

FINAL REPORT

“MAPPING AND SIZE ESTIMATION OF KEY POPULATIONS IN NEPAL, 2024”



Ministry of Health and Population
National Centre for AIDS and STD Control
Teku, Kathmandu | 2024

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Ministry of Health and Population
National Centre for AIDS and STD Control
Teku, Kathmandu

Intrepid Nepal
Kathmandu, Nepal

Save the Children
Nepal Country Office
Kathmandu, Nepal

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Ministry of Health and Population
National Centre for AIDS and STD
Control, Teku, Kathmandu



Intrepid Nepal
Innovation, Excellence

Intrepid Nepal



Save the Children

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Dr. Sarbesh Sharma
Director

Foreword

The 2023 Mapping and Size Estimation (MSE) of Key Populations in Nepal marks the third round of surveys conducted to generate national and sub-national size estimates of key populations. The first National level Mapping and Size Estimation of Key Populations was carried out in 2011, followed by the second in 2017. The 2023 MSE was carried out by Intrepid Nepal under the leadership and direction of the National Center for STD and AIDS Control, Government of Nepal, with Financial and Technical support from the Save the Children-Global Fund Nepal. A technical steering committee was responsible for coordination, oversight, advice, and decision-making regarding all major aspects of the MSE.

The purpose of the 2023 survey was to generate national and sub-national estimates of the populations of People Who Inject Drugs (PWID), Men Who Have Sex with Men (MSM), Transgender (TG) individuals, Female Sex Workers (FSW), and Male Labor Migrants (MLM) in Nepal. This survey provides empirical evidence to inform policy development and program design for HIV and AIDS prevention and control. The report estimates the size of key populations in selected districts and extrapolates these figures to estimate the populations at both sub-national and national levels.

Given the mobile nature of key populations, up-to-date information about their numbers and hotspots in each district is essential. Without this information, efforts to include key populations in HIV prevention programs or treatment, care, and support services could fall short. Accurate data on the size of key populations is crucial for guiding the national HIV response, as it serves as a foundation for shaping policies and programs. The results of this mapping exercise are expected to aid in program planning for key populations, policy formulation, and strategy development, contributing to targeted interventions and desired outcomes.

This report is dedicated to all participants, key population members, and stakeholders who have contributed to the national HIV response in Nepal.

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Abbreviations

AIDS	Acquired immunodeficiency syndrome
ART	Antiretroviral Therapy
CAPI	Computer-Assisted Personal Interviews
CBO	Community Based Organization
CI	Confidence Interval
CR	Capture-Recapture
CSpro	Census and Survey Processing System
ERB	Ethical Review Board
FSW	Female sex workers
GPS	Global Positioning System
HIV	Human immunodeficiency virus
KII	Key Informant Interview
KP	Key Population
MLM	Male labor migrants
MSM	Men who have sex with men
MSW	Men who sell sex to other men
NCASC	National Center for AIDS and STD Control
NGO	Non- government Organization
NHRC	Nepal Health Research Council
NSU	Network Scale-up
PLHIV	People Living with HIV
PrEP	Preexposure prophylaxis
PSE	Population size estimation
PWID	People who inject drugs
SCI	Save the Children
SPSS	Statistical Package for Social Sciences
TG	Transgender People
TM	Transmen
TW	Transwomen
UN	United Nations

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Executive Summary

Introduction:

In Nepal, where HIV prevalence is concentrated in specific subpopulations, accurately estimating the size of key populations (KPs) such as people who inject drugs (PWID), men who have sex with men (MSM), transgender people (TG), and sex workers is crucial for effective intervention. As of 2023, an estimated 30,300 people were living with HIV in Nepal, with the country striving to achieve the 95-95-95 target by 2030. This survey aims to update and generate national and subnational size estimates of KPs in Nepal, using various methods to enhance resource allocation and intervention strategies. Accurate KP estimates are essential for informing effective national HIV and AIDS responses and meeting the set targets.

Method

The mapping and size estimation exercise for KPs, including MSM, MSW, TG, PWID, and FSW, was conducted in 36 districts. In addition to geographical mapping, population size estimation methods such as Capture-recapture (CRC), network scale-up (NSU) and multiplier were used and further Bayesian modeling (called Anchored Multiplier) was used to synthesize the estimates.

This exercise focused on gathering relevant information directly from hotspots where key population members congregate. Key informant interviews were conducted with both KP members and non-KP informants familiar with the local situation around these hot spots. Districts were selected from each stratum to provide direct estimates for mapped districts and to inform extrapolated estimates for the remaining districts in the same strata.

As part of the mapping process, a comprehensive list of venues was compiled. These venues were places where KP members meet clients and other sexual partners or buy/obtain/inject drugs (in the case of PWID). Key informants associated with each hotspot were then interviewed to estimate the number of KP members who visit that hotspot weekly, their visit frequency, and their mobility patterns to other hotspots within the same district. Data collection for this survey occurred between May and June 2024. To ensure data quality, monitoring visits were conducted by the core research team and representatives from the technical working group. Following data collection, a validation meeting was held with key stakeholders to present the survey's findings. The goal of the meeting was to reach a consensus on the population estimates for each hotspot area and district. A technical committee, including national-level key stakeholders and representatives from KP networks, was formed to guide and facilitate the process, survey design, site selection for geographic mapping, and validation of population size.

Data Management and Analysis:

Census and Survey Processing System (CSPPro) was used to develop the CSentry CAPI questionnaire for collecting the data. The dataset was transferred to SPSS for data cleaning and further analysis. Data cleaning involved removal of any misreporting, discrepancies, outliers and inconsistencies. Adjustment factors (mobility adjustment, frequency adjustment and invisibility adjustment) were sequentially applied to all three KPs. The results were triangulated against the district specific 2023 programmatic reach data. The data analysis procedures were based on stratification and extrapolation, to estimate the number of KPs in mapped and unmapped districts and the entire country.

Geographical mapping KP Size estimation:

- The national estimates of FSW are minimum 70,892 and maximum 86,809.
- The national estimates of MSM & TG are minimum 144,417 and maximum 163,820 of which minimum 30,549 and maximum 35,241 are TG, and minimum 73,725 and maximum 81,074 are MSM.
- The national estimates of PWID are a minimum of 39,844 and maximum 48,856. Among them, minimum 36,417 and maximum 44,372 are men and minimum 3,427 and maximum 4,484 are female.
- The national estimates of MLM are minimum 338,723 and maximum 544,480.

Conclusion

This survey's findings can guide programme planners to develop better targeted HIV prevention strategies, in particular provision of HIV prevention at locations where KPs congregate and consequently enhance programme coverage. In addition, various levels of estimates that this survey provided (district, provincial and national level) should be used for target setting, planning the scale of HIV interventions and for advocacy efforts.

CHAPTER I: INTRODUCTION

1.1 Background

At the end of 2022, there were an estimated 39 million people living with human immunodeficiency virus (HIV) and 630,000 HIV-related deaths, globally.¹ HIV is an incurable virus that attacks the immune system. While some individuals may not experience any symptoms after being infected with HIV, untreated, HIV may progress to into HIV Stage 3, commonly known as acquired immunodeficiency syndrome (AIDS), which is defined as the onset of opportunistic disease in people living with HIV (PLHIV).² HIV is transmitted when an infected person's bodily fluids containing sufficient viral loads of HIV comes in contact with the mucous membrane or damaged tissue of an uninfected individual.³ HIV may also be transmitted from an infected mother to child at birth; however, this does not always occur. Due to the mode of transmission of HIV, infection commonly occurs through anal or vaginal sex or the sharing of needles, syringes, or other tools used to inject drugs.³ While HIV is incurable, preventative methods such as condoms (and lubricants), pre-exposure prophylaxis (PrEP), and needle exchange programs, Opioid Substitution Therapy etc. are effective in controlling and preventing HIV transmission. Additionally, for PLHIV, antiretroviral therapy (ART) reduces viral loads of HIV to undetectable and untransmissible levels.

As of 2024, the status of the HIV epidemic in Nepal was "concentrated epidemic," indicating low prevalence of HIV in the general population but higher prevalence in certain subpopulations. As of 2023, an estimated 30,300 people were living with HIV in Nepal with HIV incidence at 0.02 per 1000 population.⁴ Nepal has established a 95-95-95 by 2030 goal as part of its national policy—i.e., 95% of PLHIV are aware of their status, 95% of PLHIV aware of their status undergo treatment, and 95% of PLHIV undergoing treatment successfully suppress the virus.⁵

Certain populations are at higher risk of HIV infection. These key populations (KPs) include sex workers, men who have sex with men (MSM), and people who inject drugs (PWID). In countries where HIV epidemics are concentrated, as in Nepal, it is crucial to determine the size of KPs to develop an effective national response to HIV and AIDS. However, accurately estimating the size of these populations can be difficult as many KPs are hidden and reluctant to reveal their identities.^{6,7} In low- and middle-income countries, including Nepal, accurately measuring the size of KPs affected by concentrated HIV epidemics can be challenging due to the presence of stigma, discrimination, and criminalization of certain HIV-related behaviors. Quality data on the size of KPs through means such as census and routine data collection are often not readily available. In Nepal, HIV programs rely on the mapping and estimation process to identify geographical areas and prioritize interventions targeting KPs. KPs in Nepal comprise people who inject drugs (PWID), men who have sex with men (MSM), transgender people (TG), including transwomen (TW) and transmen (TM), sex workers, prison inmates, male labor migrants (MLM), and their spouses.

A robust estimate of the size of different key populations is required to guide the national response in HIV and AIDS. These includes census and enumeration methods, population survey methods, multiplier methods, nomination methods, capture-recapture methods, and multiple sample recaptures. Currently, Nepal is using the projected district level data of the 2016 mapping and size estimation for program planning and implementation. To make informed decisions about the allocation of resources for priority interventions and to improve the accuracy of coverage estimates for existing services, it is essential to have district-level estimates of the size of KPs

in Nepal. Such estimates can provide valuable insights into where resources are required and to what extent, helping to prioritize interventions and allocate resources effectively.

Hence, to achieve the 95-95-95 targets and expedite our response to HIV, it is crucial to update our understanding of the geographical concentration of key populations and their hotspots in the last five to six years. As these concentrations may have changed over time, it is essential to re-evaluate the size of these populations and their risk behaviors in each geographical area.

1.2 Objectives of the survey:

The overall objective of the mapping and size estimation is:

- To generate national and subnational level size estimates of People who inject drugs (PWID), Men who have sex with men (MSM), Transgender (TG), Female Sex workers (FSW) and Male labor migrants (MLM) in Nepal.

Specific objectives

- Estimate the total key population sizes in the selected districts.
- Use the available data to extrapolate and estimate the size of key populations in all districts and to the sub-national and national level.

1.3 Epidemic Situation

The HIV epidemic in Nepal, beginning with the first detected case in 1988, has evolved from a low prevalence epidemic to a concentrated epidemic in certain key populations (KPs).^{8,9} Key populations in Nepal include people who inject drugs (PWID), men who have sex with men (MSM), transgender people (TG), male and female sex workers (MSW and FSW), and male labor migrants (MLM) and their partners.⁸ As of 2023, an estimated 30,300 people were living with HIV (PLHIV), of whom approximately 29,000 were aged 15 years and over.⁸

The primary mode of transmission in Nepal is heterosexual transmission, accounting for 69% of the incidence, while mother-to-child transmission remains low.⁸ Members of KPs are at higher risk for HIV due to the practice of risky behaviors—including the sharing of needles or other injection equipment, unprotected sex with multiple partners, and inconsistent condom usage—and social stigma that poses a barrier to accessing HIV/STI-related health services.¹⁰ The highest prevalence of HIV is among clients of sex workers (7.2%), followed by MSM and TG (4.7%), sex workers (2.5%), PWID (0.2%), migrants (0.2%), and partners of migrants (0.2%).⁸

To date, there have been 70,512 people infected with HIV and 29,518 AIDS-related deaths.⁸ HIV is slightly more prevalent among men, compared to women.⁸ The prevalence of HIV varies regionally across Nepal, with the highest prevalence rate of HIV in Bagmati province, followed by Lumbini, Sudurpaschim, Madhesh, Gandaki, Koshi, and Karnali.⁸ As of 2022, of the PLHIV in Nepal, 23,362 were receiving ART, with generally high five-year ART retention rates (over 80%, on average).^{8,11}

The incidence of new HIV cases and AIDS-related deaths have been steadily declining, with HIV incidence estimated to be 0.02% and an adult prevalence of 0.13%.¹² Since the first draft of the national policy on HIV/AIDS in 1995, the national strategy for the prevention and mitigation of Nepal's HIV epidemic is regularly updated with robust data on prevalence, indicators, and

access to and coverage of HIV health services.⁹ The most recent National HIV Strategic Plan for 2021-2026 articulates a comprehensive framework for achieving the 95-95-95a targets associated with the UN's Sustainable Development Goals. At the end of 2019, Nepal achieved 86-77-64 coverage.¹³ The 2021-2026 strategic plan highlights identifying and reaching key populations as a core strategy to achieve the 95-95-95 targets by 2030.⁹ Thus, recent surveys have focused on identifying indicators, mapping, and population size estimation of KPs.

1.4 Implementation partners

Intrepid Nepal, a research agency, conducted the survey under the guidance of a technical working group led by National Center for AIDS and STD Control (NCASC) and consisting of various national and international organizations. Acting as the steering committee, the technical working group provided direction on finalizing mapping tools, oversaw the field work, ensured proper data management, and offered explanations to justify the results.

CHAPTER II: INTRODUCTION OF MAPPING

2.1 Description of overall approach

This survey aimed to generate both sub-national and national level estimates of the size of key populations targeted by HIV-related interventions managed at the district level in collaboration with national, local partners, and community organizations. The survey used program data from the selected districts as a primary data source, complementing data collected from the selected districts making them the as the unit of analysis. Due to logistical constraints, data collection focused on epidemiologically important districts where HIV-related interventions are implemented. To address gaps in data from districts without direct data collection, statistically robust extrapolation methods were applied to provide estimates for unmapped areas.

2.2 Rational mapping

There are various methods for size estimate. Among these, mapping or census techniques are especially useful when local estimates are required for planning and monitoring programs. A limitation of mapping is that it only includes key populations (KPs) who are present and identifiable at physical venues. Nevertheless, it offers a reliable lower estimate of the KPs that programs can reach in these areas. Additionally, by incorporating a few extra questions during fieldwork, adjustments can be made to account for KPs who visit these venues infrequently or not at all. Therefore, to maintain consistency and support trend analysis, this round of population size estimation (PSE) also relies primarily on mapping methods.

2.3 Mapping approach

In each selected district, the mapping process began by establishing rapport with local authorities and stakeholders to identify key informants and prioritize hotspot areas where key population (KP) members were likely to be found. In each priority area, Key informants were then asked to list specific hotspots where KPs such as FSW, MSM, TG, and PWID community gather. After obtaining a list of hotspots, key informants familiar with each hotspot estimated the weekly number of KPs who visited each location. They also provided information on the number of KPs from each hotspot who visited other hotspots and the number of hotspots they visited. This data was used to adjust for double counting.

Additionally, key informants estimated the frequency of KPs visit to these hotspots- daily, weekly, or less frequent basis (e.g., once a week, once a month or once in three months). This information helped adjust for less frequent visitors who might not be included in the weekly count. Finally, key informants estimated the proportion of KPs in the district who never visited the types of venues included in the mapping exercise, which helped estimate the hidden or less visible portion of the population. The data collected was then analyzed to develop a range of size estimates for planning programs and other activities.

2.4 Differences from the previous round of PSE

The 2024 mapping and Population Size Estimation (PSE) exercise was similar in its geographical mapping approach to the exercises conducted in 2010 and 2016, but it also introduced several new methodologies. A significant addition to this year's exercise was the incorporation of additional methods to estimate the size of the key population, includes the capture-recapture method, network scale-up, and service multiplier methods. Additionally, we also estimated the size of MLM population through secondary data analysis.

2.5 Survey Populations

The target populations for this survey and their definitions are as follows:

2.5.1 People who inject drugs (PWID)

The people who inject drugs are defined as "Those current injectors aged 15 years or above who have been injecting drugs for non-medical purposes in the 12 months prior to the date of the survey.

2.5.2 Men who have sex with men (MSM)

MSMs are divided into two groups; men who sell sex to other men (MSW) and those who have sex with other men but not for money or other commodities (non-MSW):

- a) **MSW** are defined as "Those males aged 15 years or above who have had sexual relations, (either oral or anal) with another male in the 12 months preceding the survey in exchange for money or other commodities."
- b) **Non-MSW** are defined as "Those males aged 15 years or above who have had sexual relations (either oral or anal) with another male in the 12 months preceding the survey without receiving a cash payment or other commodities."

2.5.3 Transgender (TG)

TG are defined as "those aged 15 years or above were born as biological males but who feel or dress as women or transwomen and had sex (oral or anal) with other men in the past 12 months. It includes two groups, transwomen who sell sex (TWSW) and those who have sex with other men but not for money or other commodities (non-TWSW):

- a) **TGSW** are defined as "TG aged 15 years or above who have had sexual relations, (either oral or anal) with another male in the 12 months preceding the survey in exchange for money or other commodities".
- b) **Non-TGSW** are defined as "TG aged 15 years or above who have had sexual relations (either oral or anal) with another male in the 12 months preceding the survey without receiving a cash payment or other commodities".

2.5.4 Female sex workers (FSW)

FSWs are women aged 15 years and above, reporting having been paid in cash or in commodities for sex (vaginal or anal) with men during the last 12 months.

2.5.5 Male labor migrants (MLM)

All the male labor migrants aged 15-49 years, having stayed continuously in India as a migrant worker.

2.6 Formative Assessment

Formative assessment (FA) was carried out before the PSE data collection to obtain the information needed for implementation of PSE, such as feasibility of carrying out various PSE methods, selection of districts for data collection and challenges that might be encountered during PSE. FA included a series of consultation meetings in each province to discuss feasibility of several PSE methods with community-based organizations (CBOs) and other stakeholders. It was carried out by a team of seven staff members and lasted two and half weeks.

During formative assessment CBOs and KP communities provided valuable information on the location of hotspots in districts, accessibility of KPs, changes in the number and distribution of hotspots and reasons for those changes. During this phase, data collection tools were developed, discussed with CBOs and community members, and piloted. Other important elements of the preparation phase included recruitment of field teams and training of field team members.

FA was carried out in the following provinces and programme districts:

- Koshi [Jhapa, Morang, Sunsari]
- Madhesh [Bara, Parsa, Rautahat, Sarlahi, Dhanusha, Mahottari, Siraha, Saptari]
- Bagmati [Kathmandu, Bhaktapur, Lalitpur, Kavrepalanchowk, Makwanpur, Chitwan]
- Gandaki [Kaski, Tanahun, East-Nawalparasi]
- Lumbini [Rupandehi, Kapilvastu, Dang, Banka, Bardiya, West-Nawalparasi]
- Karnali [Surkhet]
- Sudurpaschim [Kailali, Kanchanpur]

A separate report is available on FA. In brief, a total of 75 key informants (KIs) were interviewed: 26 from CBOs that provide services to PWID, 26 from CBOs that provide services to MSM and TG, and 23 from CBOs for FSW. Based on the findings from KI interviews, reaching KPs at hotspots is only feasible with the assistance of outreach workers (ORWs). Therefore, they had to be utilized during L2 field mapping and capture and recapture.

The findings regarding access to hotspots for each KP were as follows:

PWID: KIs reported that the number of PWID hotspots had increased in recent years. PWIDs often contact dealers through phones, collect drugs, and leave the sites immediately. KI interviews also revealed drug home delivery mechanisms through online portals like “Pathao” in urban cities such as Kathmandu and Lalitpur.

MSM & TG: The number of hotspots might be lower in certain districts compared to 2016, while there is also a certain number of new hotspots.

FSW: The number of FSW hotspots was reported to have decreased. It was reported that some of the previously known hotspots closed due to use of virtual platforms to meet clients.

In the sampled districts, a total of 1560 hotspots were identified for PWID, 1850 for MSM, MSW and TGW, and 1402 for FSW.

During FA, it was also assessed what services were provided to KPs by CBOs working at the district-level so that appropriate questions can be asked during PSE data collection. Additionally, it was determined whether CBOs can provide unduplicated counts of KPs that received services during December 2023-May 2024, which is needed for the service multiplier method.

In terms of virtual platforms, FSW and PWID use Facebook messenger groups and WhatsApp while MSM and TGW use platforms such as Snapchat, Emo, Grindr, Tinder.

Based on the data collected during the FA, districts for PSE data collection were purposefully selected based on a combination of factors, including the number of hotspots, estimated population size reported by KIs, existing HIV programs/services, local staff capacity, and the feasibility and cost of implementation. It was decided to include 16 districts in PSE from all 7 provinces, including the capital of Kathmandu.

Based on the FA findings, the following PSE methods were selected for implementation:

- Geographical mapping
- Three source capture-recapture
- Multiplier method
- Network scale-up

2.7 Eligibility criteria for Key informants

2.7.1 KP Key informants

KP Key informants were required to be;

- i) be age of 18 or above.
- ii) be familiar with the hotspot.
- iii) be active KP members who had got engaged in the behavior of interest (sex work, injecting drug use, anal intercourse).

2.7.2 Non-KP Key informants

Non-KP Key informants were required to be;

- i) be age of 18 or above.
- ii) be familiar with the hotspot.

Examples of Non-KP Key informants include:

- People who worked at the hotspot or nearby such as establishment owners/ managers (e.g. Bars, hotels, lodges, clubs etc.),
- People who were hosts/hostesses, security personnel (bouncers) or customers at the establishments,
- People who owned shops or stalls nearby to the hotspot and interacted with people visiting the hotspot, and
- Pimps, Taxi drivers, or NGO outreach workers.

CHAPTER III: POPULATION SIZE ESTIMATION METHODS

The 2024 Population Size Estimation (PSE) exercise followed a geographical mapping approach similar to the 2010 and 2016 exercises. In addition, three other methods were used to estimate the size of key populations: the capture-recapture method, network scale-up, and service multiplier methods. The size of the MLM population was also estimated through secondary data analysis.

3.1 Survey Sites for Geographical mapping

The objective of this survey was to conduct Population Size Estimation (PSE) for key populations targeted by HIV-related interventions across districts in Nepal, excluding certain remote hilly and mountainous areas. Following a formative assessment and consultations with stakeholders, the mapping and size estimation exercise was carried out in selected districts for Female Sex Workers (FSW), Transgender individuals and Men who have Sex with Men (TG/MSM), and People Who Inject Drugs (PWID). The mapping covered all designated program districts for each population group across Nepal's seven provinces, as well as additional non-programme districts used as proxy sites to extrapolate estimates for unmapped areas. The survey sites for geographical mapping and size estimation are listed below:

FSW: 26 program districts and 6 non-program districts as a proxy district for extrapolation of unmapped districts.

TG/MSM: 27 program districts and 6 non-program districts as a proxy district for extrapolation of unmapped districts.

PWID: 27 program districts and 5 non-program districts as a proxy district for extrapolation of unmapped districts.

Table 1: Selected districts for geographical mapping (Program and Proxy districts)

Province	District	Type	FSW	TG/MSM	PWID
Koshi	Jhapa	Program	✓	✓	✓
	Morang	Program	✓	✓	✓
	Sunsari	Program	✓	✓	✓
	Udayapur	Proxy	✓	✓	✓
Madhesh	Saptari	Program	✓	✓	Proxy
	Siraha	Program	✓	✓	✓
	Mahottari	Program	✓	✓	✓
	Dhanusha	Program	✓	✓	✓
	Sarlahi	Program	✓	✓	✓
	Rautahat	Program	✓	✓	✓
	Bara	Program	✓	✓	✓
	Parsa	Program	✓	✓	✓

Province	District	Type	FSW	TG/MSM	PWID
Bagmati	Kathmandu	Program	✓	✓	✓
	Bhaktapur	Program	✓	✓	✓
	Lalitpur	Program	✓	✓	✓
	Makwanpur	Program	✓	✓	✓
	Chitwan	Program	✓	✓	✓
	Kavre	Program			✓
	Nuwakot	Proxy	✓	✓	✓
Gandaki	Kaski	Program	✓	✓	✓
	Nawal-parasi_E	Program	✓	✓	✓
	Baglung	Proxy		✓	✓
	Mustang	Proxy		✓	
	Tanahu	Program			✓
Lumbini	Rupandehi	Program	✓	✓	✓
	Kapilvastu	Program	✓	✓	✓
	Nawal-parasi_W	Program	✓	✓	✓
	Dang	Program	✓	✓	✓
	Banke	Program	✓	✓	✓
	Bardiya	Program	✓	✓	✓
	Palpa	Proxy	✓	✓	✓
Karnali	Surkhet	Program			✓
	Salyan	Proxy	✓	✓	✓
Sudurpaschim	Kailali	Program	✓	✓	✓
	Kanchanpur	Program	✓	✓	✓
	Doti	Proxy	✓	✓	

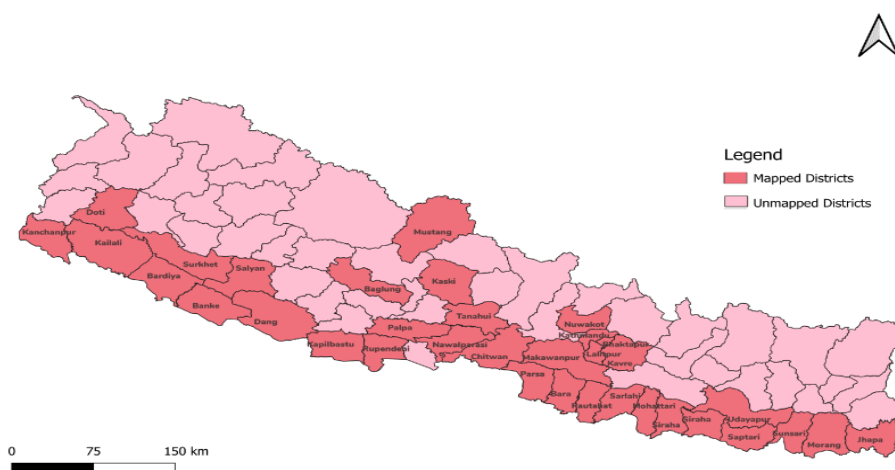


Figure 1: Mapped districts and unmapped districts, Mapping and size estimation 2024

[Note: The selected districts were all HIV program intervention districts with few additional proxy districts]

3.2 Survey Sites for Service Multiplier, Network Scale-Up, and 3-CRC Method

These exercises were conducted in nine districts, nine each for FSW and TG/MSM and ten districts for PWID:

Table 2: Survey Sites for Service Multiplier, Network Scale-Up, and 3-CRC Method

FSW	TG/MSM	PWID
Jhapa	Morang	Morang
Dhanusha	Dhanusha	Dhanusha
Bara	Parsa	Parsa
Kathmandu	Kathmandu	Kathmandu
Makwanpur	Lalitpur	Makwanpur
Kaski	Nawalparasi_E	Kaski
Nawalparasi_W	Rupandehi	Nawalparasi_W
Banke	Dang	Banke
Kailali	Kailali	Surkhet
-	-	Kailali

3.3 Data collection approach

3.3.1 Geographical mapping

Geographical mapping was conducted via multiple steps, including:

- a) Pre-mapping preparations.
- b) Level 1 mapping.
- c) Level 2 mapping (during the first capture).
- d) Second and third captures of some hotspots selected at random.

