Report on the National Size Estimation of the Most at Risk Populations for HIV in Sri Lanka

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FORWORD

Director, National STD/AIDS Control Programme, Sri Lanka

ACRONYMS

ADIC	Alcohol & Drug Information Centre
AIDS	Acquired Immune Deficiency Syndrome
BB	Beach Boy
CBOs	Community Based Organization
CSO	Civil Society Organizations
DS	Divisional Secretariat
DU	Drug User
FPA	Family Planning Association
FRO	Field Research Officer
FS	Field Supervisor
FSW	Female Sex Worker
GFATM	The Global Fund to Fight AIDS, Tuberculosis and Malaria
HIV	Human Immunodeficiency Virus
IBBSS	Integrated Biological and Behavioural Surveillance Survey
KI	Key Informant
KP	Key Population
L1	Level 1
L2	Level 2
MoH	Ministry of Health
MSM	Men who have Sex with Men
MSW	Male Sex Worker
NGO	Non-Governmental Organization
NSACP	National STD/AIDS Control Programme
PLHIV	People Living with HIV
PWID	People who Inject Drugs
RDS	Respondent-Driven Sampling
SAC	Surveillance Advisory Committee
STI	Sexually Transmitted Infection
SW	Sex Worker (or Sex Work)
TG	Transgender
TGW	Transgender women
UNAIDS	United Nations Joint Program on HIV and AIDS
WG	Working Group
WHO	World Health Organization
WHO CC	WHO Collaborating Centre

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EXECUTIVE SUMMARY

This report describes the process and the results of the size estimation study of key populations (KPs) in Sri Lanka, which was based on the methods of the geographical mapping with enumeration and the multiplier, as well as the results of the consensus-building workshop that utilised the Delphi process to arrive at the final population size estimates (PSE). Following KPs were included in the size estimation study: female sex workers (FSWs), men who have sex with men (MSM), male sex workers (MSW), transwomen, people who inject drugs (PWID) and beach boys (BBs).

The divisional secretariat (DS) was selected as the unit area for geographical mapping. DSs were divided into three categories based on the general population census conducted in 2012, and 49 DSs were included in mapping and enumeration. Mapping and enumeration data were collected through Level 1 and Level 2 activities. The output of Level 1 activity is a comprehensive list of unique spots where KPs can be found, time of their operation and estimated minimum and maximum number of KPs at each spot. This information was provided by secondary key informants (KIs). Level 2 activities include visits to the spots identified at Level 1 to validate their existence and interview primary KIS about the minimum and maximum number of KP members that socialize at the hotspots on peak days and during an average month. Two types of corrections (adjustments) were applied on the mean (minimum-maximum) estimate of a KP during an average month: an adjustment for mobility (KP individuals interviewed at the identified spots in Level 2 activities were asked about their mobility across spots) and an adjustment for hidden populations (based on information collected in IBBS based on RDS carried out in 2018).

Extrapolation of the PSE from DSs which were mapped to the district, provincial and national level was done using the adjusted estimated number of KPs calculated in each of the randomly selected DS.

Several service-based and unique object-based multipliers were obtained to estimate the size of KPs in cities were integrated bio-behavioural surveys (IBBS) were carried out in 2018.

Final population size estimates were discussed and agreed upon at the stakeholders meeting held in June 2018. In addition to inputs on point estimates of the population size, a goal of this process was to establish upper and lower plausibility bounds for the estimates based on this study, previous PSE studies in Sri Lanka, expert opinion and the UNAIDS estimates for Asia and the Pacific region. The workshop used a modified Delphi method to achieve consensus.

Results

A total of 1,170 primary KIs were interviewed during L1 activities.

Female sex workers

For FSW, a total of 456 spots were validated during L2 activities, and 376 primary and 233 secondary KIs were interviewed. Mapping and enumeration resulted in an estimate of 2,811 FSW (range: 2,370-3,251) during an average month. Adjustment for mobility gave an estimate of 2,563, while an additional adjustment for a hidden population an estimate of 6,139 (range: 5,249-7,180). The extrapolated estimated number of FSW in Sri Lanka based on mapping is 31,748 (27,148 – 37,131).

The median estimated size of FSW in Colombo based on the multiplier is 2155 (95% CI 1812-2660) while in Galle it is 1134 (95% CI 983-1342). In Kandy, the multiplier estimate was not possible to calculate because of missing programme (NGO) data. There were two rounds of Delphi estimations to reach the consensus estimate. The group agreed on the national estimate of 30,000 (20,000 – 35,000) FSW in Sri Lanka.

Men who have sex with men

A total of 164 spots were identified for MSM in L2 activities, and interviews were carried out with 139 primary and 81 secondary KIs. Without any adjustment, there were 994 MSM found in L2 activities (range: 833-1,155) during an average month. Adjustment for mobility gave a slightly lower average estimate of 952, while adjustment for a hidden population the estimate of 1,570 (range: 1,303-1,814). The estimate of 8,120 (6,739 – 9,381) of MSM was obtained through the extrapolation procedure, which was based on mapping data.

The median of the estimated size of MSM based on the available multiplier data in Colombo is 2,960 (95% CI 2621-3365), while in Galle it is 2,491 (95% CI 2,045 - 3,214). In Anuradhapura the median was not possible to calculate due to heterogeneity in the estimates.

Three rounds of a Delphi process were conducted.[a] A consensus estimate of 40,000 (30,000 – 50,0000) MSM was reached using the median estimated number participants provided in the third round.

Male sex workers

MSW were identified at 158 spots. Without adjustments, there was an average of 587 MSW (range: 469-704) during an average month at the spots mapped. Adjustment for mobility gave an estimate of 561, while adjustment for "a hidden population" the estimate of 778 (range: 626-937). The extrapolated number of MSW in Sri Lanka is 4,024 (3,240 – 4,848). The final estimation from the

[a] Participants discussing the MSM data provided diverging estimates, ranging from 12,000 to 700,000 of MSM in Sri Lanka. Lower estimates were mostly provided by those involved in planning HIV programmes for MSM and higher estimates were driven by LGBT activists.

consensus meeting was that 15% (10% - 21%) of MSM engage in sex work, which translates to 6,000 (4,000 – 8,400) of MSW in Sri Lanka.

People who inject drugs

For PWID, a total of 41 KIs (33 of these primary and 8 secondary) were interviewed in L2 activities, and 17 spots in five DSs were identified. Without adjustments the average number of PWID during an average month is 368 (range: 315 - 404). Adjustment for mobility gave a slightly lower average estimate of 356, while adjustment for a hidden population the estimate of 517 (range: 451-582). The extrapolated number of PWID in Sri Lanka is 2,672 (2,333 – 3,012). The median of the size estimates based on the multiplier data in Colombo is 682 (95% CI 542-916). However, the agreement reached at the consensus meeting was that there are 900 (650 – 1,200) PWID in Sri Lanka, and the largest number lives in the Colombo district (n=677).

Transwomen

55 spots were transwomen socialise were visited, and mapping yielded an unadjusted estimate of 189 (range: 154-224) transwomen. Adjustment for mobility gave a slightly lower average estimate of 183, while adjustment for "a hidden population" the estimate of 331 (range: 269-380). Extrapolation procedure yielded an estimate of 711 (1,393 – 1,966) transwomen in Sri Lanka, while the multiplier method produced an estimate of 531 (95% CI 467-614) transwomen in Colombo and 117 (95% CI 110-126) in Jaffna.

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The final PSE was reached after the first round of the Delphi process - 2,200 (2,000 – 3,500) of transwomen at the national-level.

Beach boys

During L2 activities, 31 unique spots were BBs congregate were visited. Without any adjustment the average number of BBs during an average month is 2,355 (range: 2,092 - 2,618). Adjustment for mobility gave a slightly lower average estimate of 2,216, while adjustment for "a hidden population" the estimate of 3,357 (range: 2,989-3,725). The extrapolated estimated number of BBs at the national-level based on mapping is 11,056 (9821 – 12,291). The multiplier method produced an estimate of 1,022 (95% CI 859-1,515) BBs in Galle. The agreement reached at the consensus meeting was that there are 4500 (3,000 – 6,000) BBs in Sri Lanka.

Key limitations

Methods based on mapping tend to underestimate hidden populations. To address this weakness of the method, community guides were part of the mapping teams as that ensured a better access to information about KPs as well as KP themselves. To adjust for migration in this study, information was collected on mobility across spots and its frequency. Final estimates are also adjusted for a part of a population that is "hidden" i.e. unlikely to visit outdoor venues using data from IBBS based on

RDS. However, the quality of data on a sub-set of population that do not visit outdoor venues depends on the representativeness of RDS. In some DSs, the estimated size of KPs as reported by respondents is very low, and that is in particular the case with MSM, MSW and PWID. Also, the number of spots found is low for some populations, such as PWID, BB and transwomen.

The key source of a bias in the multiplier estimates in general is the selection bias in the survey leading to dependence between data sources. This could happen if those in contact with the service provider are more likely to be included in the survey than those not in the programme.

Efforts were done to ensure that in both data sources populations are defined in the same way, in terms of time-periods and geographic areas, and that unique objects were not distributed to ineligible individuals.

Data provided by NGOs on the number of KP individuals who got a certain service could have been to some extent inaccurate as the numbers were often rounded (for example, FSW, beach boys, transgender and MSM who were clients of NGOs).

The selected data extrapolation method assumes a linear relationship between the total general population and the number of KPs in DSs, i.e. the proportion of a KP is constant in all geographical areas in a country. This may not be true for areas where some geographical characteristics are related to the number of KPs, such as the number of tourists (increased proportion of BBs and FSW), larger cities (more opportunity for PWID to inject, also MSM often migrate to larger cities) and other characteristic. A statistical test of the relationship was conducted for each KP, showing no evidence for a linear relationship for BBs and strong evidence for a linear relationship for other KPs.

The accuracy of the Delphi method depends on the knowledge of participants about a certain KP, the type of work they are involved in and their level of expertise.

Overall, the approaches used in this round of PSE were robust and in line with the WHO and UNAIDS recommendations. Resulting estimates of the size of KPs should be used to improve the scale, coverage, and further roll-out and evaluation of HIV prevention programmes among these populations.

