Cohort 2022-24



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TO WHOMSOEVER MAY CONCERN

This is to certify that Ms. Ganga Marasini, student of Master of Public Health (Science) Program offered by IIHMR University, Jaipur has undergone Practicum Training at Nepal Health Research Council, Kathmandu from date 15th Dec 2023 to 8th Sep 2024.

The candidate has successfully carried out the study on **“Implementation Challenges and Factors of Malaria Screening in Health Desks of Nepal-India Border of Lumbini Province, Nepal”** during practicum training and her approach to the study has been sincere and analytical. She worked under supervision of **Dr. Bishnu P. Marasini**, Senior Officer/Consultant.

The Practicum Training is in fulfilment of the course requirements. I wish her success in her future endeavours.

Sincerely,

Dr. Pramod Joshi
Member-Secretary
(Executive Chief)

Abstract

Introduction:

Malaria is still in 21st Century a serious public health issue, particularly in areas where migration is common, like the border between India and Nepal. The study focuses on **Implementation Challenges and Facilitating Factors of Malaria Screening in Health Desks of Nepal-India Boarder of Lumbini Province, Nepal** essential for developing national and regional malaria control plans, as Nepal seeks to eradicate malaria by 2030.

Objectives:

The study aims at enhancing screening programs in line with the worldwide objective of eliminating malaria by 2030. The objective was to determine the barriers and facilitators which affect the implementation of malaria screening services at health desks in the border region between India and Nepal.

Methodology:

An explanatory sequential study design with mixed methods was used. At the health desks in Jamunaha, Belahiya, and Krishnanagar, service records were reviewed in order to gather quantitative data. Key malaria screening parameters from 2020 to 2023 were covered in the records. Furthermore, systematic checklists were used to record observations in order to evaluate screening procedures and available resources. Focus groups with migrants who were crossing the border between Nepal and India, in-depth interviews with health desk employees, and key informant interviews with municipal health officials were used to collect qualitative data. The qualitative data were subjected to thematic analysis, which revealed prospects and barriers for enhancing malaria screening services.

Results:

Despite the relatively high number of people crossing the border for health services, the quantitative data showed a significant reduction in malaria screening at the investigated health desks between 2020 and 2023. The irregular and insufficient supply of Rapid Diagnostic Test (RDT) kits and unavailability of microscopes for blood testing were among the resource-related issues that observational data brought to light. The qualitative results highlighted poor governance, inadequate screening protocol, and irregular material supply as the main obstacles. In addition, patterns of cross-border movement played a role in the spread of malaria, with imported cases from India presenting a persistent threat to efforts to control the disease.

Conclusion:

The absence of clear screening methods, inadequate governance, and budget constraints are major obstacles. In order to improve malaria screening services and meet the 2030 national goal of eliminating malaria, it is imperative that these hurdles be addressed. In order to overcome these challenges, it will be essential to improve staff training and resource allocation in addition to fortifying collaboration between national, provincial, and local health authorities. The study suggests that Nepal and India work together in the region to improve cross-border health services and reduce the spread of malaria through cross-border migration.

Key words: Malaria, Cross-border, Health desks, PoE, Malaria screening, Resource limitations, Migrants, Malaria elimination.

Acknowledgement

I wish to extend my deepest appreciation and gratitude to everyone who contributed to the success of my practicum project, titled “Implementation Challenges and Facilitating Factors of Malaria Screening in Health Desks of Nepal-India Border of Lumbini Province, Nepal.”

I am deeply grateful to my practicum mentor, Dr. Nutan P. Jain, from IIHMR University, whose expertise, guidance, and support was instrumental in shaping my understanding and encouraging critical thinking throughout the project.

I would like to express my profound appreciation to my organizational supervisor, Dr. Bishnu Prasad Marasini, from the Nepal Health Research Council. His guidance from the proposal development stage to report writing was invaluable, and without his support, this project would not have been possible.

I would also like to extend my appreciation to Mr. Khimlal Pandey, Lab Technologist Officer of the Lumbini province, Health Directorate, for sharing his valuable insights and assisting in coordinating with the Health Desks.

My heartfelt thanks go to the staffs of Jamunaha Health Desk, Belahiya Health Desk, and Krishnanagar Health Desk for their time and the information they provided. I am grateful to Vector control Officer of Health office of Rupandehi, Banke and Kapilvastu Districts. I would like to thank the health section co-coordinator and staffs of Siddharthnagar Municipality, Krishnanagar Municipality and Nepalgunj Sub Metropolitan City. Furthermore, I am grateful to the clients who allowed me to gather essential information for this project.

I would also like to acknowledge the support of my fellow colleague, Mr. Nilanjan, whose guidance was instrumental throughout this project.

This practicum project has been an enlightening and transformative experience, deepening my understanding of the National Malaria Elimination Program and its implementation at Health Desks.

Once again, I extend my heartfelt gratitude to all border authorities for their cooperation, as well as to my family and all individuals and organizations that provided direct and indirect support in making this project a resounding success.

Thank you.

Ganga Marasini

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Abbreviations

AD - Anno Domini (Gregorian calendar)
BS - Bikram Sambat (Nepali calendar)
CFIR - Consolidated Framework for Implementation Research
DHIS-2 - District Health Information Software 2
EDCD - Epidemiology and Disease Control Division
ERB - Ethical Review Board
FGD - Focus Group Discussion
HIV - Human Immunodeficiency Virus
IHR - International Health Regulations
INGO – International Non-Governmental Organization
ITNs - Insecticide-Treated Nets
IRS - Indoor Residual Spraying
MOHP - Ministry of Health and Population
NGO - Non-Governmental Organization
NHRC - Nepal Health Research Council
PoE - Point of Entry
PF - Plasmodium falciparum
PV - Plasmodium vivax
RDT - Rapid Diagnostic Test
SCF - Save the Children Fund
SDG - Sustainable Development Goal
VBD - Vector-Borne Disease
WHO - World Health Organization

Chapter 1

Introduction

1.1 Background

Malaria is a tropical vector borne communicable disease claiming lives especially in developing countries like Nepal, India. The World Health Organization's (WHO) global technical strategy for malaria 2016-2030 emphasized malaria elimination in at least 10 countries by 2020 with the launch of a special initiative called 'E-2020' where WHO funded 21 countries have the potential to eliminate malaria, and Nepal was one among them ⁽¹⁾. Therefore, it is clear that Nepal was on track of achieving its goal of reducing malaria incidence and mortality by 90% by 2020 as per the global strategy but failed to achieve it for many reasons including the additional challenges posed by the COVID-19 pandemic. The question arises: what are the challenges led Nepal not achieving malaria elimination by 2020 while the situation was under control within the country? To answer this question, it is important to understand the malaria situation from Southeast Asia regional perspectives especially the neighboring countries sharing border with Nepal. One of the frequently cited challenges in the literatures of malaria elimination is 'border malaria' or 'cross border malaria' ⁽²⁾. Border often considered as last mile for malaria elimination as it connects with the population and environment.

The world malaria report 2021 ⁽³⁾ revealed that India accounted for 82.5% of malaria cases in the Southeast Asia region, and the Uttar Pradesh state (a northern state of India) was the largest contributor: about 70% of malaria cases were reported in Uttar Pradesh in 2019. Therefore, it is important to understand the situation of the adjacent country Nepal which is currently bordering with 21 Indian districts from 5 states (Sikkim, West Bengal, Bihar, Uttar Pradesh and Uttarakhand) ⁽⁴⁾. Nepal is also bordering with China which has a history of malaria resurgence or re-introduction by imported cases such as Sri Lanka and Kyrgyzstan. ⁽⁵⁾ In both China and Nepal, the risk is due to return migration of laborers undertaking work and employment mostly in neighboring countries or within the region in malaria endemic areas. ⁽⁶⁾ In a study, Sabine Schmid ⁽⁷⁾ showed that industrialized countries like United Kingdom and United States were highly affected by the malaria cases imported from India. Therefore, cross border migration is threatening sustaining the malaria elimination and malaria importation is posing a major barrier in achieving elimination in these countries. An open border system led to high in-and-out migration between Nepal and India, but adequate information/data is not

available about the cross-border migrants due to weak reporting system. Studies estimated about 3 million Nepali residing in India and about 1 million Nepali migrated to India for temporary job.⁽⁸⁾ Given both the country i.e., Nepal and India aiming for eliminating malaria by 2025 and 2027 respectively, a weak and ineffective cross-border strategy is posing hindrance to malaria elimination targets in border areas and other parts of Nepal.

A study⁽⁹⁾ found trends and differences in malaria indicators reported through the routine surveillance of health facilities between 1963-2012. This study revealed that there was an increasing trend of falciparum and imported cases in the last decade. Other studies⁽¹⁰⁾ have shown a significant reduction of malaria burden in Nepal: about 80% reduction from 5393 in 2005 to 1064 in 2018). Though there was a declining trend, the study conducted by S. Bhattarai et al.⁽¹⁰⁾ found that several spatial clusters of districts reported increasing trend of malaria indicators. Kathmandu and Bhaktapur are being the significant in reporting increasing trend, and other larger clusters are located in the western part of the country i.e., in Lumbini, Karnali and SudurPashchim provinces, which are sharing borders with India. The study conducted by Smith et al.⁽¹¹⁾ found that imported malaria cases increased local malaria transmission in Nepal. The analysis revealed that the malaria cases among indigenous population in the Kailali, Kanchanpur, and Bardiya districts of Nepal increased with the increase in imported cases. Therefore, it is important to understand the pattern of imported cases: imported cases found to be distributed throughout the southern part of the country from east to the west in the districts that are bordering with India⁽¹²⁾. The study conducted by Gautam et al.,⁽¹³⁾ found that, though the malaria cases have been declined in 25 studied districts adjacent towards the India border between 2001 to 2017, still malaria is endemic in majority of these districts. Further Gautam⁽¹⁴⁾ emphasized strengthening malaria elimination through promoting cross border mobility malaria control strategies such as ITNs, IRS etc., or through implementing strict border screening and isolation.

Though countries are signatories to the international health regulation, many countries like India have not effectively implemented health interventions in border areas adjacent to Nepal. The nature of cross border movement suggests that movement are not sourced and destined between the border areas, but also sourced and destined from and beyond border areas which has high potential to transmit imported cases to a larger population in the recipient country. Given a weak health system in border areas, it is very difficult to quantify the level of imported transmission cases occurring from cross border movement. The quantification of imported cases is also depending on the health systems response in the recipient country.

⁽¹⁵⁾Therefore, to control cross border transmission of malaria and other communicable diseases, Government of Nepal implemented health desks at the border entry points (also known as Points of Entry PoE). Currently there are 16 health desks, of which 14 are located in Nepal-India border and rest are in Nepal-China border. Diseases like COVID-19 and other infectious diseases, malaria and dengue, and tuberculosis are being screened in these health desks.

Epidemiology and Disease Control Division (EDCD) of Government of Nepal is responsible for monitoring these health desks (and airports) and its services.⁽¹⁶⁾

1.2 Rationale

Malaria program implemented across the country and given a

strong evidence of malaria transmission through cross borders especially in the Nepal-India borders, which is affecting the achievement of Nepal government's goal of eliminating malaria by 2026, it is important to strengthen screening of services in the health desks. A report published by Nepal Health Research Council⁽¹⁷⁾ on possible actions for controlling and eliminating vector borne diseases also emphasized similar strategy. There is a need to incorporate other vector borne diseases which are communicable in nature into the screening system at health desks.

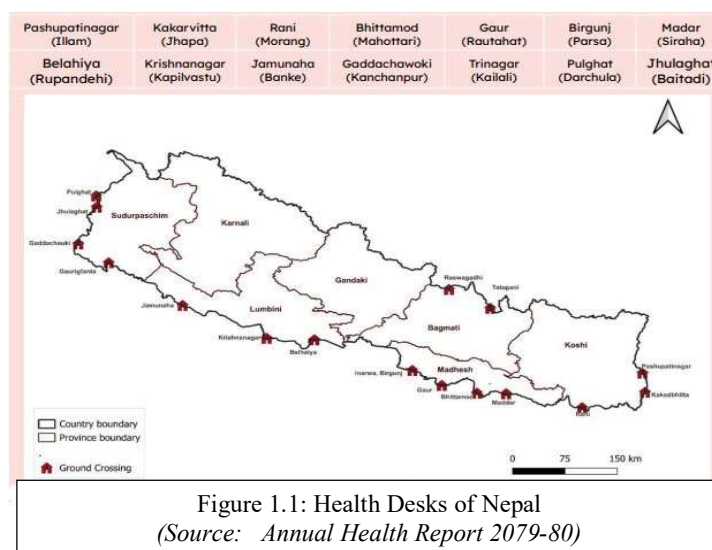
Due to the lack of implementation research, it is difficult to analyze the current situation of the health desks and the barriers and facilitators in malaria screening service delivery.

1.3 Research Question

What are the barriers and facilitators in implementing malaria screening in health desks at cross boarder setting of Lumbini Province?

1.4 Objective of this study

This study attempted to identify the barriers and facilitators of malaria screening in the health desks of Lumbini province in Nepal through an implementation research.