3.3.1.1 Pre-mapping

Pre-mapping activities were conducted prior to Level 1 mapping. Meetings with national-level community network stakeholders for key populations streamlined the process before mapping exercise. The objectives of pre-mapping were to:

- Establish rapport with district level authorities and local stakeholders to identify different types of hotspots where key population members could be found within the district.
- Obtain lists of hotspots for each key population from NGOs that carry out HIV prevention outreach.
- Understand the types and profile of existing hotspots and assess their accessibility to field teams as some spots are located indoors (in particular for FSW) and the majority outdoors.
- Identify potential key informants for L1 mapping.

Here, stakeholders and local authorities included:

- i) HIV focal persons at the local level.
- ii) Representatives of the District Police office.
- iii) Motivators (members of the KP community who could help to access the community).

- iv) Peer educators from the community network who helped identify hotspot areas in the district.
- v) Key informants who were able to provide detailed information about specific hotspots.

3.3.1.2 Level 1 mapping at the district level

The Level 1 mapping was conducted at the district level to create a comprehensive list of hotspots in the districts.

- We developed a list of hotspots by interviewing both KP and non-KP key informants (KI), and each KI asking each informant to name the hotspots they were familiar with.
- For each reported hotspot, we collected the information's on the minimum and maximum number of the key population visiting during peak times.
- Through the Level 1 mapping, we created a master list of the hotspot for each district including location and size.
- Hotspots mentioned by multiple key informants were cross referenced to eliminate duplicate thereby resulting in a unique list of hotspots with unique hotspot identification numbers.

Key data collected in L1 included:

- Hotspot name and address.
- Minimum estimates of KPs (average of All minimums mentioned by KIs).
- Maximum estimates (average of ALL maximums mentioned by KIs).
- Population types accessing the hotspots.

3.3.1.3. Level 2 mapping at the district level

Level 2 mapping at the district level involved the following steps:

In the first round, all hotspots reported by key informants (from the table above) were visited. For rounds two and three, data were collected by visiting a maximum of 50 randomly selected hotspots.

Level 2 mapping was the process of collecting detailed information about the presence of KP members at hotspots identified in Level 1 mapping. At each hotspot, we conducted interviews with KPs and asked them to estimate the number of KPs who visited the hotspot during peak times. The purpose of this hotspot verification was to update the status of each hotspot in the L1 master. Specifically, we aimed to:

- Confirm that the hotspot existed and was operational.
- Confirm that the hotspot was unique (i.e., not a duplicate of another hotspot).
- Verify the location/address of the hotspot.
- Record the GPS coordinates of the hotspot.
- Obtain estimates of the minimum and maximum number of KPs that visited hotspots during an average week.
- Enumerate the number of KPs present during each hotspot visit.

- Obtain adjustment factors for mobility across the hotspots and the proportion of each KP that did not visit hotspots (i.e., the proportion of the population that was “hidden”).

Since the capture-recapture method required venue visits, the first capture was used to collect L2 information to carry out the survey effectively. The capture -recapture exercise was done only in province-wise selected districts.

3.3.2 Service multiplier

Data for the service-based multipliers were part of data collection forms completed during mapping and CRC. Respondents were asked whether they received the following services from CBOs:

- Condoms from CBOs in December 2023 - May 2024.
- HIV testing from CBOs in December 2023 - May 2024.
- Syphilis testing from CBOs in November 2023 - April 2024 (asked to MSM, TGW and FSW).
- Sterile needles and syringes from CBOs in December 2023 - April 2024 (asked to PWID).

The second data source for the multiplier method was the unduplicated count of KPs that were given the above-mentioned services at the same time-period. These data were obtained from program implementing organizations through CBOs.

3.3.3 Capture-recapture (CRC)

Field-based - CRC is used to estimate the size of KPs that are accessible at outdoor venues (hotspots). CRC consists following steps i.e. i) visiting hotspots where KP members congregate on two or more separate occasions (captures), ii) tagging (i.e. marking) all KP members found at the hotspots on each capture, iii) calculating the extent of overlap, and iv) generating a size estimate. There has to be direct contact between data collectors and KP members, and the eligibility of a person must be confirmed before a person can be tagged.

Capture–recapture is feasible for populations that are mobile and less appropriate for more stationary populations who frequent hotspots at fixed times according to fixed patterns (for example brothel-based sex workers).

CR with three samples (3S-CR) is a more valid approach compared to 2 S-CRC as it relaxes the assumption of independence and allows for more sophisticated analysis resulting in more accurate PSE.^{14,15} More than two captures increase the number of data points from which estimates are generated, generally resulting in more stable and robust size estimate. By using Bayesian methodology, independence between captures can be accounted for. This method was successfully implemented in several settings such as Uganda, South Sudan and Ghana.^{16,17} In CRC studies it is important to correctly identify KP members who participated in each phase of the survey. This is achieved by giving participants some memorable objects like key chains or bracelets during each phase as “tags”.

KPs were sampled in this survey during three independent captures. The first capture was geographical mapping while the 2nd and the 3rd capture included 50 randomly selected hotspots. All three captures were set one week apart to minimize the effect of migration.

The process of implementing 3S CRC method was as follows:

In this survey, KPs (PWID, MSM, FSW, TG) were each sampled during three independent captures. Each capture was set one week apart to minimize the effect of migration in and out of selected geographical areas. Unique objects (picture- Mountain (Capture 1) and Rhino (Capture 2)) were given to KPs that people could easily carry with them. The types of objects to be given were decided during the formative assessment by interviewing KPs. Each team who went for capture-recapture consisted of two field enumerators.

- **First capture:** Hotspots were visited in programmatic mapping. When at a hotspot, interviewers firstly visually identified individuals thought to be KP members, then approached them and asked in a sensitive manner whether they belong to a KP.

After determining eligibility, an object was given to a KP member. Those approached member could either accept or refuse the object, and both events were recorded. KP members were instructed to keep the unique objects with them for the next 2 weeks and not to give it away.

Second capture: Re-visits to all the hotspots were done one week after capture 1. Interviewers recorded data on the number of persons who accepted objects during the second visit and the number of those who reported receiving the object in capture 1. KP members were asked to show objects they had received. In case that someone reported receiving the object but could not show it, they were asked to identify the correct object from a laminated card with the distributed unique objects mixed with several incorrect objects (some similar to the real objects, some very different). Recaptures were persons who could show the object or identify it from a set of pictures.

- **Third capture:** Here, re-capture implies re-visits to all the hotspots one week after the second capture. After approaching people at hotspots and assessing eligibility, interviewers asked respondents whether they got unique objects in captures 1 and 2 and asked them to show/ recognize the objects.

The objects distributed included two different photos (nature and animals) and were the same for all KPs.

Each field team consisted of two staff members (an interviewer and a member of a KP community) who knew well the target population and had experience in working with the target population.

3.3.4 Network Scale Up

Network scale up (NSU) was done as part of the household survey of male labor migrants conducted in spring 2024. In NSU, members of the general population such as male labor migrants (not necessarily KP themselves) are asked about the overall number of members in their network and the number of KP they know in their networks. If this question is asked to a large representative number of people in a community, the collective information can provide a robust estimate of the KP population size as a whole. The advantages of NSU are 1) It does not require a survey of KP itself, 2) It can estimate more than one KP in one round, 3) It can be integrated into national surveys among general populations and so produce national counts.

To perform NSU data analysis, the following questions were added to the data collection form for capture-recapture of PWID, MSM, TGW, and FSW to measure and adjust the NSU estimates for two possible biases: "Transmission bias" and "Barrier effect".

The following questions were asked in the capture-recapture:

- How many adult men do you know who worked in India for some time during the last 3 years?
 - How many of those know that you are injecting drugs (for PWID), sell sex (for FSW), have sex with other men (for MSM and TGW)?
- How many adults do you know who are divorced or permanently separated?
 - How many of those know that you are injecting drugs (for PWID), sell sex (for FSW), have sex with other men (for MSM and TGW)?
- How many medical doctors (including specialists) do you know?
 - How many of those know that you are injecting drugs (for PWID), sell sex (for FSW), have sex with other men (for MSM and TGW)?
- How many women do you know who gave birth in 2023?
 - How many of those know that you are injecting drugs (for PWID), sell sex (for FSW), have sex with other men (for MSM and TGW)?
- How many people do you know who are on kidney dialysis?
 - How many of those know that you are injecting drugs (for PWID), sell sex (for FSW), have sex with other men (for MSM and TGW)?

By “**know**”, we mean that a respondent knows them, and they know a respondent by sight or by name, that a respondent could contact them, that they live within Nepal, and that there has been some contact between a respondent and them (either in person, by telephone or mail) in the past year.

3.4 Data collection period

The field work started on May 2nd, 2024, and was completed on June 7th, 2024.

3.5 Data Collection Tools

To ensure the collection of valid and reliable information during the survey, we used objectively designed and pre-tested tools. These mapping tools, including questionnaires (both in English and Nepali), consent forms (both in English and Nepali), data collection forms, and other necessary instruments. Extensive consultation was conducted with various stakeholders while developing the research instruments.

The developed tools were reviewed by the SCI and NCASC team and other key stakeholders. Feedback from the review was incorporated into the final version tool. The finalized tools were digitized in tablets using CAPI. While developing the tools in the e-application of the tablets, all the skip patterns, responses, and legal values were well-defined within the electronic data recording system.

The questionnaire covered topic related to; capture-recapture, service multiplier and network scale-up.

3.6 Recruitment and training of field team

Field team members were recruited from the list of researchers with the prior experience in collecting data in similar setting with similar survey populations. A two-day training course (including one day for field practice and pre-testing of tools) was conducted in Kathmandu for

the members of data collection team. Following the main training, six field teams were formed to implement the research. In total there were six field supervisors and thirty-four enumerators.

The entire team was centrally supervised by the field manager. Teams were formed considering the four different key populations, i.e., PWID, MSM, TG, and FSW. Each team and location involved in the mapping exercise included members of the respective KPs to assist in identifying hotspots and creating an enabling environment for interviews and data collection.

3.7 District-level validation meetings

After data collection was completed in each district, the research team conducted a validation meeting with key stakeholders to present the findings. Members of the local networks of KPs and local intervention agencies were invited to the validation meetings. The purpose of the meetings was to reach a consensus on the estimates of each population hotspot area and the hotspots in each district.

3.8 Data Management, Entry, and Analysis

3.8.1 Data entry

The database was designed using Census and Survey Processing System (CSPRO) with built-in checks for data entry errors (inconsistent or invalid data) and enabling skip patterns as designed in the data collection forms.

3.8.2 Data cleaning

After the completion of the data entry in each district, the data set was checked once again by running simple frequency tables. Then the data sets were transferred into SPSS for further cleaning and analysis. The following things were checked and fixed as necessary:

The following things were checked and fixed when necessary:

- During data collection, the responses to questions were given in ranges. The data were checked to confirm that the minimum values did not exceed the maximum values.
- To correct for mobility, respondents were asked about the estimated number of KPs at hotspots where they were being interviewed, they were also asked about other hotspots in district visited frequently, and the number of other hotspots they might visit.
- It was made sure that the estimated number of KPs who visited other hotspots did not exceed number of KPs who visited the hotspot where the interview was conducted, because the question asked referred to the KPs from that hotspot only.
- It was confirmed that the estimated number of other hotspots visited did not exceed the number of hotspots that were mapped in the district.

In order for the mobility adjustment to function properly, these two conditions needed to be

- To correct the frequency of visits to hotspots (which was measured on average of daily, weekly times per month, or less frequently). The totals of these values had to add up to the unadjusted size estimate for the spot in order for the frequency adjustment to function properly. In cases where they did not add up, the two were forced to match by modifying the original unadjusted size estimate.

3.9 Development of District Level Estimates (For Geographical Mapping)

We have utilized different approaches for district, province and national level estimation.

3.9.1 Consolidation of multiple responses and removal of outliers

There were four different key informants for each hotspot. To finalize the estimates, the responses of the four respondents was consolidated. Often, this was done by taking the mean value across respondents. However, in cases where one response was significantly different from the other responses, the outlier value was brought into line with the acceptable upper limit of values for the district.

3.9.2 Calculation of unadjusted estimates and adjusted estimates

Four sets of numbers were calculated for each district based on the consolidated data from each spot. The first was the unadjusted estimate, and the other three were calculated by applying adjustment factors derived from the data collected during the mapping fieldwork.

Table 3. Description of adjustment factors

Adjustment	Process
Unadjusted hotspot level estimates	Number of KPs likely to be found at each hotspot over the course of a week – which can be used for planning and monitoring outreach activities. (Note: Depending on the amount of movement between hotspots, the same people may be found at multiple sites, so these numbers cannot be directly used to measure the coverage).
District level estimates adjusted for double-counting	This estimate represents the total number of KPs likely to be found at all hotspots in the district over the course of one week, after accounting for double counting. It can be used to set weekly targets and measure weekly coverage for the district.
District level estimates adjusted for double counting and frequency of visiting hotspots	This estimate represents the total number of KPs reachable at hotspots in the districts over a period of several weeks or months. Because this estimate accounts for people who visit hotspots regularly, and those who visit less frequently, it can be useful to measure cumulative numbers of KPs reached by programs over time (e.g. quarterly, annual figures).
District level estimates adjusted for double counting, frequency of visiting hotspots and percentage of who do not visit hotspots	This estimate represents the total number of KPs in the district including both of those who come to hotspots frequently and those who do not. It also includes the less visible KPs who may not come to hotspots at all, or who may be less visible, and consequently, less reachable target population by the program.

3.10 Estimation steps

Estimates obtained from interviewing primary KIs during Level 2 field work were taken as the final unadjusted estimates. Hotspot estimates were generated by averaging the median/minimum/maximum estimates provided by informants interviewed. District-level unadjusted estimates were obtained by summing across hotspot estimates.

An adjustment for mobility was done to reduce double counting of KPs frequenting multiple hotspots.

The following formula was used to adjust for mobility:

$$S_2 = S_1 (1 - O_1) + (S_1 * O_1 / m_1)$$

Where:

- S_2 = estimated number of KP individuals at a hotspot adjusted for mobility.
- S_1 = crude number of KP individuals at a hotspot .
- O_1 = proportion of KP individuals that visit more than one hotspot on a peak day.
- m_1 = mean number of hotspots that KP members visit on a peak day.

The following formula was used to further adjust for the frequency of visits to a hotspot:

$$S_3 = (S_2 \times P_1 \times W_1) + (S_2 \times P_2 \times W_2) + (S_2 \times P_3 \times W_3) + (S_2 \times P_4 \times W_4) + (S_2 \times P_5 \times W_5)$$

Where:

- S_2 = Mean number in a week adjusted for mobility.
- P_1 = % visit at least once a week.
- P_2 = % visit every other week.
- P_3 = % visit around once a month.
- P_4 = % visit around once in 3 months.
- P_5 = % visit less than once in 3 months.
- W_1 = weight of at least once a week = 1.
- W_2 = weight of every other week = 2.
- W_3 = weight of around once a month = 4.
- W_4 = weight of around once in 3 months = 12.
- W_5 = weight of less than once in 3 months = 24.

The following formula will be used to further adjust for the population that is hidden:

$$S_4 = S_3 / (1 - q).$$

Where,

- S_4 = estimated number of KP individuals at a venue adjusted for mobility, frequency, and the hidden population.
- S_3 = number of KP individuals at a venue adjusted for mobility and frequency.
- q = proportion of KP individuals that are hidden, i.e., do not visit venues that are mapped.

3.11 Triangulation with other data sources

After calculating the adjusted and unadjusted mapping estimates for each district, they were compared with other available sources, particularly district-specific program reach data, to evaluate their validity and plausibility.

The sources of district specific program reach data are;

1. 2023 district specific program reach data from Save the Children Nepal.
2. 2023 district specific program reach data from FHI 360.
3. Program and estimated data from Key population specific Community based organizations (CBOs).
 - Blue Diamond Society (BDS)
 - Recovery Nepal (RN)
 - Jagriti Mahila Maha Sangh (JMMS)
 - Migrant Network

3.12 Extrapolation of the population size

The extrapolation of the findings for all four key populations (PWID, MSM, FSW, TG) was done for all districts, provinces, and the whole country.

Regarding the geographical mapping data, the method of extrapolation was used to calculate the proportion of adult males (in case of MSM and PWID) and the proportion of adult females (in case of FSWs) in the mapped district, and then multiplied that proportion by the number of adult males and adult females (respectively for MSM, PWIDs and FSW) in the unmapped district. The formula used for this is shown below in equation. Each unmapped district was matched with a mapped district thought to be most similar to it and used for extrapolation purposes according to the formula below. We also consulted with the experts (responsible for implementing the program at district level) to identify the similar districts (in terms of burden of HIV, risk behaviors and other geographical representation) for extrapolation. The final extrapolation processes are described in the results chapter.

Equation: Extrapolation Formula

$$E = N * P$$

Where,

E = Estimated number for unmapped district

N = Estimated number of mapped districts used for extrapolation

P = Population proportion of unmapped district

3.13 Process of Capture-recapture

The following are the main outputs of the descriptive analysis:

- Number of individuals approached in capture 1, 2 and 3 per KP.
- Number and percentage of individuals who met eligibility criteria out of those approached.
- Number and percentage of KP members who accepted an object in captures 1 and 2 among those found to be eligible.
- Number and percentage of approached in the same capture who were already approached by field teams in captures 1, 2 and 3.
- Number of KP members who reported receiving the object in capture 1 and capture 2, out of those interviewed in captures 2 and 3.

Data analysis was done in [Multiple Source Capture Recapture Analysis \(epiapps.com\)](http://epiapps.com) using Bayesian 3S CRC approach, the non-parametric latent class models to estimate the KP sizes. Shiny recap, the Multiple Source Capture-Recapture Analysis Software was developed using the Shiny web framework for R.^{18,19,20} Final size estimates were based on a Bayesian approach to accommodate the complex patterns of heterogeneity between captures and aggregation of homogenous strata into latent classes. The PSE and the corresponding 95% credible interval (CI) were calculated.

3.14 Process of Service Multiplier

The following formula was used for PSE based on the multiplier method:

$$N = M/P$$

Where,

N=Estimated size

P=Percentage of KP members interviewed in geographical mapping and capture-recapture who reported receiving certain service during a specific period.

M=Number of KP members who received a certain service by CBOs in the same time-period.

A 95% confidence interval (CI) is calculated as: $95\%CI = N \pm 1.96 \text{ Var}(N)$

The following formula was used to calculate $\text{Var}(N)$:

$$\text{Var}(N) = \frac{\text{Var}(M)}{[E(P)]^2} + \frac{[E(M)]^2}{[E(P)]^4} \text{Var}(P)$$

Where,

- N=Population size estimates
- M= Number of KPs who received services of CBOs (CBO data), which has a Poisson distribution.
- E (P)= Proportion of KPs who reported receiving a service in mapping and CRC
- E (M)= Number of MSM who received a service (CBO data)
- Var (M)=As it has a Poisson distribution, Var(M) is equal to M.
- Var (P)= The variance of the proportion of KPs in mapping and CRC

3.15 Process of Network Scale-up

To conduct NSU data analysis, questions were added to the data collection form for the capture-recapture survey of PWID, MSM, TGW, and FSW. These questions aimed to measure and adjust for two potential biases in NSU estimates:

- **Transmission bias:** The likelihood that KP members were underrepresented in general population networks.
- **Barrier effect:** The degree to which certain social barriers limited the visibility of KP members in general networks.

The Network Scale-Up (NSU) method estimated the size of a hidden population (e.g., key populations or KPs) by asking general population members about their social networks. Here's the basic formula used in NSU¹¹:

$$N = \frac{\sum_{i=1}^n \frac{e_i}{m_i}}{n} \times T$$

Where,

- **N** = Estimated size of the hidden population (e.g., KP population)
- **n** = Number of people surveyed (respondents)
- **e_i** = Number of people in the hidden population known by respondent *i*
- **m_i** = Total size of respondent *i*'s personal network
- **T** = Total population of the area being studied (e.g., the district or national population)

Explanation of Each Component:

1. **Personal Network Size (m_i):** Each respondent's total network size was typically estimated by asking how many people they knew in specific categories (e.g., people they could invite to a wedding), which provided an approximate measure of their network size.
2. **Known Members of the Hidden Population (e_i):** Respondents were asked how many people they knew within the hidden population (e.g., people who inject drugs, MSM, TG, FSW).
3. **Average Ratio Across Respondents:** The ratio was calculated for each respondent and then averaged across all respondents to obtain a general estimate.

Adjustments for Biases: Two main biases could affect NSU estimates:

- **Transmission Bias:** This occurred if people in the general population were less likely to know members of the hidden population.
- **Barrier Effect:** This occurred if social stigma or other barriers prevented general population members from knowing people in the hidden population.

To address these biases, correction factors were applied based on responses to additional questions that measured visibility and access barriers for each KP.

$$N_{\text{adjusted}} = N \times \text{Correction Factor}$$

The final adjusted NSU estimate was then calculated. This adjustment helped improve accuracy by accounting for potential underestimation of KP members due to social or visibility constraints in respondents' networks.

3.16 Bayesian modeling anchored multiplier

Bayesian modeling (called Anchored Multiplier) is used to synthesize all estimates into one population size estimate. The Anchored Multiplier method synthesizes multiple estimates of the size of a population into a single estimate. It uses a Bayesian modeling framework to combine empirical estimates (e.g., population size estimates from different methods) with a prior belief (e.g., an estimate from a previous survey in Nepal). The calculator fitted the data input to a beta probability distribution that reflects the certainty (i.e., the strength) of the data point. Data points with narrower confidence intervals will have a greater influence on the final estimate than data points with wider confidence intervals. When there is additional variance between the estimated population sizes entered that needs to be considered, the calculator will also provide the variance-adjusted estimate ("Anchored Multiplier-VA"). For the prior, we used the population size estimated for key populations in Nepal in 2016.

Following data were used for the Bayesian synthesis:

- Prior PSE from 2016
- Service multiplier estimates
- CRC
- NSU
- Geographical mapping

Census data were used to calculate the percentage of KPs in the general population. The weight of the prior was reduced by increasing the width of 95%CI by a factor of 4.

Results of each of the method that were statistically less than the program counts 95%CI were not included in the Bayesian synthesis.

3.16.1 Extrapolation of the population size for Bayesian Model

After estimating the population size for the districts where data was collected for PSE/Mapping using Bayesian modeling, we used Lasso regression with a Poisson family with a log-link function and adult population as an offset to select the best proxy predictors (among several candidate predictors including employment, poverty, education, arrest, etc.) for the extrapolation of the population size of the studied districts to (unobserved) districts where we did not directly collect PSE/Mapping data.

After estimating the population size for the districts where we collect data for PSE/Mapping by the Bayesian modeling, we use stratification for the extrapolation of the population size of the studied districts (mapped) to unstudied districts (unmapped districts) where we did not directly collect PSE/Mapping data. If the results of a mapped district were zero, we replaced zero with the minimum population size estimated resulted from Bayesian synthesis. For example, for FSW population, the minimum PSE was from Jhapa district (0.27%, 95%CI 0.24 to 0.32). And we used this minimum % for any districts that the PSE was zero from mapping. The stakeholder and expert opinion were base of our stratification (to choose from what mapped district we need to borrow the PSE).

3.17 Estimation process for MLM

Regarding the MLM size estimation, secondary data analysis was done based on the census data, 2021 obtained from National Statistical Office (NSO) and other secondary sources i.e. International Organization for Migration (IOM), 2023. Baseline Study on Cross-border Migration. IOM, Kathmandu and Nepal Demographic and Health Survey 2011, 2016, and 2022 Population Division Ministry of Health and Population Government of Nepal Kathmandu.

The steps followed for the secondary data analysis are as follow;

- The 2021 census shows that a total of 2,190,592 persons from 1,555,961 households (23.4%) are absent and living abroad. Out of the total absentees living abroad, 1,799,675 (82.2 %) are male and 390,917 (17.8 %) are female. In 2011, 1,921,494 persons from 1,378,678 (25.4%) households were absent abroad of which males were 87.6% and females were 12.4%.
- The 2021 census also shows that 70.35 percent are economically active population and among the total usually economically active population, (93.05 percent) are usually employed.

- In addition, the 2021 census also shows that 32.9 percent of total absent population are migrating to India.
- The data from NDHS 2016 also shows that out of the migrated male population to India, 78.3% migrated for work whereas data from IOM 2022 shows only 67.9% migrated for work to India. This study took 73.3 percent Migrant as Male labor migrant (MLM).
- Out of the 73.3 percent migrant population, 81% (585026) are male.
- The population that falls under the fertile age group of 15-49 years has been considered for secondary analysis.
- After analyzing the data from different sources as stated above, average % by age the total male migrated population to India was extrapolated to different age group by district. This calculation shows that about 503422 Male population migrated to India for different purposes. Out of the total Male migrant i.e. 503422, 73.3% (368002) are Male Labor Migrants.
- For district level calculation, "proportion of absent population to India by district" as provided by CBOs was triangulated for MLM estimation.
- For calculation of lower limit and upper limit calculation, p value of 0.2% (ref: IBBS among MLM, 2024) and z-value of 2.58 for 95% CI has been considered.

3.18 Data Quality Control Measures

Multiple quality check mechanisms were established, both at the central level and the field level. All data collectors were trained and tested regarding interviewing techniques and survey procedures. Meetings were regularly held to assess progress and identify and resolve any challenges arising during field operation. Questionnaires were checked for completion and quality before the end of the interview, and survey teams regularly conducted monitoring and supervisory visits and provided feedback.