1. Background

Sri Lanka consists of nine provinces and twenty-five (25) districts and has a population of twenty one million and two hundred thousand (21.2 million). Sri Lanka has been classified by UNAIDS as a country with a low-level HIV epidemic, with a national HIV prevalence of less than 0.1%. According to UNAIDS, an estimated 4,000 (2,700-6,000) adults (15 years and above) were living with HIV in Sri Lanka at the end of 2016.[1]

Knowing the size of key populations (KPs) at higher risk of HIV such as sex workers (SW), men who have sex with men (MSM) and people who inject drugs (PWID) is essential for intervention planning, resource allocation and for advocacy efforts. It also enables to estimate the number of people infected with HIV, evaluate coverage with interventions, project disease burden and model and project HIV transmission. Credible estimates of population size contribute to documenting progress in HIV prevention scale-up and in obtaining continued funding for the provision of various services. Measuring the size of KPs is, however, challenging since behaviours that put individuals at increased risk of HIV are often stigmatizing, which creates challenges in reaching these populations.

The size of KPs can be estimated using different methods, each having its strengths and weaknesses.[2] [3] UNAIDS and WHO recommend that multiple methods are used in order to generate an estimate of a size of a KP for an area, given the variability in estimates produced by single studies.[4]

Methods to estimate the size of KPs can be broadly categorized into methods based on collection of data directly from a KP, including existing institutional data (mapping, census and enumeration, multiplier, and capture–recapture), and methods whereby data are collected from a general population (population-based surveys, network scale-up).[5]

A geographical mapping and enumeration and the multiplier method were deemed as the most appropriate approaches for population size estimations in Sri Lanka for two reasons: firstly, mapping and enumeration were successfully done in 2013; secondly, in 2017-2018 Integrated Biological and Behavioural Surveillance (IBBS) surveys based on respondent-driven sampling (RDS) were carried out in several KPs, which provided an opportunity to implement the multiplier method in conjunction with the IBBS implementation.[6] In line with the WHO recommendations, individuals from KPs were included in planning and implementation of studies. The choice of the geographical mapping and the multiplier method was also based on experiences in other countries in Asia where these methods have been used, and results applied to improve targeted HIV prevention programmes for KPs.[7]

Mapping and enumeration carried out in 2013 estimated a total of 14,132 female sex workers (FSWs) in Sri Lanka (ranging from a minimum of 12,329 to a maximum of 15,935); 7551 MSM (range 6547-8554), 17,459 (15,338-19,542) drug users (around 2% were estimated to inject drugs, which translates to approximately 350 PWID), and 1314 (1142-1486) beach boys (BB).[5]

The population size estimation study done in 2018 was led by the National STI and AIDS Control Program (NSACP) in Sri Lanka, and conducted by the Management Frontiers Ltd., with the technical Assistance from the World Health Organization Collaborating Centre (WHO CC) for HIV Strategic Information based in Zagreb, Croatia.

1.1 Objectives

The key objectives of conducting a comprehensive PSE of the key population groups under purview using most suitable methodology such as multiplier method in all the selected regions across the country are to generate estimates of the size of the specified key population groups and distribution in each site, by different categories in the selected sites and extrapolate the results to find-out finally districts, provinces and national level figures, to describe the sexual network patterns of the key population groups in all the locations and to provide locations of hotspots (disaggregated by KP group) where HIV risk activities predominantly take place. This report describes the process and the results of the size estimation of KPs in Sri Lanka, based on the methods of geographical mapping and enumeration and multiplier. The geographical mapping also aimed to identify locations frequented by KPs and characterise specific spots in terms of operational typologies and the types of KPs present. Along with the design and implementation of the size estimation studies, the technical team of the WHO CC for HIV Strategic Information also conducted a process of capacity building in size estimations for the staff of the Ministry of Health and staff of the NGOs and other agencies that were involved in the implementation activities.

1.2 Collaborating institutions

1.2.1 National STD and AIDS Control Program

The studies were led by the National STD and AIDS Control Program of Sri Lanka, which coordinates all the activities related to planning and implementation of the HIV strategic information system and the prevention and treatment response. Ministry of Health as well as other government ministries and agencies provided a strong commitment and support during project implementation.

1.2.2 Management Frontiers Ltd.

Management Frontiers (Pvt) Limited, a firm of management consultants in Sri Lanka conducted the PSE survey on behalf of the NSACP with the technical assistance of local Technical Consultants

and foreign consultants from the World Health Organization Collaborating Centre (WHO CC) for HIV Strategic information, Croatia.

1.2.3 World Health Organization Collaborating Centre (WHO CC) for HIV Strategic Information

The WHO CC for HIV Strategic Information has extensive experience in design and implementation of HIV surveillance-related activities, particularly in low-level and concentrated epidemics. As a technical partner of WHO and other UN agencies, WHO CC provided technical support in design and implementation of HIV IBBS and population size estimations in over 20 countries of Asia, eastern Europe and North Africa and the Middle East.

For this population size estimation study, WHO CC developed a protocol and data collection tools, trained field teams, analysed data and wrote this report.

1.3 Guidance and oversight

1.3.1 The Surveillance Advisory Committee (SAC)

The Surveillance Advisory Committee (SAC) is chaired by the Director of the NSACP and includes representatives of the NSACP (Consultant Venereologists, Head of the Strategic Information Management Unit and Epidemiologist), Universities (Public health specialists) and civil society organizations (CSOs) working with KPs, representatives from Sri Lanka Police. The SAC Coordinator is the epidemiologist from the NSACP.

The SAC was responsible for reviewing and approving the study protocol, monitoring the progress and quality of the field work, liaising with the GFATM and ensuring the timely completion of all activities and submission of deliverables.

1.4 Pre-mapping activities

Several activities had to be conducted before roll-out of the studies, and included:

- Meetings with stakeholders
- Development of a protocol and data collection tools
- Recruitment of staff
- Training of field teams
- Preparation of documents for Ethics Clearance and obtaining Ethics clearance
- Submission of the Incepotion Report and the Risk Assesment Plan to the SAC

Ethical approval for the study was granted by the Ethics Review Committee, Faculty of Medicine, University of Sri Jayewardenepura.

2. Methods

2.1. Eligibility criteria

Following KPs were included in the size estimation study: FSWs, MSM, male sex workers (MSW), transwomen, PWID, and beach boys (BBs).

Eligibility criteria for inclusion in the study were:

- **FSW:** Any female who sells sex in exchange of money or goods. This includes the following sub-types of FSW: street, lodge/hotel, brothel, home/shanty, karaoke/casino/nightclub, and vehicle based FSW.

- **MSM:** Man who has anal sex with another man, irrespective of sexual orientation. This includes nachchis (effeminate males who have sex with other males) and male sex workers. **MSW** – an MSM who sells sex to other men.

- **PWID:** A person injects drugs for non-medical purposes.

- **BB:** Beach boys are defined as men (homosexual, heterosexual or bisexual) who cruise in and around beach areas and who have anal and/or vaginal sex with tourists.

- **Transgender (transwomen):** a person who was assigned to be a male at birth but who self-identifies as a transgender/transwoman and has penetrative sex with men.

- Additional eligibility criteria for inclusion in IBBS (relevant for the multiplier method) included:
    - Being older than 18 years of age
    - Able to provide verbal informed consent (e.g. was not under the influence of alcohol or other drugs) in order to participate in the IBBS survey.
    - Reside or work in the area where IBBS was done for at least 12 months before the IBBS

2.2. Mapping and enumeration

2.2.1. Selection of geographical units for data collection

The Divisional Secretariat division (DS division) is the smallest administrative division under the decentralized provincial administration and has defined boundaries. The DS Division or "zone' was selected as the unit area for geographical mapping, as was the case in the last round of mapping carried out in 2013. Data on DSs were used from the Census of Population and Housing 2012, available from Department of Census and Statistics Sri Lanka (statistics.gov.lk), District and Divisional Secretariat Portal (www.ds.gov.lk) and aggregated at Statoids Divisions of Sri Lanka (www.statoids.com/ylk.html).

DSs were divided into three categories (i.e. terciles) based on the general population census 2012 information: high density (n=110, total population ranging from 323,257 – 61,638), medium density (n=110, 61,484 – 32,609 population) and low density (n=111, 32,386 – 298 population). Random sampling was applied using the Random Integer Set Generator (random.org) to select 25% (n=28), 12.5% (n=14) and 6.25% (n=7) of DSs from high, medium and low density DSs, respectively. The process of generating random numbers is described in Appendix 1. Selected DSs (n=49) are shown in Appendix 2 and in Table 2.1 below. Due to random sampling selection procedures, no DS from the Northern province was not included in the sample.