Chapter 2

Review of Literature

Table 2.1 : A snapshot of Literature Review

0.Table 2.1Authors (Year)	Study title	Location	Salient features
Xiaohong Li, Robert W. Snow, Kim Lindblade, Abdisalan M. Noor, Richard Steketee, Regina Rabinovich, DeyerGopinath, ElkhanGasimov& Pedro L. Alonso (2023)	Border malaria: defining the problem to address the challenge of malaria elimination		Higher intrinsic transmission potential, the neglect of investment and development, the constant risk of malaria importation due to cross-border movement, the challenges of implementing interventions in complex environments and uncoordinated action in a cross-border shared transmission focus all contribute to the difficulties of malaria elimination in border areas.
Bhattarai, Shreejana et al.(2023)	Spatio-temporal patterns of malaria in Nepal from 2005 to 2018: A country progressing towards malaria elimination	Nepal	Using spatial variation in a temporal trend method, this study mapped trends in malaria prevalence. Though there is an increasing trend of imported malaria cases, yet overall trend is showing that the malaria burden was decreasing in Nepal, and need focused interventions in the endemic districts.
NirmalGautam, SampurnaKakchapati, Sarala Shrestha and WandeeWanishsakpong(2019)	Patterns and trends of malaria in 25 risk districts of Nepal from 2001 to 2017		This study analyzed malaria situation reported in the Annual Reports from 2001-2017 by the Government of Nepal. This analysis found a very upward and downward trends between 2001 to 2017. The higher rate of malaria reported in Dadeldhura, Kanchanpur, Kailali, Bardiya, and Jhapa districts.
Smith, J.L., Ghimire, P., Rijal, K.R. et al. (2019)	Designing malaria surveillance strategies for mobile and migrant populations in Nepal: a mixed-methods study	Nepal	This research attempts to identify link between the imported and indigenous cases by using a mixed-method approach. More than 50% of malaria cases were found imported between 2013-2016. This study found monthly indigenous cases and previous month's case importation rate.
Regmi, Pramod R et al. (2019)	The Health of Nepali Migrants in India: A Qualitative Study of Lifestyles and Risks.	India	Lack of basic amenities in accommodation, work-related hazards such as lack of safety measures at work or safety training, reluctance of employers to organise treatment for work-related accidents, occupational health issues such as long working hours, high workload, no/limited free time, discrimination by co-workers

			were identified as key problems.
Rijal, Komal Raj et al. (2018)	Epidemiology of Plasmodium vivax Malaria Infection in Nepal		This review of the epidemiology of P. vivax malaria infections as recorded by the national malaria control program of Nepal between 1963 and 2016 for vivax malaria is prevalent and dominated in Nepal in the last 50 years. Falciparum cases increased between 2005 to 2010 and the declined. This review also found an 18% increase in imported cases and 50% in 2016.
Yaobao Liu, Hugh J W Sturrock, Haitao Yang, Roly D Gosling, Jun Cao (2017)	The challenge of imported malaria to eliminating countries		China is on the path to malaria elimination with most areas of the country in the prevention of reintroduction phase. Other elimination settings face the same threat of malaria resurgence or re-introduction by imported cases such as Sri Lanka and Kyrgyzstan. In China and Nepal, the risk is due to returning labourers undertaking high-risk work outside with scarce awareness of self-protection in malaria endemic areas.
Dhimal, Meghnath et al. (2014)	Malaria control in Nepal 1963-2012: challenges on the path towards elimination.		This study found trends and differences in malaria indicators reported through the routine surveillance of health facilities between 1963-2012. This study revealed that there was an increasing trend of falciparum and imported cases in the last decade.
Sabine Schmid, Peter Chiodini, Fabrice Legros, Stefania D'Amato, Irene Schöneberg, Conan Liu, Ragnhild Janzon, Patricia Schlagenhauf (2009)	The Risk of Malaria in Travelers to India		This study identified risk of imported malaria cases to travelers in India. It found that vivax malaria is predominant among the travelers to India.

Chapter 3

Methodology

3.1 Study design

A mixed method explanatory sequential study design was applied to collect data on the barriers in implementation of the malaria screening at health desks. Explanatory sequential design started with quantitative data collection and analysis and then followed up with qualitative data collection and analysis, which led to interpretation. Given lack of implementation research in cross border malaria screening at health desks, quantitative data alone may not define the in-depth systemic problems, and therefore to capture a broader picture of the implementation barriers both quantitative and qualitative data together or mixed-method was applied for better understanding of problem statement. The study was carried out at system level and community level.

3.2 Study settings

The research was carried out in three health desks i.e., at Jamunaha, Krishnanagar, and Belahiyasituated in Lumbini province of Nepal. ⁽³⁾⁽⁴⁾ Lumbini, with an area of 22,288 square kilometers (8,605.44 sq. mi) covers about 15.1% of Nepal's total area. Lumbini province is almost the size of US state of New Jersey. The province extends 150 km (93 mi) north to south and about 300 km (186 mi) East to West at its maximum width. It shares 413.14 km (256 mi) of border with India (states of Bihar and Uttar Pradesh). There are three ecological regions of Mountains (3.1%), Hills (69.3%), and Terai (27.6%) of the province.

The health desks were purposively selected as they are situated in the cross-border entry points of Lumbini province. Lumbini province has experienced consistently high increasing trends in imported malaria, PF & PV malaria, and total malaria cases between 2005 to 2018, and similar trend continued thereafter. Lumbini province has also experienced a very high cross border migration through Nepal-India entry points.

Inclusion and exclusion criteria of study sites:

- (i) *Inclusion:* All the three regular health desks which in the cross-border entry points (Jamunaha, Krishnanagar, Belahiya) in the Lumbini Province were selected under the study. Belahiya

- (ii) *Exclusion:* Other health desks which were established for screening of COVID-19 -19 during pandemic (both functioning /Non-functioning) were excluded.

The updated Consolidated Framework for Implementation Research (CFIR 2.0) by Damschroder et al. was used to guide data collection, coding, analysis as well as reporting.

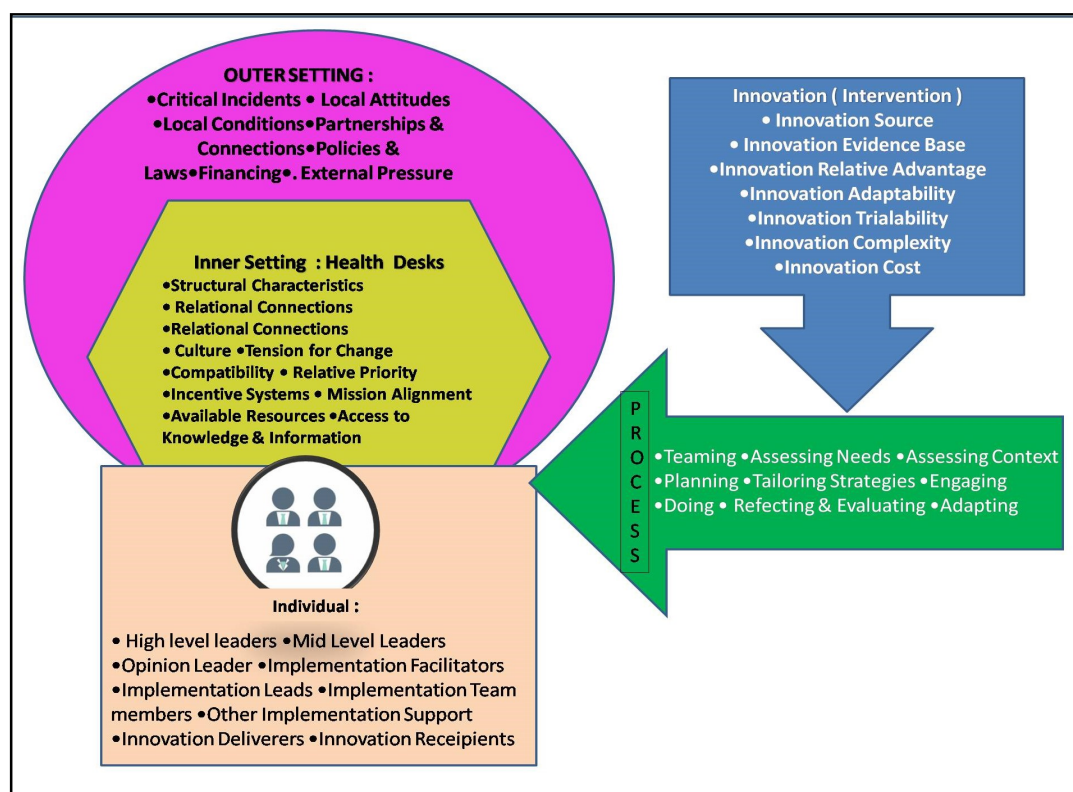


Figure 3.1 : Conceptual Model of CFIR 2.0 construct for Malaria Screening at Health Desk (Adopted from Domschroder et al 2022)

The CFIR has major five domain among which this study was done to find out barriers and facilitators of Inner setting that is the setting where the intervention is implemented.

3.4 Data collection techniques

- (i) Quantitative data collection : The service statistics was collected through review of the records/registers available at the health desks from the inception of the desk, that is,December 2023.

Table 3.1 Service statistics by three health desks by years

Total Clients	Jamunaha	Belahiya	Krishnanagar	Total
2077-78 BS (2020-21 AD)	132378	28896	925	162199
2078-79 BS (2021-22)	223653	118530	16420	358603
2079-80 BS (2021-22)	128158	114631	35030	277819
Total	484189	262057	52375	798621

(ii) Qualitative data collection

- Observations were carried out in the health desks to document malaria screening related services and protocol guidelines. Observational data was collected using an observation checklist.
- Three In-depth Interviews of health staff deployed at the health desks were conducted. A total of six Key Informant Interviews were conducted.
Three with Health Section head of Municipality
Three with Vector Control Focal Person in Health Office
- Three Focus Group Discussions (FGDs) were conducted with the Nepal citizens crossing the border from malaria-burden states/districts of India to Nepal or vice-versa.

3.5 Data Analyses

Services statistics data from the three selected health desks was entered in Microsoft excel by last three fiscal year by year, sex; and a descriptive univariate analysis was performed to understand the pattern on malaria screening, its burden and other screening services by fiscal years

Observation based data was analyzed separately to support the service statistics and data collected qualitatively.

Thematic analysis of the qualitative data was performed. The data collected in Nepali language was transcribed at first, and then translated to English. The thematic analysis of the qualitative data was done using Excel software. Next, multiple readings of the transcripts was

performed to generate codes and recognize the broader themes originating from the codes. Then, the narratives under each theme were analyzed to identify those narratives strongly associated with the themes. Field notes from direct observations, collected before/after each interview were also reviewed along with the themes.

3.6 Ethical considérations

Ethical approval was obtained from Ethical Review Board (#121_2024), Nepal Health Research Council to conduct the research in selected health desks of Lumbini province. Further permission was obtained from Health Directorate, Lumbini Province to collect relevant data for this research purpose using checklists and interviews. Written informed consent was obtained from the participants. Simultaneously, consent from the participants was obtained to audio-record the interviews.

Chapter 4

Results

4.1 Context analysis

According to the International Health Regulation, health desks were implemented in the Nepal-India cross border setting. Three such health desks were located in the Jamunaha, Belahiya, and Krishnanagar of Lumbini province of Nepal and bordered with the Uttar Pradesh state of India.

Health desks provide screening service to the individuals crossing the border from India to Nepal. The screening services are available for COVID-19, Malaria, HIV, Tuberculosis, Dengue and Kalaazar. But currently dengue and Kalaazar are not being screened. Malaria specific data collected was analyzed to assess the malaria situation in these three health desks. The data provide an overview of the number of clients attended these health desks for screening, individuals screened for malaria and other diseases across three fiscal years: 2077-78 BS (2020-21 AD), 2078-79 BS (2021-22 AD), and 2079-2080 BS (2022-23 AD).

Table 4.1 provides a picture of utilization of health desks screening services by the individuals/migrants. Though the data collected coincide with the duration of COVID-19 pandemic, the number of individuals utilized screening services might be much higher than the normal situation. The data reveals that Jamunaha health desk screening highest number of individuals compared to Belahiya and Krishnanagar. Further, the number of individuals/migrants screened depends on the functioning of the health desks: Krishnanagar health desks were established in 2021 whereas the other two health desks were functional from pre-COVID-19 times. Therefore, the data showed that Krishnanagar served the lowest number individuals/migrants. Moreover, number male individuals were screened was much higher than the female, indicate male migration to India from Nepal is very high, and these individuals were returned to their home country due to COVID-19 pandemic. In addition to the disease specific screening, fever screening is mandatory for all individuals/migrants visiting health desks. Only Jamunaha health desks reported 40 fever cases between 2021-2023.

Table 4.1: Screening Service Utilization, by Health Desks and Year

	Jamunaha			Belahiya			Krishnanagar		
	2077-78 BS (2020-21 AD)	2078-79 BS (2021-22 AD)	2079-2080 BS (2022-23 AD)	2077-78 BS (2020-2021 AD)	2078-79 BS (2021-22 AD)	2079-2080 BS (2022-23 AD)	2077-78 BS (2020-21 AD)	2078-79 BS (2021-22 AD)	2079-2080 BS (2022- 23 AD)
Total Client	132378	223653	128158	28896	118530	114631	925	16420	35030
Male	97079	160321	97923	22368	85964	72918	633	12253	25978
	73.33	71.68	76.41	77.41	72.53	63.61	68.43	74.62	74.16
Female	35299	63332	30235	6528	32566	41713	292	4167	9052
	36.36	39.50	30.88	29.18	37.88	57.21	46.13	34.01	34.84
Fever Screening	Not recorded	26	14	Not recorded	Not recorded	Not recorded	Not recorded	Not recorded	Not recorded

Table 4.2: Malaria Screening and Testing

	Jamunaha			Belahiya			Krishnanagar		
	2077-78 BS (2020- 21 AD)	2078-79 BS (2021- 22 AD)	2079-2080 BS (2022- 23 AD)	2077-78 BS (2020- 2021 AD)	2078-79 BS (2021- 22 AD)	2079-2080 BS (2022- 23 AD)	2077-78 BS (2020- 21 AD)	2078-79 BS (2021- 22 AD)	2079-2080 BS (2022- 23 AD)
RDT conducted for Malaria	6981	8570	2793	168	2681	2436	5	0	565
P. Vivax +ve cases	0	3	0	0	1	0	0	0	1
P. Falciparum +ve cases	0	0	1	0	0	0	0	0	0

Table 4.3 : Other Services Provided by Health Desk

	Jamunaha			Belahiya			Krishnanagar		
	2077-78 BS (2020- 21 AD)	2078-79 BS (2021- 22 AD)	2079-80 BS (2022-23 AD)	2077-78 BS (2020- 2021 AD)	2078-79 BS (2021-22 AD)	2079-80 BS (2022- 23 AD)	2077-78 BS (2020- 21 AD)	2078-79 BS (2021-22 AD)	2079-80 BS (2022-23 AD)
COVID-19 Screening	9642	76743	32123	5484	77710	54428	63	401	4917
+ve cases	274	1097	397	131	1429	1560	13	104	213
-ve cases	9368	75646	31726	5353	76281	52868	50	297	4704
Tuberculosis	36	1303	864	0		595		4	242
Sputum +ve cases	0	11	5	0					1
HIV counselling		89		0				20	484
HIV Testing		51		0				10	119

Table 4.2 provides data on the number of individuals/migrants screened for malaria. Malaria screening was conducted to all individuals especially who produce fever and body ache. Due to unavailability of microscopic examination for malaria, screening is conducted using RDT (Rapid Diagnostic Test), but the accuracy of the test is questionable. That is why all malaria positive cases reported in health desks were referred to a nearby hospital to undergo a microscopic examination for confirmation.