3.19 Monitoring and Supervision

Monitoring and supervision were conducted regularly during the field operation. A systematic monitoring schedule was developed, and survey monitoring was strengthened by continued communication between field teams and review sessions held regularly within each team, with the goal of reinforcing the training received and correcting any field operation errors. In addition to the internal supervision of each field team NCASC, SCI and other key partners also regularly monitored the field and ensured the field operation was as per the approved mapping protocol. A joint monitoring committee was formed using NCASC, SCI and other relevant stakeholders and monitoring visits were conducted to ensure the protocol was being followed. The monitoring visits were conducted in all ecological belts and in all districts, in close coordination with NCASC prior to any monitoring and supervision visits.

A standard monitoring form/checklist and matrix was used to systematically guide the monitoring activities. In addition to the field visit itself, other methods like telephone and email were also employed for monitoring visits. The monitoring visits focused on observing the data collection process, the quality of data being collected, and the adherence to protocols. To ensure the quality of the field operations, supervisory visits were also conducted using a supervision checklist.

3.20 Ethical Considerations

Ethical approval was obtained from Nepal Health Research Council (NHRC) {Reference number: 1157} Ethical Review Board (ERB) prior to the start of the survey. Informed consent was sought from each participant before enrolling the participant in the survey. The purpose of the survey and the activities of the survey were explained in simple, understandable terms. As a result, the survey participants were well informed about their participation in the survey and able to make an informed decision about their participation. While communicating with individuals participating in the survey proper counseling was provided. The confidentiality of the collected information was also maintained. The research was conducted in compliance with ethical and human rights standards.

CHAPTER IV: FINDINGS

This chapter presents estimates of the number of active hotspots and the estimated number of KP in all mapped districts and, along with extrapolated estimates for unmapped districts. It included finding all methods used for size estimation i.e. geographical mapping, capture recapture, service multiplier and network scaleup.

4.1 Findings from Geographical Mapping

4.1.1 FSW mapped districts

Kathmandu had the highest number of hotspots (320), followed by Dhanusha (151) and Kaski (105). The lowest number of FSW hotspots among mapped district was found in Palpa (4) and Doti (4).

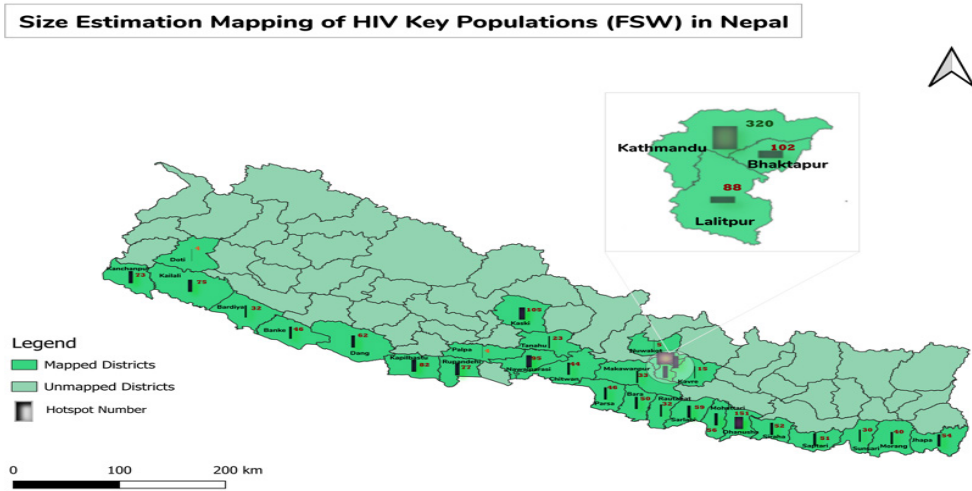


Figure 2: Number of FSW hotspots in the mapped districts

4.1.2 MSM & TG mapped districts

Parsa had the highest number of cruising sites for MSM & TG (160), followed by Sarlahi (155) and Kathmandu (154). The lowest number of MSM & TG hotspots among mapped district was in Kavre (5) and Nuwakot (5).

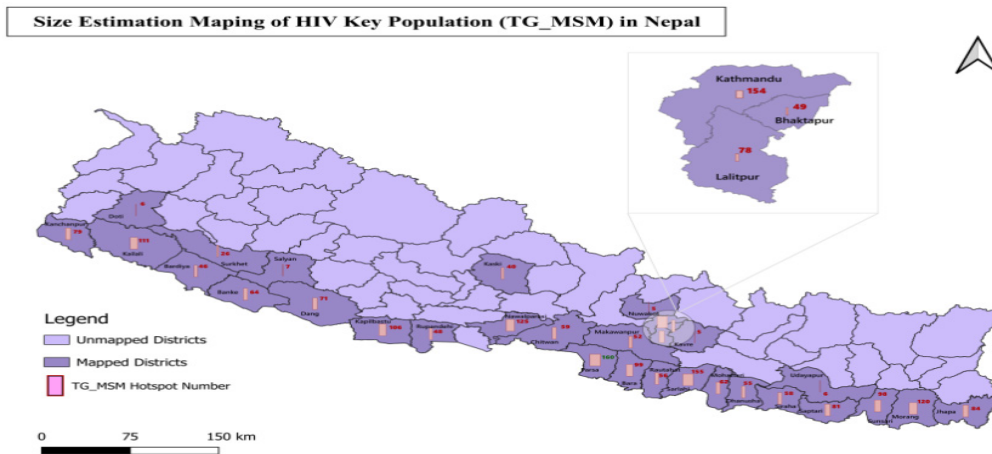


Figure 3: Number of MSM & TG hotspots in the mapped districts

4.1.3 PWID mapped districts

Kaski had the highest number of hotspots for PWIDs (277) followed by Kathmandu (213). The lowest number of PWID spots among mapped district was found in Nuwakot (6).

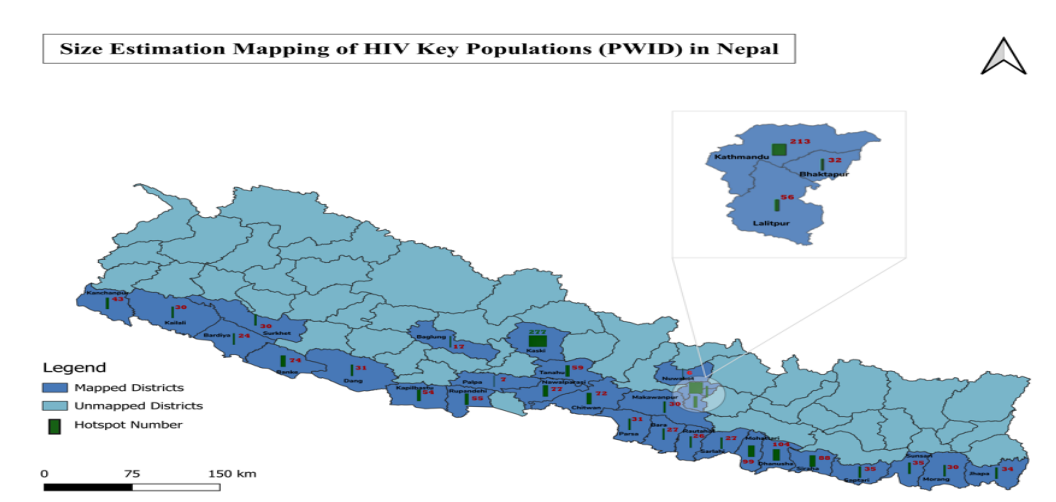


Figure 4: Number of PWID hotspots in the mapped districts

4.2 Extrapolation process

National level estimates include all districts in the country, both mapped and unmapped.

Table 4: Summary of number of mapped, unmapped and extrapolated districts for FSWs, MSM/MSW/TG, and PWIDs

Districts	Mapping Status		Mapping Result		Extrapolation required	
	Mapped	Unmapped	Zero	Non-zero	No	Yes
FSWs						
Program districts	28	-	-	28	28	-
Non-program districts	6	43	6	-	-	49
Total	34	43	6	28	28	49
MSM/TG						
Program districts	28	-	-	28	28	-
Non-program districts	6	43	2	4*	-	49
Total	34	43	2	32	28	49
PWIDs						
Program districts	30	-	-	30	30	-
Non-program districts	5	42	3	2*	-	47
Total	35	42	3	32	30	47

*MSM/TG Non-zero/Non-program districts: Udaipur, Palpa, Salyan, Doti

*PWIDs Non-zero/Non-program districts: Saptari, Palpa

4.2.1 Extrapolation Rules

The following rules were followed for the extrapolation.

- Mapped districts used their own results unless they were mapped as zero.
- Unmapped districts used the district they were matched to for extrapolation. If the district they were matched to was mapped as 'zero', the non-program district with the lowest number of KP (in terms of percentage of females aged above 15 for FSWs, or percentage of males age above 15 for MSM and above 15 for general population of PWIDS) was used as the source district for extrapolation. This was done assuming that the presence of KPs may be very low in some districts, it is unlikely to be zero (especially for MSM). This is supported by the fact that districts with no programs were far more likely to have zero values than districts with programs.
- The non-program districts with the lowest values were also used to extrapolate to the districts that were mapped as 'zero'.

4.3 National level estimates

Size estimates were calculated by applying several adjustment factors to the raw unadjusted estimates from the key informant interviews. After consolidating responses from multiple key informants at each hotspot, adjustments were applied to account for KPs who were double-counted, who came to hotspots less frequently than once a week, and who did not come to hotspots at all. The results presented in this section represent the estimates using all three adjustments, so they should be considered as the estimates of the districts.

4.3.1 National size estimates for FSWs

The national estimate of FSW is minimum 70,892 and maximum of 86,809. This estimate includes both mapped and unmapped district.

Table 5: National size estimates of FSWs

Districts	FSWs	
	Min	Max
Mapped	66,553	81,025
Unmapped	4,339	5,784
Total	70,892	86,809

4.3.2 District size estimates of FSWs

Table 6 presents the estimated number of FSWs from mapped and unmapped districts.

Table 6: District size estimates of FSWs

District	Establishment		Street		Home		Total	
	Min	Max	Min	Max	Min	Max	Min	Max
Taplejung	-	-	-	-	-	-	23	33
Sankhuwasabha	-	-	-	-	-	-	30	43
Solukhumbu	-	-	-	-	-	-	20	29
Okhaldhunga	-	-	-	-	-	-	26	38

District	Establishment		Street		Home		Total	
	Min	Max	Min	Max	Min	Max	Min	Max
Khotang	-	-	-	-	-	-	33	48
Bhojpur	-	-	-	-	-	-	30	43
Dhankuta	-	-	-	-	-	-	28	41
Terhathum	-	-	-	-	-	-	17	24
Panchthar	-	-	-	-	-	-	32	47
Ilam	-	-	-	-	-	-	52	76
Jhapa	1738	2600	59	77	-	-	1797	2677
Morang	1596	2291	-	-	11	16	1607	2307
Sunsari	2705	3263	-	-	25	32	2730	3295
Udaipur	-	-	-	-	-	-	64	92
Saptari	1004	1544	-	-	4	5	1008	1549
Siraha	1103	1799	25	37	13	19	1141	1855
Dhanusha	2731	3176	338	350	306	392	3375	3918
Mahottari	484	843	716	1102	153	226	1353	2171
Sarlahi	924	774	465	660	70	89	1459	1523
Rautahat	1129	1183	189	260	44	58	1362	1501
Bara	826	704	596	727	308	361	1730	1792
Parsa	1035	1253	476	453	67	86	1578	1792
Dolakha	-	-	-	-	-	-	33	47
Sindhupalchok	-	-	-	-	-	-	49	71
Rasuwa	-	-	-	-	-	-	9	13
Dhading	-	-	-	-	-	-	746	951
Nuwakot	-	-	-	-	-	-	49	71
Kathmandu	11655	12999	1592	1589	118	138	13365	14726
Bhaktapur	4818	5434	343	443	69	80	5230	5957
Lalitpur	1813	2153	2335	3017	102	129	4250	5299
Kavrepalanchowk	773	987	60	75	-	-	833	1062
Ramechhap	-	-	-	-	-	-	32	46
Sindhuli	-	-	-	-	-	-	687	876
Makwanpur	2175	2650	59	59	78	91	2312	2800
Chitwan	1463	2000	101	123	38	49	1602	2172
Gorkha	-	-	-	-	-	-	1126	1476
Manang	-	-	-	-	-	-	2	2
Mustang	-	-	-	-	-	-	3	4
Myagdi	-	-	-	-	-	-	20	29
Kaski	4048	4764	505	480	238	291	4791	5535
Lamjung	-	-	-	-	-	-	699	917
Tanahun	1370	1803	-	-	70	85	1440	1888
Nawalparasi East	73	140	118	188	64	72	255	400
Syangja	-	-	-	-	-	-	47	68
Parbat	-	-	-	-	-	-	25	36
Baglung	-	-	-	-	-	-	47	67
Rukum East	-	-	-	-	-	-	11	16
Rolpa	-	-	-	-	-	-	44	64

District	Establishment		Street		Home		Total	
	Min	Max	Min	Max	Min	Max	Min	Max
Pyuthan	-	-	-	-	-	-	44	63
Gulmi	-	-	-	-	-	-	46	67
Arghakhachi	-	-	-	-	-	-	33	48
Palpa	-	-	-	-	-	-	46	66
Nawalparasi west	538	687	485	606	121	148	1144	1441
Rupandehi	2014	2880	47	62	134	176	2195	3118
Kapilvastu	305	402	85	85	111	127	501	614
Dang	1098	1397	164	209	39	49	1301	1655
Banke	1950	2552	100	114	32	40	2082	2706
Bardiya	713	855	99	148	27	31	839	1034
Dolpa	-	-	-	-	-	-	8	12
Mugu	-	-	-	-	-	-	12	18
Humla	-	-	-	-	-	-	11	15
Jumla	-	-	-	-	-	-	22	32
Kalikot	-	-	-	-	-	-	27	40
Dailekh	-	-	-	-	-	-	47	68
Jajarkot	-	-	-	-	-	-	36	51
Rukum West	-	-	-	-	-	-	31	45
Salyan	-	-	-	-	-	-	45	65
Surkhet	-	-	-	-	-	-	78	112
Bajura	-	-	-	-	-	-	26	38
Bajhang	-	-	-	-	-	-	36	51
Darchula	-	-	-	-	-	-	25	36
Baitadi	-	-	-	-	-	-	45	66
Dadeldhura	-	-	-	-	-	-	26	38
Doti	-	-	34	50	4	5	38	55
Achham	-	-	-	-	-	-	43	62
Kailali	3806	4085	33	55	72	83	3911	4223
Kanchanpur	737	1144	184	240	71	99	992	1483
Total	54624	66362	9208	11209	2389	2977	70892	86809

4.3.3 National size estimates for MSM/ TG/MSW/TGSW

The national estimate of MSM/MSW/TG/TGSW is minimum of 144,177 and maximum of 163,820. These estimates include both mapped and unmapped districts.

Table 7: National size estimates of MSM/ TG/MSW/TGSW

Districts	TGs		TGSW		MSM		MSW		Total	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Mapped	30,549	35,241	11,805	14,250	73,725	81,074	22,127	25,955	138,768	157,229
Unmapped	-	-	-	-	-	-	-	-	5,409	6,591
Total	30,549	35,241	11,805	14,250	73,725	81,074	22,127	25,955	144,177*	163,820*

* Total minimum; difference of 562 [attributing to extrapolation done only in the total size estimation value]

* Total maximum; difference of 709 [attributing to extrapolation done only in the total size estimation value]

4.3.4 District size estimates of MSM/TGSW/MSM/MSW

Table 8 presents the estimated number of MSM/TGSW/MSM/MSW from mapped and unmapped districts.

Table 8: District size estimates of MSM/TGSW/MSM/MSW

District	TG		TGSW		MSM		MSW		Total	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Taplejung	-	-	-	-	-	-	-	-	62	78
Sankhu-wasabha	-	-	-	-	-	-	-	-	81	103
Solukhumbu	-	-	-	-	-	-	-	-	54	68
Okhaldhunga	-	-	-	-	-	-	-	-	183	231
Khotang	-	-	-	-	-	-	-	-	230	290
Bhojpur	-	-	-	-	-	-	-	-	207	261
Dhankuta	-	-	-	-	-	-	-	-	198	249
Terhathum	-	-	-	-	-	-	-	-	117	147
Panchthar	-	-	-	-	-	-	-	-	226	285
Ilam	-	-	-	-	-	-	-	-	366	462
Jhapa	556	669	215	263	3092	3457	885	1070	4748	5459
Morang	577	691	167	207	1904	2121	481	571	3129	3590
Sunsari	258	307	185	217	2121	2402	1125	1344	3689	4270
Udaipur	105	133	39	51	258	319	44	59	446	562
Saptari	920	1091	293	349	1678	1881	737	848	3628	4169
Siraha	364	437	187	223	1198	1408	664	770	2413	2838
Dhanusha	1035	1230	421	504	3185	3491	657	749	5298	5974
Mahottari	1453	1649	418	485	1205	1373	434	497	3510	4004
Sarlahi	1257	1553	79	98	2275	2775	32	48	3643	4474
Rautahat	415	474	103	124	2285	2522	306	356	3109	3476
Bara	1767	1984	131	155	2038	2328	121	157	4057	4624
Parsa	970	1180	523	622	2719	3125	357	425	4569	5352
Dolakha	-	-	-	-	-	-	-	-	89	112
Sindhupal-chok	-	-	-	-	-	-	-	-	135	170
Rasuwa	-	-	-	-	-	-	-	-	24	31
Dhading	-	-	-	-	-	-	-	-	622	676
Nuwakot	-	-	-	-	-	-	-	-	135	171
Kathmandu	10075	10720	3393	3858	29313	30218	8066	8784	50847	53580
Bhaktapur	575	663	261	325	638	704	426	500	1900	2192
Lalitpur	901	1072	321	406	1113	1235	570	675	2905	3388
Kavrepalan-chowk	156	173	100	122	377	391	62	69	695	755
Ramechhap	-	-	-	-	-	-	-	-	88	110
Sindhuli	-	-	-	-	-	-	-	-	573	623
Makwanpur	535	638	397	484	1791	1956	612	764	3335	3842
Chitwan	364	460	228	286	897	1078	282	345	1771	2169
Gorkha	-	-	-	-	-	-	-	-	129	163

District	TG		TGSW		MSM		MSW		Total	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Manang	-	-	-	-	-	-	-	-	3	4
Mustang	-	-	-	-	-	-	-	-	8	10
Myagdi	-	-	-	-	-	-	-	-	55	70
Kaski	1377	1698	597	727	1858	2202	899	1100	4731	5727
Lamjung	-	-	-	-	-	-	-	-	80	101
Tanahun	-	-	-	-	-	-	-	-	165	208
Nawalparasi East	121	155	97	123	328	392	175	229	721	899
Syangja	-	-	-	-	-	-	-	-	130	164
Parbat	-	-	-	-	-	-	-	-	67	85
Baglung	-	-	-	-	-	-	-	-	128	161
Rukum East	-	-	-	-	-	-	-	-	30	37
Rolpa	-	-	-	-	-	-	-	-	121	152
Pyuthan	-	-	-	-	-	-	-	-	119	150
Gulmi	-	-	-	-	-	-	-	-	127	160
Arghakhachi	-	-	-	-	-	-	-	-	91	115
Palpa	-	-	-	-	-	-	-	-	126	159
Nawalparasi west	308	459	237	392	390	514	452	691	1387	2056
Rupandehi	402	505	411	517	1397	1701	428	558	2638	3281
Kapilvastu	311	404	222	313	859	1053	233	321	1625	2091
Dang	1295	1540	1348	1595	2431	2891	1565	1992	6639	8018
Banke	897	1089	406	520	2011	2280	598	721	3912	4610
Bardiya	644	755	294	357	2221	2477	730	860	3889	4449
Dolpa	-	-	-	-	-	-	-	-	22	28
Mugu	-	-	-	-	-	-	-	-	34	42
Humla	-	-	-	-	-	-	-	-	29	36
Jumla	-	-	-	-	-	-	-	-	61	77
Kalikot	-	-	-	-	-	-	-	-	75	94
Dailekh	-	-	-	-	-	-	-	-	130	163
Jajarkot	-	-	-	-	-	-	-	-	97	123
Rukum West	-	-	-	-	-	-	-	-	86	108
Salyan	17	23	14	22	58	68	33	41	122	154
Surkhet	177	215	125	164	528	604	181	210	1011	1193
Bajura	-	-	-	-	-	-	-	-	71	90
Bajhang	-	-	-	-	-	-	-	-	97	123
Darchula	-	-	-	-	-	-	-	-	69	87
Baitadi	-	-	-	-	-	-	-	-	171	207
Dadeldhura	-	-	-	-	-	-	-	-	99	120
Doti	47	56	19	25	62	74	16	20	144	175
Achham	-	-	-	-	-	-	-	-	161	196
Kailali	2264	2706	451	553	2877	3301	604	725	6196	7285
Kanchanpur	406	512	123	163	618	733	352	456	1499	1864
Total	30549	35241	11805	14250	73725	81074	22127	25955	144177	163820

4.3.5 National size estimates for PWIDs

The national estimate of PWIDs is minimum 39,844 and maximum 48,856. These estimates include both mapped and unmapped districts.

Table 9: National size estimates for PWIDS

Districts	Male		Female		Total	
	Min	Max	Min	Max	Min	Max
Mapped	34,498	41,284	3,198	3,995	37,696	45,279
Unmapped	1,919	3,088	229	489	2,148	3,577
Total	36,417	44,372	3,427	4,484	39,844	48,856

4.3.6 District size estimates of PWIDs

Table 10 presents the estimated number of PWIDs from mapped and unmapped districts.

Table 10: District size estimates of PWIDs

District	PWID Male		PWID Female		Total	
	Min	Max	Min	Max	Min	Max
Taplejung	9	12	-	-	9	12
Sankhuwasabha	11	16	-	-	11	16
Solukhumbhu	6	9	-	-	6	9
Okhaldhunga	9	12	-	-	9	12
Khotang	11	14	-	-	11	14
Bhojpur	12	14	3	5	15	19
Dhankuta	9	14	2	4	13	18
Terhathum	4	8	-	-	4	8
Panchthar	11	16	-	-	11	16
Ilam	25	29	7	9	32	38
Jhapa	1000	1360	58	62	1058	1422
Morang	1702	1969	52	59	1754	2028
Sunsari	842	1133	148	225	990	1358
Udaipur	146	156	-	-	146	156
Saptari	755	976	-	-	755	976
Siraha	693	888	9	12	702	900
Dhanusha	1574	1731	20	29	1594	1760
Mahottari	1362	1692	8	29	1370	1721
Sarlahi	1114	1286	-	-	1114	1286
Rautahat	955	1139	11	11	966	1150
Bara	1745	2036	8	15	1753	2051
Parsa	1436	1726	10	11	1446	1737
Dolakha	6	11	5	10	11	21
Sindhupalchok	8	16	8	12	16	28
Rasuwa	3	14	1	3	4	17
Dhading	10	36	1	2	11	38
Nuwakot	53	62	-	-	53	62
Kathmandu	3711	4459	517	598	4228	5057
Bhaktapur	1165	1382	147	155	1312	1537

District	PWID Male		PWID Female		Total	
	Min	Max	Min	Max	Min	Max
Lalitpur	1040	1338	200	257	1240	1595
Kavrepalanchowk	73	86	3	10	76	96
Ramechhap	8	28	2	5	10	33
Sindhuli	14	29	4	8	18	37
Makwanpur	743	897	104	139	847	1036
Chitwan	1051	1301	269	308	1320	1609
Gorkha	198	418	8	15	206	433
Manang	0	0	0	0	0	0
Mustang	3	13	-	-	3	13
Myagdi	22	50	4	12	26	62
Kaski	2455	2979	672	812	3127	3791
Lamjung	124	282	137	289	261	571
Tanahun	1639	2076	10	12	1649	2088
Nawalparasi East	997	1191	14	23	1011	1214
Syangja	50	112	8	30	58	142
Parbat	26	59	2	6	29	65
Baglung	356	495	1	1	357	496
Rukum East	1	6	1	2	2	8
Rolpa	7	13	1	2	8	15
Pyuthan	6	22	1	2	7	24
Gulmi	7	19	1	2	8	21
Arghakhachi	5	18	-	-	5	18
Palpa	48	57	1	1	49	58
Nawalparasi west	958	1235	30	40	988	1275
Rupandehi	1151	1461	342	440	1493	1901
Kapilvastu	1310	1374	53	103	1363	1477
Dang	1002	1090	34	67	1036	1157
Banke	2003	2164	432	516	2435	2680
Bardiya	616	724	25	38	641	762
Dolpa	2	5	1	1	3	6
Mugu	3	8	1	1	4	9
Humla	3	9	1	3	4	12
Jumla	4	8	2	5	6	13
Kalikot	4	19	2	5	6	24
Dailekh	48	94	-	-	48	94
Jajarkot	7	26	5	6	12	32
Rukum West	42	67	-	-	42	67
Salyan	52	72	-	-	52	72
Surkhet	556	647	6	8	562	655
Bajura	4	18	2	8	6	26
Bajhang	5	16	2	5	7	21
Darchula	4	18	2	8	6	26
Baitadi	7	19	5	10	12	29
Dadeldhura	6	18	3	6	9	24
Doti	41	48	1	1	42	49

District	PWID Male		PWID Female		Total	
	Min	Max	Min	Max	Min	Max
Achham	6	16	1	1	7	17
Kailali	788	902	10	15	798	917
Kanchanpur	534	609	8	10	542	619
Total	36,417	44,372	3,427	4,484	39,844	48,856

The details of the hotspot of key populations; FSW, MSM/TG and PWID is in the excel sheet Appendix 5.

4.4 Estimates of MLM

Table 11 presents the estimates of MLM as per district.