Table 2.1: Divisional secreteriats selected for mapping, by province and district

No.	Province	District	Divisional secreteriat
1	Central	Matale	Ukuwela
2	Central	Matale	Pallepola
3	Eastern	Trincomalee	Kinniya
4	Eastern	Trincomalee	Kantalai
5	Eastern	Trincomalee	Echchilampattu
6	Eastern	Ampara	Ampara
7	Eastern	Ampara	Addalachchenai
8	Eastern	Ampara	Alayadiwembu
9	Eastern	Batticaloa	Eravur Town
10	North Central	Polonnaruwa	Elahera
11	North Central	Anuradhapura	Kahatagasdigiliya
12	North Central	Anuradhapura	Palagala
13	North Central	Anuradhapura	Mahavilachchiya
14	North Western	Puttalam	Wennappuwa
15	North Western	Puttalam	Dankotuwa
16	North Western	Puttalam	Nattandiya
17	North Western	Puttalam	Mundel

No.	Province	District	Divisional secreteriat
18	North Western	Puttalam	Vanathavilluwa
19	North Western	Kurunegala	Polgahawela
20	North Western	Kurunegala	Mawathagama
21	North Western	Kurunegala	Bingiriya
22	North Western	Kurunegala	Kuliyapitiya East
23	North Western	Kurunegala	Maspotha
24	Sabaragamuwa	Ratnapura	Ratnapura
25	Sabaragamuwa	Ratnapura	Pelmadulla
26	Sabaragamuwa	Ratnapura	Balangoda
27	Sabaragamuwa	Ratnapura	Eheliyagoda
28	Sabaragamuwa	Ratnapura	Kiriella
29	Sabaragamuwa	Kegalle	Mawanella
30	Sabaragamuwa	Kegalle	Rambukkana
31	Sabaragamuwa	Kegalle	Yatiyanthota
32	Southern	Galle	Hikkaduwa
33	Southern	Galle	Elpitiya
34	Southern	Galle	Karandeniya
35	Southern	Matara	Dickwella
36	Southern	Matara	Malimbada
37	Southern	Hambantota	Katuwana
38	Southern	Hambantota	Sooriyawewa
39	Uva	Badulla	Bandarawela
40	Uva	Moneragala	Katharagama
41	Western	Colombo	Colombo
42	Western	Colombo	Kaduwela
43	Western	Colombo	Kesbewa
44	Western	Colombo	Ratmalana
45	Western	Colombo	Padukka
46	Western	Gampaha	Katana
47	Western	Gampaha	Biyagama
48	Western	Gampaha	Aththanagalla
49	Western	Kalutara	Beruwala

2.2.2. Data collection

Data were collected through two types of activities: Level 1 and Level 2. Level 1 activities entail collection of information from secondary key informants (KIs) about locations of hotspots where KPs socialize in selected DSs, and interviewing KIs about the minimum and maximum number of KP individuals that socialize at those hotspots. Before Level 1 activities, consultation meetings with stakeholders (local health officials, STI clinicians and NGO representatives) were conduced for several adjoining DSs. The aim of these meetings was to prepare a list of locations (by KP) that should be visited within each DS and at which KPs are likely to be present.

Secondary KIs are persons who are knowledgeable about their local area and likely to have contacts with KPs, such as pimps, local food sellers, hotel staff, taxi drivers, as well as those who interact with KPs in their professional capacities (police, health care staff, and NGO workers). For different KPs different KIs can be interviewed. KP members themselves can also act as secondary KIs.

The output of Level 1 activity is a comprehensive list of unique spots where KPs can be found, time of their operation and estimated minimum and maximum number of KPs at each spot.
To facilitate data collection during Level 1 and Level 2 activities, each targeted DS was divided into smaller geographic zones based on administrative boundaries and/or other physical features and landmarks.

Level 2 activities include visits to the spots identified at Level 1 to validate their existence. In Level 2, interviews are conducted with KPs themselves (primary KIs) about operational characteristics of the hotspots: the minimum and maximum number of KP members that socialize at the hotspots on peak days and during an average month, type of the hotspot (public place, brothel, night club, etc) and locations of other hotspots that they might know. Primary KIs are FSW, PWID, MSM, transwomen and BBs. Hotspots the most frequently mentioned in Level 1 data collection were visited first. Peer educators (community mobilisers) accompanied the study teams to the identified spots and mobilised primary KIs for interviews.

2.2.3. Data collection instruments

Level 1 questionnaire
The L1 questionnaire was used to collect the following information by interviewing secondary KIs:

- Geographic locations where KPs are found (name of the spot, address of the spot, type of the spot, time of operation of the spot)
- Types of KPs found at spots (MSM, Transgender, PWID, FSW and BB)

- Minimum and maximum estimates of KP individuals that can be found at each location on a peak day of a week.

L1 interviews continued until new secondary KIs stop providing information on new hotspots. i.e. when saturation of hotspots within the zone is achieved.

Level 2 questionnaire

Data collected in the L2 questionnaire include the types and estimate of KPs that can be found at a given spot on a peak day and during an average month in a year, and the type of a hotspot (public place, bar, bus station, etc). Primary KIs were also asked about their mobility across spots, which is needed for adjustment of the size of a KP by reducing double counting of KP members frequenting multiple spots. Both questionnaires were completed electronically, using tablets.

2.3. Multiplier method

Several service-based and unique object-based multipliers were obtained to estimate the size of KPs in cities were IBBS were carried out, and these are:

- FSW: Colombo, Kandy and Galle
- MSM: Anuradhapura, Galle and Colombo
- PWID: Colombo
- Beach boys: Galle
- Transwomen: Colombo and Jaffna

2.3.1. Procedures for a service multiplier PSE

This entails obtaining data from programmes servicing a KP on the total number of KP individuals who got a certain service during a specific period. During formative assessment information was collected on the programmatic sources that can be used for the multiplier estimates in order to tailor the IBBS questionnaire accordingly. During administration of the IBBS questionnaire, all respondents were asked whether they accessed a specific service during a specified time period. To strengthen accuracy, efforts were made to ensure that service data counts include all the KP members accessing the service, are unduplicated and that service data are for the appropriate period.

Following programmatic data were attempted to be collected for the period May, June, July 2017:
MSM Colombo:

- Number of individual MSM who were clients of the NGO Heart to Heart
- Number of individual MSM who received a condom from the NGO Heart to Heart
- Number of individual MSM who were escorted to an STI clinic by the staff of the NGO Heart to Heart

MSM Galle:

- Number of individual MSM who were clients of the NGO Sathya Guna Foundation
- Number of individual MSM who received a condom from the NGO Sathya Guna Foundation
- Number of individual MSM who were escorted to an STI clinic by the staff of the NGO Sathya Guna Foundation

MSM Anuradhapura:

- Number of individual MSM who were clients of the NGO Rajarata Gemi Pahana
- Number of individual MSM who received a condom from the NGO Rajarata Gemi Pahana
- Number of individual MSM who were escorted to an STI clinic by the staff of the NGO Rajarata Gemi Pahana

PWID Colombo:

- Number of individual PWID who were clients of the NGO Mithuru Mithuro
- Number of individual PWID who received a condom from the NGO Mithuru Mithuro
- Number of individual PWID who were clients of rehabilitation centre in Colombo
- Number of individual PWID who were arrested by police in Colombo

FSW Kandy:

- Number of individual FSW who were clients of the NGO Laksetha Sahana Sewa
- Number of individual FSW who received a condom from the NGO Laksetha Sahana Sewa
- Number of individual FSW who were escorted to an STI clinic by the staff of the NGO Laksetha Sahana Sewa

FSW Colombo:

- Number of individual FSW who were clients of the NGO Abhimani
- Number of individual FSW who received a condom from the NGO Abhimani
- Number of individual MSM who were escorted to an STI clinic by the staff of the NGO Abhimani

FSW Galle:

- Number of individual FSW who were clients of the NGO Saviya Development
- Number of individual FSW who received a condom from the NGO Saviya Development
- Number of individual MSM who were escorted to an STI clinic by the staff of the NGO Saviya Development

Transwomen, Colombo:

- Number of individual transwomen who were clients of the NGO Heart to Heart
- Number of individual transwomen who received a condom from the NGO Heart to Heart

Transwomen, Jaffna:

- Number of individual transwomen who were clients of the NGO Journey for Health Life
- Number of individual transwomen who received a condom from the NGO Journey for Health Life

Beach boys, Galle:

- Number of individual BB who were clients of the NGO Samadhi Foundation
- Number of individual BB who received a condom from the NGO Samadhi Foundation
- Number of individual BB who were escorted to an STI clinic by the staff of the NGO Samadhi Foundation

2.3.2. Procedures for a unique object multiplier PSE

The unique object multiplier method consists of a distribution of a unique object to the target population before the implementation of a survey. A week before the IBBS implementation, a study team consisting of field workers of NGOs that provide prevention services to KPs distributed a specified number of objects to members of the target population as widely as possible. The number of unique objects distributed was determined by the number of contacts the distributing outreach organisations anticipate reaching within one week. Each member of the population received only one object. Staff assessed the inclusion criteria before distributing the unique object to an individual and verified that he/she had not received a unique object from a different staff member. They also informed the target population members to keep the object because they might be asked about it in the near future by another project staff member during IBBS, remember it and not give it to anyone else. The locations where objects were distributed were determined based on sites where NGOs conduct their outreach activities (parks, streets, beaches, markets, etc). In the IBBS questionnaire, all respondents were asked whether they received a unique object by NGO staff during the specified time period.

3. Training, roles and responsibilities of different staff categories and quality assurance

3.1. Training

WHO CC for HIV Strategic Information facilitated a 2-days training workshop for representatives of the NGOs that were carrying out mapping and enumeration and NGOs that provided data for the multiplier. The training focused on the study design, data collection instruments, practical aspects of field work including the challenges in accessing/ interacting with KIs during data collection. Practical sessions were spent exercising the use of data collection forms and recording information for Level 1 and Level 2 activities.

During a training on RDS, a session was held on how to collect data for the multiplier method.

3.2. Roles and responsibilities of staff during mapping and enumeration

Level One – Each team consists of two interviewers representing non-KP and KP individuals to facilitate interaction with the secondary KIs, and a team co-ordinator who is in charge of taking geo-coordinates of locations (used to minimize duplicates) and supports interviewers.

Level Two - Staff are organized into five different teams - FSW team, MSM team, PWID, TG and BB team. During data collection, the teams were supported by community mobilisers (current or former members of local KP communities). Community mobilisers are trusted by the KP communities and play a critical role in enhancing participation of primary KIs in the study. Ethnicity and language ability of field staff members was considered when assigning teams to the different zones. Geo-coordinates of locations were taken again during L2 activities as that enabled to create a unique list of locations that were validated as being locations where KPs can be found.

3.3. Quality assurance at field and documentation-level

There were several activities that helped to assure quality of data collected. Field supervisors had a crucial role in assuring data quality, and had the following responsibilities:

- conduct morning and evening meetings with the teams. The morning meeting addressed planning the day's activities and ensuring that the field research officers (FROs) are correctly recording data in data collection forms. The evening meetings were focused on discussing and sharing the experiences from the field including issues and challenges faced, reviewing all data collection forms the FROs completed on the day and addressing the gaps or discrepancies in the forms.
- ensure that the hotspot names and locations are well recorded.
- visit the field and carry out quality checks by interviewing KIs in some of the randomly identified hotspots.
- review the list of KIs on data collection forms to ensure the quality of KIs recruited within a DS.
- ensure that data collection forms are complete and that missing data are kept to the minimum

Data were collected electronically using tablets, and quality was checked again by study co-ordinator in Colombo.