Overall, higher number of RDT tests for malaria conducted in Jamunaha health desk compared to Belahiya and Krishnanagar. In Jamunaha, RDT for malaria decreased from 8570 in 2021-22 to 2793 in 2022-23. Other health desks such as Belahiya health desk observed slight decrease in RDT for malaria. Given Krishnanagar health desk was operation in 2021 after COVID-19, it showed a very minimal RDT for malaria conducted. *P. Vivax*+ve cases were reported in all the three health desks between and only one case of *P. Falciparum*+ ve case was reported in Jamunaha health desk 2020-2023. No significant cases of probable or clinical malaria and no deaths due to malaria were reported.

Further data collected for other screening services revealed that screening for tuberculosis and HIV were reduced likely due to the COVID-19 pandemic, and therefore COVID-19 screening was reported very high in all three health desks compared to the screening of other diseases. Table 4.3 showed the number of screening conducted for COVID-19, tuberculosis and HIV and positive cases were reported from these screening services.

Overall, the studied health desks showed a significant contribution through its screening services during and post COVID-19. The above data indicated that services provided by the health desks were accepted and utilized by the individuals/migrants. But variation existed in utilizing the services. In case of malaria, the data concluded that decrease in RDT for malaria is a concern and need to identify barriers that hindering delivery of malaria screening.

4.4 Stakeholder analysis

Table 4.4 : Stakeholder Analysis Framework

Stakeholder	Contact person	Interest	Power to Influence	Importance	Contribution to the program	Any negative affect to the program	Matrix classificati on	Matrix strategy
Epidemiology and Disease Control Division, Department of Health Service, Kathmandu Nepal	www.edcd.gov.np Section Chief Vector Borne Disease control Section	High	High	Monitoring of diseases through health desks present at point of entries at international ground crossing point	Provide support to Ministry of Health and Population for drafting national laws, policies, and strategies related to Communicable diseases and Infectious disease, including VBDs . -Develop guidelines - Monitoring and Evaluation -Budgeting	The priorities may change from Malaria Elimination to other health issues; Less or no reliability on the findings; focus on pandemic or endemic problem - not allocating sufficient budget	Champion	Manage Closely
Province Directorate, Ministry of Health , Lumbini Province	https://mohp.lumbini.gov.np/ Focal Person /Vector borne disease and NTD	High	High	Program Implementation	- Monitoring Supervision - Logistic Management	By not monitoring frequently Lack of communication - poor	Champion	Manage Closely

						logistic management		
Health Office	Vector Borne Disease Control Inspector ,	High	Low	Implementation of VBD control program within the district	-Monitoring and evaluation - co-ordination between central, province and local government - Logistic Management	lack of interest as they do not have budget at district for health desk management	Avoider	Keep Satisfied
Local Municipality	Health Section Co-ordinator	High	Low	Implementation of VBD control program within the municipality	-Monitoring and evaluation - co-ordination between central, province and local government and health desk - Logistic Management	lack of interest as they do not have budget at district for health desk management	Silent Booster	Keep onside, Monitor interest
Health Desk (POE)	Incharge	High	Low	Disease Screening, Isolation, quarantine testing and treatment management coordination	Infectious Disease Control, Early diagnosis and treatment	Overall management of Health desk will be affected and results in poor quality	Silent Booster	Keep onside, Monitor interest

Service Providers (Health Desk)	Paramedics ,Nurse and Lab staffs	High	Low	Disease Screening,Isolationquarantine testing and treatment	Infectious Disease Control, Early diagnosis and treatment helps for malaria elimination	Lack of knowledge, skill for service delivery	Silent Booster	Keep outside, Monitor interest
Nepal Police	Inspector	Low	High	Referring migrants to health desk for screening	Service Coverage will increase	Lack of Interest in health program	Champion	Manage Closely
Armed Police Force		Low	Medium	Referring migrants to health desk for screening	Service Coverage will increase	Lack of Interest in health program	Champion	Manage Closely
Custom Offices	Government Officer	Low	Medium	Co-ordination with health desk	Service Coverage will increase	Lack of Interest in health program	Champion	Manage Closely
Tourist Police		Low	Low	Referring migrants to health desk for screening	Service Coverage will increase	Lack of Interest in health program	Champion	Manage Closely
Local NGO - KIDS	Lab Staffs	High	Low	Screening of Tuberculosis and help for malaria screening	Service Coverage will increase	Project duration ending	Uncertain	Minimal effort
Save The Children	Health Workers appointed from SCF	High	Low	Malaria Screening	Service Coverage will increase	Ending project	Uncertain	Minimal effort
Other NGOS – MaitiNepal,KIN	Social Workers	Low	Low	Increase awareness and refer	Increased awareness	Lack of Interest in health program	Blocker	Keep informed

The stakeholder analysis found twelve key stakeholders, involved in the malaria program at the studied health desks. These stakeholders were classified as champions, avoiders, silent boosters and blockers based on their role and engagement in the program. Each of these classification was explained below.

(i) *Champions*

The two stakeholder, the Epidemiology and Disease Control Division (EDCD) and the Province Directorate, Ministry of Health, Lumbini Province, were classified as champion as they hold high interest and influence in the program. Their role in policy planning, implementation and monitoring is critical in achieving desired objectives of the program.

(ii) *Avoiders*

The health office and local municipality were classified as avoiders as they hold high interest but low influence. Therefore their limited power may not allow them to make a sustained impact. Further they are not an authority to receive and provide fund for the health desks management.

(iii) *Silent Boosters*

The health desks service providers were silent boosters as they hold high interest but low to medium influence. Their role as service providers are critical in delivery of the screening services in the health desks. Their limited influence need a supportive environment from higher authorities to provide quality services effectively and efficiently through the health desks.

(iv) *Blocker*

External NGOs (Maiti Nepal, KIN) are classified as blocker as hold a high interest but low influence. They hold potential for increasing awareness and also improving service coverage.

The stakeholder analysis exercise was helpful in identifying key stakeholders who could participate in this research study. Based on this analysis, data collection technique was decided and recruited one key focal person from almost each stakeholder entity as a participant in this research study.

4.3 Observational data analysis

Table 4.5 : Observation Checklist

Parameters	Krishnanagar	Jamunaha	Belahiya
Laboratory			
Lab Technician Availability	Partial	Partial	Partial
Blood Microscopy for Malaria	Not being done, Microscope not available	Not being done, Microscope not available	Not being done, Microscope not available
RDT for Malaria (Antigen)	Bivalent (Pv/Pf)	Bivalent (Pv/Pf)	Bivalent (Pv/Pf), conducted randomly
Training of LTs in past three years on Malaria	Yes	No	Yes
Resource Availability			
a) Functional Microscope	No	No	No
b) Reagents	No	No	Yes
c) Glass Slides	No	Yes	Yes
d) Lancets	No	Yes	Yes
e) Hollow/Injection Needles used for Finger Prick	Yes	Yes	Yes
f) RDTs for Malaria	Yes	Yes	No
Availability of arrangement for segregation of BMW at the session site.	Yes	No	No
OPD and Service Provision Area			
IEC Related to Malaria displayed in Facility	No	No	No
Display of treatment guidelines for Malaria	No	No	No
Provision for temperature measurement of Fever Cases			
a) Thermometer	Yes	Yes	No
b) Temperature being Measured	Yes	No	No
Recording and reporting of Fever Cases (Check registers/ask Providers)	No	Not being done (only if necessary)	No
Drug Dispensing			
Drug Availability			
a) Chloroquine Tablets	Yes	Yes	No
b) Primaquine Tablets	No	No	No
c) Artesunate Combination Therapy	No	Yes	No
d) Injection Artesunate	No	Yes	No

e)	Quinine Tablets	No	Yes	No
f)	Quinine Injection	No	Yes	No
g)	Ambulance Availability	No	Yes	No

Observational data was collected using an observation checklist to evaluate the malaria screening service delivery from the three studied health desks located at Krishnanagar, Jamunaha, and Belahiya. The analysis conducted based on the parameters in the checklist that structured around laboratory, resource availability, OPD & service provision areas and drug dispensing.

In laboratory, it was found that lab technician was partially available in all three health desks. Lack of full-time availability of technicians could impact delivery of screening services timely. Further training of the lab technicians is utmost important in delivering services which is lacking in Jamunaha health desks. Lab technicians at Belahiya and Krishnanagar health desks were already trained. Given lack of microscopic examination due to microscope is not available in all the three health desks, confirmation accuracy for malaria diagnosis is challenging. Bivalent RDT kit is used for conducting malaria testing which is effective in rapid detection of malaria through mass screening, but confirmation needs microscopic examination.

In case of resource availability, there is a huge inconsistency in resource allocation, distribution and utilization. In addition to the unavailability of the functional microscope, other laboratory resources like reagents were available only in Belahiya indicate that there is a concern over supplying of reagents in health desks. Glass slides and lancets were available in Jamunaha and Belahiya, but not in Krishnanagar. Similar RDT kit was available in Jamunaha and Krishnanagar but not in Belahiya. Segregation of biomedical/laboratory wastes, which is part of the infection prevention and control, are not practiced in Jamunaha and Belahiya.

In OPD and service provision area, malaria specific IEC (Information, Education and Communication) materials were unavailable in all the three health desks. There is absence of screening protocol too. Fever screening is done for all individuals/migrants visiting the health desks using thermometer but it found inconsistent in Belahiya health desk. Recording and reporting of fever cases was not consistent in all three health desks: Krishnanagar and Jamunaha health desks didn't record and report whereas Belahiya did it for some time only if necessary.

In case of drug availability, malaria specific drugs such as chloroquine and primaquine were

not available in all the three health desks, Artesunate Combination Therapy was only available in Jamunaha and Injection Artesunate & Quinine Tablets/Injections were available only in Krishnanagar.

Ambulance facility is not available in all the three health desks which is key to any emergency response or referring to higher hospital/treatment center.

Overall, addressing these issues through better resource allocation, training, and system improvements is crucial for enhancing the effectiveness of malaria control efforts in these border health desks.

4.4 Thematic analysis

The qualitative data analysis revealed context specific barriers and facilitators of malaria screening service delivery in the selected health desks located in three PoEs of Nepal-India borders of Lumbini province i.e., Jamunaha, Krishnanagar, and Belahiya. The barriers were highlighted more by the participants than the facilitators of malaria screening, indicates the unpreparedness and ineffective delivery of malaria screening services in the health desks. Though there are barriers, participants also emphasized on the importance of health desks and strengthening its services for disease control and transmission of imported diseases from other countries. One of the participants, P2, said *“Yes, there are indigenous cases, they come from outside...many cases have come from outside, and many cases have appeared in the community of Kapilvastu. What is special is that this is the way diseases penetrate the community and if we do this screening and identify positive cases, disease could not go to the community and transmitted. That's the thing. That's why we think that having a health desk has a good effect.”* Participants, such as P3, confident that diseases are mostly imported by the migrants, said *“imported cases come to Nepal from migrants.”* According to the participants, the importance of health desks is little diminished compared to COVID-19 times. Participant, P1, connected individual's obeying and listening to health desk staff with the importance of health desk, said *“During the time of COVID-19, we started screening for tuberculosis and malaria as well. The atmosphere at that time was such that whatever the health workers said, they would accept them. At that time, when the epidemic was spreading, they would accept our words directly.”* P2 said that border authorities used to treat them well, value them during COVID-19 screening by referring individuals crossing border to the health desk but health is not considered important to them, quoted *“Immigration, tourist police, Maiti Nepal and many other people are providing services in the border. They help*

more on co-ordination. Health is not important to them.....They don't perceive health is important now. At COVID-19 time they used to treat us very differently. But now time changed." Another example how individuals' attitude towards health and safety have changed after COVID-19 times, as P2 said, "People think that COVID-19 has disappeared. So why should we check now? They should not say no to screening of other diseases because of COVID-19. There are other diseases as well, like malaria, tb, HIV, that's why we are screening. It should be said that there is need to test other infectious disease as well not only COVID-19." Eventually health authorities at national level had given importance to health desk and established few health desks during COVID-19 pandemic and also emphasized introduction of malaria screening in the routine practices of health desks, as P3 quoted, "This health desk has been functioning well since the start of the COVID-19 epidemic. At that time, everyone was worried about how to save their lives. We used to enter the IMU for COVID-19 screening testing. Later, it was said that fever cases also should be checked for malaria and RDT was made available." Therefore, political will and commitment must drive progress by strengthening infrastructure and all services including malaria screening provided by the health desks, but the situation is different as revealed by this study analysis. Given this study is focused on malaria screening in the health desks, the analysis identified six important implementation barriers, as explained below, those are really posing a challenge in functioning of the studied health desks and delivering a quality malaria screening service.

(i) Poor governance of health desks affecting screening services

Health desks are governed by the national health authority, EDCD. Yet there are hierarchies from local to national level. Participant P4 said, "These three health desks are the offices of federal government directly under EDCD. Since this is not office of the provincial government, it cannot be operated by the province by making separate arrangements." Provincial level doesn't have power to allocate fund or manages fund but municipality has power and manages operational costs incurred for the health desks. P4 said "Our job is to manage the budget distribution, monitoring, taking reports, if there are any problems, forwarding the problem to central government, appointing staff, and doing work. Our work is management according to received budget.....And the local municipality also conducts some programs now There is a budget in the local municipality. The federal government has put it in the municipality. There is some budget in municipality for operational costs of health desk."

Service providers in health desk experience difficulties and challenges on daily basis to execute the malaria screening. But they don't aware of whom to approach for advice or solutions to the recurring challenges. Participant P1 highlighted such difficulties of poor governance and support of higher authorities to the functioning of the health desks, leading to poor relationship between the health desk providers and higher authorities and enhancing communication barrier.

“There is confusion as to who the health desk is under. Sometimes the local level sends staff and budget, sometimes the state. The state says that we are under the EDCCD, but the state will support us, We people who live in the corner do not know where our work is done, which person is from which part. The biggest thing is the distance from the province and EDCCD is far from here The province is also far away The local level is close If there is any problem, you should tell the province Whenever help is needed, it would be better if it was resolved immediately It takes time to solve the problem when it is placed in the department and province Even though it is closer than the provincial department, there is no clarity with whom to talk.” (P1)

Participant P2 connected poor governance and communication barrier from higher authorities with the lack of enough budget for health desk management.