Table 11: Estimates of MLM as per district

Districts	Min	Max
Taplejung	313	504
Sankhuwasabha	337	541
Solukhumbu	174	280
Okhaldhunga	572	919
Khotang	505	811
Bhojpur	593	953
Dhankuta	234	377
Terhathum	293	471
Panchthar	536	861
Ilam	1195	1921
Jhapa	6882	11063
Morang	5116	8223
Sunsari	2802	4504
Udayapur	1109	1783
Saptari	2387	3837
Siraha	3253	5229
Dhanusha	4149	6669
Mahottari	5769	9274
Sarlahi	3510	5642
Rautahat	3947	6345
Bara	1025	1648
Parsa	1373	2208
Dolakha	786	1263
Sindhupalchok	834	1340
Rasuwa	54	86
Dhading	1922	3089
Nuwakot	924	1485
Kathmandu	2427	3901
Bhaktapur	297	478
Lalitpur	292	470
Kavrepalanchowk	351	565
Ramechhap	696	1119
Sindhuli	681	1094

Districts	Min	Max
Makwanpur	566	910
Chitwan	3797	6103
Gorkha	2032	3267
Manang	15	24
Mustang	46	75
Myagdi	406	653
Kaski	3597	5781
Lamjung	1300	2089
Tanahu	4143	6660
Nawalparasi (East)	4696	7548
Syangja	4757	7646
Parbat	2064	3318
Baglung	4964	7980
Rukum (East)	453	728
Rolpa	4060	6526
Pyuthan	12767	20522
Gulmi	10167	16343
Arghakhachi	8629	13871
Palpa	6619	10639
Nawalparasi (West)	3099	4981
Rupandehi	10571	16992
Kapilvastu	10828	17405
Dang	10834	17414
Banke	7089	11395
Bardiya	8165	13125
Dolpa	40	65
Mugu	233	375
Humla	119	191
Jumla	731	1176
Kalikot	1811	2911
Dailekh	8329	13388
Jajarkot	1548	2488
Rukum (West)	2666	4285
Salyan	3712	5967
Surkhet	10893	17511
Bajura	4756	7645
Bajhang	11169	17953
Darchula	2724	4378
Baitadi	9753	15677
Dadeldhura	6667	10718
Doti	13142	21125
Achham	16580	26652
Kailali	38865	62473
Kanchanpur	23985	38555
Total	338723	544480

4.5 Other Method Findings

The results from the service multiplier, capture-recapture (CRC), and network scale-up methods, along with provincial and national-level estimates based on Bayesian synthesis and data extrapolation, are provided in Appendix 7.

CHAPTER V:

DISCUSSION AND CONCLUSION

5.1 Strengths

This survey employed multiple methods to map and estimate the size of key populations, including Geographical Mapping, Capture-Recapture, Network Scale-Up, Service Multiplier, and Hotspot Observations. These methods align with best practices for estimating key population sizes, enhancing the reliability and validity of the estimates. Future analyses could benefit from incorporating Bayesian models to further improve accuracy and provide more detailed estimates.

5.2 Limitations

Hotspot-Based Limitations: Mapping studies are restricted to hotspots where intervention programs are active, capturing a significant portion of KPs frequenting these areas but potentially missing those who visit less regularly or congregate in unmonitored locations.

Key Informant Dependency: The reliance on key informants (KIs) for estimating KP sizes rather than direct observation introduces potential inaccuracies, as these estimates may not fully reflect the actual population sizes.

Definition Compliance: Ensuring that individuals identified by KIs align accurately with KP definitions can be difficult, risking inclusion of non-target populations in estimates.

Network Size Reporting Bias: KP respondents may provide biased estimates of their social network sizes, which could result in an over- or under-estimation of KP sizes.

Systematic Biases in PSE: Reaching all KPs inherently presents challenges, and PSE studies are subject to systematic biases that are challenging to mitigate through statistical methods alone.

Venue Reporting and Outreach: There is a possibility that certain venues were missed by outreach workers, which could underestimate KP size estimates. Additionally, only venues with active outreach services were included, potentially excluding other relevant sites.

Variability in Key Informant Estimates: Key informant-based estimates can vary, with some respondents potentially overestimating or underestimating KP sizes at their venues.

Stigmatization and Underreporting: Due to stigmatization, KP members may underreport behaviors, leading to potential underestimation of actual KP sizes.

Hotspot Congregation Limitations: Estimates are based on KPs who gather at identifiable hotspots, excluding those who do not congregate at such sites and are thus not represented in multiplier and capture-recapture analyses.

Mismatch in Multiplier-Based Estimates for FSW: There are discrepancies in multiplier-based estimates for Female Sex Workers (FSW) as community-based organizations (CBOs) primarily distribute condoms to high-risk FSW, which may not accurately reflect the total FSW population.

Capture-Recapture Assumptions: Accurate population estimates from capture-recapture (CRC) depend on four assumptions: a closed population, independent captures, accurate capture

history, and homogeneous capture probability. Violation of these assumptions affects CRC accuracy. For example, not all members of target populations may have an equal chance of being tagged, leading to uneven distribution.

Network Scale-Up (NSU) Biases: NSU estimates depend on the extent to which KPs disclose behaviors to others within their social networks, introducing biases that have been corrected to some extent in the analysis.

Comparability to Previous PSE Rounds: Results are broadly comparable to the 2016 PSE round, with slightly higher estimates for FSW and PWID populations in 2024.

5.3 Conclusion

Despite its limitations, this survey's findings can guide programme planners to develop more targeted HIV prevention strategies and enhance programme coverage. The mapping exercise provides the detailed data of each mapped districts, including the number and list of hotspots (35 districts for FSW, 36 districts each for MSM/TG and PWID) along with PSE. While other methods used about 10 districts data for the estimations, the geographical mapping exercise covered all program districts. The findings were triangulated with routine program data and validated with representatives from the communities and program implementers. Therefore, these geographical mapping estimates serve as the primary data for program planning and implementation HIV prevention programs.

The knowledge gained from this survey supports to the development of micro plans to strategic service delivery. This PSE survey provides essential information about the size, distribution, and characteristics of KPs in a systematic and scientific manner. Importantly, the process involved civil society and community organizations representing and working with KPs, this leads to greater ownership of data and should result in more strategic delivery of services and increased uptake of interventions.

5.4 Recommendations

When implementing future IBBS, data should be collected on whether KPs visit outdoor venues or not, to obtain estimates of those who do not frequently visit hotspots. That would enable to obtain adjustment factors for a hidden population in the next round of mapping.

When conducting next round of mapping, we should ensure that all hotspots where KPs congregate are mapped, and not only those where outreach services are provided.

- Virtual mapping should be conducted to obtain estimates of the number of KPs that seek partners via virtual platforms. This would result in development of virtual interventions specific for this sub-set of KPs.
- Consideration should be done for further implementation of NSU as a PSE method when conducting health surveys in a general population.
- Continuation of implementation of multiple PSE methods and high-quality data collection by timely preparation of activities and robust selection and training of staff.

5.4.1 Continuity of Bayesian Modeling for future PSE

- **Expand Bayesian Modeling:** Integrate multiple estimation methods through Bayesian modeling to create a single, reliable population estimate across different areas.

- **Apply Anchored Multiplier Widely:** Use the Anchored Multiplier with Bayesian modeling in more districts to get a broader, representative population estimate.
- **Use Bayesian Estimates to Adjust Programs:** Update programs based on Bayesian estimates, targeting underserved and high-risk areas effectively.
- **Plan for Future Scenarios:** Apply Bayesian modeling to assess potential changes in population sizes, preparing for shifts due to factors like urbanization and migration.

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APPENDICES

Appendix 1: List of Mapped districts

S. No	Province	District
1.	Bagmati	Bhaktapur
2.	Bagmati	Kathmandu
3.	Bagmati	Kavre
4.	Bagmati	Lalitpur
5.	Bagmati	Makwanpur
6.	Bagmati	Nuwakot
7.	Bagmati	Chitwan
8.	Madhesh	Bara
9.	Madhesh	Siraha
10.	Madhesh	Saptari
11.	Madhesh	Dhanusha
12.	Madhesh	Mahottari
13.	Madhesh	Parsa
14.	Madhesh	Rautahat
15.	Madhesh	Sarlahi
16.	Province 1	Udaipur
17.	Province 1	Jhapa
18.	Province 1	Morang
19.	Province 1	Sunsari
20.	Sudurpaschim	Doti
21.	Sudurpaschim	Kailali
22.	Sudurpaschim	Kanchanpur
23.	Karnali	Salyan
24.	Karnali	Surkhet
25.	Gandaki	Baglung
26.	Gandaki	Kaski
27.	Gandaki	Tanahun
28.	Gandaki	Nawalparasi East
29.	Gandaki	Mustang
30.	Lumbini	Kapilvastu
31.	Lumbini	Nawalparasi West
32.	Lumbini	Rupandehi
33.	Lumbini	Banke
34.	Lumbini	Bardiya
35.	Lumbini	Dang
36.	Lumbini	Palpa

Appendix 2: Formulas used for applying adjustment

Analysis of programmatic mapping data

The following formula was used to adjust for mobility:

$$S_2 = S_1 (1 - p_1) + (S_1 * p_1 / m_1)$$

S_2 = estimated number of KP individuals at a venue adjusted for mobility

S_1 = crude number of KP individuals at a venue

p_1 = proportion of KP individuals that visit more than one venue on a peak day

m_1 = mean number of venues that KP members visit on a peak day

The following formula was used to further adjust for the population that is hidden:

$$S_3 = S_2 (1 - p_2)$$

S_3 = estimated number of KP individuals at a venue adjusted for mobility and the hidden population

S_2 = number of KP individuals at a venue adjusted for mobility

P_2 = proportion of KP individuals that are hidden, i.e., do not visit venues that are mapped

The adjusted estimates for each KP were divided by the size of the total male and female population using census data, to obtain population proportions.

Appendix 3: Questionnaire

L2 Formats

1	Type of Key Informant (Please identify and select the respondent KP or Non_KP, who can give best information about this hotspot)				
		KP FSW	1		
		Taxi Driver	2		
		Client	3		
		Pimp	4		
		Staff of NGO/CBO/ Outreach Worker	5		
		Street Vender (Chai, Paan)	6		
		Establishment Owner/Manager	7		
		Security Guard/Bouncer	8		
		Establishment Staff/Bar or club worker	9		
		Other (specify)	96		
1a	How old are you: _____ years <i>If younger than 18 years, please end the interview.</i>				
1b	Visit of this hotspot: Visit one(Capture one)_____1 visit two (Capture two)_____2 Visit three (Capture three)_____3				
1c	Do females visit this hotspot to look for clients to have sex in exchange for money or goods? INTERVIEWER: If respondent says no or don't know, or no response, please end the interview .	Yes	1		
		No	2		
		Don't know	8		
		No response	9		
2	Select the code that best describes the type of hotspot				
		Disco	1	Park	12
		Dance Bar	2	Market	13
		Restaurant	3	Bus Stand	14
		Massage Parlor	4	Street – (Urban)	15
		Local Bar/Bar	5	Jungle	16
		Dohori	6	Highway – (Outside the city)	17
		Hotel/Lodge	7	Private home	18
		Casino	8	Flat	19
		Khaja ghar/snacks outlet	20	Taxi stand	21
		Cinema Hall	10	Other (specify)	96
		Beauty Parlor	11		
		INTERVIEWER: If coded 1 in q1 (and respondent is KP) continue the interview if coded 2 to 96 in q1(respondent is non KP), skip to Q4 .			
Capture 1:					
2a	Have you been already approached and interviewed by staff from the organization INPL like me (Please show your ID card) in the past 30 days, and who are working on the study that aims to estimate the number of FSW in this area? <i>If yes, please end the interview.</i>	Yes	1		
		no	2		

3f	Sometimes men give money or gifts to women for sex. Has a man other than your main partner given money or valuable goods to you in the past 12 months for having sex with him? If yes, skip to Q4, If no and "Don't know", please end the interview Please circle one .	Yes	1
		No	2
	INTERVIEWER: If respondent says no or don't know, please end the interview .	Don't know	8
	Capture 2 : Ask this section for the respond if coded 1 in q1 and coded 2 in q1b		
3c2	Sometimes men give money or gifts to women for sex. Has a man other than your main partner given money or valuable goods to you in the past 12 months for having sex with him? If no and "Don't know", please end the interview .	Yes	1
		No	2
		Don't know	8
C2a	Have you been already approached by staff from the organization INPL like me (show your ID card) in the past two days, and who are working on the study that aims to estimate the number of FSW in this area? Have they offered you a _____ (mention here the object or show here capture 2 object)? If no, continue and if yes, end the interview.	Yes	1
		no	2
C2b	Can I please give you this object? Can you please keep this object with you in the following 4 weeks and remember that you received it? You might be asked whether you received it in the following 2-3 weeks by another outreach worker at this or another site in this city. Please do not give it to another person. <i>If accepted the object, Give a respondent an object for Capture 2</i> If refused the object, End the interview .	Accepted the object	1
		Refused the object	2
C2c	Did you receive an object from the INPL staff like me (show your ID card) last week? If yes, continue, if no, skip to Q4 and If refuse to answer, End the interview .	yes	1
		no	2
		Refuse to answer	3
C2d	Can you please show me this object? If Respondent showed the right object, end the interview . If Refuses to show, End the interview .	Respondent showed the right object	1
		Respondent says she got the object but does not have it with her	2
		Refuses to show	3
C2e	Can you please have a look at this card and tell me which object you received? Show a respondent a laminated card If refuse to answer, End the interview .	Showed an appropriate object	1
		Showed a wrong object	2
		Refuses to show	3
	Capture 3: : Ask this section for the respond if coded 1 in q1 and coded 3 in q1b .		
3c3	Sometimes men give money or gifts to women for sex. Has a man other than your main partner given money or valuable goods to you in the past 12 months for having sex with him? If no and "Don't know", please end the interview .	Yes	1
		No	2
		Don't know	8

C3a	Have you been already approached by staff from the organization INPL like me (<i>show your ID card</i>) in the past two days, and who are working on the study that aims to estimate the number of FSW in this area? Have they offered you _ (<i>mention here the object, or show the capture 3 object</i>)? If no, continue if yes, end interview.	yes	1						
		no	2						
C3b	Did you receive an object from the INPL staff like me (<i>show your ID card</i>) two weeks ago? If yes, continue, if no, skip to qC3e and If refuse to answer, end the interview .	yes	1						
		no	2						
		Refuse to answer	3						
C3c	Can you please show me this object? If Respondent showed the right object, skip to qc3e, If Refuses to show, End the interview If respondent says she got the object but does not have it with her, continue .	Respondent showed the right object	1						
		Respondent says she got the object but does not have it with her	2						
		Refuses to show	3						
C3d	Can you please have a look at this card and tell me which object you received? Show a respondent a laminated card. If refuse to answer, End the interview .	Showed an appropriate object	1						
		Showed a wrong object	2						
		Refuses to show	3						
C3e	Did you receive an object from the outreach worker a week ago? If yes, continue, If a person did not receive any objects so far (if if coded 2 in this question and also code 2 in qC3b skip to Q4 If refuse to answer, End the interview .	yes	1						
		no	2						
		Refuse to answer	3						
C3f	Can you please show me this object? If respondent showed the object end the interview . If Respondent says she got the object but does not have it with her, continue. If Refuses to show, End the interview .	Respondent showed the right object	1						
		Respondent says she got the object but does not have it with her	2						
		Refuses to show	3						
C3g	Can you please have a look at this card and tell me which object you received? Show a respondent a laminated card. If refuse to answer, End the interview.	Showed an appropriate object	1						
		Showed a wrong object	2						
		Refuses to show	3						
4	During an average week, how many female sex workers usually come to this hotspot to look for clients? (Please provide a range. If respondent does not know or does not give any response, please code 888 or 999 respectively). INTERVIEWER: If respondent says don't know or does not respond, please end the interview .	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table> MIN				<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table> MAX			
5	During an average week, how many female sex workers who come to this hotspot also go to other hotspot to look for clients? By other hotspot I mean Discos, Dance Bars, Cabin Restaurants, Massage Parlors, Local Bars, Dohoris, Hotel/Lodges, Casinos, Restaurants, Cinema Hall, Beauty Parlors or any other similar venue. Please provide a range. If respondent does not know or does not give any response, please code 999.	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table> MIN				<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr></table> MAX			

6	<p>Among those female sex workers who also go to other venues (<i>please refer to Q5</i>), on average how many venues do you think they go to during an average week, including this one?</p> <p>Please provide a range. If respondent does not know or does not give any response please code 999.</p>	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> MIN	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> MAX
7	<p>Among sex workers who come to this hotspot, how many of them come weekly? Biweekly? Monthly, Ect?</p> <p>INTERVIEWER: Please read each response and fill in the number. Do not leave any box blank.</p> <p>Please make sure that the max and min values previously recorded in Q4 are satisfied (i.e. sum of the mins should add up to the min in Q4 and sum of the maxes should add up to the max in Q4) .</p>	<p>At least once a week</p> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> MIN	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> MAX
<p>INTERVIEWER: Please read each response and fill in the number. Do not leave any box blank.</p>		<p>Less than once a week but at least once in a month</p> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> MIN	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> MAX
<p>Please make sure that the max and min values previously recorded in Q4 are satisfied (i.e. sum of the mins should add up to the min in Q4 and sum of the maxes should add up to the max in Q4) .</p>		<p>Around once a month</p> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> MIN	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> MAX
<p>Please make sure that the max and min values previously recorded in Q4 are satisfied (i.e. sum of the mins should add up to the min in Q4 and sum of the maxes should add up to the max in Q4) .</p>		<p>Less than once in a month but more than once in three months</p> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> MIN	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> MAX
<p>Please make sure that the max and min values previously recorded in Q4 are satisfied (i.e. sum of the mins should add up to the min in Q4 and sum of the maxes should add up to the max in Q4) .</p>		<p>Less than once in three months but more than once in six months</p> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> MIN	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> MAX
8	<p>How many sex workers who come to this hotspot (<i>refer to Q4</i>) do you think also go to other districts to look for client? <i>If respondent does not know or does not give any response please code 888 or 999 respectively .</i></p>	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> MIN	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> MAX
9	<p>How many FSW do you know who live or work in this district?</p> <p>Please provide a range. If respondent does not know or does not give any response please code 888 or 999 respectively .</p> <p>INTERVIEWER: If response is 0, 888 or 999, skip to Q10.</p>	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> MIN	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> MAX
10	<p>How many of the FSW that you know who live or work in this district (<i>refer to Q9</i>) do not EVER come to ANY hotspots to look for clients?</p> <p>Please provide a range. If respondent does not know or does not give any response please code 888 or 999 respectively.</p>	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> MIN	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> MAX
11	<p>How many sex workers who come to this hotspot (<i>refer to Q4</i>) do you think use social media or websites to look for clients?</p> <p>Please provide a range. If respondent does not know or does not give any response please code 888 or 999 respectively .</p>	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> MIN	<div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 30px; height: 20px; display: inline-block;"></div> MAX

	Service multiplier (Ask the following questions only for FSW KP)		
12	In the past 6 months (from December 2023 – May 2024), have you received condoms from the NGO _____ (name here of the service provider NGO of (sample districts from the list provided) that has data for the multiplier)?	yes	1
		no	2
13	In the past 6 months (from December 2023 – May 2024), were you tested for HIV by staff of the NGO _____ (name here of the NGO that has data for the multiplier)?	yes	1
		no	2
14	In the past 6 months (from December 2023 – May 2024), were you tested for syphilis by staff of the NGO _____ (name here of the NGO that has data for the multiplier)?	yes	1
		no	2
15	Do you also find clients using virtual venues such as social apps, facebook, or whatsapp or some other internet pages? If no skip to Q17.	yes	1
		no	2
16	Which social media/ mobile app/website do you use to contact clients? (Select all apply)	Imo	A
		WhatsApp	B
		Facebook	C
		messengers	D
		Instagram	E
		Other (specify)_____	X
17	(Display only for Capture 1 of recapture sample districts) Can I please give you this object? Can you please keep this object with you in the following 4 weeks and remember that you received it? You might be asked whether you received it in the following 1-2 weeks by another INPL staff at this or another site in this city. Please do not give it to another person. Give a respondent an object for Capture 1 .	Accepted the object	1
		Refused the object	2

Appendix3: Questionnaire

L2 Formats

TOOL L2 FORM FOR FSW –ENGLISH												
Form serial number					5.Location			2.Date of interview				
					Urban	1						
Province name/code				District name/code	Rural	2	DD	MM	YY			
Talika_____					Ward number							
Type of Key Population					FSW	1	→	Continue				
					TGW/MSM	2	→	Skip to L2 Format for TG/MSM				
					PWID	3	→	Skip to L2 Format for PWI				
L2 Format for FSWs												
Is this existing hotspots(as per the list) or new hotspot							Existing New (Please specify_____)			1 2		
Hotspot area code					Hotspot code							
Hotspot Area Name/code_____												
Hotspot Name/code_____												
Interviewer name/ Code												
Type of FSW 1 – Establishment 2 – Street 3 Home (Circle One)												
UNIQUE ID												
GPS Coordinates												

THANK THE RESPONDENT AND END THE INTERVIEW

L2 Formats for TG/MSW/MSM

TOOL L2 FORM FOR MSM/MSW/TG-ENGLISH												
Form serial number						Location			Date of interview			
						Urban	1					
Palika Name_____		Ward number				Rural	2	DD	MM	YY		
Is this existing hotspots(as per the list) or new hotspot							Existing New (Please specify_____)			1 2		
Hotspot area code						Hotspot code						
4.District Name /code _____				3. Province name/code-----Hotspot Area Name/code_____								
Hotspot Name/code_____							1.Interviewer name/ Code					
UNIQUE ID												
GPS Coordinates												

1	Type of Key Informants INTERVIEWER, (Please identify and select the respondent KP or Non_KP, who can give best information about this hotspot)	KP TGW	1	
		KP TGSW	2	
		KP(MSM)	3	
		KP MSW	4	
		Staff of NGO/CBO	5	
		Outreach Worker	6	
		Establishment Manager/Owner	7	
		Street Vender (Chai, Paan Wallah)	8	
		Patron of Establishment	9	
		Pimp	10	
		Police	11	
	Other Specify	96		
1a	How old are you: _____ years	<input type="text"/>	<input type="text"/>	<input type="text"/>
	<i>If younger than 18 years, please end the interview.</i>			
1b	Visit of this hotspot: Visit one(Capture one)_____1 visit two (Capture two)_____2 Visit three (Capture three)_____3			
1c	Do men visit this location to meet friends or look for male sexual partners? INTERVIEWER: If respondent says no or don't know, or no response, please end the interview.	Yes	1	
		No	2	
		Don't know	8	
		No response	9	
2	Select the code that best describes the type of hotspot	Park	1	
		Street	2	
		Bus Stand	3	
		Highway	4	
		Massage Parlor	5	
		Hotel/ Lodge	6	

	Dohari Restaurant	7
	Local Bar (Bhatti Pasal)	8
	Barber Shop/Beauty Parlor	9
	Dance Bar Restaurant	10
	Cabin Restaurant	11
	Disco	12
	Market	13
	Jungle	14
	Other Specify	96

INTERVIEWER: If coded 1 to 4 in q1 (and respondent is KP) continue the interview if coded 5 to 96 in q1 (respondent is non KP), skip to Q4 .

Capture 1:

2a	Have you been already approached and interviewed by staff from the organization INPL like me (Please show your ID card) in the past 30 days, and who are working on the study that aims to estimate the number of TG/MSW/MSM in this area? <i>If yes, please end the interview.</i>	yes	1
		no	2
3m	Men who have sex with men come to this location to find partners. Have you had sex with another men in the past 12 months? <i>If yes, skip to Q4, If no and "Don't know", please end the interview. Please circle one.</i>	Yes	1
		No	2
		Don't know	8
Capture 2: Ask this section for the respond if coded 1 to 4 in q1 and coded 2 in q1b			
3c2	Men who have sex with men come to this location to find partners. Have you had sex with other men in the past 12 months? If no and "Don't know", please end the interview .	Yes	1
		No	2
		Don't know	8
C2a	Have you been already approached by staff from the organization INPL in the past two days, and who are working on the study that aims to estimate the number of TG/MSW/MSM in this area? Have they offered you a _____ (<i>mention here the object or show here capture 2 object</i>)? <i>If no continue and if yes, end interview .</i>	yes	1
		no	2
C2b	Can I please give you this object? Can you please keep this object with you in the following 4 weeks and remember that you received it? You might be asked whether you received it in the following 2-3 weeks by another INPL staff at this or another site in this city. Please do not give it to another person. <i>If accepted the object, Give a respondent an object for Capture 2 If refused the object, End the interview .</i>	Accepted the object	1
		Refused the object	2
C2c	Did you receive an object from the INPL staff like me (show your ID card) last week? <i>If yes, continue, if no, skip to Q4 and If refuse to answer, End the interview.</i>	yes	1
		no	2
		Refuse to answer	3

C2d	Can you please show me this object? If Respondent showed the right object, end the interview. If Refuses to show, End the interview .	Respondent showed the right object	1
		Respondent says he got the object but does not have it with her	2
		Refuses to show	3
C2e	Can you please have a look at this card and tell me which object you received? Show a respondent a laminated card If refuse to answer, End the interview .	Showed an appropriate object	1
		Showed a wrong object	2
		Refuses to show	3
	Capture 3: Ask this section for the respond if coded 1 to 3 in q1 and coded 3 in q1b		
3c3	Men who have sex with men come to this location to find partners. Have you had sex with other men in the past 12 months? If no and "Don't know", please end the interview.	Yes	1
		No	2
		Don't know	8
C3a	Have you been already approached by staff from the organization _ INPL like me (show your ID card) in the past two days, and who are working on the study that aims to estimate the number of TG/MSW/MSM in this area? Have they offered you _ (mention here the object)? If no, and the interview and if yes, end interview.	Yes	1
		No	2
C3b	Did you receive an object from the outreach worker two weeks ago? If yes, continue, if no, skip to c3e and If refuse to answer, end the interview .	yes	1
		no	2
		Refuse to answer	3
C3c	Can you please show me this object? If Refuses to show, End the interview If respondent says she got the object but does not have it with her, continue .	Respondent showed the right object	1
		Respondent says he got the object but does not have it with her	2
		Refuses to show	3
C3d	Can you please have a look at this card and tell me which object you received? Show a respondent a laminated card. If refuse to answer, End the interview.	Showed an appropriate object	1
		Showed a wrong object	2
		Refuses to show	3
C3e	Did you receive an object from the outreach worker a week ago? If yes, continue, If a person did not receive any objects so far (if if coded 2 in this question and also code 2 in qC3b skip to Q4 If refuse to answer, End the interview .	yes	1
		no	2
		Refuse to answer	3
C3f	Can you please show me this object? If respondent showed the object end the interview If Respondent says she got the object but does not have it with her, continue If Refuses to show, End the interview.	Respondent showed the right object	1
		Respondent says she got the object but does not have it with her	2
		Refuses to show	3