4. Data management and analysis

4.1. Mapping and enumeration

At the end of each day and after completion of Level 1 activity, the field supervisors reviewed and collated data from the L1 questionnaires to generate unique lists of hotspots and estimates for each KP group. These unique lists of hotspots were used to plan the Level 2 activities.

Existence of hotspots was validated in Level 2 activities. Estimates obtained from interviewing primary KIs during Level 2 field work were taken as the final unadjusted estimates. To arrive at a single estimate, the mid-point ("mean") of the minimum and maximum estimates were used. Two types of corrections (adjustments) were applied on the mean (min-max) estimate of a KP during an average month:

- An adjustment for mobility was done to reduce double counting of KP frequenting multiple spots. The KP individuals interviewed at the identified spots in Level 2 activities were asked about their mobility across spots (for example, FSW were asked whether they solicit clients at more than one spot in a day, and if so, at how many spots, on average).
- An adjustment for hidden populations was done based on the assumption that a certain number of KP individuals do not socialize at venues and will therefore not be reached with mapping. To estimate this, IBBS questionnaires included questions to determine the proportion of respondents that do not visit outdoor places to find partners and socialize there with other members of their respective KP.

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 in an area
S_1= estimated number of KP individuals at a spot level
p_1= proportion of KP individuals that visit more than one spot in a day
m_1= mean number of spots that KP members visit in a day

The following formula was used to adjust for a "hidden population" at sites were IBBS was done:

$S_3 = S_2 / (1-p_2)$
S_s = size of a KP adjusted for mobility
S_3 = estimated size after adjusting for "a hidden population"
p_2= estimated proportion of a KP who do not frequent hotspots (assumed to be "hidden")

4.2. Multiplier method

The following formula was applied to estimate the population size:

N= M/P

Where:
N = the estimated size of a KP
P = proportion of respondents in an IBBS survey who reported receiving a service or a unique object during a specific period
M = Number of KP individuals (MSM, FSW, etc) recorded in the service registry in the same period (or a number of KP individuals who were given an object by the outreach team).

A 95% confidence interval (CI) of a size estimate was calculated applying the 95% CI for a proportion of an indicator generated by the RDS-Analyst software package.

4.3. Extrapolation of mapping and enumeration results

The aim of extrapolation is to produce a point estimate and a range (low and high estimate) for the population size among each of the six KP groups in Sri Lanka at a district, province and national level. The basis for calculation is the adjusted estimated number of KPs calculated in each of the randomly selected DS obtained through mapping and enumeration.

For each sampled DS, an estimated number of KP members, including low and high estimate, was used to calculate a proportion of KP members among the total general population based on the census 2012 data. This was calculated for each KP and DS separately. To determine plausibility of estimates, relationship between the estimated number of a KP and the general population was tested using the coefficient of determination (R^2).

The pooled mean of proportions of mid-estimate, low and high estimate was calculated using the formula:

$$p = \frac{\sum_i^n M_{DS_i}}{\sum_i^n N_{DS_i}}$$

where:
p = proportion of a KP among the general population
n = number of sampled DSs (n=49)
M_{DS} = estimated number of a KP in a DS

N_{DS} = number of the general population in a DS based on the census done in 2012

The pooled proportion was applied to census data of each DS, district, province and national counts to establish estimates at the district, province and national level.

4.4. Comparison of results of the size estimations methods

In provinces where both the multiplier and the mapping and enumeration methods were employed, comparisons are done to assess the extent to which results are diverging from each other and reasons behind differences in estimates. In addition, results are compared with the previous round of mapping and with the UNAIDS estimates for Asia and the Pacific region.

4.5. Consensus meeting

Final population size estimates were discussed and agreed upon at the stakeholders meeting held in June 2018. In addition to inputs on point estimates of the population size, a goal of this process was to establish upper and lower plausibility bounds for the estimates based on the shared local and international data and on the expert opinion. Plausibility bounds are not the same as statistical CIs but rather bounds established that make 'plausible sense' in a specific context.

The workshop used a modified Delphi method to achieve consensus. Participants were presented with the results of estimation methods used in this study. Following the discussion of results, each participant provided his/her own estimates. Google forms were used to collect participants' estimates (Appendix 4). The data collection form included questions on the estimated most likely number, minimum and maximum number of FSW, MSM, TGW, BB and PWID in Sri Lanka. For MSW, the estimate of the most likely, minimum and maximum proportion (%) of MSM who sell sex was collected. In addition to national estimates, participants classified each district into low/medium/high according to the estimated proportion of KP among adult general population. Those estimates were collated and presented to the group after all participants entered their estimates using the form. For the consensus estimate, median values of the most likely, minimum and maximum estimates were used. For district classification each density category was assigned a value: low=1, medium=2, high=3; an arithmetic mean was calculated and each district was assigned an average density. When needed, adjustments to the estimates were made and additional rounds of estimation were conducted.

5. Ethical considerations

The study was designed to respect international ethical guidelines, specifically those relating to studies done in KPs.[8] Following issues were in particular deemed important:

- Safety of staff and respondents: Meetings had been held with the police and law enforcement agencies in each district before the project started in order to inform them of the nature and the purpose of the study and avoid possible challenging situations during the implementation phase.

- Consent and voluntary participation: Interviews with KIs were conducted only after describing the study procedures. They were informed that the participation in the study was voluntary. Since no personal data were collected, informed consent was not sought.

- Confidentiality: No names of respondents were recorded anywhere in data sources. The electronic database is password-protected and only authorized officials have access to the data files.

6. Results of L1 activities

A total of 1170 primary KIs were interviewed during L1 activities. The Western province yielded the highest number of KIs interviewed (52%), followed by the Southern province (12,8%).

Table 6.1: Number of primary key informants interviewed by province and district

Province	District	Number	Proportion of each province in total (%)
Central	Matale	40	3.4
Eastern	Trincomalee	25	
	Ampara	57	
Total Eastern		82	7.0
North Central	Batticaloa	7	
	Polonnaruwa	3	
	Anuradhapura	13	
Total North Central		23	2.0
North Western	Puttalam	41	
	Kurunegala	47	
Total North Western		88	7.5
Sabaragamuwa	Ratnapura	80	
	Kegalle	38	
Total Sabaragamuwa		118	10.1
Southern	Galle	93	
	Matara	28	
	Hambantota	29	
Total Southern		150	12.8
Uva	Badulla	27	
	Moneragala	35	
Total Uva		62	5.3
Western	Colombo	441	
	Gampaha	140	
	Kalutara	26	
Total Western		607	51.9
Total		**1,170**	**100**.0

The commonest type of primary KIs were FSW (21,3%), followed by taxi drivers (16,2%) and MSM (10,0%).

Table 6.2: Number of primary key informants by the type of key informant

Key Informant Group	Number	(%)
FSW	249	21.3
MSM	117	10.0
DU / PWID	18	1.5
TG	45	3.8
BB	26	2.2
Taxi driver	190	16.2
Local food seller	50	4.3
Pimp / Brothel owner / Madam	27	2.3
Watchman / Security staff	37	3.2
Hotel / Lodge worker	47	4.0
Bar worker / Owner / Patron	12	1.0
Porter	24	2.1
Petty shop owner	75	6.4
Pharmacist	27	2.3
Lottery seller	79	6.8
Sanitary worker on the streets / toilets	23	2.0
NGO staff	68	5.8
Health care service provider	16	1.4
Government / Law enforcement official	11	0.9
Street family	1	0.1
Public / Private transport staff	14	1.2
Construction worker / Labourer	14	1.2
Total	**1,170**	**100.0**

7 Estimates of female sex workers

7.1 Mapping

A total of 456 spots were validated during L2 activities in all the provinces (n=8) and 43 DSs, and 376 primary and 233 secondary KIs were interviewed.

Spots (total n=456) visited by FSW were found in the following provinces:

- Western (53.5%, n= 244)
- Sabaragamuwa (12.3%, n= 56)
- North Western (7.9%, n= 36)
- Southern (7.5%, n= 34)
- Eastern (7.0%, n=32)
- Uva (6.6%, n=30)
- Central (4.6%, n=21)
- North Central (0.9%, n= 4)

At 72.1% (n=329) of spots interviews were done with FSW, while at the remaining ones with secondary KIs. The majority of the spots were validated during the first visit (70.8%, n=323), while the remaining ones required a second visit.

Spots were described as follows: street/public place (39.5%, n=180), spa (20.8%, n=95), lodge/hotel (13.8%, n=63), shanti (9.6%, n=44), home (9.2%, n=42), other (1.9%, n=9), brothel (1.8%, n=8), karaoke/night club (1.1%, n=5), beach (0.9%, n=4), park (0.9%, n=4), massage parlor (0.4%, n=2). The busiest day at spots is Saturday (n=174), followed by Friday (n=173), Sunday (n=44), Thursday (n=30), Wednesday (n=18), Tuesday (n=15) and Monday (n=2). Spots are the most frequented between noon - 5 pm (n=245), 5 pm – 9 pm (n=141), 9 pm – late night (n=60), and morning – noon (n=10).

Mobility was found at 20.6% (n=94) of spots. At 78 spots FSW visit in total two spots on a peak day, while at 16 they visit three spots.

Based on mapping, there is an average number of 2,811 FSW (range: 2,370 - 3,251) in an average month. Adjustment for mobility gave an estimate of 2,563, while an additional adjustment for a hidden population an estimate of 6,139 (range: 5,249 – 7,180).

The average unadjusted number of FSW per spot is 6.

Table 7.1 Size estimates on a peak day and during an average month, adjusted for mobility and the proportion of the population that is "hidden", FSW

	Low estimate	High estimate	Average estimate
On a peak day	1,977	2,616	2,297
During an average month	2,370	3,251	2,811
Adjustment for mobility across spots	2,244	3,056	2,563
Adjustment for the "hidden population"	**5,249**	**7,180**	**6,139**

7.2. Extrapolation of Mapping Data

Using the estimates from randomly selected and mapped DSs, the proportion of FSW among the general population was calculated. The variation in the proportion of FSW among the general population in the sampled DSs was high and has ranged from 0,000% to 0,775%. There were 12 DSs were FSW were not found during mapping. The highest proportion of FSW in a DS was found in Echchilampattu (88 FSW, 0.775%), Ratmalana (716 FSW, 0.749%) and Dickwella (344, 0.629%). The proportional contribution of FSW in the general population in all sampled DSs is available in the Appendix 3. The relationship between estimated FSW and census population was strong (R^2=0.449).