“If I will talk to the higher body, They Do not pay attention to anything from upper authorities. The municipality is not interested in our problem.... When talking about training like now, the municipality does not take interest Nothing matters to them as they don't have any budget for Health desk management.” (P2)

In case of monthly report that health desk submits to local level i.e., at municipality, there is no feedback provided on the performance and to improve the performance by resolving the recurring challenges affecting screening.

“Our report is linked to the performance of the municipality. They look at the reporting of everything from that point of view such as the monthly reporting meeting, but there is no feedback. They have a reporting meeting on the 7th of every month. Sometimes they call us and sometimes they don't.” (P2)

It is clear according to the participants that they are highly motivated to carry out their responsibilities in health desks, but feedback, acknowledging their service, guidance and

support towards providing minimum resources required to deliver quality services including malaria screening.

“We are motivated because we have served here during the crisis of COVID-19. COVID-19 time was very hard for us too. We haven’t met family didn’t take rest, but no one acknowledged our effort. This situation is far better than that [COVID-19] time, we need proper guidance and minimum resources.” (P3)

Overall, according to the participants, health desk is not given importance and prioritizes to include in any propaganda by the higher authorities. Participant P1 said *“There is a Malaria Guide of Nepal Government. We are confused as to whom we should screen. It is not possible to check everyone. Suspects are examined in other health institutions. He goes to another institution after falling ill. When we ask, not everyone speaks the correct answer. In all the advertisements of the Nepal government, there is a message to go to the health center, but there is no message and propaganda to get services from the health desk. That should also be included in the messages coming from the government of Nepal.”*

(ii) Lack of screening protocol

One of the common implementation barriers in malaria screening in the studied health desks was the absence of a standard screening protocol or guidelines. Participant P2 said *“the biggest thing is how to run this health desk? How to manage it? Which protocol should be followed? It should be clear. Some of the guidelines are not being followed. Now the guidelines may have been made. It has not come to us. We do not even know.”* Participant P1 also connected absence of protocol/guideline with the lack of motivation and lack of attention by national and local health authorities, said *“In POE, it doesn't seem like there is a guideline that tells us to do exactly this or that. If it [some tasks] doesn't work, we have to be responsible. There was no motivation or fear to do it. Do whatever you want to do, seems like you [higher authorities] don't care about anything.”* In the absence of protocol/guideline, instructions provided by the locally available experienced person local are mostly followed by the health desk staff, P1 said *“..... local level sir previously worked in the health office. So we perform according to his instructions.”* P2 said *“We are doing it on the basis of our knowledge.”*

Absence of protocol/guideline led the participants doubtful about the standard operating procedure of the screening process. Screening is done following a unique process in all the

three health desks for the individuals return/enter Nepal through the nearby cross borders. Many diseases screening is being conducted by the staff of health desks and malaria screening is one among them. Participants explained how the screening process is being conducted: Firstly, information is being collected and documented on history of travel and illness, then collection of blood sample, testing of the blood sample, and finally report preparation. Rapid Diagnostic Kit (RDT) is used for malaria screening and diagnosis in all the three health desks.

“We screen for COVID-19 including malaria, HIV tuberculosis. When talking about malaria, we ask Nepali people who come from across the border, do you have any problem or not? Do you have a fever or not? Do you have muscle pain in your hands or knees? Do you have a headache or not? Do you feel tired or not? We ask if they have some of these symptoms, then we check for malaria. We use RDT to test for malaria immediately and provide report to them immediately. The other thing is that we do a mandatory check on the immigrants coming from risk zones like Maharashtra, Chennai, Mumbai of India, whether they have symptoms or not. We follow the same for screening testing.” (P3)

While asking about diagnosis, P1 said *“Yes Only RDT. If it comes negative, they will be sent back home and if it comes positive, there is a different modality.”*

Participant P4 connected absence of protocol/guideline with the difficult to follow IHR regulation, said *“IRH tells that health system should be resilient to prevent infectious disease. No one can follow that principle of IRH madam. EDCD and Health directorate has set minimum standard to establish health desks at our international border points according to IRH. A guideline should be made based on the needs of these service recipients. There is no guideline in that form. This is what everyone should do during COVID-19. Later, we added to screen all the diseases that are going to be eliminated. We started to screen these diseases, but now all provinces are screening also.”*

As screening is being done to identify individuals with ‘positive’ result, therefore staff in health desks strive towards getting ‘positive’ cases through screening and attempt further steps for such cases.

“If there is a chance that his result comes positive, then we have not left that person. There is no such a guideline, how to do screening at the health desk to find out

malaria cases.” (P2)

Most importantly, malaria screening is being conducted using both active and passive surveillance approach i.e., staff reaches to the individual migrants in a place beside roadside or border police booth and as well as individuals visit the health desks for screening. In majority of the cases, staff needs to reach out to the individual migrants as they don't come forward for screening in health desks or try to avoid/skip the screening procedures for personal reason or they don't provide correct information as they won't be allowed to go home alike COVID-19 situation.

Another thing is that the people there [in the border] are in a hurry. Because of the excitement of meeting the family, they try to avoid testing. They act like it is a waste of time. They say that nothing has happened to me. We only take your name and general information, so we don't take much of your time. I will bring them to the health desk for only 10-15 minutes. If it looks positive, we say that medicine is available, so you don't have to stay here. (P1)

“We don't say that everyone is checked. We will go on the road and go to the border crossing and call everyone from there. If the police did not tell them, they would not come here. But even the police do not always help. When we stopped the bus for those coming in Nepal via Bharat Maitri bus, we got them down from the bus with the help of the police and asked them their names, the place where they live in India and Nepal and the history of fever and cough. When the kit is available, we test everyone.” (P3)

“In the cross-border setting, people do not want to confirm that they have come from far away because they think that they can't go home as happened during COVID-19” (P3)

(iii) Border dynamics weakening prioritizing health screening

International borders, including those borders where health desks are located for this study, are very busy areas and everyday high volume of individuals cross these borders. Therefore, if all individuals need to screen, then health desk must be prepared in terms of resources and quality standards to screen large number of individuals. P2 said *“About 400 to 500 people are coming here [in health desk] in a day. If you look at the ratio [staff vs. service users], it could definitely happen that some cases are going missing [escaped from going through*

screening].”

In one health desk, the challenges of conducting screening services including malaria is the location of the health desk. Participant P1 said *“Most of Immigrants who come to our POE are from India sometimes people from third country also come through Indian transit. First of all, this health desk is on the opposite side. It should be on the left side from which side people from India return to Nepal, but it is in the direction to going towards India. There is a risk when crossing the road. We get help from the police. They send people for health check here.”* Location of the health desk is a challenge because of which migrants don’t come forward for screening by themselves or may be the health desk is not visible due to crowded nature on the road.

In border, the important authority is the border police. Migrants obey them and listen to them. Therefore, coordination with the border police is very important for health desk. It was found that border police are supportive to health desks sometimes and non-supportive too. As P1 said, *“Nepal Police is the one who helps us the most. Nepal Police sends immigrants from India to take service with us. Seeing their dress, they agree to come there. But when our health workers go and call them, they refuse to come.”* When police don’t support, effort made by the health desk staff to direct migrants to the health desks, as P2 said, *“The police say to go to the health desk for screening and testing, but some police do not say that and people are always looking for escape. Our health desk has a physical barrier, and we have one of our staff standing there. Whether it's me or someone else, there is a staff member. They tell them [migrants] to go there and go through the screening process.”* P2 also highlighted the support they receive from many other border agencies including police especially in case of staff absenteeism, said *“Co-ordination is maintained good from our side with everyone.... with APF police, custom and police. For example, if something happens to the [health desk] staff, if they are sick, they are unable to come to morning duty, if they are on leave, only 2 people will do the recording. That time APF police also helps to keep the people in line. The people follow what the APF police says and come when police send for testing and screening.”* The police personnel are always not same throughout the year. They too have transfer and new police person appointed in the border here. To make the new police person aware of the health desk and its services, health desk staff constantly be in touch with them and request them to send migrants for screening. P3 quoted *“Since the various agencies working here are working, all millers have to work. Especially we work closely with the*

police whenever they are transferred. And when a new employee comes, they have to be informed again. Not everyone cooperates easily. The response comes from the police that our work is security related.”

According to the participants, community’s perception (i.e., the individuals/migrants cross the border to Nepal) on the health desk also matters whether the individuals coming forward to utilize the services provided by the health desks. According to P1 individuals returning/entering to Nepal through border consider malaria is an old disease or not a disease at all, said *“About Malaria, it is an old disease”*. Many times, individuals’ self-perception of health define their health status as they are not infected with malaria and screening is not required. According to P2 *“Do you think I am sick? Do I look sick? why doing the test? These are the responses. Then I am healthy. He says that he will not do the test. People from same group sit in the line during the screening and as soon as they say fever cases and risk area, we ask for the testing. The other people start yelling why you are testing him only? They suspect us.”* Overall acceptance of services like screening depends both on community’s perception on the health desks and self-perceived health.

Some understand some don't. Now we have to explain to them that we are people of health. We are not the customs people. We are not even the police. We are people of health. We are working like this, but no one understands our effort. Some uneducated people treat us badly. The person is educated, give a good positive response, but sometimes they don't.” (P2)

Another important aspect is that community is not aware of the health desks services other than COVID-19-19. Therefore, it is important to create awareness of the presence of health desks and its services. Participant P2 said *“What can be done about these activities? First of all, I think it is very important to change the IEC materials. There is not a single IEC of malaria in the health desk. All IEC are based on COVID-19. If we set it in people's minds, there is a health desk in Nepal that says that every time they enter through any checkpoint, now they do a COVID-19 test. No one knows that malaria, TB, HIV test is done.”*

Overall, community’s perception found similar that were perceived by the participants, i.e., the staff of health desks. In addition to what the participants expressed about community’s practices, the majority of the participants of the focus group discussions added that they didn’t hear about malaria and know about dengue. One of the participant expressed malaria

and dengue area same disease, said *“I heard dengue is the same as malaria.”* Very few of the participants know benefit of screening. Only one participant had expressed about screening. One participant said *“If all the diseases are checked and treated here [in health desk], then it will not be transmitted to the family.”* Another participant connected screening with the achievement of the government, said *“It is beneficial for us as well as for the government of Nepal.”* But the community is worried about the emergence or resurgence of various diseases. One of the participant said, *“I worried that various diseases are spreading, sometimes it is COVID-19, sometimes it is dengue nowadays, diseases have also increased a lot”*. Participants emphasized about public awareness creation about malaria, organizing camps and screening services.

(iv) Inadequate human resources, unclear roles and responsibilities of service providers affecting screening

Staffing, roles and responsibilities of staff, training requirement and untimely salary were hindering service delivery including malaria screening in all the studied health desks. These were found to be one of the major barriers which might be due to the absence of protocol/guidelines.

Health desk experiences a very different staffing pattern where, in addition to government healthcare providers, technical staffs from Non-Governmental Organizations were also appointed here. P1 quoted *“Staff management is very good here. Some are permanent employees of Nepal government like me, and some are appointed by NGOs or INGO or state. Everyone has a different appointment. The focal person of the directorate said that no employee can be sent here directly It was said that no renewal of appointment will be provided to anyone until the EDCD gives the letter. For the contract, the government of Nepal opens vacancies and appoints them. Both type of staff working now are good. There is confusion between save the children and KIDS working under us. It would be nice if all the staff came from one source.”* According to the participants, the program specific laboratory technicians are mostly appointed from external source through Nepal government. In one health desk, laboratory technician is responsible for testing the sample collected for malaria screening. P1 said *“Screening is done by both nursing and paramedics. There are two dedicated lab staff for testing. They enter data and test. One dedicated lab staff from save the children for HIV and the other one is from KIDS for TB.”*

In addition to issues in appointment and staffing, staff retention in health desks are also poor.

Given majority of the staff are in contractual position, staff works here for a very short-term period and the leaves. Therefore, work productivity and effectiveness reduce with the joining of a new staff over the experienced staff. As quoted by P1 *“Employees must be stable. Employees learn from work over the time. When the employees are kept and removed in the middle, they learnt from this job now, and then, when the next one comes, we have to teach them everything. It affects the output of the work. Another thing is that there should be a fixed rank of the staff and the staff should be working according to that. The ministry in the upper body knows how much workload we have in the health desks. If there are shortage of employees according to the work, arrangements should be made accordingly. Sometimes it is 4 months and sometimes it is 6 months. It is good if employees are retained for one financial year.”* Participant P4 said that, due to contractual/temporary position, staff turnover is high and regular screening is affected due to this turnover in health desk, said *“Our screening stops in the middle of that [when staff left in between]. It is difficult to address those things [managing staff retention] regularly. When the EDCD identifies it as a subordinate office, there should be a regular permanent post, there should be an arrangement to supplement the permanent staff, then the regular screening from the health desk will be easy.”*

Further, untimely contract renewal leading to untimely disbursement of salary which demotivate staff. According to P3: *“The contract has not been renewed for the staff. They have not even received their salary for 5 months since November. I don't know anything about whether or not the contract will be renewed, but the work has been done. There is no incentive for us.”* Therefore, staff working for more than five months without salary in international border shows implementation of a very weak policy, rules and regulations. Participant P4 reflected on the unavailability of fund as a reason for staff didn't receive salary, said *“Staffs have not received salary since last December (Mangsir). The budget ceiling has come down from the federal government. When the Ministry of Finance decided to cut the budget of all sectors, it happened in vain. It has happened only in Sudurpaschim Province and Lumbini Province. Budget has not decreased in other provinces. Again we have requested the budget from EDCD, now it may come.”*

Another problem of staffing is that shortage of staff considering the proportion of staff and number of individual's screen in the health desk, and unclarity of responsibilities arising from this shortage. One staff is responsible for many tasks lead to delay in completion of full screening procedure. According to participants, the tasks those consider important for

screening are pulling of migrants to the health desks, crowd management, screening procedures include collecting and documenting history, screen, testing and diagnose, prepare test report, counseling and data recording and reporting. P2 said *“The main thing is staffing, but how to work without enough staff from 6 AM to 7 PM? We are only 6 staffs no public holiday. Only 6 staff are not enough for 2 shift duty.”* This also indicates that staff are working continuously without any leave, and there is no replacement available if any staff goes on leave.