C3g	Can you please have a look at this card and tell me which object you received? <i>Show a respondent a laminated card. If refuse to answer, End the interview.</i>	Showed an appropriate object	1	
		Showed a wrong object	2	
		Refuses to show	3	
4	During an average week, how many TG/MSM come to this hotspot to visit, meet friends, or look for potential male sex partners or clients? INTERVIEWER - Enter <u>TOTAL</u> MIN/MAX in "TOTAL" Among those TG (ref TG number), how many of them are TGSW (TG who receive money or goods in exchange for sex) come to this location? INTERVIEWER – Enter <u>MSM</u> MIN/MAX in "MSM"	TG	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> MAX
		TGSW	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> MAX
		MSM	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> MAX
	Among those MSM (ref MSM number), how many of them are MSWs (Men who receive money or goods in exchange for sex) come to this location? INTERVIEWER – Enter <u>MSM</u> MIN/MAX in "MSM" <i>(Please provide a range for each. If respondent does not know or does not give any response for any of the categories, please code 888 or 999 respectively)</i> INTERVIEWER – If the respondent says "00" for all the categories – Please end the interview.	MSW	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> MAX
5	During a normal week, how many of TG/TGSW/MSM/MSW who come to this location (refer to Q4) also go to other locations to visit, meet friends, or look for potential male sex partners or clients? <i>Please provide a range for each. If respondent does not know or does not give any response, please code 888 or 999 respectively.</i> INTERVIEWER: If respondents says 0, 888 or 999 for all of the categories, SKIP to Q7 .	TG	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> MAX
		TGSW	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> MAX
		MSM	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> MAX
		MSW	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> MAX
6	Among those TG/TGSW/MSM/MSW who also go to other locations during the week (refer to Q5), on average how many locations do you think they go to, including this one? <i>Please provide a range for each. If respondent does not know or does not give any response please code 888 or 999 respectively.</i>	TG	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> MAX
		TGSW	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> MAX
		MSM	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> MAX
		MSW	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> MAX
7	Among TG who come to this location, how many of them come	At least once a week	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>

	<p>every week? Every 2 weeks? Once a month? ETC?</p> <p>INTERVIEWER: Please read each response and fill in the number. Do not leave any box blank. Provide a range for each. If respondent does not know or does not give any response please code 888 or 999 respectively.</p> <p>Please make sure that the min and max values previously recorded in Q4. are satisfied (i.e. the sum of the mins for TG should add up to the min for TG With Q4 and the sum of the maxes for TG should add up to the max for TG in Q4).</p>	Less than once a week but at least once in a month	<input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/>
		Around once a month	<input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/>
		Less than once in a month but more than once in three months	<input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/>
		Less than once in three months but more than once in six months	<input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/>
			MIN	MAX
7.1	<p>Among TGSW who come to this location, how many of them come every week? Every 2 weeks? Once a month? ETC?</p> <p>INTERVIEWER: Please read each response and fill in the number. Do not leave any box blank. Provide a range for each. If respondent does not know or does not give any response please code 888 or 999 respectively.</p> <p>Please make sure that the min and max values previously recorded in Q4. are satisfied (i.e. the sum of the mins for TGSW should add up to the min for TGSW in Q4 and the sum of the maxes for TGSW should add up to the max for TGSW in Q4).</p>	At least once a week	<input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/>
		Less than once a week but at least once in a month	<input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/>
		Around once a month	<input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/>
		Less than once in a month but more than once in three months	<input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/>
		Less than once in three months but more than once in six months	<input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/>
7.3	<p>Among MSM who come to this location, how many of them come every week? Every 2 weeks? Once a month? ETC?</p> <p>INTERVIEWER: Please read each response and fill in the number. Do not leave any box blank. If respondent does not know or does not give any response please code 888 or 999 respectively.</p>	At least once a week	<input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/>
		Less than once a week but at least once in a month	<input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/>
		Around once a month	<input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/>
		Less than once in a month but more than once in three months	<input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/>

	<i>Please make sure that the max and min values previously recorded in Q4. are satisfied (i.e. the sum of the mins for MSM should add up to the min for MSM in Q4 and the sum of the maxes for MSM should add up to the max for MSM in Q4) .</i>	Less than once in three months but more than once in six months	<input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/>
			MIN	MAX
7.4	<p>Among other MSW who come location, how many of them come every week? Every 2 weeks? Once a month? ETC?</p> <p>INTERVIEWER: Please read each response and fill in the number. Do not leave any box blank. <i>If respondent does not know or does not give any response please code 888 or 999 respectively .</i></p> <p><i>Please make sure that the min and max values previously recorded in Q4. are satisfied (i.e. the sum of the mins for other MSW should add up to the min for other MSW in Q4 and the sum of the maxes for other MSW should add up to the max for other MSW in Q4) .</i></p>	At least once a week	<input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/>
		Less than once a week but at least once in a month	<input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/>
		Around once a month	<input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/>
		Less than once in a month but more than once in three months	<input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/>
		Less than once in three months but more than once in six months	<input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/>
			MIN	MAX
8	<p>How many TGW/TGS/MSM/MSW who come to this hotspot (refer to Q4) do you think also go to other districts to look for male sexual partners?</p> <p><i>If respondent does not know or does not give any response please code 888 or 999 respectively .</i></p> <p>If respondent says 0, 888 or 999, SKIP to Q15 .</p>	TG	<input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> MAX
		TGSW	<input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> MAX
		MSM	<input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> MAX
		MSW	<input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> MAX
9	<p>How many TGW/TGS/MSM/MSW do you know who live or work in this district?</p> <p><i>(Please provide a range, If respondent say don't know and not give any response please code 88 and 99 respectively) .</i></p>	TG	<input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> MAX
		TGSW	<input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> MAX
		MSM	<input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> MAX
		MSW	<input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> MAX

10	How many of the TGW/TGS/MSM/MSW that you know who live or work in this district (refer to Q9) do not EVER come to ANY location to visit, meet friends or look for potential male sex partners? (Please provide a range, if respondent say don't know and not give any response, please code 88 and 99 respectively) .	TG	<input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> MAX
		TGSW	<input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> MAX
		MSM	<input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> MAX
		MSW	<input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> MAX
11	How many TGW/TGS/MSM/MSW who come to this location (refer to Q4) do you think use social media or websites to look for male sexual partners or clients? Please provide a range. If respondent does not know or does not give any response please code 888 or 999 respectively .	TG	<input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> MAX
		TGSW	<input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> MAX
		MSM	<input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> MAX
		MSW	<input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> MAX
Service multiplier (Ask the following questions only for TG/TGS/MSM/MSW KP)				
12	(Ask the following questions for KP only) In the past 6 months (from December 2023 – May 2024), have you received condoms from the NGO _____ (name here of the service provider NGO of (sample districts from the list provided) that has data for the multiplier .	yes		1
		no		2
12.1	In the past 6 months (from December 2023 – May 2024), have you received lubricant from the NGO _____ (name here of the NGO that has data for the multiplier)?	yes		1
		no		2
13	In the past 6 months (from December 2023 – May 2024), were you tested for HIV by staff of the NGO _____ (name here of the NGO that has data for the multiplier)?	yes		1
		no		2
14	In the past 6 months (from December 2023 – May 2024), were you tested for syphilis by staff of the NGO _____ (name here of the NGO that has data for the multiplier)?	yes		1
		no		2
15	Do you also find male sexual partner using virtual venues such as social apps, facebook, or whatsapp or some other internet pages? If no skip to Q17.	yes		1
		no		2
16	Which social media/ mobile app/website do you use to contact male sexual partner? (Please read all listed social media) Select all apply	Facebook		A
		messenger groups		B
		Snapchat		C
		Emo		D
		Grindr		E
		Tinder		F
		Pen.		G
		Glasses		H
		Heesay		I
		Instagram		J
Other (Specify)____		X		

17	(Display only for Capture1 of recapture sample districts) Can I please give you this object? Can you please keep this object with you in the following 4 weeks and remember that you received it? You might be asked whether you received it in the following 1-2 weeks by another INPL staff at this or another site in this city. Please do not give it to another person. <i>Give a respondent an object for Capture 1.</i>	Accepted the object	
		Refused the object	

THANK THE RESPONDENT AND END THE INTERVIEW

L2 Formats for PWDs

TOOL L2 FORM FOR PWID ENGLISH									
Form serial number				1.Location			2.Date of interview		
				Urban	1				
Province name/code		District name/code		Rural	2	DD	MM	YY	
Palika name_____				Ward number					
UID									
GPS coordinates:									

1	Type of Key Informants INTERVIEWER Please circle one.	1	Male PWID		9	Taxi/auto driver
		2	Female PWID		10	General people
		3	Peer/Outreach Worker		11	Barbar shop
		4	NGO/CBO worker		12	Teacher
		6	Pharmacy Shop		13	Bus driver
		7	Street Vendor (Chai, Paan)		14	Motor service center mechanics
		8	Hotel/Establishment Owner Manager		15	Worker at brick factory
					96	Other Specify
1a	How old are you: _____ years					<input type="text"/>
<i>If younger than 18 years, please end the interview.</i>						
1b	Visit of this hotspot:					
Visit one(Capture one)_____1 visit two (Capture two)_____2						
Visit three (Capture three)_____3						
1c	Do PWID visit this location to inject drugs?				Yes	1
INTERVIEWER If person says no or don't know, please end the interview.				No	2	
				Don't know	8	
				No response	9	
2	Select the code that best describes the type of hotspot.	1	DIC		10	Construction site
		2	College		11	Temple site
		3	Establishment (e.g. Restaurant, bar, disco, hotel)		12	Barber Shop/Beauty Parlor
		4	Park		13	Custody (Incarceration)
		5	Jungle		14	Rehabilitation Center
		6	Bus Park		15	OST
		7	Public toilet		96	Other Specify
		8	Under the bridge			
	9	River side				
INTERVIEWER: If coded 1 to 2 in q1 (and respondent is KP) continue the interview if coded 3 to 96 in q1(respondent is non KP), skip to Q4 .						

Capture 1:			
	Have you been already approached and interviewed by staff from the organization INPL like me (Please show your ID card) in the past 30 days, and who are working on the study that aims to estimate the number of Male/Female PWID in this area? If yes, please end the interview.	no	2
3p	Have you injected drugs for non-medical purpose in past 12 months? If no and "Don't know", please end the interview.	Yes	1
		No	2
		Don't know	8
	Capture 2: Ask this section for the respond if coded 1 to 2 in q1 and coded 2 in q1b .		
3c2	Have you injected drugs for non-medical purpose in past 12 months? If no and "Don't know", please end the interview .	Yes	1
		No	2
		Don't know	8
C2a	Have you been already approached by staff from the organization INPL like me (show your ID card) in the past two days, and who are working on the study that aims to estimate the number of Male/Female PWID in this area? Have they offered you a _____ (mention here the object or show here capture 2 object)? If yes, end the interview .	yes	1
		no	2
C2b	Can I please give you this object? Can you please keep this object with you in the following 4 weeks and remember that you received it? You might be asked whether you received it in the following 2-3 weeks by another INPL staff at this or another site in this city. Please do not give it to another person. <i>If accepted the object, Give a respondent an object for Capture 2</i> If refused the object, End the interview .	Accepted the object	1
		Refused the object	2
C2c	Did you receive an object from the INPL staff like me (show your ID card) last week? If yes, continue, if no, skip to Q4 and If refuse to answer, End the interview .	yes	1
		no	2
		Refuse to answer	3
C2d	Can you please show me this object? If Respondent showed the right object, end the interview. If Refuses to show, End the interview .	Respondent showed the right object	1
		Respondent says she got the object but does not have it with her	2
		Refuses to show	3
C2e	Can you please have a look at this card and tell me which object you received? <i>Show a respondent a laminated card</i> If refuse to answer, End the interview .	Showed an appropriate object	1
		Showed a wrong object	2
		Refuses to show	3
	Capture 3: Ask this section for the respond if coded 1 to 2 in q1 and coded 3 in q1b .		
3c3	Have you injected drugs for non medical purpose in past 12 months? If no and "Don't know", please end the interview.	Yes	1
		No	2
		Don't know	8

C3a	Have you been already approached by staff from the organization _INPL like me (show your ID card) in the past two days, and who are working on the study that aims to estimate the number of MPWID/FPWID in this area? Have they offered you _ (mention here the object)? or show the capture 3 object)? If no, and the interview and if yes, end interview .	yes	1
		no	2
C3b	Did you receive an object from the INPL staff like me (show your ID card) two weeks ago? If yes, continue, if no, skip to C3e and If refuse to answer, end the interview.	yes	1
		no	2
		Refuse to answer	3
C3c	Can you please show me this object? If Refuses to show, End the interview If respondent says she got the object but does not have it with her, continue .	Respondent showed the right object	1
		Respondent says she got the object but does not have it with her	2
		Refuses to show	3
C3d	Can you please have a look at this card and tell me which object you received? <i>Show a respondent a laminated card.</i> If refuse to answer, End the interview .	Showed an appropriate object	1
		Showed a wrong object	2
		Refuses to show	3
C3e	Did you receive an object from the outreach worker a week ago? If yes, continue, If a person did not receive any objects so far (if if coded 2 in this question and also code 2 in qC3b skip to Q4 . If refuse to answer, End the interview .	yes	1
		no	2
		Refuse to answer	3
C3f	Can you please show me this object? If respondent showed the object end the interview . If Respondent says she got the object but does not have it with her, continue .	Respondent showed the right object	1
		Respondent says she got the object but does not have it with her	2
		Refuses to show	3
C3g	Can you please have a look at this card and tell me which object you received? <i>Show a respondent a laminated card.</i> If refuse to answer, End the interview.	Showed an appropriate object	1
		Showed a wrong object	2
		Refuses to show	3

4	During an average week, how many male and female PWID usually congregate at this location (buy, inject drugs)? If respondent does not know or does not give any response please code 888 or 999 respectively) . If person says don't know or gives no response, please end the interview .	Male PWID	<input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> MAX
		Female PWID	<input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> MAX
5	During an average week, how many of the male and female PWIDS who come to this location (refer to Q4) also go to other locations to buy or inject drugs? Please provide a range for each. If respondent does not know or does not give any response please code 888 or 999 respectively . If 0, 888 or 999- SKIP to Q9 .	Male PWID	<input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> MAX
		Female PWID	<input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> MAX

6	<p>Among those male and female PWIDS who also go to other locations during a normal week (refer to Q5), on average how many locations do you think they go to, including this one?</p> <p>Please provide a range for each. If respondent does not know or does not give any response please code 888 or 999 respectively .</p>	<p># Locations Male</p> <p># Locations Female</p>	<p><input type="text"/><input type="text"/><input type="text"/> MIN</p> <p><input type="text"/><input type="text"/><input type="text"/> MIN</p>	<p><input type="text"/><input type="text"/><input type="text"/> MAX</p> <p><input type="text"/><input type="text"/><input type="text"/> MAX</p>
7	<p>Among MALE PWIDS who come to this location, how many of them come Weekly? Monthly? Etc?</p> <p>INTERVIEWER: Please read each response and fill in the number. Do not leave any box blank.</p> <p>Please make sure that the max and min values previously recorded in Q4. are satisfied i.e. sum of the mins for males should add up to the min for males in Q4 and sum of the maxes for males should add up to the max for males in Q4.</p>	<p>At least once a week</p> <p>Less than once a week but at least once in a month</p> <p>Around once a month</p> <p>Less than once in a month but more than once in three months</p> <p>Less than once in three months but more than once in six months</p>	<p><input type="text"/><input type="text"/><input type="text"/> MIN</p> <p><input type="text"/><input type="text"/><input type="text"/> MIN</p> <p><input type="text"/><input type="text"/><input type="text"/> MIN</p> <p><input type="text"/><input type="text"/><input type="text"/> MIN</p> <p><input type="text"/><input type="text"/><input type="text"/> MIN</p>	<p><input type="text"/><input type="text"/><input type="text"/> MAX</p> <p><input type="text"/><input type="text"/><input type="text"/> MAX</p> <p><input type="text"/><input type="text"/><input type="text"/> MAX</p> <p><input type="text"/><input type="text"/><input type="text"/> MAX</p> <p><input type="text"/><input type="text"/><input type="text"/> MAX</p>
7.1	<p>Among FEMALE PWIDS who come to this location, how many of them come daily? Weekly? Monthly? Etc?</p> <p>INTERVIEWER: Please read each response and fill in the number. Do not leave any box blank.</p> <p>Please make sure that the max and min values previously recorded in Q4. are satisfied i.e. sum of the mins for females should add up to the min for females in Q4 and sum of the maxes for females should add up to the max for females in Q4.</p>	<p>At least once a week</p> <p>Less than once a week but at least once in a month</p> <p>Around once a month</p> <p>Less than once in a month but more than once in three months</p> <p>Less than once in three months but more than once in six months</p>	<p><input type="text"/><input type="text"/><input type="text"/> MIN</p> <p><input type="text"/><input type="text"/><input type="text"/> MIN</p> <p><input type="text"/><input type="text"/><input type="text"/> MIN</p> <p><input type="text"/><input type="text"/><input type="text"/> MIN</p> <p><input type="text"/><input type="text"/><input type="text"/> MIN</p>	<p><input type="text"/><input type="text"/><input type="text"/> MAX</p> <p><input type="text"/><input type="text"/><input type="text"/> MAX</p> <p><input type="text"/><input type="text"/><input type="text"/> MAX</p> <p><input type="text"/><input type="text"/><input type="text"/> MAX</p> <p><input type="text"/><input type="text"/><input type="text"/> MAX</p>
8	<p>How many male/female PWID who come to this hotspot(refer to Q4), do you think also go to other districts for injecting drugs?</p> <p>Please provide a range for each. If respondent does not know or does not give any response please code 888 or 999 respectively .</p>	<p>Male PWID</p> <p>Female PWID</p>	<p><input type="text"/><input type="text"/><input type="text"/> MIN</p> <p><input type="text"/><input type="text"/><input type="text"/> MIN</p>	<p><input type="text"/><input type="text"/><input type="text"/> MAX</p> <p><input type="text"/><input type="text"/><input type="text"/> MAX</p>

9	How many male/female PWID do you know who live or work in this district? <i>Please provide a range for each. If respondent does not know or does not give any response please code 888 or 999 respectively.</i> INTERVIEWER - If 0, 888 or 999 Skip to Q11	Male PWID	<input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> MAX
		Female PWID	<input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> MAX
10	How many of the male/female PWIDs that you know who live or work in this district (<i>refer to Q9</i>) do not EVER come to ANY hotspot to buy/ inject drugs? <i>If respondent does not know or does not give any response please code 888 or 999 respectively.</i>	Male PWID	<input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> MAX
		Female PWID	<input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> MAX
11	How many of the male/female who come to this hotspot (<i>refer to Q4</i>) do you think use social media or websites to find drugs or inject drugs? <i>If respondent does not know or does not give any response please code 888 or 999 respectively.</i>	Male PWID	<input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> MAX
		Female PWID	<input type="text"/> <input type="text"/> <input type="text"/> MIN	<input type="text"/> <input type="text"/> <input type="text"/> MAX
12	(Ask the following questions for KP only) In the past 6 months (from December 2023 – May 2024), have you received condoms from the NGO _____ (<i>name here of the NGO that has data for the multiplier</i>)?	yes		1
		no		2
12.1	In the past 6 months (from December 2023 – May 2024), have you received needle/syringe from the NGO _____ (<i>name here of the NGO that has data for the multiplier</i>)?	yes		1
		no		2
13	In the past 6 months (from December 2023 – May 2024), were you tested for HIV by staff of the NGO _____ (<i>name here of the NGO that has data for the multiplier</i>)?	yes		1
		no		2
15	Do you also use virtual venues such as social apps, facebook or whatsapp or some other internet pages to find access injecting drugs? If no skip to Q17.	yes		1
		no		2
16	Which social media/ mobile app/website do you use to find drugs? Select all apply	Facebook		A
		messenger groups		B
		Tinder		C
		lmo		D
		Viber		E
		merosathi.net,		F
		WhatsApp		G
		Other (specify)_____		X
17	(Display only for Capture1 of recapture sample districts) Can I please give you this object? Can you please keep this object with you in the following 4 weeks and remember that you received it? You might be asked whether you received it in the following 1-2 weeks by another INPL staff at this or another site in this city. Please do not give it to another person. <i>Give a respondent an object for Capture 1.</i>	Accepted the object		1
		Refused the object		2

Appendix 4: Adjusted estimate vs crude ratio

FSW All adjusted estimate vs crude ratio

Table 12: FSW adjusted estimate vs. Crude Ratio

Mapped Districts	FSW (Adj / Crude Ratio)	
	Min PSE	Max PSE
Banke	10.68	10.65
Bara	6.16	5.84
Bardiya	2.69	2.89
Bhaktapur	9.49	9.52
Chitwan	10.90	11.31
Dang	12.63	12.73
Dhanusha	7.78	7.95
Doti	9.50	9.17
Jhapa	9.93	9.91
Kailali	11.82	11.60
Kanchanpur	8.00	7.49
Kapilvastu	5.83	6.33
Kaski	14.56	14.57
Kathmandu	11.60	11.35
Kavrepalanchowk	14.12	14.16
Lalitpur	10.14	9.98
Mahottari	8.56	9.28
Makwanpur	11.12	11.52
Morang	11.40	11.48
Nawalparasi_E	3.98	5.63
Nawalparasi_W	9.30	9.54
Parsa	14.09	13.27
Rautahat	17.24	15.64
Rupandehi	10.92	11.51
Saptari	10.18	10.19
Sarlahi	11.22	10.50
Siraha	7.82	7.67
Sunsari	17.28	17.07
Tanahun	30.64	33.12
Grand total	11.12	11.17

MSM/TG All adjusted estimate vs. crude ratio

Table 13: MSM/TG All adjusted estimate vs. crude ratio

Mapped Districts	TG (Adj / Crude Ratio)		TGsW (Adj / Crude Ratio)		MSM (Adj / Crude Ratio)		MSW (Adj / Crude Ratio)	
	Min PSE	Max PSE	Min PSE	Max PSE	Min PSE	Max PSE	Min PSE	Max PSE
Banke	1.96	1.96	1.51	1.52	2.07	2.07	1.40	1.40
Bara	0.51	0.51	2.05	2.04	1.16	1.16	1.10	1.10
Bardiya	1.56	1.56	1.15	1.15	2.59	2.59	1.70	1.70
Bhaktapur	0.57	0.57	0.58	0.58	0.34	0.34	0.41	0.41

Mapped Districts	TG (Adj / Crude Ratio)		TGsW (Adj / Crude Ratio)		MSM (Adj / Crude Ratio)		MSW (Adj / Crude Ratio)	
	Min PSE	Max PSE	Min PSE	Max PSE	Min PSE	Max PSE	Min PSE	Max PSE
Chitwan	0.73	0.73	0.59	0.59	1.16	1.16	0.51	0.51
Dang	0.81	0.81	0.96	0.96	1.24	1.24	1.95	1.95
Dhanusha	0.81	0.81	0.61	0.61	0.61	0.61	0.27	0.27
Doti	0.82	0.81	0.66	0.66	0.86	0.86	0.52	0.51
Jhapa	0.32	0.32	0.14	0.14	0.66	0.66	0.44	0.44
Kailali	1.65	1.65	0.51	0.51	1.33	1.33	0.57	0.57
Kanchanpur	0.71	0.71	0.40	0.40	0.86	0.86	1.15	1.15
Kapilvastu	0.68	0.68	1.55	1.55	0.65	0.65	1.45	1.45
Kaski	2.82	2.82	2.01	2.01	2.44	2.45	2.30	2.30
Kathmandu	0.75	0.75	0.83	0.83	0.86	0.86	0.84	0.84
Kavrepalanchowk	0.59	0.59	0.62	0.63	0.39	0.39	0.17	0.17
Lalitpur	0.43	0.43	0.39	0.39	0.29	0.29	0.26	0.26
Mahottari	1.62	1.62	0.70	0.70	1.40	1.40	0.76	0.76
Makwanpur	1.32	1.32	1.12	1.12	1.32	1.32	1.05	1.05
Morang	0.20	0.20	0.12	0.12	0.20	0.20	0.14	0.14
Nawalparasi_E	0.50	0.50	0.64	0.63	0.50	0.50	0.71	0.71
Nawalparasi_W	1.14	1.14	1.49	1.49	1.10	1.10	2.06	2.06
Parsa	1.26	1.26	1.84	1.84	1.31	1.31	0.97	0.97
Rautahat	0.55	0.55	1.26	1.25	0.79	0.79	0.53	0.53
Rupandehi	0.88	0.88	0.93	0.93	1.39	1.39	1.07	1.07
Salyan	0.94	0.92	1.17	1.16	0.91	0.91	1.06	1.08
Saptari	0.45	0.45	0.24	0.24	0.30	0.30	0.27	0.27
Sarlahi	0.87	0.87	1.46	1.46	1.15	1.15	1.78	1.78
Siraha	0.44	0.44	0.33	0.33	0.56	0.55	0.58	0.58
Sunsari	0.11	0.11	0.20	0.20	0.41	0.41	0.69	0.69
Surkhet	0.83	0.84	1.21	1.21	0.78	0.78	0.95	0.95
Udaipur	1.91	1.90	1.77	1.76	3.19	3.19	2.20	2.19
Grand Total	0.71	0.72	0.65	0.65	0.77	0.77	0.65	0.65

PWID All adjusted estimate vs. crude ratio

Table 14: PWID All adjusted estimate vs. crude ratio

Mapped Districts	Male PWID (Adj / Crude Ratio)		Female PWID (Adj / Crude Ratio)	
	Min PSE	Max PSE	Min PSE	Max PSE
Banke	3.12	3.21	1.79	1.79
Bardiya	3.19	3.19	2.50	2.53
Bhaktapur	2.68	2.68	1.88	1.70
Chitwan	2.50	2.50	3.36	3.05
Dhanusha	2.95	3.05	4.00	3.63
Jhapa	3.79	4.24	5.27	2.58
Kailali	1.85	1.85	10.00	3.00
Kanchanpur	0.93	0.93	4.00	3.33
Kapilvastu	3.27	3.27	2.94	3.96
Kaski	1.48	1.48	1.72	1.70
Kathmandu	1.00	1.00	0.69	0.62

Mapped Districts	Male PWID (Adj / Crude Ratio)		Female PWID (Adj / Crude Ratio)	
	Min PSE	Max PSE	Min PSE	Max PSE
Lalitpur	1.62	1.62	1.77	1.80
Makwanpur	1.55	1.55	1.20	1.19
Morang	4.71	4.39	1.79	1.48
Parsa	3.09	3.10	5.00	3.67
Rupandehi	1.80	1.80	2.41	2.28
Sarlahi	1.64	1.64	-	-
Siraha	0.57	0.57	0.32	0.31
Surkhet	2.01	2.02	0.86	0.89
Tanahun	2.55	2.55	2.00	1.71
Grand Total	1.94	1.97	1.59	1.61

Appendix 5: Hotspot details of Key Populations

The details of the hotspot of key populations; FSW, MSM/TG and PWID is in the excel sheet below;



Appendix 6: Percentage of KPs that reported receiving services of CBOs, as part of the multiplier method

Table 15: Percentage of FSW that reported receiving services of CBOs in districts where mapping was done

Districts	Received condoms past 6 months	Lower bound 95% CI	Upper bound 95% CI	Received HIV test past 6 months	Lower bound 95% CI	Upper bound 95% CI	Received syphilis test past 6 months	Lower bound 95% CI	Upper bound 95% CI
Bagmati_Kathmandu	71,2%	63,3%	78,0%	78,1%	70,9%	84,0%	71,2%	64,4%	77,1%
Bagmati_Makawanpur	97,6%	90,5%	99,4%	100,0%	100,0%	100,0%	95,2%	88,1%	98,2%
Gandaki_Kaski	92,7%	82,1%	97,3%	93,6%	82,4%	97,9%	92,7%	82,1%	97,3%
Koshi_Jhapa	94,1%	85,3%	97,8%	93,1%	85,8%	96,8%	89,2%	82,4%	93,6%
Lumbini_Banke	96,2%	91,7%	98,3%	96,2%	91,7%	98,3%	94,2%	84,6%	98,0%
Lumbini_Nawalparasi_W	78,1%	57,1%	90,6%	64,1%	43,1%	80,8%	64,1%	43,1%	80,8%
Madhesh_Bara	94,4%	74,4%	99,0%	84,5%	69,7%	92,8%	67,6%	51,3%	80,5%
Madhesh_Dhanusha	99,0%	96,3%	99,8%	99,0%	96,3%	99,8%	95,7%	92,3%	97,6%
Sudurpaschim_Kailali	94,9%	85,5%	98,3%	95,9%	87,6%	98,7%	93,9%	84,3%	97,8%

Table 16: Percentage of MSM that reported receiving services of CBOs in districts where mapping was done

Districts	Received condoms past 6 months	Lower bound 95% CI	Upper bound 95% CI	Received HIV test past 6 months	Lower bound 95% CI	Upper bound 95% CI	Received syphilis test past 6 months	Lower bound 95% CI	Upper bound 95% CI
Bagmati_Kathmandu	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
Bagmati_Lalitpur	75,0%	56,1%	87,5%	81,2%	65,7%	90,7%	76,6%	59,8%	87,8%
Gandaki_Nawalparasi_E	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
Koshi_Morang	97,1%	79,2%	99,7%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
Lumbini_Dang	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
Lumbini_Rupandehi	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
Madhesh_Dhanusha	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
Madhesh_Parsa	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
Sudurpaschim_Kailali	95,0%	67,8%	99,4%	80,0%	48,9%	94,4%	70,0%	43,1%	87,8%

Districts	Received lubricants past 6 months	Lower bound 95% CI	Upper bound 95% CI
Bagmati_Kathmandu	100,0%	100,0%	100,0%
Bagmati_Lalitpur	75,0%	56,1%	87,5%
Gandaki_Nawalparasi_E	100,0%	100,0%	100,0%
Koshi_Morang	97,1%	79,2%	99,7%
Lumbini_Dang	100,0%	100,0%	100,0%
Lumbini_Rupandehi	100,0%	100,0%	100,0%
Madhesh_Dhanusha	100,0%	100,0%	100,0%
Madhesh_Parsa	100,0%	100,0%	100,0%
Sudurpaschim_Kailali	95,0%	67,8%	99,4%

Table 17: Percentage of TGW that reported receiving services of CBOs in districts where mapping was done.