The pooled mean of proportions was calculated using the average (n=6139), low (n=5249) and high (n=7180) estimates. In DSs were mapping was conducted there is a difference between pooled/extrapolated estimates and mapping estimates. For example, in the Colombo DS, the pooled estimate (0.013%) is 10.08 times lower than the adjusted estimate from mapping (0.131%). These differences are expected and compensated at the province and national-level and were taken into account at the consensus meeting.

The extrapolated estimated number of FSW in Sri Lanka is 31,748 (27,148 – 37,131). District-level and province-level estimates are shown in tables below. Estimates per DS are available in the Appendix 3.

Table 7.2.1: Estimated number of FSW at the district-level based on the extrapolated proportion of 0.156% (0.133% - 0.182%)

District	District population	Estimated average number of FSW	Low estimate	High estimate
Ampara	731,620	**1,141**	976	1334
Anuradhapura	919,028	**1,433**	1,225	1676
Badulla	904,641	**1,411**	1,206	1650
Batticaloa	462,088	**721**	616	843
Colombo	2,305,466	**3,595**	3,074	4205
Galle	994,330	**1,551**	1,326	1813
Gampaha	2,259,241	**3,523**	3,013	4120
Hambantota	643,033	**1,003**	857	1173
Jaffna	718,721	**1,121**	958	1311
Kalutara	1,180,342	**1,841**	1,574	2153
Kandy	1,287,551	**2,008**	1,717	2348
Kegalle	808,470	**1,261**	1,078	1474
Kilinochchi	108,241	**169**	144	197
Kurunegala	1,518,541	**2,368**	2,025	2769
Mannar	150,662	**235**	201	275
Matale	479,188	**747**	639	874
Matara	761,135	**1,187**	1,015	1388
Moneragala	404,786	**631**	540	738
Mullaitivu	189,864	**296**	253	346
Nuwara Eliya	699,440	**1,091**	933	1276
Polonnaruwa	387,423	**604**	517	707
Puttalam	752,484	**1,173**	1,003	1372
Ratnapura	1,018,707	**1,589**	1,358	1858
Trincomalee	436,876	**681**	583	797
Vavuniya	237,561	**370**	317	433
Total	**20,359,439**	**31,748**	**27,148**	**37131**

Table 7.2.2: Estimated number of FSW at the province-level based on the extrapolated proportion of 0.156% (0.133% - 0.182%)

Province	Province population	Estimated average number of FSW	Low estimate	High estimate
Central	2,392,016	**3,730**	3,190	4,362
Eastern	1,877,807	**2,928**	2,504	3,425
North Central	1,431,327	**2,232**	1,909	2,610
North Western	2,316,353	**3,612**	3,089	4,224
Northern	1,452,348	**2,265**	1,937	2,649
Sabaragamuwa	1,727,146	**2,693**	2,303	3,150
Southern	2,319,900	**3,618**	3,093	4,231
Uva	1,225,412	**1,911**	1,634	2,235
Western	5,617,130	**8,759**	7,490	10,244
Total	**20,359,439**	**31,748**	**27,148**	**37,131**

7.3 Multiplier method

Following are the estimated prevalences of FSW that seek paying partners (clients) at outdoor places (sites such as streets, parks, bus stations, taxi stations, etc.) collected in IBBS in 2018 (these data were obtained to calculate population size adjusted for the proportion of FSW that do not visit outdoor places to find partners - i.e. the population that is assumed to be "hidden").

- Kandy: 52.3% (95% CI 47.2, 57.4)
- Colombo: 45.3% (95% CI 38.9, 51.7)
- Galle: 26.4% (95% CI 21.3, 31.5)

The median estimated size of FSW in Colombo based on the multiplier is 2155 (95% CI 1,812-2,660) while in Galle it is 1,134 (95% CI 983 - 1,342). In Kandy, this was not possible to calculate because of missing programme (NGO) data.

Data on the number of individual FSW who were escorted to an STI clinic from NGOs were deemed to be of low quality and therefore could not be used to make the estimates based on the multiplier method.

Table 7.3: Size estimates based on the multiplier data, FSW

	Colombo	Kandy	Galle
1. Unique object			
No. of unique objects distributed	100	100	100
Received unique object, IBBS (%, 95% CI)	10.2 (5.5, 14.8)	14.6 (10.8 18.4)	18.5 (12.6, 24.3)
Population size estimate	980 (676-1,818)	685 (543-925)	540 (412-794)
2. Number of individual FSW who were clients of an NGO	1,400	150	550
Reported being a client of an NGO in IBBS (%, 95% CI)	31.4 (25.5, 37.4)	11.0 (7.9, 14.1)	40.5 (34.3, 46.8)
Population size estimate	4,459 (3743-5,490)	1,364 (1,064-1,899)	1,358 (1,175-1,603)
3. Number of individual FSW who received a condom from an NGO	625	NA	455
Reported receiving condoms from an NGO in IBBS (%, 95% CI)	29.0 (23.5, 34.5)	6.5 (4.4, 8.7)	40.1 (33.9, 46.3)
Population size estimate	2,155 (1,812 - 2,660)	NA	1,134 (983-1,342)
4. Number of individual FSW who were escorted to an STI clinic	18	NA	18
Reported being escorted to an STI clinic by the staff of an NGO in IBBS (%, 95% CI)	21.9 (16.3, 34.5)	4.2 (2.4, 6.0)	35.5 (29.3, 41.9)
Population size estimate	82 (52-110)	NA	51 (43-62)
Median values	1, 2, 3 2,155 (1,812-2,660)	Median not possible Range: 685-1,364	1, 2, 3 1,134 (983-1,342)

Programme data were collected from the NGOs Abhimani for Colombo, Saviya Development in Galle and Laksetha Sahana Sewa in Kandy.

8. Estimates of Men Who have Sex with Men and Male Sex Workers

8.1. Mapping (MSM)

A total of 164 spots were identified for MSM in L2 activities, and interviews carried out with 139 primary and 81 secondary KIs.

MSM spots (n=164) were found in the following provinces:

- Western (68.9%, n=113)
- Sabaragamuwa (8.5%, n=14)
- North Western (6.1%, n=10)
- Southern (6.1%, n=10)
- Eastern (5.5%, n=9)
- Uva (3.0%, n=5)
- North Central (1.8%, n=3)

The majority of the spots were validated during the first visit (n=107), while the remaining ones required a second visit.

Spots were described as follows: street/public place (75.6%, n=124), public toilet (10.9%, n=18), shanti (5.5%, n=9), beach (4.3%, n=7), lodge/hotel (1.2%, n=2), home (1.2%, n=2), spa (0.6%, n=1), park (0.6%, n=1). The busiest day at spots is Saturday (n=73), followed by Friday (n=48), Sunday (n=36), Thursday (n=5) and Wednesday (n=2). Spots are most frequented between 5 pm - 9 pm (n=87), then noon – 5 pm (n=40), 9 pm – late night (n=35), and morning – noon (n=1).

Mobility was found at 24,3% of spots. As reported, at 33 spots MSM visit in total two spots on a peak day, at seven they visit three spots while at one four spots.

Following are the estimated prevalences of MSM that do not visit outdoor sites (streets, parks, bus stations, etc.) to find partners, as collected in IBBS in 2018 (these data were obtained to calculate population size adjusted for the proportion of MSM that is assumed to be “hidden”).

- Anuradhapura: 25.2% (95% CI 20.6-29.2)
- Colombo: 32.1 (26.3, 37.9)
- Galle: 85.6% (95% CI 82.1, 89.1)

Without any adjustment, there were 994 MSM enumerated is L2 activities (range: 833-1,155) during an average month. Adjustment for mobility gave a slightly lower average estimate of 952, while adjustment for a hidden population the estimate of 1,570 (range: 1,303-1,814).

The average unadjusted number of MSM per spot is 6.

Table 8.1: Size estimates on a peak day and during an average month, adjusted for mobility and the proportion of the population that is "hidden" MSM

	Low estimate	High estimate	Average estimate
On a peak day	678	901	**790**
During an average month	833	1,155	**994**
Adjustment for mobility across spots	798	1,089	**952**
Adjustment for the "hidden population"	1,303	1,814	**1,570**

8.2. Extrapolation of mapping data (MSM)

Proportional contribution of MSM in the general population was calculated using estimates from randomly selected and mapped DSs. The variation in the proportion of MSM in the general population in sampled DSs was high and has ranged from 0,000% to 0,217%. In total, there were 21 DSs were MSM were not found. The highest proportion of MSM in a DS was in Ratmalana (207 MSM, 0,217%) and Colombo (491 MSM, 0,152%). The results for all sampled DSs are available in Appendix 3. The relationship between estimated number of MSM and census population was strong (R^2=0.407).

The pooled mean of proportions was calculated using the mid (n=1,570), low (n=1,303) and high (n=1,814) adjusted estimates from all 49 selected DS and DS census data. In DSs were mapping was conducted there is a difference between pooled/extrapolated estimates and adjusted mapping estimates (for example, in Ratmalana the difference is 0.217% / 0.040%= 5.43). These differences are expected and compensated at the province and national-level.

The extrapolated estimated number of MSM in Sri Lanka is 8,120 (6,739 – 9,381). The estimated number of MSM at a district and province-level is shown in tables below. Estimates per DS are available in Appendix 3.