“Unlike other health institutions, it has opening and closing hours. Other health institutions are open from 10 am to 5 pm. The opening hours of our organization are as per the opening hours Border opening time is from 6 to 10, so we have to open according to that time..... There is no public leave for pregnancy, no DashaiTihar leave, and no additional incentive for working during the holiday. We get 3 holidays in 5 years, that too during elections. In 5 years, we only have 3 days off. Otherwise, we have to work for 365 days.” (P1)

There are clear division of work among staff including teamwork, said *“We do shift wise duty. Some will take history, some will make an entry in the register, some will do counseling and the lab staff will do the testing. All paramedics and nurses write names, ask for history, take vitals Ask if you have fever and cough. We ask about all the symptoms. If there is a fever, we send them to the lab staff for malaria testing. Their job is to test with RDT and give a report.” (P3)* Yet having clear division of work and teamwork, one staff doing multiple tasks still affecting screening. P2 said *“Talking about staffing.... if the all-staff positions are filled, we could perform well. Talking about the work only one morning, about 500-600 people were screened from 6 am to 10-11 am. And now I have to enter the data and send the report as it disappears by 12 o'clock in the night. Again, it cannot be reported after this time.”* According to P1 *“When 600-700 people come at once, some write names, some ask history, some do tests, some line up, some do crowd management, some give water.....Counseling couldn't be done when there is a lot of crowds.”* Apart from routine screening related tasks, staff are also responsible for recording and reporting of data. Therefore, it is important to understand the recording and reporting system to understand how multiple tasks may hinder routine screening procedure due to staff shortage.

“For data collection, we do all the screenings in the screening register. In which we record their name, address in Nepal, where they come from in India, their contact

number in Nepal, etc. After that, the symptoms they have are recorded. For malaria, it is also recorded in the malaria HMIS register. Reporting for data collection, we enter data in google sheet every day at night we enter. At the end of the month, we will enter DHIS-2.” (P3)

Therefore, it is clear that shortage of staff is positively affecting responsibilities to carry out screening procedure effectively.

Service delivery improves with continuous capacity building/training and effectively carrying out responsibilities. In case of malaria screening, training is vital in minimizing errors in performing screening procedures, accurately identifying suspects and documentation and reporting of relevant health information. But majority of the staff deployed in the studied health desks found untrained on malaria and its screening. Participant P1 said *“Only I have received malaria training, no one else has received it. The staff of the lab has not received it. I had already received malaria training at the beginning of my job but after joining the health desk I did not receive any malaria training.”* Almost every staff of one of the studied health desks were oriented about malaria. P3 quoted *“There is nothing special about Malaria. We have given a half-day malaria orientation class to all staff. That training was done by save the children.....there is a short orientation on why to check for malaria, what to screen, how to check. An orientation on Malaria helped us a bit, but it would have taken a little more time to learn. I have not received special training for the health desk.”* According to the participants, training also didn't cover few aspects which is considered important in screening i.e., data recording and reporting. As quoted by P1 *“The employees come from time to time and give training, not everything will be remembered. It would be better to teach not to do it...to correct the data, to teach them to record the data correctly.”*

Participants also pointed out that Government, either it is local, province or national, didn't consider health desk staff part of its health system, therefore, health desk staff weren't provided with training or excluded from periodic government training programs. Participants expressed a feeling of neglect of staff and health desk from government actions.

“No, I have not received any training from the province, local level or Central Level. If Local level and Health office would feel us as belongings, then only it would be possible. They can include us as well, but in case of Banke, it's not being done. It depends on how much support the local level has from the state.” (P1)

In case of lack of training, health desk staff use social media like YouTube and self-study to learn many things related to their tasks: *“I want to study how screening is carried out from google. We have studied a lot about how exactly we can get good history, but we have not found anything related to this.....We do everything on the basis of our self-study.”* (P2)

Further why there is need for periodic training is that every learning was not remembered and practiced *“The employees come from time to time and give training, not everything will be remembered.”* (P1)

Further training related to screening output was found important to the participants. Malaria positive cases as output of screening positively correlates and satisfactorily fulfill the responsibilities of the staff. Therefore, participants suggested microscopy-based training to the lab technicians so that no cases are missed out which has high potential to be a positive case. *“Microscope is required, and the staff of the lab is also required to be trained. If that was the case, the RDT positive cases would not have to be sent out. Even if they were negative, they could be tested if they were suspected. If they could test with a microscope, positive cases would still be found out and would not be missed. Last year, out of 4 positive cases, 1 was found to be false. Here we report positive from RDT. Once found positive using RDT, it is immediately known everywhere, sir/madam came from the health office and WHO. I went with the batch number and RDT positive kit. If there is a microscope, the patient is also safe and so we are. The current staff does not even come to take samples properly.”*

Participant P4 reflected on the unsatisfactory performance of health desks as malaria positive cases registered very less, but in contrary also reported very high number of imported malaria positive cases at provincial level, quoted *“The health desks could not find out much positive cases that is why we assume program is not reaching to the target group. but they are doing screening satisfactory. If we look at the exact cases in Lumbini, it has exceeded more than 225 cases of malaria in Lumbini province. Therefore, at the border, which we have tested, most of the imported cases have come to the community and there are only 8 indigenous cases. As all the cases are imported, it seems that there should be screened and diagnosed through our border health desks.”*

Participants were also pointed out that their performance, work are not monitored by the higher authorities. P1 said,

“What to do if the higher authority cannot give us work Due to non-monitoring from time to time by higher authorities, our work has not been evaluated If you can't give us work, what can we do?”

(v) Lack of sufficient material resources for screening

According to participants, insufficient quantity of resources like infrastructure, RDT Kit, IEC materials for counseling, microscope and recording and reporting forms/registers, and availability of common medicines were affecting malaria screening procedure.

Infrastructure was a common problem in all three studied health desks. It was found that there was no concrete building allocated for one health desk, and staff are accommodated in a tent booth, which according to the participants is very difficult to provide quality health service. Participant P3 said *“The biggest problem is the building. Our building was good enough to do all the work During COVID-19, all the services were provided by there. Now our building was destroyed to increase this road..... we do all the screening testing in this tent. now the arrangement is not good in this tent. There is no light, no net, no toilet. Now we all have to work sitting in the service tent. It is summer, our body is wet with sweat. It is very uncomfortable for the staff to work.”* Participant P1 highlighted that there is a permanent building with space for waiting only in one health desk which is a very old PoE, said *“only Nepalgunj health desk has a permanent building. And it is also the oldest There is a waiting area at the health desk here.”* According to participant P4, Government has to make health desks operational in cross-border as per the international health regulation either in temporary structure or in a building, said *“We have extensive border crossings. There is no land for the establishment of health desks, nor is there a building of their own. According to the international health regulation, there should be health desks at the border crossings.”*

In addition, enough space in the building either in permanent or rented house for carrying the screening procedure smoothly and systematically is a limitation, which is positively increasing waiting time and service user's dissatisfaction. Having less workspace dissatisfied the staff too in carrying out the screening procedure effectively and efficiently. As P2 said *“We are operating from one room and some space in front of this. This room is also provided by custom office. We don't have our own building.....in this one room where we do screening, testing and meeting. This is what we all do. There is only one room, and it is difficult to manage. If all staffs come to office, we don't have space to sit also.”* According to

the screening procedure, participants said that there should be separate space/arrangement for few activities such as laboratory, screening area, waiting room, and additional services like drinking water and toilet facilities.

“There should be a place for screening, enough people can be brought and screening, and another room is needed for the lab. Where we are going to do the testing and the staff meeting room, we need a separate store. There is no toilet. We also use toilet of custom. At any time, they might not allow to use the same.” (P2)

Further unavailability of RDT Kit is also a common problem across all three health desks. Participant P1 is connected unavailability of kit with time, said *“The challenge is changing every year. There is currently sufficient stock of malaria kit. But the malaria kit is not available from time to time. We fill the demand form and send to the health office and local municipality. It is out of stock from time to time.”* Another challenge is that kit was not supplied as per the demand. *“Do not send. When we ask for 100 kits, they send 20. Even now, it has been 4 days since the RDT kit stock was over. Unable to test.”* If demand is met, then everyone can be screened. According to the participants, they are ready to work, ready to screen more individuals, but support is required from higher authorities. If more individuals are screened, then there is a chance that cases were not missed, and positive cases were also detected and confirmed.

“We are not sure whether the RDT kit will always be received. If everyone starts testing, the kit brought today may be finished today. If you are assured that you do not lack anything, you can check everyone coming from the risk area. There is no assurance that we will support you if you work. There is no incentive for any transportation facilities.” (P1)

Talking about kit, we bring it from the health office by ourselves. In a month, what do the heads of the health office say, if so many kits are taken, they ask why there is no positive result. We are targeting positive.” (P2)

“Due to such problems [lack of sufficient supply of kits], we cannot screen and test. The cases are missed. Those cases spread from village to village. Coverage is less and many cases are missed. The more you check the more chances you get positive.” (P3)

If there is no kit available to screen, health desk staff direct the suspect cases to get the screening done from nearest health post from their residence in Nepal.

“In case of lack of kit.... we say to reach home and go to the nearest health post to get checked.” (P2)

There were operational issues, staff continuously face, in procurement and/or supply of kit from health authorities timely. Participant P2 quoted the process of procuring kit from health authorities *“It is like request form is to be filled and the request is sent to the municipality. From municipality it goes to health office. The health office will request the province supply division. Now there is also a direct link to health office, I take it directly to the health office. I don't need to go to the municipality specifically, but I have to leave the logistic request form to the municipality.....The process is very difficult. They can tell there is no kit. They say it is not provided from higher authority.”* Participants also highlighted the need for and no supply of medicines for common cold and cough related to malaria symptoms in the health desks. Participant P3 said *“The service users who come to us with other problems also, we do not have common medicine for coughs, colds, coughs, etc. Overall, we are all health persons.”*

Data recording and reporting forms/registers including test report forms were found to be a common challenge across all the studied health desks. To continue the work in cases of no supply of forms/registers or can't print the form due to lack of fund, according to the participants, staff use plain white A4 size paper.

“Due to the lack of financial arrangements, we have not been able to solve even the smallest things that we can solve by ourselves. For example, we have not been able to give reports to those who have been tested for malaria. Because we are not able to print the form. We give the report on plain paper. Stamp it on plain paper. It is hard to say that we give report on plain paper putting office stamp.” (P1)

“We don't have screening form. we are using by printing by ourselves. We don't have enough recording and reporting formats.” (P2)

Participant P1 explored the manual and electronic system of data recording and reporting including the reasons why manual registers fall short of stock, quoted,

“First of all, we record all the information of the customer in the register. Sometimes

700-800 people come to us in one day, so sometimes even the register is not enough. That is why it was also recorded in the plain register. We run several types of registers. Sometimes it was given by the Nepal government and sometimes it was given by the donor I also ran it by photocopying Now the register given by save the children is being used It is recorded in that We do data entry in Google sheet every day at 3 o'clock. Only those who have access to the Google sheet can see the data View our daily data directly from EDCCD After 3 o'clock, I add it to the next day and enter it at 3 o'clock the next day.” (P1)

In addition to the forms/registers needed for data recording and reporting, continuous supply of electricity, computer and internet with availability of fund for maintenance is essential.

“It [data] will be entered in daily Google sheet. We do it monthly or in DHIS-2. The daily service is with us and at the end of the month; it is added and entered in DHIS 2. There is access to 4 sheets in DHIS. The computer is working from solar system. Internet is also available. But the money will be released after May. Only 2 people received the training of reporting once from the Department of Health Services Not all staff have received it” (P1)

Counseling is part of screening procedure, but counseling is not provided given there is lack of IEC materials on malaria disease and its preventive and curative measures. Counseling is provided to the confirmed positive cases only.

“I haven't done that yet until we find any positive cases. Now we don't even have IEC material. There are 2-3 videos inserted in the LED display. That display is not working properly, and it has only COVID-19 related videos. I also say that you sleep using bed nets. If you are coming from risk area.” (P2)

Lastly, according to the participants, if microscopic examination is used instead of RDT Kit, then there is high chance that the accuracy and quality of the test results improves, and malaria positive cases are confirmed. P2 said *“The kits are less than needed. We don't have the microscope with us. If we had a microscope and if some doubtful result comes from RDT, then it can be solved exactly. It is not visible from the RDT, but it is visible from the next slide, and it is confirmed. It feels like a fever, and the person has symptoms, but sometimes result comes negative.”* Participant P4 reflected on ‘missing patients’ i.e., those were referred from health desks to nearest hospital for microscopic examination after RDT test come

positive goes missing, quoted *“Another challenge is that those who are positive from RDT have not been able to undergo microscopic examination. It would have been a quality test if microscope would be available and microscopic test could be done. Currently, in the health desk suspected cases are tested with RDT only and if it comes positive, it is referred to the nearest hospital for microscopic examination. In this way, sometimes the patient is missing. The missing patient may have transmitted disease to others by the time they reach their home. That is a challenge.”*

(vi) Operational challenges affecting screening

Operational problems are mostly related to the functioning of the health desks such as allocation of fund and its availability for transportation, services like drinking water facility, paying electricity bill. These problems were not only specific to the health desk in general, but also specific problems arose from malaria screening perspective alike transportation cost to bring RDT kit and related materials needed for screening.

Participant P1 connected smoothing operating cost in terms of availability of fund lead to happiness as it increases the number of service users, said *“There are many problems related to office operating expenses. There should be all the facilities and resources to increase the number of people taking the service as much as possible. As the number of service users increases, we become more and more happy.”* Participant P4 expressed, in addition to the unavailability of fund due to budget cut, procedural delays hampered receiving budget/fund on time, said *“No budget can be transferred without 6 months. For that, File have to go to EDCD, EDCD to the department, from the department to the Ministry of Health and from the Ministry of Health to the Ministry of Finance. Once there was a reply asking which file to transfer money from, we sent the reply. This work has been procedurally delayed.”* Due to unavailability of enough budget/fund, it was unsure of the long-term functionality of the health desks as undue salary, operational costs affecting service delivery. P4 said *“I had sent a letter to the branch head of the EDCD, asking whether we should operate the border crossing or close it. There was no reply from there. It did not come in writing, but it was said orally that it will be managed. We have been working on the basis of that verbal assurance.”*

In terms of electricity, there are problems with payment of electricity bills and as well finances were required for alternative arrangements where electricity is not available and health desk fully depended on solar system.