Districts	Received condoms past 6 months	Lower bound 95% CI	Upper bound 95% CI	Received HIV test past 6 months	Lower bound 95% CI	Upper bound 95% CI	Received syphilis test past 6 months	Lower bound 95% CI	Upper bound 95% CI
Bagmati_Kathmandu	99,0%	96,1%	99,7%	99,5%	96,3%	99,9%	99,5%	96,0%	99,9%
Bagmati_Lalitpur	100,0%	100,0%	100,0%	96,3%	77,0%	99,5%	96,3%	77,0%	99,5%
Gandaki_Nawalparasi_E	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
Koshi_Morang	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
Lumbini_Dang	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
Lumbini_Rupandehi	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
Madhesh_Dhanusha	100,0%	100,0%	100,0%	98,5%	89,1%	99,8%	98,5%	89,7%	99,8%
Madhesh_Parsa	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
Sudurpaschim_Kailali	98,4%	93,7%	99,6%	96,9%	92,1%	98,8%	96,9%	92,4%	98,7%

Districts	Received lubricants past 6 months	Lower bound 95% CI	Upper bound 95% CI
Bagmati_Kathmandu	98,4%	95,6%	99,5%
Bagmati_Lalitpur	100,0%	100,0%	100,0%
Gandaki_Nawalparasi_E	100,0%	100,0%	100,0%
Koshi_Morang	100,0%	100,0%	100,0%
Lumbini_Dang	100,0%	100,0%	100,0%
Lumbini_Rupandehi	100,0%	100,0%	100,0%
Madhesh_Dhanusha	98,5%	89,1%	99,8%
Madhesh_Parsa	100,0%	100,0%	100,0%
Sudurpaschim_Kailali	96,1%	91,4%	98,2%

Table 18: Percentage of PWID that reported receiving services of CBOs in districts where mapping was done.

Districts	Received condoms past 6 months	Lower bound 95% CI	Upper bound 95% CI	Received HIV test past 6 months	Lower bound 95% CI	Upper bound 95% CI	Received syringe past 6 months	Lower bound 95% CI	Upper bound 95% CI
Bagmati_Kathmandu	85,3%	75,1%	91,8%	94,1%	89,1%	96,9%	96,8%	93,2%	98,5%
Bagmati_Makawanpur	63,6%	40,2%	82,0%	88,6%	73,7%	95,6%	100,0%	100,0%	100,0%
Gandaki_Kaski	93,5%	84,8%	97,4%	95,7%	88,5%	98,5%	99,3%	97,5%	99,8%
Karnali_Surkhet	96,9%	77,5%	99,6%	90,6%	72,1%	97,3%	100,0%	100,0%	100,0%
Koshi_Morang	40,0%	22,5%	60,4%	52,0%	31,0%	72,4%	86,0%	71,3%	93,8%
Lumbini_Banke	100,0%	100,0%	100,0%	99,0%	93,1%	99,9%	99,0%	93,1%	99,9%
Lumbini_Nawalparasi_W	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
Madhesh_Dhanusha	76,6%	67,4%	83,8%	83,6%	78,1%	87,9%	97,7%	93,8%	99,1%
Madhesh_Parsa	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
Sudurpaschim_Kailali	100,0%	100,0%	100,0%	94,9%	80,3%	98,8%	100,0%	100,0%	100,0%

Appendix 7: Findings of other methods

Findings of Multiplier method

Tables below show the PSE based on the service multiplier method in districts where data collection was done, along with the number of KPs that were given certain services, as per programmatic data obtained from NGOs. The percentage of KPs that reported receiving a service is shown in Appendix 6.

Table 19 shows that the percentage of FSW in the general population of females older than 18 years based on the multiplier method ranged from 0.04% to 0.36% for the first multiplier indicator (receipt of condoms in the past 6 months), 0.04%-0.28% for the second (having an HIV test in the past 6 months) and 0.04%-0.24% for the third (syphilis test in the past 6 months). The highest prevalence of FSW is in the Dhanusha district of the Madhesh province. The highest absolute number of FSW was found in Kathmandu. In some districts, the programme count is very similar to the estimated size of FSW, which implies that there is a dependency between two data sources.

Table 19: Estimated number of FSW based on the service multiplier and the percentage of FSW in the general population of women older than 18 years

Districts	Service Counts	PSE_Est	PSE_LL	PSE_UL	% in GP	% LL	% UL
Received condoms past 6 months							
Bagmati_Kathmandu	791	1111	1014	1251	0,18	0,16	0,2
Bagmati_Makawanpur	72	74	73	80	0,06	0,06	0,06
Gandaki_Kaski	168	182	173	205	0,1	0,1	0,11
Koshi_Jhapa	143	152	147	168	0,05	0,05	0,06
Lumbini_Banke	240	250	245	262	0,16	0,15	0,16
Lumbini_Nawalparasi_W	137	176	152	241	0,15	0,13	0,21
Madhesh_Bara	72	77	73	97	0,04	0,04	0,05
Madhesh_Dhanusha	216	219	217	225	0,36	0,35	0,37
Sudurpaschim_Kailali	426	449	434	499	0,17	0,17	0,19
Had HIV test past 6 months							
Bagmati_Kathmandu	657	841	783	927	0,13	0,13	0,15
Bagmati_Makawanpur	46	47	47	47	0,04	0,04	0,04
Gandaki_Kaski	130	139	133	158	0,08	0,07	0,09
Koshi_Jhapa	140	151	145	164	0,05	0,05	0,06
Lumbini_Banke	181	189	185	198	0,12	0,12	0,13
Lumbini_Nawalparasi_W	80	125	100	186	0,11	0,09	0,16
Madhesh_Bara	67	80	73	97	0,04	0,04	0,05
Madhesh_Dhanusha	170	172	171	177	0,28	0,28	0,29
Sudurpaschim_Kailali	229	239	232	262	0,09	0,09	0,1
Had syphilis test past 6 months							
Bagmati_Kathmandu	746	1048	968	1158	0,17	0,15	0,18
Bagmati_Makawanpur	64	68	66	73	0,05	0,05	0,06
Gandaki_Kaski	113	122	117	138	0,07	0,07	0,08
Koshi_Jhapa	97	109	104	118	0,04	0,04	0,04

Districts	Service Counts	PSE_Est	PSE_LL	PSE_UL	% in GP	% LL	% UL
Lumbini_Banke	161	171	165	191	0,11	0,11	0,12
Lumbini_Nawalparasi_W	59	93	74	137	0,08	0,07	0,12
Madhesh_Bara	62	92	77	121	0,05	0,04	0,06
Madhesh_Dhanusha	139	146	143	151	0,24	0,24	0,25
Sudurpaschim_Kailali	149	159	153	177	0,06	0,06	0,07

PSE_Est= estimated number of a KP; PSE_LL= lower level of the credible interval; PSE_UL= upper level of the credible interval; % GP= percentage of a KP in a general population older than 18 years; % LL= lower level of the credible interval of the percentage of a KP in a general population older than 18 years; % UL = upper level of the credible interval of the percentage of a KP in a general population older than 18 years;

Table 20 shows that the percentage of MSM in the general population of men older than 18 years based on the multiplier method ranged from 0.07% to 0.33% for the first indicator (receipt of condoms), 0.04%-0.13% for the second (HIV test in the past 6 months), 0.03%-0.11% for the third (syphilis test) and 0.07%-0.33% for the fourth (receipt of lubricants). The highest prevalence is in the Dhanusha district of the Madhesh province and the highest absolute number of MSM was found in Kathmandu. The size of MSM seems to be substantially underestimated, possibly due to high dependency between two data sources and non-inclusion of MSM who do not visit outreach venues.

Table 20: Estimated number of MSM based on the service multiplier and the percentage of MSM in the general population of men older than 18 years

	Service count	PSE est	LL	UL	% in GP	% LL	% UL
Received condoms past 6 months							
Bagmati_Kathmandu	582	583	583	583	0,09	0,09	0,09
Bagmati_Lalitpur	271	362	310	483	0,2	0,17	0,27
Gandaki_Nawalparasi_E	-	-	-	-	-	-	-
Koshi_Morang	257	265	258	325	0,09	0,09	0,11
Lumbini_Dang	101	102	102	102	0,07	0,07	0,07
Lumbini_Rupandehi	268	269	269	269	0,1	0,1	0,1
Madhesh_Dhanusha	167	168	168	168	0,33	0,33	0,33
Madhesh_Parsa	144	145	145	145	0,08	0,08	0,08
Sudurpaschim_Kailali	413	435	416	610	0,19	0,18	0,26
Had HIV test past 6 months							
Bagmati_Kathmandu	398	399	399	399	0,06	0,06	0,06
Bagmati_Lalitpur	127	157	140	194	0,09	0,08	0,11
Gandaki_Nawalparasi_E	-	-	-	-	-	-	-
Koshi_Morang	136	137	137	137	0,05	0,05	0,05
Lumbini_Dang	60	61	61	61	0,04	0,04	0,04
Lumbini_Rupandehi	128	129	129	129	0,05	0,05	0,05
Madhesh_Dhanusha	63	64	64	64	0,13	0,13	0,13
Madhesh_Parsa	101	102	102	102	0,06	0,06	0,06
Sudurpaschim_Kailali	136	171	145	279	0,08	0,07	0,12

	Service count	PSE est	LL	UL	% in GP	% LL	% UL
Had syphilis test past 6 months							
Bagmati_Kathmandu	438	439	439	439	0,07	0,07	0,07
Bagmati_Lalitpur	96	126	110	161	0,07	0,07	0,09
Gandaki_Nawalparasi_E	-	-	-	-	-	-	-
Koshi_Morang	114	115	115	115	0,04	0,04	0,04
Lumbini_Dang	36	37	37	37	0,03	0,03	0,03
Lumbini_Rupandehi	111	112	112	112	0,04	0,04	0,04
Madhesh_Dhanusha	54	55	55	55	0,11	0,11	0,11
Madhesh_Parsa	78	79	79	79	0,04	0,04	0,04
Sudurpaschim_Kailali	73	105	84	170	0,05	0,04	0,08
Received lubricants past 6 months							
Bagmati_Kathmandu	552	553	553	553	0,08	0,08	0,08
Bagmati_Lalitpur	270	361	309	481	0,2	0,17	0,27
Gandaki_Nawalparasi_E	-	-	-	-	-	-	-
Koshi_Morang	257	265	258	325	0,09	0,09	0,11
Lumbini_Dang	99	100	100	100	0,07	0,07	0,07
Lumbini_Rupandehi	266	267	267	267	0,1	0,1	0,1
Madhesh_Dhanusha	165	166	166	166	0,33	0,33	0,33
Madhesh_Parsa	143	144	144	144	0,08	0,08	0,08
Sudurpaschim_Kailali	407	429	410	601	0,18	0,18	0,26

PSE_Est= estimated number of a KP; PSE_LL= lower level of the credible interval; PSE_UL= upper level of the credible interval; % GP= percentage of a KP in a general population older than 18 years; % LL= lower level of the credible interval of the percentage of a KP in a general population older than 18 years; % UL = upper level of the credible interval of the percentage of a KP in a general population older than 18 years;

Table 21 shows that the percentage of TGW in the general population of men older than 18 years based on the multiplier method ranged from 0.02% to 0.19% for the first indicator (receipt of condoms), 0.02%-0.09% for the second indicator (HIV test in the past 6 months), 0.01%-0.08% for the third (syphilis test) and 0.02%-0.19% for the fourth (receipt of lubricants). The highest prevalence is in the Dhanusha district of the Madhesh province and the highest absolute number of TGW was found in Kathmandu. Overall, there is little difference between the programme counts and the estimated population size.

Table 21: Estimated number of TGW based on the service multiplier data and the percentage of TGW in the general population of men older than 18 years

	Service count	PSE est	LL	UL	% in GP	% LL	% UL
Received condoms past 6 months							
Bagmati_Kathmandu	118	120	119	123	0,02	0,02	0,02
Bagmati_Lalitpur	91	92	92	92	0,06	0,06	0,06
Gandaki_Nawalparasi_E	-	-	-	-	-	-	-
Koshi_Morang	65	66	66	66	0,03	0,03	0,03
Lumbini_Dang	41	42	42	42	0,03	0,03	0,03
Lumbini_Rupandehi	92	93	93	93	0,04	0,04	0,04

	Service count	PSE est	LL	UL	% in GP	% LL	% UL
Madhesh_Dhanusha	95	96	96	96	0,19	0,19	0,19
Madhesh_Parsa	110	111	111	111	0,06	0,06	0,06
Sudurpaschim_Kailali	75	77	76	81	0,04	0,04	0,04
Received HIV test past 6 months							
Bagmati_Kathmandu	80	81	81	84	0,02	0,02	0,02
Bagmati_Lalitpur	46	48	47	60	0,03	0,03	0,04
Gandaki_Nawalparasi_E							
Koshi_Morang	32	33	33	33	0,02	0,02	0,02
Lumbini_Dang	16	17	17	17	0,02	0,02	0,02
Lumbini_Rupandehi	38	39	39	39	0,02	0,02	0,02
Madhesh_Dhanusha	44	45	45	50	0,09	0,09	0,1
Madhesh_Parsa	78	79	79	79	0,04	0,04	0,04
Sudurpaschim_Kailali	44	46	45	48	0,02	0,02	0,03
Received syphilis test past 6 months							
Bagmati_Kathmandu	93	94	94	97	0,02	0,02	0,02
Bagmati_Lalitpur	30	32	31	39	0,02	0,02	0,03
Gandaki_Nawalparasi_E	-	-	-	-	-	-	-
Koshi_Morang	36	37	37	37	0,02	0,02	0,02
Lumbini_Dang	9	10	10	10	0,01	0,01	0,01
Lumbini_Rupandehi	39	40	40	40	0,02	0,02	0,02
Madhesh_Dhanusha	40	41	41	45	0,08	0,08	0,09
Madhesh_Parsa	65	66	66	66	0,04	0,04	0,04
Sudurpaschim_Kailali	33	35	34	36	0,02	0,02	0,02
Received lubricants past 6 months							
Bagmati_Kathmandu	115	117	116	121	0,02	0,02	0,02
Bagmati_Lalitpur	91	92	92	92	0,06	0,06	0,06
Gandaki_Nawalparasi_E	-	-	-	-	-	-	-
Koshi_Morang	65	66	66	66	0,03	0,03	0,03
Lumbini_Dang	41	42	42	42	0,03	0,03	0,03
Lumbini_Rupandehi	91	92	92	92	0,04	0,04	0,04
Madhesh_Dhanusha	95	97	96	107	0,19	0,19	0,21
Madhesh_Parsa	110	111	111	111	0,06	0,06	0,06
Sudurpaschim_Kailali	75	79	77	83	0,04	0,04	0,04

PSE_Est= estimated number of a KP; PSE_LL= lower level of the credible interval; PSE_UL= upper level of the credible interval; % GP= percentage of a KP in a general population older than 18 years; % LL= lower level of the credible interval of the percentage of a KP in a general population older than 18 years; % UL = upper level of the credible interval of the percentage of a KP in a general population older than 18 years;

Table 22 shows that the percentage of PWID in the general population of men older than 18 years ranged from 0.1% to 1.15% for the indicator on the receipt of condoms, 0.07%-0.91% for an HIV test in the past 6 months, and 0.1%-0.56% for receipt of syringes. The highest prevalence of PWID is in the Dhanusha and Banke districts. The highest estimated size was found in Gandaki for the first indicator, while for other two indicators in Kathmandu. Overall, there is more pronounced difference between the programme counts and the estimated population size for PWID compared to other KPs.

Table 22: Estimated number of PWID from the service multiplier data and the percentage of PWID in the general population of men older than 18 years Received syringe in past 6 months

	Service count	PSE est	LL	UL	% in GP	% LL	% UL
Received condoms in past 6 months							
Bagmati_Kathmandu	332	390	362	443	0,03	0,03	0,04
Bagmati_Makawanpur	782	1229	954	1947	0,44	0,34	0,7
Gandaki_Kaski	2392	2558	2457	2821	0,72	0,69	0,8
Karnali_Surkhet	417	431	419	539	0,2	0,2	0,25
Koshi_Morang	1544	3860	2555	6850	0,58	0,38	1,02
Lumbini_Banke	1730	1731	1731	1731	0,55	0,55	0,55
Lumbini_Nawalparasi_W	803	804	804	804	0,36	0,36	0,36
Madhesh_Dhanusha	990	1294	1183	1469	1,15	1,05	1,3
Madhesh_Parsa	1237	1238	1238	1238	0,33	0,33	0,33
Sudurpaschim_Kailali	466	467	467	467	0,1	0,1	0,1
Received HIV test in past 6 months							
Bagmati_Kathmandu	1561	1659	1611	1753	0,13	0,12	0,13
Bagmati_Makawanpur	328	371	344	445	0,14	0,13	0,16
Gandaki_Kaski	1521	1590	1545	1720	0,45	0,44	0,49
Karnali_Surkhet	291	322	300	404	0,15	0,14	0,19
Koshi_Morang	570	1097	788	1842	0,17	0,12	0,28
Lumbini_Banke	1032	1043	1034	1109	0,33	0,33	0,35
Lumbini_Nawalparasi_W	465	466	466	466	0,21	0,21	0,21
Madhesh_Dhanusha	853	1021	971	1092	0,91	0,86	0,97
Madhesh_Parsa	800	801	801	801	0,22	0,22	0,22
Sudurpaschim_Kailali	303	320	307	378	0,07	0,07	0,08
Received syringe in past 6 months							
Bagmati_Kathmandu	2719	2810	2761	2919	0,21	0,21	0,22
Bagmati_Makawanpur	782	783	783	783	0,28	0,28	0,28
Gandaki_Kaski	2477	2495	2483	2541	0,7	0,7	0,72
Karnali_Surkhet	420	421	421	421	0,2	0,2	0,2
Koshi_Morang	1640	1907	1748	2301	0,29	0,26	0,35
Lumbini_Banke	1752	1770	1755	1882	0,56	0,55	0,59
Lumbini_Nawalparasi_W	803	804	804	804	0,36	0,36	0,36
Madhesh_Dhanusha	991	1015	1000	1057	0,9	0,89	0,94
Madhesh_Parsa	1351	1352	1352	1352	0,36	0,36	0,36
Sudurpaschim_Kailali	466	467	467	467	0,1	0,1	0,1

PSE_Est= estimated number of a KP; PSE_LL= lower level of the credible interval; PSE_UL= upper level of the credible interval; % GP= percentage of a KP in a general population older than 18 years; % LL= lower level of the credible interval of the percentage of a KP in a general population older than 18 years; % UL = upper level of the credible interval of the percentage of a KP in a general population older than 18 years;

Findings of Capture-Recapture method

Tables below show outputs of the CRC method per KP.

Table 23 shows that the median PSE of FSW by CRC in districts ranged from 68 in Banke to 577 in Kathmandu.

Table 23: Estimated number of FSW based on the CRC

FSW	Bayesian Latent Model Output			
	Province and district	Median	95% Lower	95% Upper
Sudurpaschim_Kailali		351	159	884
Madhesh_Dhanusha		394	219	846
Madhesh_Bara		98	82	145
Lumbini_Nawalparasi_W		82	71	117
Lumbini_Banke		68	59	89
Koshi_Jhapa		495	190	1172
Gandaki_Kaski		204	200	217
Bagmati_Makawanpur		100	60	207
Bagmati_Kathmandu		577	378	1340

Table 24 shows that the median PSE of PWID by CRC in districts ranged from 40 in Surkhet to 770 in Kathmandu.

Table 24: Estimated number of PWID based on the CRC

PWID	Bayesian Latent Model Output			
	Province and district	Median	95% Lower	95% Upper
Madhesh_Parsa		50	42	80
Madhesh_Dhanusha		192	131	303
Lumbini_Nawalparasi		77	55	115
Lumbini_Banke		150	100	254
Koshi_Morang		161	77	312
Karnali_Surkhet		40	37	52
Gandaki_Kaski		493	296	850
Bagmati_Makawanpur		76	55	114
Bagmati_Kathmandu		770	422	1455

Table 25 shows that the median PSE of MSM by CRC in districts ranged from 12 in Dhanusha to 221 in Lalitpur.

Table 25: Estimated number of MSM based on the CRC

MSM	Bayesian Latent Model Output			
	Province and district	Median	95% Lower	95% Upper
Sudurpaschim_Kailali		98	50	182
Madhesh_Parsa		69	41	128
Madhesh_Dhanusha		12	10	17
Lumbini_Rupandehi		31	22	51
Lumbini_Dang		67	49	103
Koshi_Morang		69	41	126
Gandaki_Nawalparasi		38	24	65
Bagmati_Lalitpur		221	95	368
Bagmati_Kathmandu		208	105	390

Table 26 shows that the median PSE of TGW by CRC in districts was higher than in MSM, which raises issues around the implementation of the method, ranging from 79 in Lalitpur to 2178 in Parsa.

Table 26: Estimated number of TGW based on the CRC

TGW	Bayesian Latent Model Output		
	Province and district	Median	95%Lower
Sudurpaschim_Kailali	1232	566	2615
Madhesh_Parsa	2178	956	4498
Madhesh_Dhanusha	351	166	692
Lumbini_Rupandehi	243	121	499
Lumbini_Dang	104	56	184
Koshi_Morang	693	314	1444
Gandaki_Nawalparasi_E	85	45	159
Bagmati_Lalitpur	79	43	141
Bagmati_Kathmandu	1465	761	3181

Findings from Network scale-up

The average size of social networks of the general population in Nepal, as obtained from a survey in male migrant workers, is 200 people (93 men and 107 women).

Table 27 shows the NSU-based PSE of FSW, which ranged from 0.26% to 4.88% across the provinces. The correction factor applied to correct for biases was 4.4 (4.34-4.45).

Table 27: Estimated number of FSW based on the NSU

Province	Est number	LL	UL	Est %	LL	UL
Lumbini	4.194	4.085	4.296	0,26	0,25	0,27
Bagmati	28.631	27.918	29.287	1,40	1,36	1,43
Gandaki	9.504	9.263	9.726	1,00	0,98	1,03
Koshi	13.754	13.417	14.064	0,83	0,81	0,84
Madhesh	82.980	80.818	84.980	4,88	4,75	5,00
Sudurpaschim	16.217	15.806	16.595	1,89	1,85	1,94
Karnali	1.871	1.825	1.914	0,38	0,37	0,39

LL= lower level of the 95% credible interval

UL= lower level of the 95% credible interval

Table 28 shows the NSU-based PSE of MSM, which ranged from 0.01% to 1.24% across the provinces. The correction factor applied to correct for biases was 1.66 (1.64-1.69). In Gandaki, no respondent in the male migrant survey reported knowing an MSM.

Table 28: Estimated number of MSM based on the NSU

Province	Est number	LL	UP	Est %	LL	UL
Bagmati	1.578	1.540	1.626	0,08	0,08	0,08
Koshi	194	189	200	0,01	0,01	0,01
Madhesh	20.960	20.464	21.590	1,24	1,21	1,28
Gandaki	-	-	-	-	-	-
Karnali	90	87	92	0,02	0,02	0,02
Lumbini	443	432	456	0,03	0,03	0,03
Sudurpaschim	146	142	150	0,02	0,02	0,02

LL= lower level of the 95% credible interval

UL= lower level of the 95% credible interval.

Table 29. shows the NSU-based PSE of PWID, which ranged from 0.05% to 1.87% across the provinces. The correction factor applied to correct for biases was 2.8 (2.77-2.84).