Table 8.2.1: Estimated number of MSM at the district-level based on the extrapolated proportion of 0.040% (0.033% - 0.046%)

District	District population	Estimated average number of MSM	Low estimate	High estimate
Ampara	731,620	**292**	242	337
Anuradhapura	919,028	**367**	304	423
Badulla	904,641	**361**	299	417
Batticaloa	462,088	**184**	153	213
Colombo	2,305,466	**919**	763	1,062
Galle	994,330	**397**	329	458
Gampaha	2,259,241	**901**	748	1,041
Hambantota	643,033	**256**	213	296
Jaffna	718,721	**287**	238	331
Kalutara	1,180,342	**471**	391	544
Kandy	1,287,551	**514**	426	593
Kegalle	808,470	**322**	268	373
Kilinochchi	108,241	**43**	36	50
Kurunegala	1,518,541	**606**	503	700
Mannar	150,662	**60**	50	69
Matale	479,188	**191**	159	221
Matara	761,135	**304**	252	351
Moneragala	404,786	**161**	134	187
Mullaitivu	189,864	**76**	63	87
Nuwara Eliya	699,440	**279**	232	322
Polonnaruwa	387,423	**155**	128	179
Puttalam	752,484	**300**	249	347
Ratnapura	1,018,707	**406**	337	469
Trincomalee	436,876	**174**	145	201
Vavuniya	237,561	**95**	79	109
Grand Total	**20,359,439**	**8,120**	**6,739**	**9,381**

Table 8.2.2 Estimated number of MSM at the province-level based on the extrapolated proportion of 0.040% (0.033% - 0.046%)

Province	Province population	Estimated average number of MSM	Low estimate	High estimate
Central	2,392,016	954	792	1102
Eastern	1,877,807	749	622	865
North Central	1,431,327	571	474	660

Province	Province population	Estimated average number of MSM	Low estimate	High estimate
North Western	2,316,353	924	767	1067
Northern	1,452,348	579	481	669
Sabaragamuwa	1,727,146	689	572	796
Southern	2,319,900	925	768	1,069
Uva	1,225,412	489	406	565
Western	5,617,130	2,240	1,859	2,588
Total	**20,359,439**	**8,120**	**6,739**	**9,381**

8.3. Multiplier method (MSM)

The median of the estimated size of MSM based on the available multiplier data in Colombo is 2960 (95% CI 2621-3365), while in Galle it is 2491 (95% CI 2045-3214). In Anuradhapura the median was not possible to calculate due to heterogeneity in the estimates.

Table 8.3: Size estimates based on the multiplier data, MSM

	Colombo	Anuradhapura	Galle
1. Unique object			
N of unique objects distributed	100	100	100
Reported receiving unique object, IBBS (%, 95% CI)	20.2 (14.2, 26.2)	19.9 (16.1, 23.8)	18.9 (13.8, 24.1)
Population size estimate	495 (382-704)	502 (420-621)	529 (415- 725)
2. Number of individual MSM who were clients of an NGO	3,200	1,200	780
Reported being a client of an NGO in IBBS (%, 95% CI)	59.6 (53.1, 66.1)	53.6 (48.6, 58.5)	26.9 (21.2, 32.7)
Population size estimate	5,424 (4,841-6,026)	2,238 (2,051-2,469)	2,900 (2,385-3,679)
3. Number of individual MSM who received a condom from an NGO	2,950	65	675
Reported receiving condoms from an NGO in IBBS (%, 95% CI)	49.1 (42.1, 56.1)	44.9 (40.0, 49.9)	27.1 (21.2, 33.0)

	Colombo	Anuradhapura	Galle
Population size estimate	6,008 (5,258 – 7,007)	145 (130-163)	2,491 (2,045-3,214)
4. Number of individual MSM who were escorted to an STI clinic	140	0	25
Reported being escorted to an STI clinic by the staff of an NGO in IBBS (%, 95% CI)	29.1 (23.4, 34.9)	9.3 (6.7, 11.9)	22.3 (17.4, 27.3)
Population size estimate	481 (401- 598)	NA	112 (92- 144)
Indicator **Median values**	1, 2, 3,4 2,960 (2,621-3,365)	Median not possible due to very different estimates Range: 145-2,238	1, 2, 3 2,491 (2,045-3,214)

Programme data were collected from the NGOs Heart to Heart in Colombo, Sathya Guna Foundation in Galle and Rajarata Gemi Pahana in Anuradhapura

8.4. Mapping (MSW)

Male sex workers (MSW) were identified at 158 spots. Mobility was found at 12,9% of spots (at 18 spots MSW reportedly visit all together two spots on a peak day, and at three they visit three spots). Following are the data from IBBS on the proportion of MSW (defined in the IBBS as MSM who sold sex to a man in the past 12 months) who do not visit outdoor sites to find partners:

- Galle: 70.5% (95% CI 62.3 - 78.7)
- Anuradhapura: 13.9% (6.3-21.5)
- Colombo: 24.2% (19.6- 29.8)

Without adjustments, there was an average of 587 MSW (range: 469-704) during an average month at the spots mapped. Adjustment for mobility gave an estimate of 561, while adjustment for "a hidden population" the estimate of 778 (range: 626-937).

The average unadjusted number (using a monthly average) of MSW per spot is 4.

Table 8.4 Size estimates on a peak day and during an average month, adjusted for mobility and the proportion of the population that is "hidden", MSW

	Low estimate	High estimate	Average estimate
On a peak day	325	516	**421**
During an average month	469	704	**587**
Adjustment for mobility across spots	453	675	**561**
Adjustment for the "hidden population"	626	937	**778**

8.5. Extrapolation of mapping data (MSW)

Proportional contribution of MSW in the general population was calculated using the estimates from randomly selected and mapped DSs. The variation in the proportion of MSW in the general population in sampled DSs was high, ranging from 0,000% to 0,139%. There were 19 DSs were MSW were not found. The highest proportion of MSW was in the Ratmalana DS (132 MSW, 0.139%).

The pooled mean of proportions was calculated using the mid (n=778), low (n=626) and high (n=937) estimates from 49 selected DSs and DS census data. The relationship between the estimated number of MSW and the census population was strong (R^2=0.421). In DSs were mapping was conducted there is a difference between pooled/extrapolated estimates and adjusted mapping estimates (for example, in Ratmalana the difference is 0.139% / 0.020% = 6.95). These differences are expected and compensated at the province and national-level and were taken into account at the consensus meeting.

The extrapolated number of MSW in Sri Lanka is 4,024 (3,240 – 4,848). The results per district and province are shown in the tables below. Estimates per DSs are available in Appendix 3.

Table 8.5.1: Estimated number of MSW at the district-level based on the extrapolated proportion of 0.020% (0.016% - 0.024%)

District	District population	Estimated average number of MSW	Low estimate	High estimate
Ampara	731,620	**145**	116	174
Anuradhapura	919,028	**182**	146	219
Badulla	904,641	**179**	144	215
Batticaloa	462,088	**91**	74	110
Colombo	2,305,466	**456**	367	549
Galle	994,330	**197**	158	237
Gampaha	2,259,241	**447**	360	538
Hambantota	643,033	**127**	102	153
Jaffna	718,721	**142**	114	171
Kalutara	1,180,342	**233**	188	281
Kandy	1,287,551	**255**	205	307
Kegalle	808,470	**160**	129	193
Kilinochchi	108,241	**21**	17	26
Kurunegala	1,518,541	**300**	242	362
Mannar	150,662	**30**	24	36
Matale	479,188	**95**	76	114
Matara	761,135	**150**	121	181
Moneragala	404,786	**80**	64	96
Mullaitivu	189,864	**38**	30	45
Nuwara Eliya	699,440	**138**	111	167
Polonnaruwa	387,423	**77**	62	92
Puttalam	752,484	**149**	120	179
Ratnapura	1,018,707	**201**	162	243
Trincomalee	436,876	**86**	70	104
Vavuniya	237,561	**47**	38	57
Total	**20,359,439**	**4,024**	**3,240**	**4,848**

Table 8.5.2: Estimated number of MSM at the province-level based on the extrapolated proportion of 0.020% (0.016% - 0.024%)

Province	Province population	Estimated average number of MSW	Low estimate	High estimate
Central	2,392,016	**473**	381	570
Eastern	1,877,807	**371**	299	447
North Central	1,431,327	**283**	228	341
North Western	2,316,353	**458**	369	552
Northern	1,452,348	**287**	231	346
Sabaragamuwa	1,727,146	**341**	275	411
Southern	2,319,900	**459**	369	552
Uva	1,225,412	**242**	195	292
Western	5,617,130	**1,110**	894	1,338
Total	**20,359,439**	**4,024**	**3,240**	**4,848**

9 Estimates of people who inject drugs

9.1. Mapping

A total of 41 KIs (33 of these primary and 8 secondary) were interviewed in L2 activities, and 17 spots in five DSs were identified. The majority of spots (n=14) are located in the Western province, Colombo district. Three spots were located in the Eastern province. Of these three, two spots were in the district Ampara and one in the district Batticaloa.

These 17 spots were characterized as streets (n=7), shanti (n=4), other (n=3), beach (n=2) and abandoned land (n=1). Seven spots were found as active during the first visit, while remaining 10 were visited twice. The peak days for the spots are Friday (n=10), Monday (n=4), Saturday (n=2), Sunday (n=1), while the peak time is 5 pm -9 pm (n=10), before noon (n=6) and from noon-5 pm (n=1).

Mobility was recorded at only two out of 17 spots, and PWID who socialize at those two spots tend to visit only one other spot. The proportion of PWID who do visit outdoor sites (streets, parks, bars) in order to buy drugs and socialize with other PWID is 30.8% (95% CI 24.2-37.5), as obtained from IBBS in Colombo.

As shown in table 9.1, without any adjustment the average number of PWID during an average month is 368 (range: 315-404). Adjustment for mobility gave a slightly lower average estimate of 356, while adjustment for a hidden population the estimate of 517 (range: 451-582).
The average unadjusted number of PWID per spot is 22.

Table 9.1: Size estimates on a peak day and during an average month, adjusted for mobility and the proportion of the population that is “hidden”, PWID

	Low estimate	High estimate	Average estimate
On a peak day	311	386	**349**
During a month	315	404	**368**
Adjustment for mobility across spots	311	402	**356**
Adjustment for the “hidden population”	451	582	**517**

9.2. Extrapolation of Mapping Data

The proportional contribution of PWID was calculated using the adjusted estimates from randomly selected and mapped DSs. The estimated proportion of PWID in the general population in the sampled DSs varied from 0,000% to 0,131%. In the majority of sampled DSs (n=44) PWID were not found. The highest proportion of PWID at the DS-level was in Colombo (425 PWID, 0.131%). The proportion of PWID in all sampled DSs is available in Appendix 3. The relationship between estimated number of PWID and census population was strong (R^2=0.273).