“This year, office operating expenses have not come. It was there until last year. There is no money even to buy small things Electricity supply has also been cut More often than not, money did not come from above for electricity, about 55000 is left to pay. It has been said that the municipality will pay. But the municipality cannot pay even the fine of 11,000, from where to pay?” (P1)

“Everything here is solar powered. Because there is no light, You know that there is no sun in Nepalgunj during winter months. So, instead of opening at 6 o'clock, we opened at 8 o'clock and worked all day using mobile lights in winter it was such a situation that we worked all day long on mobile light.” (P1)

“When 600-700 people come at once, some write names, some ask history, some do tests, some line up, some do crowd management, some give water. Drinking water, water for washing hands, everything was in order during COVID-19, but now everything has deteriorated. We have not been able to get it repaired. Breast Feeding Corner has also been established. But it is not functioning well.” (P1)

To summarize the results applying the CFIR 2.0 constructs for better understanding of the various aspects that influence the implementation of malaria screening at health desks, the facilitators and barriers are presented in tabular form.

Table 4.6: Summary of Malaria screening Implementation Facilitators using CFIR

CFIR Domain: INNER SETTING FACILITATORS	
CFIR construct	
Structural Characteristics	• Construction of one health desk (Physical infrastructure) • Availability of Computer or Laptop and internet in all health desk (IT infrastructure) • Timely reporting (daily and Monthly basis) • Availability dedicated Lab staff (Work infrastructure) • NGO and INGO support for human resource
Relational Connections	Co-ordination with border police and APF
Culture	Work as a team, Motivated Staff
Compatibility	Screening of infectious disease at PoE
Relative Priority	Recognition of malaria screening importance due to Nepal's goal of eliminating malaria by 2026
Mission Alignment	Aligned
Available Resources	RDT kit can detect both Pv and Pf Use of Alternative Energy Sources
Access to Knowledge & Information	half day orientation by donor agency

Table 4.7: Summary of Malaria screening Implementation Challenges using CFIR

CFIR Domain: Inner Settings (Barriers)	
CFIR construct	
Structural Characteristics	• Location of Health desk is problematic(Not Suitable) • Absence of standard screening protocol and treatment guideline • lack of attention of health desks by higher authorities • Difficult to follow International Health Regulation • Absence of protocol • Inadequate building infrastructure including insufficient space • Inadequate recording and reporting forms/registers • Human Resource Constraints • Unclear Roles and responsibility
Relational Connections	• Health desks are governed by federal government, less power to municipality and Province. • No clear roles and responsibilities among three tier Government (the federation, the state and the local level) • Poor communication between health workers and upper authority. • Inadequate involvement of key stakeholders, including local authorities and community leaders
Communications	• Communication barrier in reporting the challenges to higher authorities (no feedback on report from upper authorities) • Feeling of isolation of health desk while COVID cases came down
Culture	Lack of Supportive Environment: The organizational culture does not promote innovation or adaptability in overcoming implementation challenges.
Compatibility	• Absence of standard screening protocol/guideline • Absence of protocol leading to properly screen and identify malaria positive cases • Absence of protocol due to lack of attention of health desks by higher authorities • Absence of protocol leading to performing in public place or in vehicle
Relative Priority	• Relatively high priority for Covid screening • Staff sense a lack of urgency or priority for malaria screening from authorities.
Incentive Systems	• Delay in salary disbursement demotivate health desks staff • Contracts of staff have not renewed for mid-December 2023
<i>Funding</i>	• <i>No dedicated allocation of fund</i> • <i>No operational cost available for drinking water facility, paying electricity ,transportation</i>
<i>Space</i>	<i>Inadequate space for different services</i>

<i>Materials & Equipment</i>	• <i>Inadequate Screening Tools</i> • <i>Equipment Deficiency</i> • <i>Lack of timely supply of RDT Kit in adequate number, Stock out time to time</i> • <i>No microscope available, which impacted the accuracy of malaria diagnosis.</i> • <i>Lack of malaria specific IEC materials for counselling</i> • <i>There was no ambulance available for emergency responses at any of the health desks.</i> • <i>No ambulance available for emergency responses at any of the health desks.</i> • <i>The unavailability of critical items like malaria-specific drugs (e.g., chloroquine, primaquine) at some health desks</i> • <i>There was no ambulance available for emergency responses at any of the health desks.</i>
Access to Knowledge & Information	• Inadequate training in malaria screening procedures. • No focused training on health desk operation • Lack of capacity building and health desks staff were excluded from periodic government training

Chapter 5

Discussion

International borders are regulated by the respective countries, with each nation having its own set of laws and protocols. It is essential that international borders comply with the International Health Regulations (IHR) to prepare and inform public health security and response. The International Health Regulations (IHR), which were revised in 2005, are a critical framework designed to ensure public health security and establish a global response to the international spread of disease ⁽¹⁸⁾A similar public health response through the screening of individuals crossing the border was experienced during the COVID-19 pandemic between 2020 to 2022 to control the spread and transmission of the infection. During the COVID-19 pandemic, COVID-19 screening was implemented very effectively, and citizens also obeyed such rules and regulations in a disciplined manner.

This study is conducted (in 2024) almost after two years of the pandemic in the cross-border setting in Lumbini province of Nepal to explore the current situation of health desks in the context of implementation challenges in malaria screening intervention. It is clear from this results that health screening is not effectively carried out in the studied health desks considering six important barriers: poor governance of health desks, lack of screening protocol, border dynamics, unclear roles and responsibilities of service providers, lack of sufficient material resources, and operational challenges, which are positively affecting malaria screening service in the three studied health desks. These findings are consistent with other research on post-pandemic public health interventions, where gaps in infrastructure and governance have led to a weakening of health services. ⁽¹⁹⁾. The question arises: why did health regulations and responses became weak post-COVID-19 pandemic? Is malaria a neglected disease compared to COVID-19? These questions point to a broader issue of health prioritization, where diseases like malaria may receive less attention compared to global health emergencies like COVID-19⁽²⁰⁾. These study participants shared almost similar perceptions that individuals returning/entering Nepal do not want to screen themselves as they perceive their health is healthy without any symptoms like fever and cough. Such individuals also consider that malaria is not a disease like COVID-19, so why they need to be screened?

Therefore, health desks in the Nepal-India border are ill-prepared for addressing health

security and response in Lumbini province of Nepal. The identified barriers were interconnected to each other and could be divided into primary and secondary barriers. Primary barriers are those without which there is a total breakdown in the health desk's implementation and malaria screening interventions: those are poor health desk governance and lack of a screening protocol. Secondary barriers are those originating from the gaps identified in the primary barriers: those are border dynamics, unclear roles and responsibilities, lack of resources, and operational challenges. Therefore, strengthening the primary barriers positively affects improving the secondary barriers. This study result is consistent with the study conducted by International Organization of Migration which revealed that absence of disease specific protocols, inadequate infrastructure, equipment and supplies, cross border coordination, risk communication to the community were some of the barriers that found incompliant with the IHR. ⁽²¹⁾

Though health desk governance was effective during the COVID-19 pandemic, after two years of the pandemic, this study found that higher authorities, mainly municipalities, provinces, and EDCC, are providing less attention to the health desks due to insufficient/lack of enough budget. This decline in attention and funding reflects a broader trend of shifting priorities post-pandemic, where resources are reallocated, often leaving long-term health interventions underfunded. ⁽²²⁾ Inadequate funding including federal investment have limited the capacity to respond to the population health challenges. ⁽²³⁾ Participants explained less attention in the form of weak communication by the authorities, authorities don't include health desks in any propaganda, lack of feedback on performance, and monitoring of health desks' activities. This negligence holds an immense impact on carrying out day-to-day activities by the service providers in health desks.

Many health desks on the Nepal-India border, including two in Lumbini province, were implemented during the COVID-19 pandemic to provide COVID-19 screening services. Further, in addition to COVID-19 screening, health desks were directed by the government to implement malaria screening including other diseases like HIV and TB. This expansion of services without a corresponding increase in resources or training has led to operational inefficiencies and decreased the effectiveness of health desks ⁽²⁴⁾. This study found that COVID-19 guidelines and related resources like awareness/counseling materials are still available in the studied health desks. Though malaria screening is being implemented, the absence of a protocol/guideline on screening impacted the implementation of a universal

standard screening procedure in health desks.

Lack of a protocol/guideline on screening reduced service providers' motivation and was acknowledged as a lack of attention by the higher authorities. The Malaria program is implemented throughout the country, but, when implementing the malaria program in health desks, there should be a context-specific protocol/guideline as dynamics at international borders are different from usual urban and rural areas, and terai, hilly and mountain areas. This need for context-specific guidelines is critical for adapting health interventions to local conditions, ensuring they are both relevant and effective⁽²⁵⁾.

Considering the border dynamics, a huge number of individuals/families cross the border every day, especially during morning hours between 6 am to 12 pm. In a hurry to reach their destination safely and having no time for other engagement, these individuals avoid such activities that are not compulsory requirements as per custom regulation to cross the border. Services provided by health desks were also not strictly followed under custom regulation. Hence, these individuals willingly don't attempt to screen themselves or they perceive their health as healthy or their perception towards health desks is different because health centers are meant for the sick only or individuals are not aware of the health desks and its services. This highlights the importance of awareness and education in ensuring public compliance with health screenings, particularly in border regions.⁽²⁶⁾ Therefore, service providers at health desks coordinate with border police, as individuals obey them, to send individuals for screening. Simultaneously, service providers too put effort by standing on the road for directing individuals entering Nepal to the health desks.

Given health desks are not like health posts, therefore screening is done by both active and passive surveillance processes. In this case, active surveillance is reaching out to the individuals on the road or their vehicles near the health desks. Service providers had to reach out to the individuals when the location of the health desks is not in an accessible distance, like one of the studied health desks, which was located in the opposite direction where individuals cross the border from Nepal to India instead of in the direction from India to Nepal. Therefore, whatever the number of persons, according to the participants it was about 600-700 individuals by 12 pm, visit or directed for screening in health desks, the proportion of service providers and service users is unacceptable. This imbalance between the demand for screening and the resources available at health desks is a significant challenge that needs to be addressed⁽²⁷⁾. To screen such a huge number of individuals, health desks must be

equipped with not only human resources but also material resources. Given the lack of a screening protocol/guideline, service providers experienced unclear roles and responsibilities and a lack of adequate material resources.

In addition to the shortage of human resources in the studied health desks, malaria screening is affected by the constant outflow of staff due to the short-term nature of the contract, and the appointment of external staff from international NGOs. Therefore, there is a need for continuous training of staff. This issue of staff turnover and training is a common challenge in health interventions, particularly in low-resource settings⁽²⁴⁾. Two health desks staff were not trained after deployment at the health desks on malaria screening. Given health desks work in international borders, services are mostly provided to cross-border migrant populations. Therefore, there is a specific characteristic of the target population and context attached to the health desks. In addition, untimely salary also demotivated participants in executing responsibilities. But to manage the shortage of staff, participants carried out their responsibilities with a clear division of work and performed duties beyond their responsibilities. There was unity among the staff, and they tried their best to provide quality services in these resource-poor health desks.

Though quality of services depends on availability of material resources, participants had reflected their disappointment of unavailability of such resources to provide screening services to all cross border migrants. Infrastructure found to be a strong barrier: infrastructure in two health desks i.e., Belahiya health desk was operating in a tent shed and Krishnanagar had operating from a rented room of custom department. Basic amenities in these infrastructures such as space in terms of waiting area, screening area, testing area, and storage area was too found a significant concern. No action towards reconstructing the Belahiya health desk which was destroyed during expansion of road is a serious concern on governance of health desks. Poor supply of RDT kit and unavailability of blood sample testing services using microscope, non-COVID specific IEC materials or lacking malaria specific IEC materials, most importantly poor supply of malaria specific medicines and unavailability of essential medicines for fever, cold and cough were affecting delivering of screening services. Participants connected the unavailability of essential medicines with the perception of health desks i.e., health desks are not considered as treatment centers. Moreover, operational and governance issues too persists in unavailability or poor supply of these material resources.

Chapter 6

Conclusion

Imported cases especially from India are threatening to Nepal's effort towards malaria elimination as well as achievement of SDG 3.3, which states "By 2030, end the epidemics of AIDS, Tuberculosis, malaria, and Neglected Tropical Diseases, and combat hepatitis, water borne and other communicable diseases." The identified barriers through the study were positively hindering malaria screening service delivery in the studied health desks.

As compare to the facilitating factors, there are various hindering (barriers) factors like poor governance of health desks, lack of screening protocol, border dynamics, unclear roles and responsibilities of service providers, lack of sufficient material resources, and operational challenges, which are positively affecting malaria screening service in health desks. Improving these barriers may not only improve quality service delivery at the health desks but also it would help scaling up of health desks in cross borders and its compliance with IHR.

By strengthening governance and leadership of health desks, inappropriate fund allocation, communication gaps and inter-relationship problems between the federal, province, municipality and health desks could be addressed. Health desks inclusion in national health programme is vital in improving the identified barriers. Further service delivery protocol/guideline on screening services is essential in achieving a quality benchmark of the services provided and adherence to the protocol by the health workers in health desks is necessary to avoid injury, adverse reaction, preventing infection, and improve user's satisfaction. These two barriers were identified as primary barriers. The secondary barriers are connected to the primary. Therefore, if a protocol is in place, then it has a high potential in addressing the challenges of operational, material and human resources, and coordination mechanisms with the border authorities. It is important to strengthen compliance with International Health Regulation in cross borders to reduce imported cases of malaria and other communicable and infectious diseases in a non-epidemic situation from one country to another.

Strengthening health services through screening not only of malaria but also of other communicable and infectious diseases in the international borders or cross border setting is

essential in reducing resurgence or reintroduction of such diseases. A joint coordinated effort at regional level including strengthening the implementation barriers at the country level is essential in minimizing the threat from the imported cases. As the two countries, Nepal and India, are aiming to eliminate malaria by 2030, it is essential to strengthen health services including malaria screening in cross borders. The study emphasize that health desks are of utmost important and it is required to strengthen and scale up in Nepal-India and Nepal-China cross border by improving the barriers that these health desks are experiencing in delivering high quality services to the cross border migrants

Numerous factors from all CFIR 2.0 domains have an impact on the implementation of malaria screening services at health desks along the Nepal-India border in Lumbini Province. Major challenges prevent the intervention from being implemented effectively, even though there is a national commitment to it and some dedicated staff members. These consist of insufficient cross-border cooperation, inadequate infrastructure, budget limitations, inadequate training, and poor communication. In order to assist Nepal's objective of eliminating malaria, addressing these barriers with focused tactics that are in line with CFIR structures can improve the efficacy of malaria screening.