Table 29: Estimated number of PWID based on the NSU

Province	Est number	LL	UP	Est %	LL	UL
Bagmati	5.889	5.776	6.025	0,15	0,14	0,15
Gandaki	16.029	15.726	16.393	0,97	0,95	0,99
Koshi	27.280	26.770	27.894	0,88	0,86	0,90
Lumbini	1.999	1.960	2.045	0,07	0,07	0,07
Sudurpaschim	12.471	12.227	12.762	0,79	0,78	0,81
Karnali	490	481	502	0,05	0,05	0,05
Madhesh	63.279	62.076	64.721	1,87	1,83	1,91

LL= lower level of the 95% credible interval

UL= lower level of the 95% credible interval

Table 30 shows the NSU-based PSE of TGW, which ranged from 0.02% to 1.40% across the provinces. The correction factor applied to correct for biases was 1.57 (1.55-1.58).

Table 30: Estimated number of TGW based on the NSU

Province	Est number	LL	UP	Est %	LL	UL
Bagmati	3.245	3.166	3.303	0,16	0,15	0,16
Karnali	159	155	162	0,03	0,03	0,03
Lumbini	264	258	269	0,02	0,02	0,02
Madhesh	23.763	23.186	24.193	1,40	1,36	1,42
Gandaki	446	435	454	0,05	0,05	0,05
Koshi	460	449	468	0,03	0,03	0,03
Sudurpaschim	1.360	1.327	1.386	0,16	0,15	0,16

LL= lower level of the 95% credible interval

UL= lower level of the 95% credible interval

Table 31. shows the NSU-based PSE of transgender men (TGM), which ranged from 0.01% to 0.81% across the provinces. The correction factor applied to correct for biases was 1.57 (1.55-1.58).

Table 31: Estimated number of TGM based on the NSU

Province	Est number	LL	UP	Est %	LL	UL
Gandaki	334	326	340	0,05	0,05	0,05
Lumbini	169	165	173	0,01	0,01	0,01
Bagmati	2.977	2.902	3.033	0,15	0,15	0,15
Karnali	114	111	116	0,03	0,02	0,03
Koshi	-	-	-	-	-	-
Madhesh	13.571	13.233	13.826	0,81	0,79	0,82
Sudurpaschim	411	400	419	0,06	0,06	0,06

LL= lower level of the 95% credible interval

UL= lower level of the 95% credible interval

Provincial and National level PSE

This section shows the final PSE – the estimated absolute numbers with 95% credible intervals and the prevalence of KPs in the general population in Nepal, based on the Bayesian synthesis and data extrapolation. District-level PSE are shown in the Appendix.

Table 32 shows that the estimated prevalence of FSW at the national level was 0.76% (0.66-0.87), ranging from 0.27% to 1.32% across the provinces.

Table 32: Estimated number of FSW per province and the prevalence of FSW in the general population of women older than 15 years

Province	Est number	LL	UP	Est %	LL	UL
Bagmati	26.964	23.650	30.609	1,32	1,16	1,50
Gandaki	8.656	7.286	10.169	0,91	0,77	1,07
Karnali	1.322	1.177	1.567	0,27	0,24	0,32
Koshi	7.522	6.754	8.536	0,45	0,41	0,51
Lumbini	8.794	7.722	9.991	0,55	0,49	0,63
Madhesh	11.917	10.258	13.638	0,70	0,60	0,80
Sudurpaschim	5.435	4.359	6.639	0,63	0,51	0,78
Nepal	70.610	61.206	81.149	0,76	0,66	0,87

LL= lower level of the 95% credible interval

UL= lower level of the 95% credible interval

Table 33 shows the estimated number of PWID in the provinces, and the percentage of PWID in the general population, which is estimated at 0.25% (0.22-0.28) in Nepal, ranging from 0.15-0.42.

Table 33: Estimated number of PWID per province and the prevalence of PWID in the general population older than 15 years

Province	Number	LL	UP	Est %	LL	UL%
Bagmati	8.267	7.074	9.619	0,21	0,18	0,24
Gandaki	6.885	5.970	7.836	0,42	0,36	0,47
Karnali	1.434	1.260	1.609	0,15	0,13	0,17
Koshi	5.590	4.837	6.409	0,18	0,16	0,21
Lumbini	8.657	7.889	9.424	0,30	0,27	0,32
Madhesh	9.181	8.086	10.324	0,27	0,24	0,30
Sudurpaschim	3.624	3.354	3.895	0,23	0,21	0,25
Total	43.636	38.470	49.116	0,25	0,22	0,28

Table 34 shows the estimated number of MSM in the provinces, and the percentage of MSM in the general population in Nepal, which is estimated at 1.21% (1.13-1.30), ranging from 0.33-2.35 across the provinces.

Table 34: Estimated number of MSM per province and the prevalence of MSM in the general population of men older than 15 years

Province	Number	LL	UP	Est %	LL	UL%
Bagmati	46.186	44.596	47.896	2,35	2,27	2,44
Gandaki	5.087	4.504	5.746	0,72	0,64	0,81
Karnali	1.483	1.321	1.663	0,33	0,30	0,37

Koshi	11.392	10.342	12.453	0,79	0,72	0,87
Lumbini	15.395	13.933	16.980	1,15	1,04	1,27
Madhesh	15.492	14.198	16.806	0,92	0,84	1,00
Sudurpaschim	5.602	5.095	6.120	0,78	0,71	0,85
Total	100.637	93.989	107.664	1,21	1,13	1,30

Table 35 shows the estimated number of TGW in the provinces, and the percentage of TGW in the general population, which is estimated at 0.46% (0.40-0.53).

Table 35: Estimated number of TGW per province and the prevalence of TGW in the general population of men older than 15 years

Province	Number	LL	UP	Est %	LL	UL%
Bagmati	10.415	8.636	12.376	0,53	0,44	0,63
Gandaki	3.370	2.934	3.939	0,48	0,41	0,56
Karnali	622	523	755	0,14	0,12	0,17
Koshi	3.038	2.740	3.330	0,21	0,19	0,23
Lumbini	6.214	5.255	7.331	0,47	0,39	0,55
Madhesh	11.246	10.430	12.076	0,67	0,62	0,72
Sudurpaschim	3.615	2.823	4.524	0,50	0,39	0,63
Total	38.520	33.341	44.331	0,46	0,40	0,53

Table 36: Estimated number and % of FSW by districts, Nepal, 2024

S. No	Province	District	PSE From	Method	Female15p	Mapped	Est	LL	UL	Est %	LL %	UL %
1	Koshi	Taplejung	Jhapa	Bayesian PSE	44,218	No	120	107	142	0.27	0.24	0.32
2	Koshi	Panchthar	Jhapa	Bayesian PSE	69,693	No	189	168	224	0.27	0.24	0.32
3	Koshi	Ilam	Jhapa	Bayesian PSE	108,817	No	294	262	349	0.27	0.24	0.32
4	Koshi	Jhapa	Jhapa	Bayesian PSE	312,899	Yes	845	751	1,002	0.27	0.24	0.32
5	Koshi	Morang	Morang	Bayesian PSE	356,534	Yes	1,712	1,534	1,926	0.48	0.43	0.54
6	Koshi	Sunsari	Sunsari	Adj. Enum.	275,313	Yes	3,013	2,731	3,295	1.09	0.99	1.20
7	Koshi	Dhankuta	Jhapa	Bayesian PSE	62,094	No	168	150	199	0.27	0.24	0.32
8	Koshi	Terhathum	Jhapa	Bayesian PSE	38,290	No	104	92	123	0.27	0.24	0.32
9	Koshi	Sankhuwashawa	Jhapa	Bayesian PSE	56,424	No	153	136	181	0.27	0.24	0.32
10	Koshi	Bhojpur	Jhapa	Bayesian PSE	66,265	No	179	160	213	0.27	0.24	0.32
11	Koshi	Solukhumbu	Jhapa	Bayesian PSE	37,187	No	101	90	119	0.27	0.24	0.32
12	Koshi	Okhaldhunga	Jhapa	Bayesian PSE	54,003	No	146	130	173	0.27	0.24	0.32
13	Koshi	Khotang	Jhapa	Bayesian PSE	72,102	No	195	174	231	0.27	0.24	0.32
14	Koshi	Udayapur	Jhapa	Bayesian PSE	111,894	Yes	303	269	359	0.27	0.24	0.32
15	Madhesh	Saptari	Saptari	Adj. Enum.	215,293	Yes	1,280	1,009	1,550	0.59	0.47	0.72
16	Madhesh	Siraha	Siraha	Adj. Enum.	211,677	Yes	1,498	1,142	1,855	0.71	0.54	0.88
17	Madhesh	Dhanusha	Dhanusha	Bayesian PSE	244,792	Yes	1,714	1,494	1,959	0.70	0.61	0.80
18	Madhesh	Mahottari	Mahottari	Adj. Enum.	198,559	Yes	1,763	1,353	2,172	0.89	0.68	1.09
19	Madhesh	Sarlahi	Sarlahi	Adj. Enum.	237,692	Yes	1,491	1,459	1,524	0.63	0.61	0.64
20	Madhesh	Rautahat	Rautahat	Adj. Enum.	202,942	Yes	1,432	1,362	1,501	0.71	0.67	0.74
21	Madhesh	Bara	Bara	Bayesian PSE	209,171	Yes	1,109	900	1,339	0.53	0.43	0.64
22	Madhesh	Parsa	Parsa	Bayesian PSE	181,038	Yes	1,630	1,539	1,738	0.90	0.85	0.96
23	Bagmati	Sindhuli	Kavrepalanchowk	Adj. Enum.	98,547	No	651	572	729	0.66	0.58	0.74
24	Bagmati	Ramechhap	Jhapa	Bayesian PSE	75,833	No	205	182	243	0.27	0.24	0.32
25	Bagmati	Dolakha	Jhapa	Bayesian PSE	69,606	No	188	168	223	0.27	0.24	0.32
26	Bagmati	Sindhupalchok	Jhapa	Bayesian PSE	104,278	No	282	251	334	0.27	0.24	0.32
27	Bagmati	Kavre	Kavrepalanchowk	Adj. Enum.	143,617	Yes	949	833	1,063	0.66	0.58	0.74
28	Bagmati	Lalitpur	Lalitpur	Bayesian PSE	179,903	Yes	4,588	4,138	5,074	2.55	2.30	2.82
29	Bagmati	Bhaktapur	Bhaktapur	Adj. Enum.	116,704	Yes	5,595	5,230	5,957	4.79	4.48	5.10
30	Bagmati	Kathmandu	Kathmandu	Bayesian PSE	649,440	Yes	10,456	8,833	12,275	1.61	1.36	1.89

S. No	Province	District	PSE From	Method	Female15p	Mapped	Est	LL	UL	Est %	LL %	UL %
31	Bagmati	Nuwakot	Jhapa	Bayesian PSE	102,424	Yes	277	246	328	0.27	0.24	0.32
32	Bagmati	Rasuwa	Jhapa	Bayesian PSE	14,634	No	40	36	47	0.27	0.25	0.32
33	Bagmati	Dhading	Kavrepalanchowk	Adj. Enum.	123,090	No	813	714	911	0.66	0.58	0.74
34	Bagmati	Makawanpur	Makawanpur	Bayesian PSE	145,473	Yes	1,033	844	1,252	0.71	0.58	0.86
35	Bagmati	Chitwan	Chitwan	Adj. Enum.	222,623	Yes	1,887	1,603	2,173	0.85	0.72	0.98
36	Gandaki	Gorkha	Tanahun	Adj. Enum.	107,382	No	1,392	1,204	1,579	1.30	1.12	1.47
37	Gandaki	Lamjung	Tanahun	Adj. Enum.	66,802	No	866	749	982	1.30	1.12	1.47
38	Gandaki	Tanahun	Tanahun	Adj. Enum.	128,451	Yes	1,664	1,440	1,889	1.30	1.12	1.47
39	Gandaki	Syanja	Jhapa	Bayesian PSE	118,993	No	322	286	381	0.27	0.24	0.32
40	Gandaki	Kaski	Kaski	Bayesian PSE	191,506	Yes	3,505	2,835	4,252	1.83	1.48	2.22
41	Gandaki	Manang	Jhapa	Bayesian PSE	2,195	No	6	6	8	0.27	0.27	0.36
42	Gandaki	Mustang	Jhapa	Bayesian PSE	4,954	Yes	14	12	16	0.28	0.24	0.32
43	Gandaki	Myagdi	Jhapa	Bayesian PSE	43,391	No	118	105	139	0.27	0.24	0.32
44	Gandaki	Parbat	Jhapa	Bayesian PSE	58,434	No	158	141	187	0.27	0.24	0.32
45	Gandaki	Baglung	Jhapa	Bayesian PSE	104,805	Yes	283	252	336	0.27	0.24	0.32
46	Gandaki	Nawalparasi_E	Nawalparasi_E	Adj. Enum.	120,784	Yes	328	256	400	0.27	0.21	0.33
47	Lumbini	Gulmi	Jhapa	Bayesian PSE	110,156	No	298	265	353	0.27	0.24	0.32
48	Lumbini	Palpa	Jhapa	Bayesian PSE	103,118	Yes	279	248	330	0.27	0.24	0.32
49	Lumbini	Nawalparasi_W	Nawalparasi_W	Bayesian PSE	119,070	Yes	405	358	453	0.34	0.30	0.38
50	Lumbini	Rupandehi	Rupandehi	Bayesian PSE	309,033	Yes	2,627	2,195	3,060	0.85	0.71	0.99
51	Lumbini	Kapilbastu	Kapilbastu	Adj. Enum.	183,346	Yes	558	501	614	0.30	0.27	0.33
52	Lumbini	Arghakhachi	Jhapa	Bayesian PSE	76,502	No	207	184	245	0.27	0.24	0.32
53	Lumbini	Pyuthan	Jhapa	Bayesian PSE	80,542	No	218	194	258	0.27	0.24	0.32
54	Lumbini	Rolpa	Jhapa	Bayesian PSE	76,296	No	206	184	245	0.27	0.24	0.32
55	Lumbini	Rukum_E	Jhapa	Bayesian PSE	18,210	No	50	44	59	0.27	0.24	0.32
56	Lumbini	Dang	Dang	Bayesian PSE	197,199	Yes	1,302	1,184	1,420	0.66	0.60	0.72
57	Lumbini	Bankey	Bankey	Bayesian PSE	163,949	Yes	1,706	1,525	1,919	1.04	0.93	1.17
58	Lumbini	Bardiya	Bardiya	Adj. Enum.	152,128	Yes	938	840	1,035	0.62	0.55	0.68
59	Karnali	Rukum_W	Jhapa	Bayesian PSE	49,287	No	134	119	158	0.27	0.24	0.32
60	Karnali	Salyan	Jhapa	Bayesian PSE	79,183	Yes	214	191	254	0.27	0.24	0.32
61	Karnali	Surkhet	Jhapa	Bayesian PSE	117,832	Yes	319	283	378	0.27	0.24	0.32
62	Karnali	Dailekh	Jhapa	Bayesian PSE	80,709	No	218	194	259	0.27	0.24	0.32

S. No	Province	District	PSE From	Method	Female15p	Mapped	Est	LL	UL	Est %	LL %	UL %
63	Karnali	Jajarkot	Jhapa	Bayesian PSE	48,283	No	131	116	155	0.27	0.24	0.32
64	Karnali	Dolpa	Jhapa	Bayesian PSE	11,158	No	31	27	36	0.28	0.24	0.32
65	Karnali	Jumla	Jhapa	Bayesian PSE	32,204	No	87	78	104	0.27	0.24	0.32
66	Karnali	Kalikot	Jhapa	Bayesian PSE	38,423	No	104	93	123	0.27	0.24	0.32
67	Karnali	Mugu	Jhapa	Bayesian PSE	15,883	No	43	39	51	0.27	0.25	0.32
68	Karnali	Humla	Jhapa	Bayesian PSE	15,000	No	41	37	49	0.27	0.25	0.33
69	Sudurpaschim	Bajura	Jhapa	Bayesian PSE	40,454	No	110	98	130	0.27	0.24	0.32
70	Sudurpaschim	Bajhang	Jhapa	Bayesian PSE	60,708	No	164	146	195	0.27	0.24	0.32
71	Sudurpaschim	Achham	Doti	Adj. Enum.	81,897	No	55	45	65	0.07	0.05	0.08
72	Sudurpaschim	Doti	Doti	Adj. Enum.	70,311	Yes	48	38	55	0.07	0.05	0.08
73	Sudurpaschim	Kailali	Kailali	Bayesian PSE	267,295	Yes	3,609	2,861	4,464	1.35	1.07	1.67
74	Sudurpaschim	Kanchanpur	Kanchanpur	Adj. Enum.	158,425	Yes	1,239	992	1,483	0.78	0.63	0.94
75	Sudurpaschim	Dadeldhura	Doti	Adj. Enum.	47,935	No	33	26	38	0.07	0.05	0.08
76	Sudurpaschim	Baitadi	Doti	Adj. Enum.	84,590	No	57	46	67	0.07	0.05	0.08
77	Sudurpaschim	Darchula	Jhapa	Bayesian PSE	44,328	No	120	107	142	0.27	0.24	0.32
	TOTAL				9,294,220		70,610	61,206	81,149	0.76	0.66	0.87

Table 37: Estimated number and % of PWID by districts, Nepal, 2024

S. No	Province	District	PSE from	PSEMethod	Total15p	Mapped	Est	LL	UL	Est %	LL %	UL %
1	Koshi	Taplejung	Kailali	Bayesian synthesized PSE	82.274	No	91	83	99	0.11	0.10	0.12
2	Koshi	Panchthar	Kailali	Bayesian synthesized PSE	127.526	No	141	128	154	0.11	0.10	0.12
3	Koshi	Ilam	Kailali	Bayesian synthesized PSE	208.457	No	230	209	251	0.11	0.10	0.12
4	Koshi	Jhapa	Kailali	Adj. Enumm.	577.509	Yes	1.616	1.454	1.778	0.28	0.25	0.31
5	Koshi	Morang	Morang	Bayesian synthesized PSE	674.726	Yes	1.080	810	1.417	0.16	0.12	0.21
6	Koshi	Sunsari	Kailali	Adj. Enumm.	523.371	Yes	1.576	1.374	1.777	0.30	0.26	0.34
7	Koshi	Dhankuta	Kailali	Bayesian synthesized PSE	113.441	No	125	114	137	0.11	0.10	0.12
8	Koshi	Terhathum	Kailali	Bayesian synthesized PSE	68.986	No	76	69	83	0.11	0.10	0.12
9	Koshi	Sankhu-washawa	Kailali	Bayesian synthesized PSE	104.133	No	115	105	125	0.11	0.10	0.12

S. No	Province	District	PSE from	PSEMethod	Total15p	Mapped	Est	LL	UL	Est %	LL %	UL %
10	Koshi	Bhojpur	Kailali	Bayesian synthesized PSE	121.449	No	134	122	146	0,11	0,10	0,12
11	Koshi	Solukhumbu	Kailali	Bayesian synthesized PSE	70.559	No	78	71	85	0,11	0,10	0,12
12	Koshi	Okhaldhunga	Kailali	Bayesian synthesized PSE	97.276	No	108	98	117	0,11	0,10	0,12
13	Koshi	Khotang	Kailali	Bayesian synthesized PSE	131.875	No	146	132	159	0,11	0,10	0,12
14	Koshi	Udayapur	Kailali	Adj. Enumm.	203.207	Yes	75	68	81	0,04	0,03	0,04
15	Madhesh	Saptari	Kailali	Adj. Enumm.	414.597	Yes	866	755	976	0,21	0,18	0,24
16	Madhesh	Siraha	Kailali	Adj. Enumm.	400.032	Yes	601	526	675	0,15	0,13	0,17
17	Madhesh	Dhanusha	Dhanusha	Bayesian synthesized PSE	484.951	Yes	1.261	922	1.649	0,26	0,19	0,34
18	Madhesh	Mahottari	Kailali	Adj. Enumm.	387.209	Yes	1.546	1.370	1.721	0,40	0,35	0,44
19	Madhesh	Sarlahi	Kailali	Adj. Enumm.	477.862	Yes	1.200	1.114	1.286	0,25	0,23	0,27
20	Madhesh	Rautahat	Kailali	Adj. Enumm.	416.478	Yes	1.058	966	1.150	0,25	0,23	0,28
21	Madhesh	Bara	Kailali	Adj. Enumm.	426.065	Yes	1.902	1.753	2.051	0,45	0,41	0,48
22	Madhesh	Parsa	Parsa	Adj. Enumm.	379.664	Yes	748	680	816	0,20	0,18	0,21
23	Bagmati	Sindhuli	Kailali	Bayesian synthesized PSE	183.755	No	203	184	221	0,11	0,10	0,12
24	Bagmati	Ramechhap	Kailali	Bayesian synthesized PSE	135.996	No	150	136	164	0,11	0,10	0,12
25	Bagmati	Dolakha	Kailali	Bayesian synthesized PSE	126.267	No	139	127	152	0,11	0,10	0,12
26	Bagmati	Sindhupal-chok	Kailali	Bayesian synthesized PSE	197.477	No	218	198	237	0,11	0,10	0,12
27	Bagmati	Kavre	Kailali	Adj. Enumm.	269.422	Yes	86	76	96	0,03	0,03	0,04
28	Bagmati	Lalitpur	Kailali	Adj. Enumm.	363.143	Yes	1.418	1.240	1.595	0,39	0,34	0,44
29	Bagmati	Bhaktapur	Kailali	Adj. Enumm.	233.709	Yes	1.000	923	1.076	0,43	0,39	0,46
30	Bagmati	Kathmandu	Kathmandu	Bayesian synthesized PSE	1.356.395	Yes	2.849	2.306	3.527	0,21	0,17	0,26
31	Bagmati	Nuwakot	Kailali	Adj. Enumm.	192.444	Yes	58	53	62	0,03	0,03	0,03
32	Bagmati	Rasuwa	Kailali	Bayesian synthesized PSE	29.138	No	33	30	35	0,11	0,10	0,12
33	Bagmati	Dhading	Kailali	Bayesian synthesized PSE	224.837	No	248	225	270	0,11	0,10	0,12
34	Bagmati	Makawanpur	Makawanpur	Bayesian synthesized PSE	281.562	Yes	620	451	817	0,22	0,16	0,29
35	Bagmati	Chitwan	Kailali	Adj. Enumm.	417.156	Yes	1.246	1.125	1.367	0,30	0,27	0,33
36	Gandaki	Gorkha	Kailali	Bayesian synthesized PSE	185.500	No	205	186	223	0,11	0,10	0,12

S. No	Province	District	PSE from	PSEMethod	Total15p	Mapped	Est	LL	UL	Est %	LL %	UL %
37	Gandaki	Lamjung	Kailali	Bayesian synthesized PSE	116.729	No	129	117	141	0,11	0,10	0,12
38	Gandaki	Tanahun	Kailali	Adj. Enumm.	218.910	Yes	2.033	1.794	2.272	0,93	0,82	1,04
39	Gandaki	Syanja	Kailali	Bayesian synthesized PSE	198.590	No	219	199	239	0,11	0,10	0,12
40	Gandaki	Kaski	Kaski	Bayesian synthesized PSE	356.891	Yes	3.070	2.606	3.569	0,86	0,73	1,00
41	Gandaki	Manang	Kailali	Bayesian synthesized PSE	5.230	No	6	6	7	0,11	0,11	0,13
42	Gandaki	Mustang	Kailali	Adj. Enumm.	10.645	Yes	3	3	3	0,03	0,03	0,03
43	Gandaki	Myagdi	Kailali	Bayesian synthesized PSE	75.381	No	83	76	91	0,11	0,10	0,12
44	Gandaki	Parbat	Kailali	Bayesian synthesized PSE	99.604	No	110	100	120	0,11	0,10	0,12
45	Gandaki	Baglung	Kailali	Adj. Enumm.	175.278	Yes	417	357	476	0,24	0,20	0,27
46	Gandaki	Nawal-parasi_E	Kailali	Adj. Enumm.	212.190	Yes	611	526	695	0,29	0,25	0,33
47	Lumbini	Gulmi	Kailali	Bayesian synthesized PSE	180.063	No	199	181	217	0,11	0,10	0,12
48	Lumbini	Palpa	Kailali	Bayesian synthesized PSE	174.636	No	193	175	210	0,11	0,10	0,12
49	Lumbini	Nawal-parasi_W	Nawal-parasi_W	Bayesian synthesized PSE	225.412	Yes	812	789	835	0,36	0,35	0,37
50	Lumbini	Rupandehi	Kailali	Adj. Enumm.	592.302	Yes	1.459	1.283	1.635	0,25	0,22	0,28
51	Lumbini	Kapilbastu	Kailali	Adj. Enumm.	360.225	Yes	1.526	1.476	1.576	0,42	0,41	0,44
52	Lumbini	Arghakhachi	Kailali	Bayesian synthesized PSE	126.059	No	139	127	152	0,11	0,10	0,12
53	Lumbini	Pyuthan	Kailali	Bayesian synthesized PSE	132.092	No	146	133	159	0,11	0,10	0,12
54	Lumbini	Rolpa	Kailali	Bayesian synthesized PSE	133.654	No	148	134	161	0,11	0,10	0,12
55	Lumbini	Rukum_E	Kailali	Bayesian synthesized PSE	33.087	No	37	34	40	0,11	0,10	0,12
56	Lumbini	Dang	Kailali	Adj. Enumm.	360.234	Yes	1.097	1.036	1.157	0,30	0,29	0,32
57	Lumbini	Bankey	Bankey	Bayesian synthesized PSE	320.268	Yes	2.210	1.890	2.531	0,69	0,59	0,79
58	Lumbini	Bardiya	Kailali	Adj. Enumm.	285.392	Yes	691	631	751	0,24	0,22	0,26
59	Karnali	Rukum_W	Surkhet	Bayesian synthesized PSE	91.797	No	202	175	230	0,22	0,19	0,25
60	Karnali	Salyan	Kailali	Adj. Enumm.	147.244	Yes	52	48	56	0,04	0,03	0,04
61	Karnali	Surkhet	Surkhet	Bayesian synthesized PSE	220.076	Yes	485	419	551	0,22	0,19	0,25
62	Karnali	Dailekh	Surkhet	Bayesian synthesized PSE	152.693	No	336	291	382	0,22	0,19	0,25
63	Karnali	Jajarkot	Kailali	Bayesian synthesized PSE	96.369	No	107	97	116	0,11	0,10	0,12
64	Karnali	Dolpa	Kailali	Bayesian synthesized PSE	22.433	No	25	23	27	0,11	0,10	0,12
65	Karnali	Jumla	Kailali	Bayesian synthesized PSE	65.109	No	72	66	79	0,11	0,10	0,12