The pooled mean of proportions was calculated using the mid (n=517), low (n=451) and high (n=582) estimates from 49 selected DSs and DS census data. The resulting proportion is 0.013% (0.011% - 0.015%) of PWID among the general population. In DSs were mapping was conducted there is a difference between pooled/extrapolated estimates and adjusted mapping estimates (for example, in Colombo the difference is 0.131% / 0.013% = 10.08).

The extrapolated number of PWID in Sri Lanka is 2,672 (2,333 – 3,012). The results at a district and province-level are shown in the tables below (estimates per DS are available in Appendix 3).

Table 9.2.1: Estimated number of PWID at the district-level based on the extrapolated proportion of 0.013% (0.011% - 0.015%)

District	District population	Estimated average number of PWID	Low estimate	High estimate
Ampara	731,620	96	84	108
Anuradhapura	919,028	121	105	136
Badulla	904,641	119	104	134
Batticaloa	462,088	61	53	68
Colombo	2,305,466	303	264	341
Galle	994,330	131	114	147
Gampaha	2,259,241	297	259	334
Hambantota	643,033	84	74	95
Jaffna	718,721	94	82	106
Kalutara	1,180,342	155	135	175
Kandy	1,287,551	169	148	190
Kegalle	808,470	106	93	120
Kilinochchi	108,241	14	12	16

District	District population	Estimated average number of PWID	Low estimate	High estimate
Kurunegala	1,518,541	199	174	225
Mannar	150,662	20	17	22
Matale	479,188	63	55	71
Matara	761,135	100	87	113
Moneragala	404,786	53	46	60
Mullaitivu	189,864	25	22	28
Nuwara Eliya	699,440	92	80	103
Polonnaruwa	387,423	51	44	57
Puttalam	752,484	99	86	111
Ratnapura	1,018,707	134	117	151
Trincomalee	436,876	57	50	65
Vavuniya	237,561	31	27	35
Total	**20,359,439**	**2,672**	**2,333**	**3,012**

Table 9.2.2: Estimated number of PWID at the province level based on the extrapolated proportion of 0.013% (0.011% - 0.015%)

Province	Province population	Estimated average number of PWID	Low estimate	High estimate
Central	2,392,016	**314**	274	354
Eastern	1,877,807	**246**	215	278
North Central	1,431,327	**188**	164	212
North Western	2,316,353	**304**	265	343
Northern	1,452,348	**191**	166	215
Sabaragamuwa	1,727,146	**227**	198	255
Southern	2,319,900	**305**	266	343
Uva	1,225,412	**161**	140	181
Western	5,617,130	**737**	644	831
Total	**20,359,439**	**2,672**	**2,333**	**3,012**

9.3. Multiplier

The median of the size estimates based on the multiplier data in Colombo is 682 (95% CI 542-916).

Table 9.3: Size estimates based on the multiplier data, PWID

	Colombo
1. Unique object	
N of unique objects distributed	100
Reported receiving unique object, IBBS (%, 95% CI)	15.6 (11.3, 19.8)
Population size estimate	641 (505-885)
2. Number of individual PWID who were clients of an NGO	142
Reported being clients of an NGO in IBBS (%, 95% CI)	20.8 (15.5, 26.2)
Population size estimate	682 (542-916)
3. Number of individual PWID who received a condom from an NGO	130
Reported receiving a condom from an NGO in IBBS (%, 95% CI)	8.2 (4.3, 12.0)
Population size estimate	1585 (1083-3250)
4. Treated for drug use at the rehabilitation center	NA
Reported being treated for drug use at the rehabilitation center in IBBS (%, 95% CI)	13.7 (9.0,18.5)
Population size estimate	NA
5. Arrested by police because of drug use in Colombo	NA
Reported being arrested by police because of drug use in Colombo in IBBS (%, 95% CI)	5.8 (8.9-18.5)
Population size estimate	NA
Indicator	1, 2, 3
Median values	682 (542-916)

Programme data on the use of prevention services were collected from the NGO, Mithuru Mithuro in Colombo.

10. Estimates of transwomen

10.1. Mapping

During L2 activities, 78 KIs were interviewed (44 primary and 34 secondary KIs) and 55 spots were transwomen socialise were visited. Spots were located in the Western province (n=47), Southern (n=4), Uva (n=2), Sabaragamuwa (n=1) and North Central (n=1).

Spots were found in the following districts:

- Western province: Colombo (n=36); Gampaha (n=11)
- Southern: Hambantota (n=3); Galle (n=1)
- Uva: Moneragala (n=2)
- Sabaragamuwa: Ratnapura (n=1)
- North Central: Anuradhapura (n=1)

Saturday was mentioned as the busiest day of the week (n=27), followed by Sunday (n=14) and Friday (n=12), while at one spot it was Wednesday and at another Thursday.

The most frequently mentioned peak time was from 5 pm – 9 pm (n=26), 9 pm-late night (n=18), followed by noon – 5 pm (n=9) and morning - noon (n=2). Types of spots were described as streets/public places (65.5%; n=36), shanti (12.7%; n=7), other (9.1%; n=5), beach (5.5%; n=3), public toilet (5.5%; n=3) and home (1.8%; n=1).

Thirty spots were visited once, while 25 required a second visit. Primary KIs were interviewed at 29 spots, and secondary KIs at 26 spots. At only two spots it was indicated that there was mobility on a peak day, and that included a visit to only one other spot.

From IBBS data collected, 42.3% (95% CI 35.6-49.9) of transwomen in Colombo and 69.9% (63.9-75.5) in Jaffna do not visit outdoor places to find partners, and these are considered as estimates of "a hidden population" for the purpose of adjustment.

As shown in table 10.1, without any adjustment the average number of transwomen during an average month is 189 (range: 154-224). Adjustment for mobility gave a slightly lower average estimate of 183, while adjustment for "a hidden population" the estimate of 331 (range: 269-380). The average unadjusted number of transwomen per spot is 3.

Table 10.1: Size estimates on a peak day and during an average month, adjusted for mobility and the proportion of the population that is "hidden", transwomen

	Low estimate	High estimate	Average estimate
On a peak day	127	183	**155**
During an average month	154	224	**189**
Adjustment for mobility across spots	149	217	**183**
Adjustment for the "hidden population"	269	380	**331**

10.2. Extrapolation of mapping data

The proportion of transwomen in the general population was calculated using the estimates from randomly selected and mapped DSs. The proportion of transwomen among the general population at a DS-level ranged from 0,000% to 0,101%. In total, there were even 37 DSs were transwomen were not found. The highest proportion of transwomen in any DS was in Katharagama (n=18, 0.101%) and Ratmalana (n=66, 0.070%). The results for all sampled DSs are available in Appendix 3. The relationship between the estimated number of transwomen and the census population was strong (R^2=0.393).

The pooled mean of proportions was calculated using the mid (n=331), low (n=269) and high (n=380) estimates. The resulting proportion is 0.008% (0.007% - 0.010%) of transwomen in the general population. In DSs were mapping was conducted there is a difference between pooled/extrapolated estimates and adjusted mapping estimates (for example, in Katharagama the difference is 0.101% / 0.008% = 12.63).

The extrapolated number of transwomen in Sri Lanka is 1,711 (1,393 – 1,966). The results per district and province are shown in tables below. Estimates per DS are available in Appendix 3.

Table 10.2.1: Estimated number of transwomen at the district level based on the extrapolated proportion of 0.008% (0.007% - 0.010%)

District	District population	Estimated average number of transwomen	Low estimate	High estimate
Ampara	731,620	**61**	50	71
Anuradhapura	919,028	**77**	63	89
Badulla	904,641	**76**	62	87
Batticaloa	462,088	**39**	32	45
Colombo	2,305,466	**194**	158	223
Galle	994,330	**84**	68	96
Gampaha	2,259,241	**190**	155	218
Hambantota	643,033	**54**	44	62
Jaffna	718,721	**60**	49	69
Kalutara	1,180,342	**99**	81	114
Kandy	1,287,551	**108**	88	124
Kegalle	808,470	**68**	55	78
Kilinochchi	108,241	**9**	7	10
Kurunegala	1,518,541	**128**	104	147
Mannar	150,662	**13**	10	15
Matale	479,188	**40**	33	46
Matara	761,135	**64**	52	74
Moneragala	404,786	**34**	28	39
Mullaitivu	189,864	**16**	13	18
Nuwara Eliya	699,440	**59**	48	68
Polonnaruwa	387,423	**33**	27	37
Puttalam	752,484	**63**	51	73
Ratnapura	1,018,707	**86**	70	98
Trincomalee	436,876	**37**	30	42
Vavuniya	237,561	**20**	16	23
Total	**20,359,439**	**1,711**	**1,393**	**1,966**

Table 10.2.2 Estimated number of transwomen at the province level based on the extrapolated proportion of 0.008% (0.007% - 0.010%)

Province	Province population	Estimated average number of transwomen	Low estimate	High estimate
Central	2,392,016	**201**	164	231
Eastern	1,877,807	**158**	128	181
North Central	1,431,327	**120**	98	138
North Western	2,316,353	**195**	158	224
Northern	1,452,348	**122**	99	140
Sabaragamuwa	1,727,146	**145**	118	167
Southern	2,319,900	**195**	159	224
Uva	1,225,412	**103**	84	118
Western	5,617,130	**472**	384	543
Total	**20,359,439**	**1,711**	**1,393**	**1,966**

10.3. Multiplier

The median of the estimated size based on the multiplier data in Colombo is 531 (95% CI 467-614), while in Jaffna it is 117 (95% CI 110-126).