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Data collection Tools :

**IN-DEPTH INTERVIEW QUESTIONNAIRE
(For Nurse/Paramedics at Health Desk)**

General Information

Your Sex
(लिंग):.....
Age (in years):
उमेर (वर्षमा) :
Level of education:
शिक्षा:
Designation:
पद :
Areas of expertise:
विशेषज्ञताकाक्षेत्रहरू:
Total years of service:
सेवाकोकुलवर्ष:

General Background:

Q. Can you provide an overview of your role and responsibilities as a service provider in malaria screening at this health desk?

केतपाईं यस हेल्थ डेस्कमा मलेरिया स्क्रिनिङ कार्यमा आफ्नो भूमिका र जिम्मेवारीहरूको बारेमा जानकारी प्रदान गर्न सक्नुहुन्छ?

Knowledge and Training:

Q. Can you describe the training you received regarding malaria screening and treatment?

मलेरिया स्क्रिनिङ र उपचारको सम्बन्धमा तपाईंले प्राप्त गर्नु भएको तालिमको वर्णन गर्न सक्नुहुन्छ?

Q. In general, what kind of training have you received regarding malaria screening and its importance? and specifically, what specific training have you received for malaria screening in a cross-border setting?

सामान्यतया,

मलेरिया स्क्रिनिङ र यसको महत्त्वको सम्बन्धमा तपाईंले कुनै प्रकारको तालिम प्राप्त गर्नु भएको छ?

र विशेषगरी, यस हेल्थ डेस्क सेटिङमा मलेरिया जाँचको लागि तपाईंले कुनै विशेष प्रशिक्षण प्राप्त गर्नु भएको छ?

Q. Are there specific aspects of the training that you found particularly helpful or challenging?

के त्यहाँ प्रशिक्षणका विशेष पक्षहरू छन् जुन तपाईंले विशेषगरी उपयोगी वा चुनौतीपूर्ण पाउनुभयो?

Q. Are you aware of the current protocol? How comfortable do you feel with the current cross border screening protocols and procedures?

के तपाईं हालको प्रोटोकल बारेमा चेतनुहुन्छ?

हालको क्रस बर्डर स्क्रिनिङ प्रोटोकल र प्रक्रियाहरूसँग तपाईंको सहज महसुस गर्नुहुन्छ?

Q. What are some of the challenges faced by you (health desk personnel) in conducting

malaria screening?

मलेरियास्क्रिनिङसञ्चालनगर्दातपाई (स्वास्थ्यडेस्ककाकर्मचारीहरू) लेसामनागर्नुपरेकाकेहि समस्या र चुनौतीहरूकेकेछन्?

Operational Challenges:

Q. Can you describe the typical workflow of screening (in general and specifically of malaria) at the health desk?

केतपाईँहेल्थडेस्कमास्क्रिनिङकोसामान्यकार्यप्रवा(सामान्यरविशेषगरीमलेरियाको) वर्णनगर्नसक्नुहुन्छ?

Q. What logistical challenges do you face in implementing malaria screening procedures in this health desk?

यसहेल्थडेस्कमामलेरियास्क्रीनिङप्रक्रियाहरूलागूगर्नमातपाईँलेके-कस्ताचुनौतीहरूसामनागर्नुहुन्छ?

Q. How do you address these challenges to ensure consistent and effective screening services?

निरन्तरप्रभावकारीस्क्रिनिङसेवाहरूसुनिश्चितगर्नयीचुनौतीहरूलाईकसरीसम्बोधनगर्नुहुन्छ?

Resources and Facilities:

Q. Do you have access to all the necessary equipment and supplies for malaria screening?

OR are there any resource limitations, such as infrastructure, staffing, equipment, or supplies, transportation that hinder the efficient implementation of malaria screening?

केतपाईँसँगमलेरियास्क्रीनिङकोलागिसबैआवश्यकउपकरणआपूर्तिहरूमापहुँचछ?

वा

केत्यहाँकुनैस्रोतसीमितताहरूछन्, जस्तैपूर्वाधार, कर्मचारी, उपकरण, वाआपूर्ति, यातायातजसलेमलेरियास्क्रीनिङकार्यको प्रभावकारीकार्यान्वयनमाबाधापुर्याउँछ?

Q. How do these resource constraints impact the quality and coverage of malaria screening services?

यीस्रोतअवरोधहरूलेमलेरियास्क्रीनिङसेवाहरूकोगुणस्तररकभरेजलाईकसरीअसरगर्छ?

Q. How do you address these challenges to ensure consistent and effective screening services?

निरन्तरप्रभावकारीस्क्रिनिङसेवाहरूसुनिश्चितगर्नयीचुनौतीहरूलाईकसरीसम्बोधनगर्नुहुन्छ?

Cross-Border Dynamics:

Q. How does this cross-border setting affect the implementation of malaria screening? Are there unique implementation challenges in this cross-border setting for malaria screening?

योसीमापारसेटिङलेमलेरियास्क्रिनिङकोकार्यान्वयनलाईकसरीअसरगर्छ?

केत्यहाँमलेरियास्क्रीनिङकोलागियोसीमापारसेटिङमाअद्वितीयकार्यान्वयनचुनौतीहरूछन्?

Q. Are there legal or regulatory barriers that affect your ability to carry out malaria screening activities at this health desk?

केत्यहाँकानुनीवानियामकअवरोधहरूछन्जसलेयसस्वास्थ्यडेस्कमामलेरियास्क्रीनिङगतिविधिहरूसञ्चालनगर्नेतपाईँकोक्षमतालाईअसरगर्छ?

Coordination with Border Authorities:

Q. Can you describe the level of coordination with Nepal border authorities and other relevant stakeholders (like NGOs etc.) for malaria screening?

मलेरियास्क्रिनिङकालागिनेपालसीमाअधिकारीहरूसँगअन्यसम्बन्धितसरोकारवालाहरू(जस्तैगैरसरकारी संस्थाहरूआदि) सँगकोसमन्वयकोस्तरवर्णनगर्नसक्नुहुन्छ?

Q. What challenges have you encountered in collaborating with different agencies or authorities?

विभिन्ननिकायवाअधिकारीहरूसँगसहकार्यगदकिकस्ताचुनौतीहरूसामनागर्नुभएकोछ?

Q. How do you address these challenges to ensure consistent and effective screening services?

निरन्तरप्रभावकारीस्क्रिनिङसेवाहरूसुनिश्चितगर्नयीचुनौतीहरूलाईकसरीसम्बोधनगर्नुहुन्छ?

Data Collection and Reporting:

Q. Can you share insights into the process of data collection and reporting for malaria program in this health desk?

केतपाईंयसहेल्यडेस्कमामलेरिया कार्यक्रमकोलागिडाटासङ्कलनरिपोर्टिङकोप्रक्रियाको जानकारी दिन सक्नुहुन्छ?

Q. Have you encountered any challenges in accurately recording and reporting cases?

केतपाईंलेकेसहरूकोसहीरेकर्डिङरिपोर्टिङमाकुनैचुनौतीहरूकोसामनागर्नुभएकोछ?

Q. How do you address these challenges to ensure effective recording and reporting?

प्रभावकारिरेकर्डिङरिपोर्टिङसुनिश्चितगर्नयीचुनौतीहरूलाईकसरीसम्बोधनगर्नुहुन्छ?

Community Perceptions and Beliefs:

Q. How do the individuals crossing the border perceive malaria and its screening in this cross-border setting?

सीमापारगर्नेव्यक्तिहरूलेयसहेल्य डेस्कमामलेरियारयसकोस्क्रीनिङकसरीबुझ्छन्?

Q. Have you observed any cultural/religious beliefs or misconceptions that affect the acceptance of malaria screening services?

केतपाईंलेमलेरियास्क्रीनिङसेवाहरूकोस्वीकृतिलाईअसरगर्नेकुनैसांस्कृतिक/धार्मिकविश्वासवागतधार णाहरूहेर्नुभएकोछ?

Network and Communication:

Q. How would you describe the level of collaboration and communication among healthcare staff involved in the malaria program?

मलेरियाकार्यक्रममासंलग्नस्वास्थ्यकर्मीहरूबीचकोसहकार्यसञ्चारकोस्तरलाईतपाईंकसरीवर्णनगर्नुहुन्छ ?

Q. Are there any challenges or barriers in communicating with other healthcare professionals or upper authorities?

केयहा काम गर्नेस्वास्थ्यसेवाकर्मचारीहरूवामाथिल्लो निकायहरूसँगसञ्चारमाकुनैचुनौतीवाअवरोधहरूछन्?

Q. Are your working relationships with your colleagues affects in implementing malaria screening?

केतपाईंकासहकर्मीहरूसँगकोतपाईंकोकामकोसम्बन्धलेमलेरियास्क्रिनिङकार्यान्वयनमाअसरगर्छ?

Relative Priority

Q. Are there any high priority initiatives already happening that reduces prioritizing malaria screening at this health desk?

केयसहेल्थडेस्कमामलेरियास्क्रिनिङकोप्राथमिकतालाईकमगर्नेकुनैउच्चप्राथमिकताका
पहलहरूपहिलेनैभइरहेकाछन्?

Q. Describe activities or initiatives that (appear to) have highest priority for you?

तपाईंको बिचारमा उच्चप्राथमिकतागतिविधिहरूवापहलहरूके के हुन् ? तपाईंको विचार रखिदिनुहोस
?

o What kind of pressure are you feeling to accomplish this? Where is it coming from?
Why?

योपूरागर्नतपाईंकोस्तोप्रकारकोदबाबमहसुसगर्दैहुनुहुन्छ? योकहाँबाटआउँदैछ? किन?

Q. To what extent might the malaria screening take a backseat to other high-priority initiatives going on now?

मलेरियास्क्रिनिङलेअहिलेचलिरहेकाअन्यउच्चप्राथमिकताकापहलहरूलाईकतिहदसम्मपछाडिलैजानस
क्छ?

o How important do you think malaria screening is compared to the other priorities
initiatives/activities?

अन्यप्राथमिकताकापहलहरू/क्रियाकलापहरूकोतुलनामामलेरियाजाँचलाईकतिकोमहत्त्वपूर्ण
ठाव्नुहुन्छ?

Implementation Climate

Q. What is the general level of acceptability in implementing the malaria screening activities in this health desk?

यसहेल्थडेस्कमामलेरियास्क्रिनिङकार्यान्वयनमास्वीकार्यता / ग्रहणशीलताकोकस्तोछ?

Compatibility

Q. How does the malaria screening fit with the existing work processes and practices in this health desk?

यसहेल्थडेस्कमाअवस्थितकार्यप्रक्रियारअभ्यासहरूसँगमलेरियाजाँचकसरीमिल्छ?

Barriers to Program Implementation:

Q. In your experience, what are the main barriers to the successful implementation of the malaria screening at this health desk?

तपाईंकोअनुभवमा, योहेल्थडेस्कमामलेरियास्क्रिनिङकोसफलकार्यान्वयनमामुख्यबाधाहरू के के हुन्?

Q. Are there any systemic issues or policies that hinder your ability to provide effective malaria screening and treatment?

केत्यहाँकुनैप्रणालीगतसमस्याहरूवानीतिहरूछन्जसलेप्रभावकारीमलेरियास्क्रिनिङरउपचारप्रदानगर्नेत
पाईंकोक्षमतामाबाधापुर्याउँछ?

Q. Are the incentive/rewards posing as a barrier to the malaria screening? Are you motivated in carrying out your role and responsibilities?

केप्रोत्साहन/पुरस्कारलेमलेरियास्क्रिनिङमाबाधापुर्याइरहेको

छ?

केतपाईं आफ्नो भूमिकारजिम्मेवारीहरू पूरा गर्न उत्प्रेरित हुनुहुन्छ?

Suggestions for Improvement:

Q. Based on your experience, what suggestions do you have for improving the malaria screening program at this health desk?

तपाईंको अनुभवको आधारमा, यो हेल्थ डेस्कमा मलेरिया स्क्रीनिंग कार्यक्रम सुधार गर्न तपाईं सँग के सुझाव छ?

Q. Are there any specific interventions or changes that you believe would enhance the effectiveness of the program?

के त्यहाँ कुनै विशेष हस्तक्षेप वा परिवर्तनहरू छन् जुन तपाईंलाई विश्वास छ कि कार्यक्रमको प्रभावकारिता बढाउने छ?

Focus Group Discussion Guide

(For Community – Nepali Citizens Crossing the Border from India to Nepal)

General Understanding and Awareness:

Q. What is your understanding of malaria and its transmission?

मलेरियारसको प्रसारण बारे तपाईंको ज्ञान के छ?

Q. What is your understanding of Malaria Prevention?

मलेरिया रोकथाम कसरि गर्न सकिन्छ ? हजुरको विचार राखि दिनुहोला ।

Q. How aware are you of the importance of malaria screening, especially when crossing the Nepal-India border?

विशेष गरी नेपाल-भारत सीमाना का पार गर्दा मलेरिया परीक्षणको महत्त्व बारे तपाईंको सचेत हुनुहुन्छ?

Travel Patterns and Behaviors:

Q. Can you describe your typical travel patterns between Nepal and India?

तपाईं भारत बाट नेपाल र नेपालबाट भारत कसरि यात्रा गर्नुहुन्छ, वर्णन गर्न सक्नुहुन्छ?

Q. How frequently do you cross the border, and for what reasons?

तपाईं बर्षमा कतिपटक सीमा पार गर्नुहुन्छ, र के कारणले?

Knowledge and Perception of Malaria Screening:

Q. Have you ever undergone malaria screening when traveling between Nepal and India?

के तपाईंले नेपाल र भारत बिच यात्रा गर्दा मलेरिया जाच गराउनु भएको छ?

Q. What are your perceptions of malaria screening services available at the border entry point?

सीमा प्रवेश बिन्दु मा उपलब्ध मलेरिया सेवा बारे तपाईंको धारणा के छ?

Barriers to Malaria Screening:

Q. What factors discourage you from undergoing malaria screening at the border?

सीमानामा मलेरिया जाँच गराउन बाट कुन कुराले तपाईंलाई निरुत्साहित गर्छ?