S. No	Province	District	PSE from	PSEMethod	Total15p	Mapped	Est	LL	UL	Est %	LL %	UL %
66	Karnali	Kalikot	Kailali	Bayesian synthesized PSE	76.534	No	85	77	92	0,11	0,10	0,12
67	Karnali	Mugu	Kailali	Bayesian synthesized PSE	32.258	No	36	33	39	0,11	0,10	0,12
68	Karnali	Humla	Kailali	Bayesian synthesized PSE	30.798	No	34	31	37	0,11	0,10	0,12
69	Sudurpas-chim	Bajura	Kailali	Bayesian synthesized PSE	77.225	No	85	78	93	0,11	0,10	0,12
70	Sudurpas-chim	Bajhang	Kailali	Bayesian synthesized PSE	110.552	No	122	111	133	0,11	0,10	0,12
71	Sudurpas-chim	Achham	Kailali	Bayesian synthesized PSE	145.531	No	161	146	175	0,11	0,10	0,12
72	Sudurpas-chim	Doti	Kailali	Adj. Enumm.	122.248	Yes	46	42	49	0,04	0,03	0,04
73	Sudurpas-chim	Kailali	Kailali	Bayesian synthesized PSE	507.228	Yes	558	508	609	0,11	0,10	0,12
74	Sudurpas-chim	Kanchanpur	Kailali	Adj. Enumm.	292.061	Yes	2.299	2.148	2.450	0,79	0,74	0,84
75	Sudurpas-chim	Dadeldhura	Kailali	Bayesian synthesized PSE	85.879	No	95	86	104	0,11	0,10	0,12
76	Sudurpas-chim	Baitadi	Kailali	Bayesian synthesized PSE	151.711	No	167	152	183	0,11	0,10	0,12
77	Sudurpas-chim	Darchula	Kailali	Bayesian synthesized PSE	82.122	No	91	83	99	0,11	0,10	0,12
	TOTAL				17.591.183		43.636	38.470	49.116	0,25	0,22	0,28

Table 38: Estimated number and % of MSM by districts, Nepal, 2024

S.N.	Province	District	PSE From	PSE Method	Male15p	Mapped	Est	LL	UL	Est %	LL %	UL %
1	Koshi	Taplejung	Parsa	Bayesian synthesized PSE	38.056	No	118	96	145	0,31	0,25	0,38
2	Koshi	Panchthar	Udaipur	Adj. Enumm.	57.833	No	216	192	240	0,37	0,33	0,41
3	Koshi	Ilam	Udaipur	Adj. Enumm.	99.641	No	372	330	413	0,37	0,33	0,41
4	Koshi	Jhapa	Jhapa	Bayesian synthesized PSE	264.609	Yes	4.075	3.837	4.314	1,54	1,45	1,63
5	Koshi	Morang	Morang	Bayesian synthesized PSE	318.192	Yes	1.623	1.337	1.910	0,51	0,42	0,60
6	Koshi	Sunsari	Sunsari	Adj. Enumm.	248.058	Yes	3.497	3.246	3.746	1,41	1,31	1,51
7	Koshi	Dhankuta	Udaipur	Adj. Enumm.	51.348	No	192	170	213	0,37	0,33	0,41
8	Koshi	Terhathum	Udaipur	Adj. Enumm.	30.696	No	115	102	128	0,37	0,33	0,42
9	Koshi	Sankhuwashawa	Parsa	Bayesian synthesized PSE	47.708	No	148	120	182	0,31	0,25	0,38
10	Koshi	Bhojpur	Udaipur	Adj. Enumm.	55.184	No	206	183	229	0,37	0,33	0,41
11	Koshi	Solukhumbu	Parsa	Bayesian synthesized PSE	33.371	No	104	84	127	0,31	0,25	0,38
12	Koshi	Okhaldhunga	Udaipur	Adj. Enumm.	43.274	No	162	144	180	0,37	0,33	0,42
13	Koshi	Khotang	Udaipur	Adj. Enumm.	59.773	No	223	198	248	0,37	0,33	0,41
14	Koshi	Udayapur	Udaipur	Adj. Enumm.	91.313	Yes	341	303	378	0,37	0,33	0,41
15	Madhesh	Saptari	Saptari	Adj. Enumm.	199.304	Yes	2.572	2.416	2.730	1,29	1,21	1,37
16	Madhesh	Siraha	Siraha	Adj. Enumm.	188.355	Yes	2.021	1.862	2.178	1,07	0,99	1,16
17	Madhesh	Dhanusha	Dhanusha	Bayesian synthesized PSE	240.159	Yes	1.057	865	1.249	0,44	0,36	0,52
18	Madhesh	Mahottari	Mahottari	Adj. Enumm.	188.650	Yes	1.756	1.640	1.871	0,93	0,87	0,99
19	Madhesh	Sarlahi	Sarlahi	Adj. Enumm.	240.170	Yes	2.565	2.308	2.824	1,07	0,96	1,18
20	Madhesh	Rautahat	Rautahat	Adj. Enumm.	213.536	Yes	2.736	2.592	2.878	1,28	1,21	1,35
21	Madhesh	Bara	Bara	Bayesian synthesized PSE	216.894	Yes	2.169	2.018	2.321	1,00	0,93	1,07
22	Madhesh	Parsa	Parsa	Bayesian synthesized PSE	198.627	Yes	616	497	755	0,31	0,25	0,38
23	Bagmati	Sindhuli	Kavrepalan-chowk	Adj. Enumm.	85.208	No	305	298	312	0,36	0,35	0,37
24	Bagmati	Ramechhap	Parsa	Bayesian synthesized PSE	60.163	No	187	151	229	0,31	0,25	0,38
25	Bagmati	Dolakha	Parsa	Bayesian synthesized PSE	56.661	No	176	142	216	0,31	0,25	0,38
26	Bagmati	Sindhupalchok	Parsa	Bayesian synthesized PSE	93.199	No	289	233	355	0,31	0,25	0,38
27	Bagmati	Kavre	Kavrepalan-chowk	Adj. Enumm.	125.805	Yes	451	439	460	0,36	0,35	0,37
28	Bagmati	Lalitpur	Lalitpur	Bayesian synthesized PSE	183.241	Yes	990	733	1.247	0,54	0,40	0,68

S.N.	Province	District	PSE From	PSE Method	Male15p	Mapped	Est	LL	UL	Est %	LL %	UL %
29	Bagmati	Bhaktapur	Bhaktapur	Adj. Enumm.	117.004	Yes	1.134	1.065	1.205	0,97	0,91	1,03
30	Bagmati	Kathmandu	Kathmandu	Bayesian synthesized PSE	706.955	Yes	38.105	37.328	38.954	5,39	5,28	5,51
31	Bagmati	Nuwakot	Parsa	Bayesian synthesized PSE	90.020	Yes	280	226	343	0,31	0,25	0,38
32	Bagmati	Rasuwa	Parsa	Bayesian synthesized PSE	14.504	No	45	37	56	0,31	0,26	0,39
33	Bagmati	Dhading	Kavrepalanchowk	Adj. Enumm.	101.747	Yes	364	356	373	0,36	0,35	0,37
34	Bagmati	Makawanpur	Makawanpur	Bayesian synthesized PSE	136.088	Yes	2.559	2.409	2.722	1,88	1,77	2,00
35	Bagmati	Chitwan	Chitwan	Adj. Enumm.	194.532	Yes	1.301	1.179	1.424	0,67	0,61	0,73
36	Gandaki	Gorkha	Parsa	Bayesian synthesized PSE	78.119	No	243	196	297	0,31	0,25	0,38
37	Gandaki	Lamjung	Parsa	Bayesian synthesized PSE	49.927	No	155	125	190	0,31	0,25	0,38
38	Gandaki	Tanahun	Parsa	Bayesian synthesized PSE	90.460	Yes	281	227	344	0,31	0,25	0,38
39	Gandaki	Syanja	Parsa	Bayesian synthesized PSE	79.597	No	247	199	303	0,31	0,25	0,38
40	Gandaki	Kaski	Kaski	Bayesian synthesized PSE	165.385	Yes	3.027	2.779	3.308	1,83	1,68	2,00
41	Gandaki	Manang	Parsa	Bayesian synthesized PSE	3.035	No	10	8	12	0,33	0,26	0,40
42	Gandaki	Mustang	Parsa	Bayesian synthesized PSE	5.691	Yes	18	15	22	0,32	0,26	0,39
43	Gandaki	Myagdi	Parsa	Bayesian synthesized PSE	31.990	No	100	80	122	0,31	0,25	0,38
44	Gandaki	Parbat	Parsa	Bayesian synthesized PSE	41.170	No	128	103	157	0,31	0,25	0,38
45	Gandaki	Baglung	Parsa	Bayesian synthesized PSE	70.473	Yes	219	177	268	0,31	0,25	0,38
46	Gandaki	Nawalparasi_E	Nawalparasi_E	Bayesian synthesized PSE	91.405	Yes	659	595	723	0,72	0,65	0,79
47	Lumbini	Gulmi	Parsa	Bayesian synthesized PSE	69.907	No	217	175	266	0,31	0,25	0,38
48	Lumbini	Palpa	Parsa	Bayesian synthesized PSE	71.518	Yes	222	179	272	0,31	0,25	0,38
49	Lumbini	Nawalparasi_W	Nawalparasi_W	Adj. Enumm.	106.342	Yes	1.024	843	1.205	0,96	0,79	1,13
50	Lumbini	Rupandehi	Rupandehi	Bayesian synthesized PSE	283.268	Yes	2.238	2.040	2.493	0,79	0,72	0,88
51	Lumbini	Kapilbastu	Kapilbastu	Adj. Enumm.	176.879	Yes	1.233	1.093	1.375	0,70	0,62	0,78
52	Lumbini	Arghakhachi	Parsa	Bayesian synthesized PSE	49.557	No	154	124	189	0,31	0,25	0,38
53	Lumbini	Pyuthan	Parsa	Bayesian synthesized PSE	51.550	No	160	129	196	0,31	0,25	0,38
54	Lumbini	Rolpa	Parsa	Bayesian synthesized PSE	57.358	No	178	144	218	0,31	0,25	0,38
55	Lumbini	Rukum_E	Parsa	Bayesian synthesized PSE	14.877	No	47	38	57	0,32	0,26	0,38
56	Lumbini	Dang	Dang	Bayesian synthesized PSE	163.036	Yes	3.995	3.636	4.386	2,45	2,23	2,69
57	Lumbini	Bankey	Bankey	Bayesian synthesized PSE	156.319	Yes	2.783	2.580	2.986	1,78	1,65	1,91

S.N.	Province	District	PSE From	PSE Method	Male15p	Mapped	Est	LL	UL	Est %	LL %	UL %
58	Lumbini	Bardiya	Bardiya	Adj. Enumm.	133.264	Yes	3.144	2.952	3.337	2.36	2.22	2.50
59	Karnali	Rukum_W	Salyan	Adj. Enumm.	42.510	No	63	57	69	0.15	0.13	0.16
60	Karnali	Salyan	Salyan	Adj. Enumm.	68.062	Yes	101	92	110	0.15	0.14	0.16
61	Karnali	Surkhet	Surkhet	Bayesian synthesized PSE	102.244	Yes	706	665	747	0.69	0.65	0.73
62	Karnali	Dailekh	Salyan	Adj. Enumm.	71.984	No	106	97	116	0.15	0.13	0.16
63	Karnali	Jajarkot	Parsa	Bayesian synthesized PSE	48.086	No	150	121	183	0.31	0.25	0.38
64	Karnali	Dolpa	Parsa	Bayesian synthesized PSE	11.275	No	35	29	43	0.31	0.26	0.38
65	Karnali	Jumla	Parsa	Bayesian synthesized PSE	32.904	No	103	83	126	0.31	0.25	0.38
66	Karnali	Kalikot	Parsa	Bayesian synthesized PSE	38.110	No	119	96	145	0.31	0.25	0.38
67	Karnali	Mugu	Parsa	Bayesian synthesized PSE	16.374	No	51	41	63	0.31	0.25	0.38
68	Karnali	Humla	Parsa	Bayesian synthesized PSE	15.798	No	49	40	61	0.31	0.25	0.39
69	Sudurpas-chim	Bajura	Parsa	Bayesian synthesized PSE	36.771	No	114	92	140	0.31	0.25	0.38
70	Sudurpas-chim	Bajhang	Parsa	Bayesian synthesized PSE	49.843	No	155	125	190	0.31	0.25	0.38
71	Sudurpas-chim	Achham	Doti	Adj. Enumm.	63.634	No	106	96	116	0.17	0.15	0.18
72	Sudurpas-chim	Doti	Doti	Adj. Enumm.	51.937	Yes	87	79	95	0.17	0.15	0.18
73	Sudurpas-chim	Kailali	Kailali	Bayesian synthesized PSE	239.933	Yes	3.767	3.480	4.055	1.57	1.45	1.69
74	Sudurpas-chim	Kanchanpur	Parsa	Adj. Enumm.	133.635	Yes	1.080	970	1.189	0.81	0.73	0.89
75	Sudurpas-chim	Dadeldhura	Doti	Adj. Enumm.	37.944	No	63	57	69	0.17	0.15	0.18
76	Sudurpas-chim	Baitadi	Doti	Adj. Enumm.	67.121	No	112	101	122	0.17	0.15	0.18
77	Sudurpas-chim	Darchula	Parsa	Bayesian synthesized PSE	37.794	No	118	95	144	0.31	0.25	0.38
	TOTAL				8.296.964		100.637	93.989	107.664	1.21	1.13	1.30

Table 39: Estimated number and % of TGW by districts, Nepal, 2024

S.No	Prv	Dis	PSE From	PSEMethod	Male15p	dist_TGW	mapped	Est	LL	UL	Est %	LL %	UL %
1	Koshi	Taplejung	Rupandehi	Bayesian synthe-sized PSE	38.056	Taplejung	No	61	50	80	0,16	0,13	0,21
2	Koshi	Panchthar	Udaipur	Adj. Enumm.	57.833	Panchthar	No	104	92	117	0,18	0,16	0,20
3	Koshi	Ilam	Udaipur	Adj. Enumm.	99.641	Ilam	No	179	158	201	0,18	0,16	0,20
4	Koshi	Jhapa	Jhapa	Bayesian synthe-sized PSE	264.609	Jhapa	yes	715	662	768	0,27	0,25	0,29
5	Koshi	Morang	Morang	Bayesian synthe-sized PSE	318.192	Morang	yes	764	701	796	0,24	0,22	0,25
6	Koshi	Sunsari	Sunsari	Adj. Enumm.	248.058	Sunsari	yes	484	444	524	0,20	0,18	0,21
7	Koshi	Dhankuta	Udaipur	Adj. Enumm.	51.348	Dhankuta	No	93	81	104	0,18	0,16	0,20
8	Koshi	Terhathum	Udaipur	Adj. Enumm.	30.696	Tehrathum	No	56	49	62	0,18	0,16	0,20
9	Koshi	Sankhu-washawa	Rupandehi	Bayesian synthe-sized PSE	47.708	Sankhu-wasabha	No	77	63	101	0,16	0,13	0,21
10	Koshi	Bhojpur	Udaipur	Adj. Enumm.	55.184	Bhojpur	No	100	88	112	0,18	0,16	0,20
11	Koshi	Solukhumbu	Rupandehi	Bayesian synthe-sized PSE	33.371	Solukhumbu	No	54	44	71	0,16	0,13	0,21
12	Koshi	Okhaldhunga	Udaipur	Adj. Enumm.	43.274	Okhaldhunga	No	78	69	88	0,18	0,16	0,20
13	Koshi	Khotang	Udaipur	Adj. Enumm.	59.773	Khotang	No	108	95	121	0,18	0,16	0,20
14	Koshi	Udayapur	Udaipur	Adj. Enumm.	91.313	Udayapur	yes	165	144	185	0,18	0,16	0,20
15	Madhesh	Saptari	Saptari	Adj. Enumm.	199.304	Saptari	yes	1.328	1.214	1.440	0,67	0,61	0,72
16	Madhesh	Siraha	Siraha	Adj. Enumm.	188.355	Siraha	yes	607	552	660	0,32	0,29	0,35
17	Madhesh	Dhanusha	Dhanusha	Bayesian synthe-sized PSE	240.159	Dhanusha	yes	721	553	889	0,30	0,23	0,37
18	Madhesh	Mahottari	Mahottari	Adj. Enumm.	188.650	Mahottari	yes	2.003	1.872	2.135	1,06	0,99	1,13
19	Madhesh	Sarlahi	Sarlahi	Adj. Enumm.	240.170	Sarlahi	yes	1.495	1.336	1.651	0,62	0,56	0,69
20	Madhesh	Rautahat	Rautahat	Adj. Enumm.	213.536	Rautahat	yes	558	518	598	0,26	0,24	0,28
21	Madhesh	Bara	Bara	Bayesian synthe-sized PSE	216.894	Bara	yes	1.931	1.822	2.061	0,89	0,84	0,95

S.No	Prv	Dis	PSE From	PSEMethod	Male15p	dist_TGW	mapped	Est	LL	UL	Est %	LL %	UL %
22	Madhesh	Parsa	Parsa	Bayesian synthe-sized PSE	198.627	Parsa	yes	2.603	2.563	2.642	1,31	1,29	1,33
23	Bagmati	Sindhuli	Kavrepalan-chowk	Adj. Enumm.	85.208	Sindhuli	No	187	174	200	0,22	0,20	0,23
24	Bagmati	Ramechhap	Rupandehi	Bayesian synthe-sized PSE	60.163	Ramechhap	No	97	79	127	0,16	0,13	0,21
25	Bagmati	Dolakha	Rupandehi	Bayesian synthe-sized PSE	56.661	Dolakha	No	91	74	119	0,16	0,13	0,21
26	Bagmati	Sindhupal-chok	Rupandehi	Bayesian synthe-sized PSE	93.199	Sindhupal-chok	No	150	122	196	0,16	0,13	0,21
27	Bagmati	Kavre	Kavrepalan-chowk	Adj. Enumm.	125.805	Kavrepalan-chok	yes	276	256	295	0,22	0,20	0,23
28	Bagmati	Lalitpur	Lalitpur	Bayesian synthe-sized PSE	183.241	Lalitpur	yes	587	459	697	0,32	0,25	0,38
29	Bagmati	Bhaktapur	Bhaktapur	Adj. Enumm.	117.004	Bhaktapur	yes	912	837	988	0,78	0,72	0,84
30	Bagmati	Kathmandu	Kathmandu	Bayesian synthe-sized PSE	706.955	Kathmandu	yes	6.222	4.949	7.636	0,88	0,70	1,08
31	Bagmati	Nuwakot	Rupandehi	Bayesian synthe-sized PSE	90.020	Nuwakot	yes	145	118	190	0,16	0,13	0,21
32	Bagmati	Rasuwa	Rupandehi	Bayesian synthe-sized PSE	14.504	Rasuwa	No	24	19	31	0,17	0,13	0,21
33	Bagmati	Dhading	Kavrepalan-chowk	Adj. Enumm.	101.747	Dhading	yes	224	208	239	0,22	0,20	0,23
34	Bagmati	Makawanpur	Makawanpur	Bayesian synthe-sized PSE	136.088	Makawanpur	yes	831	749	912	0,61	0,55	0,67
35	Bagmati	Chitwan	Chitwan	Adj. Enumm.	194.532	Chitwan	yes	669	592	746	0,34	0,30	0,38
36	Gandaki	Gorkha	Rupandehi	Bayesian synthe-sized PSE	78.119	Gorkha	No	125	102	165	0,16	0,13	0,21
37	Gandaki	Lamjung	Rupandehi	Bayesian synthe-sized PSE	49.927	Lamjung	No	80	65	105	0,16	0,13	0,21

S.No	Prv	Dis	PSE From	PSEMethod	Male15p	dist_TGW	mapped	Est	LL	UL	Est %	LL %	UL %
38	Gandaki	Tanahun	Rupandehi	Bayesian synthe-sized PSE	90.460	Tanahun	yes	145	118	190	0,16	0,13	0,21
39	Gandaki	Syanja	Rupandehi	Bayesian synthe-sized PSE	79.597	Syangja	No	128	104	168	0,16	0,13	0,21
40	Gandaki	Kaski	Kaski	Bayesian synthe-sized PSE	165.385	Kaski	yes	2.051	1.869	2.266	1,24	1,13	1,37
41	Gandaki	Manang	Rupandehi	Bayesian synthe-sized PSE	3.035	Manang	No	5	4	7	0,16	0,13	0,23
42	Gandaki	Mustang	Rupandehi	Bayesian synthe-sized PSE	5.691	Mustang	yes	10	8	12	0,18	0,14	0,21
43	Gandaki	Myagdi	Rupandehi	Bayesian synthe-sized PSE	31.990	Myagdi	No	52	42	68	0,16	0,13	0,21
44	Gandaki	Parbat	Rupandehi	Bayesian synthe-sized PSE	41.170	Parbat	No	66	54	87	0,16	0,13	0,21
45	Gandaki	Baglung	Rupandehi	Bayesian synthe-sized PSE	70.473	Baglung	yes	113	92	148	0,16	0,13	0,21
46	Gandaki	Nawal-parasi_E	Nawal-parasi_E	Bayesian synthe-sized PSE	91.405	Nawalparasi East	yes	595	476	723	0,65	0,52	0,79
47	Lumbini	Gulmi	Rupandehi	Bayesian synthe-sized PSE	69.907	Gulmi	No	112	91	147	0,16	0,13	0,21
48	Lumbini	Palpa	Rupandehi	Bayesian synthe-sized PSE	71.518	Palpa	yes	115	93	151	0,16	0,13	0,21
49	Lumbini	Nawal-parasi_W	Nawal-parasi_W	Adj. Enumm.	106.342	Nawalparasi west	yes	698	546	852	0,66	0,51	0,80
50	Lumbini	Rupandehi	Rupandehi	Bayesian synthe-sized PSE	283.268	Rupandehi	yes	454	369	595	0,16	0,13	0,21
51	Lumbini	Kapilbastu	Kapilbastu	Adj. Enumm.	176.879	Kapilbastu	yes	625	534	718	0,35	0,30	0,41
52	Lumbini	Arghakha-chi	Rupandehi	Bayesian synthe-sized PSE	49.557	Arghakhanchi	No	80	65	105	0,16	0,13	0,21
53	Lumbini	Pyuthan	Rupandehi	Bayesian synthe-sized PSE	51.550	Pyuthan	No	83	68	109	0,16	0,13	0,21

S.No	Prv	Dis	PSE From	PSEMethod	Male15p	dist_TGW	mapped	Est	LL	UL	Est %	LL %	UL %
54	Lumbini	Rolpa	Rupandehi	Bayesian synthe-sized PSE	57.358	Rolpa	No	92	75	121	0,16	0,13	0,21
55	Lumbini	Rukum_E	Rupandehi	Bayesian synthe-sized PSE	14.877	Rukum East	No	24	20	32	0,16	0,13	0,22
56	Lumbini	Dang	Dang	Bayesian synthe-sized PSE	163.036	Dang	yes	1.452	1.142	1.778	0,89	0,70	1,09
57	Lumbini	Bankey	Bankey	Bayesian synthe-sized PSE	156.319	Banke	yes	1.454	1.314	1.611	0,93	0,84	1,03
58	Lumbini	Bardiya	Bardiya	Adj. Enumm.	133.264	Bardiya	yes	1.025	938	1.112	0,77	0,70	0,83
59	Karnali	Rukum_W	Salyan	Adj. Enumm.	42.510	Rukum West	No	24	20	29	0,06	0,05	0,07
60	Karnali	Salyan	Salyan	Adj. Enumm.	68.062	Salyan	yes	38	31	46	0,06	0,05	0,07
61	Karnali	Surkhet	Surkhet	Bayesian synthe-sized PSE	102.244	Surkhet	yes	256	225	287	0,25	0,22	0,28
62	Karnali	Dailekh	Salyan	Adj. Enumm.	71.984	Dailekh	No	41	33	48	0,06	0,05	0,07
63	Karnali	Jajarkot	Rupandehi	Bayesian synthe-sized PSE	48.086	Jajarkot	No	77	63	101	0,16	0,13	0,21
64	Karnali	Dolpa	Rupandehi	Bayesian synthe-sized PSE	11.275	Dolpa	No	19	15	24	0,17	0,13	0,21
65	Karnali	Jumla	Rupandehi	Bayesian synthe-sized PSE	32.904	Jumla	No	53	43	70	0,16	0,13	0,21
66	Karnali	Kalikot	Rupandehi	Bayesian synthe-sized PSE	38.110	Kalikot	No	61	50	81	0,16	0,13	0,21
67	Karnali	Mugu	Rupandehi	Bayesian synthe-sized PSE	16.374	Mugu	No	27	22	35	0,16	0,13	0,21
68	Karnali	Humla	Rupandehi	Bayesian synthe-sized PSE	15.798	Humla	No	26	21	34	0,16	0,13	0,22
69	Sudur-paschim	Bajura	Rupandehi	Bayesian synthe-sized PSE	36.771	Bajura	No	59	48	78	0,16	0,13	0,21
70	Sudur-paschim	Bajhang	Rupandehi	Bayesian synthe-sized PSE	49.843	Bajhang	No	80	65	105	0,16	0,13	0,21

S.No	Prv	Dis	PSE From	PSEMethod	Male15p	dist_TGW	mapped	Est	LL	UL	Est %	LL %	UL %
71	Sudur-paschim	Achham	Doti	Adj. Enumm.	63.634	Achham	No	91	81	100	0,14	0,13	0,16
72	Sudur-paschim	Doti	Doti	Adj. Enumm.	51.937	Doti	yes	75	66	81	0,14	0,13	0,16
73	Sudur-paschim	Kailali	Kailali	Bayesian synthe-sized PSE	239.933	Kailali	yes	2.496	1.848	3.240	1,04	0,77	1,35
74	Sudur-paschim	Kanchanpur	Kanchanpur	Adj. Enumm.	133.635	Kanchanpur	yes	602	530	675	0,45	0,40	0,51
75	Sudur-paschim	Dadeldhura	Doti	Adj. Enumm.	37.944	Dadeldhura	No	55	49	60	0,14	0,13	0,16
76	Sudur-paschim	Baitadi	Doti	Adj. Enumm.	67.121	Baitadi	No	96	86	105	0,14	0,13	0,16
77	Sudur-paschim	Darchula	Rupandehi	Bayesian synthe-sized PSE	37.794	Darchula	No	61	50	80	0,16	0,13	0,21
	TOTAL				8.296.964			38.520	33.341	44.331	0,46	0,40	0,53