Q. Are there any barriers that hinder access to malaria screening services at the border and/or at your community/residence in Nepal?

के त्यहाँ कुनै अवरोधहरू छन् जसले सीमा मार/वनेपाल मा तपाईंको समुदाय/निवासमा मलेरिया जाँच सेवाहरू मा पहुँचमा बाधा पुर्याउँछ?

Facilitators of Malaria Screening:

Q. What factors encourage you to participate in malaria screening at the border?

कुन कारकहरूले तपाईंलाई सीमा मा मलेरिया परीक्षणमा भाग लिन प्रोत्साहन दिन्छ?

Perceived Risk and Importance of Screening:

Q. How concerned are you about the risk of contracting malaria during your cross-border travels?

तपाईं आफ्नो सीमा पार यात्राको क्रममा मलेरिया संकुचित हुने जोखिमको बारेमा कतिको चिन्तित हुनुहुन्छ?

Q. Do you believe malaria screening is essential for protecting your health and the health of

your community (in Nepal)?

केतपाईं आफ्नो स्वास्थ्य रतपाईंको समुदाय (नेपालमा) को स्वास्थ्यजोगाउनको लागि मलेरिया जाच आवश्यक छ भन्ने विश्वास गर्नुहुन्छ?

Accessibility and Availability of Services:

Q. Are malaria screening services readily available and accessible at the Nepal-India border entry points? (affordable /staff behaviour/time consume)

के नेपाल-भारत सीमा प्रवेश बिन्दुहरूमा मलेरिया जाँच सेवाहरू सजिलै उपलब्ध र पहुँच योग्य छन्?

Q. What challenges do you face in accessing these services?

यी सेवाहरूको पहुँचमा तपाईंले के कस्ता चुनौतीहरू सामना गर्नुहुन्छ?

Communication and Information Dissemination:

Q. How did you receive information about malaria screening services at the border?

सीमा मामलेरिया जाँच सेवाको बारेमा जानकारी कसरी लिनुभयो?

Q. Are there any gaps in communication that need to be addressed to ensure awareness and understanding of screening protocols?

स्क्रिनिङ प्रोटोकलहरूको जागरूकता र समझ सुनिश्चित गर्नको लागि सम्बोधन गर्न आवश्यक संचारमा कुनै कमीहरू छन्?

Cultural and Social Factors:

Q. Are there any cultural beliefs or social norms that influence your attitude towards malaria screening?

के त्यहाँ कुनै सांस्कृतिक विश्वास वा सामाजिक मान्यताहरू छन् जसले मलेरिया जाच प्रतिको तपाईंको मनोवृत्तिलाई असर गर्छ?

Q. How do social networks and community influences shape decisions regarding health-seeking behaviors?

सामाजिक सञ्जाल र समुदायले स्वास्थ्य खोज्ने व्यवहार सम्बन्धी निर्णयहरूलाई कसरी प्रभाव पार्छ?

Previous Experiences and Feedback:

Q. Have you previously utilized malaria screening services at the border?

के तपाईंले सीमा मामलेरिया परीक्षण सेवाहरू प्रयोग गर्नुभएको छ?

Q. What were your experiences, and do you have any feedback or suggestions for improving these services?

तपाईंको अनुभवहरू के थिए, र यी सेवाहरू सुधार गर्न तपाईं सँग कुनै प्रतिक्रिया वा सुझावहरू छन्?

Perceptions of Border Health Policies:

Q. What are your opinions on the current border health policies and regulations related to malaria screening?

मलेरिया स्क्रिनिङ सम्बन्धी हालको सीमा स्वास्थ्य नीति र नियमहरूमा तपाईंको राय के छ?

Q. Do you believe these policies adequately address the health needs of individuals traveling between Nepal and India?

के तपाईं यी नीतिहरूले नेपाल र भारत बीच यात्रा गर्ने व्यक्तिहरूको स्वास्थ्य आवश्यकतालाई पर्याप्त रूपमा सम्बोधन गर्दछ भन्ने विश्वास गर्नुहुन्छ?

Key Informant Interview Guide
(Health Section head of Municipality and Vector control Focal Person in
Health Office and Lumbini Province)

General Information

Your Sex
(लिंग):.....
Age (in years):
उमेर (वर्षमा) :
Level of education:
शिक्षा:
Designation:
पद :
Areas of expertise:
विशेषज्ञताकाक्षेत्रहरू:
Total years of service:
सेवाकोकुलवर्ष:

Q. What is the role of the Province / health Office in overseeing and supporting malaria screening activities in this region?

यसक्षेत्रमामलेरियास्क्रीनिंगगतिविधिहरूकोनिरीक्षणरसमर्थनगर्नस्वास्थ्यकार्यालय / प्रदेश स्वास्थ्य कार्यालयको के भूमिका रहेको छ ?

Q. How have you been dealing with Malaria program in this province/district/ Municipality?
यस प्रदेश /जिल्ला/नगरपालिकामामलेरियाकार्यक्रमलाईकसरीव्यवहारगरिरहनुभएकोछ ?

Q. How do you encourage screening of Malaria among in-and out cross border migrants in this district through health desk?

हेल्थडेस्कमार्फतयसजिल्लामाभिन्निरेरबाहिरकाआप्रवासीहरूलाईमलेरियाजाँचगर्नकसरीप्रोत्साहनदिनुहुन्छ?

If yes, can you please explain how?

यदिहोभने, कृपयाकसरीव्याख्यागर्नुहोस्?

If not, can you please explain why?

यदिहोइनभने, कृपयाकिनव्याख्यागर्नसक्नुहुन्छ?

Can you please explain what are the mechanism for malaria screening, in this province/district/ Municipality?

यस प्रदेश/जिल्ला/नगरपालिकामामलेरियाजाँचगर्नेप्रक्रियाकेहोभनीबताउनसक्नुहुन्छ?

How often you monitor health desk? Do you have monitoring and feedback system at health desk? Can you please explain the mechanism?

कतिपटक हेल्थ डेस्क अनुगमन गर्नुहुन्छ ? के तपाईं सँग हेल्थ डेस्कमा अनुगमन र पृष्ठपोषण व्यवस्था / योजना छ ? कृपया व्याख्या गर्न सक्नुहुन्छ ?

What barriers do you find for Malaria screening at health desk in your province/district / Municipality?

तपाईंको प्रदेश/जिल्ला/नगरपालिकामा रहेको हेल्थ डेस्कमा औलोपरीक्षण कालागितपाईलाई के बाधा अवरोधहरू छन् ?

Q. What are the enabling factors in Malaria screening at health desk in your province/district / Municipality?

तपाईंको प्रदेश/जिल्ला/नगरपालिकामा रहेको हेल्थ डेस्कमा मलेरिया जाँच गराउने सकारात्मक कारकहरू के हुन् ?

Q. How is coordination maintained with health authorities on the Indian side of the border regarding malaria screening activities? Are there any challenges or opportunities for collaboration across the border?

मलेरिया स्क्रीनिंग गतिविधिहरूको सम्बन्धमा सीमाको भारतीय पक्षमा स्वास्थ्य अधिकारीहरूसँग कसरी समन्वय राखिएको छ ? सीमा पार सहकार्य कालागिकुनै चुनौती वा अवसरहरू छन् ?

Q. Based on your insights, what recommendations would you make to address the identified challenges and enhance the success of malaria screening activities in Lumbini Province along the Nepal-India border?

तपाईंको विचारमा, पहिचान गरिएका चुनौतिहरूलाई सम्बोधन गर्न नेपाल-भारत सीमामा रहेको लुम्बिनी प्रदेशमा औलोपरीक्षण गतिविधिहरूको सफलता बढाउन के-कस्ता सुझावहरू दिनुहुनेछ ?

How is the effectiveness of malaria screening activities assessed and monitored in Lumbini Province? What mechanisms are in place to evaluate the impact of screening efforts on malaria control?

लुम्बिनी प्रदेशमा मलेरिया परीक्षण गतिविधिहरूको प्रभावकारिता कसरी मूल्याङ्कन र अनुगमन गरिन्छ ? मलेरिया नियन्त्रणमा स्क्रिनिङ प्रयासहरूको प्रभाव मूल्याङ्कन गर्न कुन संयन्त्रहरू छन् ?

Malaria Elimination Program

Health Facility Name:

Address:

Chief Of the Facility :

Date of data collection:

Data collected by:

	2077-78 BS (2020-21 AD)	2078-79 BS(2021-22 AD)	2079-2080 BS (2022-23 AD)	Remarks
I .General services:				
Total Clients				
Total Clients				
Nepali Citizen				
Indian Citizen				
Gender wise				
Male				
Female				
Ethnic group				
1 Dalit				
2. Janajati				
3.Madhesi				
4.Muslim				
5.Bramhin/Kshetri				
6.Others				
Total Children <5				
Male				

Female							
II. Malaria							
A. Microscopy							
1.Total Blood Smear Examined for Malaria							
2.Malaria (Microscopy -P Vivax Test +ve)							
3. Malaria (Microscopy -P Falciparum Test +ve)							
4. Malaria(Mixed)							
B. Malaria RDT							
1. RDT conducted for Malaria							
2.Malaria RDT Conducted P Vivax Test +ve)							
3.Malaria RDT Conducted P Falciparum Test +ve)							
4.Malaria RDT Conducted(Both)							
C. Malaria Treatment							
1. Patients Treated on Outpatient Basis for Malaria							
2. Patients admitted with Malaria							
3. Probable/clinical suspected malaria cases							
4. Deaths Due to Malaria							
5. Referred cases							
Dissagregated Data on Malaria Cases	M	F	M	F	M	F	
SEX (Male /Female)							
Caste/Ethnic Group							

Provisions & Organization of Services (Observation and Assessment Checklist)

A	Laboratory	Options			Remarks
				NA	
1	Lab Technician Availability	24x7 ☐	Partial ☐	Not Available ☐	
2	Blood Microscopy for Malaria	Being Done ☐	Not Being Done ☐	If Not Done Specify Reason _____	
3	Maximum Testing Load for Malaria (Per Day)	Specify number of Slides _____			
4	Reporting of Blood Test for Malaria				
	a) Usual Time taken to give report (Ask the technician)	----- Hrs			
	b) Documentation (Check the register for few reported cases for time taken)				
5	RDT for Malaria (Antigen)	Bivalent (Pv/Pf) ☐	Pv and / or Pf ☐	Conditions for Doing RDT All ☐ Selective ☐	
7	Training of LTs in past three years on Malaria	Yes ☐	No ☐	Remarks _____	
8	Resource Availability		<i>Supply Issues / Stockouts in Past (Ask)</i>		
	a) Functional Microscope	Yes ☐ No ☐	Yes ☐ No ☐		
	b) Reagents	Yes ☐ No ☐	Yes ☐ No ☐		
	c) Glass Slides	Yes ☐ No ☐	Yes ☐ No ☐		
	d) Lancets	Yes ☐ No ☐	Yes ☐ No ☐		
	e) Hollow/Injection Needles used for Finger Prick	Yes ☐ No ☐	Yes ☐ No ☐		
	f) RDTs for Malaria	Yes ☐ No ☐	Yes ☐ No ☐		
9	There is arrangement for segregation of BMW at the session site.	Yes ☐ No ☐			

B OPD and Service Provision Area					
1	IEC Related to Malaria displayed in Facility	Yes ☐ No ☐			
2	Display of treatment guidelines for Malaria	Yes ☐ No ☐			
3	Provision for temperature measurement of Fever Cases				
	a) Thermometer	Yes ☐ No ☐			
	b) Temperature being Measured	Yes ☐ No ☐			
4	Recording and reporting of Fever Cases (Check registers/ask Providers)				Describe Briefly:
C Drug Dispensing					
1	Drug Availability	Availability	Supply Issues / Stockouts in Past (Ask)		
	a) Chloroquine Tablets	Yes ☐ No ☐	Yes ☐ No ☐		
	b) Primaquine Tablets				
	c) Artesunate Combination Therapy	Yes ☐ No ☐	Yes ☐ No ☐		
	d) Injection Artesunate	Yes ☐ No ☐	Yes ☐ No ☐		
	e) Quinine Tablets	Yes ☐ No ☐	Yes ☐ No ☐		
	f) Quinine Injection	Yes ☐ No ☐	Yes ☐ No ☐		
D Other					
	Ambulance Availability	Yes ☐ No ☐			



Government of Nepal
Nepal Health Research Council (NHRC)



Ref. No.: 1646

28 March 2024

Ms. Ganga Marasini
Principal Investigator
IIHMR University
India

Ref: Approval of thesis protocol

Dear Ms. Marasini,

This is to certify that the following protocol and related documents have been reviewed and granted approval through the expedited review process for its implementation.

Protocol Registration No/ Submitted Date	121_2024 4 March 2024	Sponsor Protocol No	NA	
Principal Investigator/s	Ms. Ganga Marasini	Sponsor Institution	NA	
Title	Implementation Challenges and Facilitating Factors of Malaria Screening in Health Desks of Nepal-India Boarder of Lumbini Province, Nepal			
Protocol Version No	NA	Version Date	NA	
Other Documents	1. Data collection tools 2. Informed Consent Form 3. University letter 4. Recommendation letter from the supervisor 5. Support letter 6. Conflict of Interest (CoI) 7. Ethics Training Certificate 8. Work plan	Risk Category	Minimal risk	
Co-Investigator/s	1. Dr. Bishnu P. Marasini 2. Prof. Nutan Prabha Jain			
Study Site	Lumbini Province, Nepal			
Type of Review	☒	Expedited	Timeline of study 28 March 2024 to September 2024 Duration of Approval 28 March 2024 to 24 March 2025 This approval will be valid for one year	Frequency of continuing review NA
	☐	Full Board		
		Review Date: 28 March 2024		



Government of Nepal
Nepal Health Research Council (NHRC)



Ref. No.: 1646

Total budget of research	Self-funded
Ethical review processing fee	NRs 10,000.00
<u>Investigator Responsibilities</u> • If you do not start the project within 3 months of this letter, please contact the Ethical Review M & E Section at NHRC • Any amendments shall be approved from the ERB before implementing them • Submit progress report every 6 months • Submit final report after completion of protocol procedures at the study site • Comply with all relevant international and NHRC guidelines • Abide by the principles of Good Clinical Practice and ethical conduct of the research	

If you have any questions, please contact the Ethical Review M & E Section at NHRC.

Thanking you,

Dr. Pramod Joshi
Member Secretary