Table 10.3 Size estimates based on the multiplier data, transwomen

	Colombo	**Jaffna**
1. Unique object		
N of unique objects distributed	100	100
Reported receiving unique object, IBBS (%, 95% CI)	16.7 (12.2, 21.1)	34.0 (26.7, 41.4)
Population size estimate	599 (474-826)	294 (242-375)
2. Number of individual transwomen who were clients of an NGO	300	90
Reported being a client of an NGO in IBBS (%, 95% CI)	60.3 (53.3, 67.2)	76.9 (71.3, 82.5)
Population size estimate	498 (446-563)	117 (110-126)
3. Number of individual transwomen who received a condom from an NGO	275	45

	Colombo	Jaffna
Reported receiving condoms from an NGO in IBBS (%, 95% CI)	51.8 (44.8, 58.9)	44.6 (37.6, 51.5)
Population size estimate	531 (467-614)	101 (87-120)
4. Number of individual transwomen who were escorted to an STI clinic	NA	NA
Reported being escorted to an STI clinic by the staff of an NGO in IBBS (%, 95% CI)	25.5 (18.8, 32.0)	27.8 (21.1, 34.7)
Population size estimate	NA	NA
Indicator **Median values**	1, 2, 3 531 (467-614)	1, 2, 3 117 (110-126)

Programme data were collected from the NGOs Heart to Heart for Colombo, and Journey for Life in Jaffna.

11. Estimates of beach boys

11.1. Mapping

During L2 activities, 73 KIs were interviewed (69 of these were primary and 4 were secondary KIs) and 31 unique spots were BBs congregate were visited. Spots were located in the Southern (districts Galle and Matara) and Western (district Colombo) provinces. All spots, except one, were located in the Southern province. The majority of spots were in the Galle district (n=25), followed by five in Matara and one in Colombo.

At the majority of spots January was mentioned as a peak month (n=17), followed by December (n=14). The busiest days in the week were Monday (n=16), Sunday (n=6) and Friday (n=5). The most frequently mentioned peak time was from noon-5 pm (n=13) and 9 pm – late night (n=8), followed by morning (before noon, n=6) and 5-9 pm (n=4). Types of spots were predominantly described as “other” (58.1%, n=18) and beaches (38.7%, n=12), while one spot was described as a street.

All spot except two were visited once. Only at two spots it was indicated that BB visit other spots on a peak day to find partners. Overall, the mobility was found to be low.

For BB, no information was available from IBBS on how many visit outdoor sites. Instead, we used the information on the proportion that meets tourists on a beach (66,4%, 95% CI 61.3% - 71.5%) to

estimate the proportion of the "hidden population". Therefore, the final estimates are adjusted for the proportion that does not meet tourists on a beach (33.6%), assuming that they represent a "hidden population".

As shown in table 11.1, without any adjustment the average number of BB during an average month is 2355 (range: 2092-2618). Adjustment for mobility gave a slightly lower average estimate of 2216, while adjustment for "a hidden population" the estimate of 3357 (range: 2989-3725).
The average number of BB per spot is 76 (unadjusted).

Table 11.1: Size estimates on a peak day and during an average month, adjusted for mobility and the proportion of the population that is "hidden", beach boys

	Low estimate	High estimate	Average estimate
Peak day	2,039	2,553	**2,296**
During a month	2,092	2,618	**2,355**
Adjustment for mobility across spots	1,973	2,459	**2,216**
Adjustment for the "hidden population"	2,989	3,725	**3,357**

11.2. Extrapolation of mapping data

The variation in the proportion of BBs in the sampled DSs was high and ranged from 0,000% to 3,294% among the general population. The highest proportion of BB in a DS was in Hikkaduwa (n=3357, 3.294%). As there is very weak evidence of a linear relationship between the general population and the BB population (R^2=0.002) the extrapolation process was conducted only in selected districts where sampling was done and BBs were found (n=3). The pooled mean of proportions was calculated using the mid (n=3357), low (n=2989) and high (n=3725) estimates in 49 selected DSs and DS census data.

The extrapolated estimated number of BBs in Sri Lanka is 11,056 (9,821 – 12,291). The results per district and province are shown in the tables below. Estimates per DS are available in Appendix 3.

Table 11.2.1: Estimated number of BBs at the district level based on the extrapolated proportion of 0.272% (0.242% - 0.303%)

District	District population	Estimated average number	Low estimate	High estimate
Colombo	2,305,466	6,277	5,576	6,978
Galle	994,330	2,707	2,405	3,009
Matara	761,135	2,072	1,841	2,304
Total	**4,060,931**	**11,056**	**9,821**	**12,291**

Table 11.2.2: Estimated number of BBs at the province level based on the extrapolated proportion of 0.272% (0.242% - 0.303%)

Province	Province population	Estimated average number	Lower bound	Upper bound
Southern	1,755,465	4,779	4,245	5,313
Western	2,305,466	6,277	5,576	6,978
Total	**4,060,931**	**11,056**	**9,821**	**12,291**

11.3. Multiplier

The median of the estimated size based on the multiplier data in Galle is 1022 (95% CI 859-1515). The indicator on clients being escorted to STI services could not be used due to a small number of BBs from programmatic data.

Table 11.3: Size estimates based on the multiplier data, beach boys

	Galle
1. Unique object	
Number of unique objects distributed	100
Reported receiving unique object, IBBS (%, 95% CI)	10.9 (6.6, 15.1)
Population size estimate	917 (663-1515)
2. Number of individual BB who were clients of an NGO	600
Reported being a client of an NGO in IBBS (%, 95% CI)	27.1 (22.2, 32.0)
Population size estimate	2,222 (1,875-2,727)
3. Number of individual BB who received a condom from an NGO	275
Reported receiving a condom from an NGO in IBBS (%, 95% CI)	26.9 (21.9, 32.0)
Population size estimate	1,022 (859-1,256)
4. Number of individual BB who were escorted to an STI clinic	12
Reported being escorted to an STI clinic by the staff of an NGO in IBBS (%, 95% CI)	21.6 (16.8, 26.3)
Population size estimate	56 (46-71)
Indicator **Median value**	1, 2, 3 1,022 (859-1,515)

Programme data were collected from the NGOs Samadhi Foundation in Galle

12. Comparison of size estimation data, including comparisons with previous Population Size Estimates

FSW

Mapping and enumeration carried out in 2013 estimated a total of 14,132 FSWs in Sri Lanka (ranging from a minimum of 12,329 to a maximum of 15,935). The largest number of spots were identified in the Western (46.0%) and the North Central province (13.6%).

In 2018, 53.5% of all spots found were in the Western province followed by the Sabaragamuwa (12.3%) province. In 2018, unadjusted estimate of FSW from mapping is 2811, while adjusted 6139 (low estimate 5249- high estimate 7180). After extrapolating mapping data to the national level, the estimated number of FSW in Sri Lanka is 31,748 (27,148 – 37,131), which is larger compared to the estimates in 2013.

The median estimated size of FSW in Colombo based on the multiplier is 2,155 (95% CI 1,812-2,660) while in Galle it is 1134 (95% CI 983-1342). The estimates from extrapolation using mapping data suggest that there are 3595 (3074 – 4205) FSW in the Colombo district, while 1,551 (1,326 – 1,813) in the Galle district.

MSM

During mapping in 2013 it was found that there were 7551 MSM (range 6547-8554). The highest number of spots were identified in the Western (62.6%) and Southern province (8.7%) and 7% in Central.

This is similar to the findings from 2018 when 68.9% of spots were located in the Western province, 8.5% in Sabaragamuwa and 6.1% in North Western and Southern (each). The unadjusted estimate of MSM from mapping is 994, while adjusted 1570 (range 1303-1814). After extrapolating mapping data to the national level, estimated number of MSM in Sri Lanka is 8,120 (6,739 – 9, 381), similar to 2013 estimates.

Substantially higher estimates were obtained from the multiplier method – Colombo: 2960 (95% CI 2621-3365); Galle: 2491 (95% CI 2045-3214). Extrapolated estimates from mapping data are lower: 919 (763 – 1062) in the Colombo district and 397 (329 – 458) in the Galle district.

MSW

In 2013, it was found that there were 2627 (range: 2317-3027) MSW in Sri Lanka. The unadjusted estimate of MSW from mapping in 2018 is 587, while adjusted 778 (range: 626-937). MSW were found at 158 spots. After extrapolating mapping data to the national level, estimated number of MSW in Sri Lanka is 4,024 (3,240 – 4,848), larger than 2013 estimates.

PWID

In mapping done in 2013, it was estimated there were 423 PWID (range: 328-516) and 60.5% of these were from the Western province, followed by 20.6% from the North Western province and 8.0% from the Central province.[b]

In 2018, 17 spots were identified, and of these 82.4% were in the Western province and 17.6% in Eastern (in no other province PWID were found). In 2018, the unadjusted estimate of the size of PWID population is 368, while adjusted 517 (range: 451-582), which is more than in 2013. After extrapolating mapping data to the national level, the estimated number of PWID in Sri Lanka is 2,672 (2,333 – 3,012), substantially higher than 2013 estimates.

The multiplier method produced the estimate of 682 (95% CI 542-916) PWID in Colombo – again more than in 2013. However, the estimated number based on the extrapolation of the mapping data for the Colombo district is 303 (264 – 341) PWID.

Transwomen

While not directly comparable to transwomen, mapping done in 2013 found that there were 2693 (range 2335-3051) nachchis (76.5% were from the Western province and 7.7% from Southern).

In 2018, 55 spots visited by transwomen were identified during mapping (85.5% from Western and 7.3% from Southern province). Mapping yielded unadjusted estimates of 189 and adjusted of 331 (range: 269-380). The median estimate from the multiplier is 531 (95% CI 467-614) transwomen in Colombo and 117 (95% CI 110-126) in Jaffna. After extrapolating mapping data to the national level, estimated number of transwomen in Sri Lanka is 1,711 (1,393 – 1,966), similar to 2013 estimates.

Beach boys

In 2013, it was found that there were 1314 (range: 1142-1486) BBs on a peak day and 2001 (range: 1750-2251) during a peak month.[c] The highest proportion of BBs was found in the Southern province (45.4%), followed by 26.6% from Western and 25.6% from Eastern provinces.

In 2018, 31 spots were found and 96.8% (n=30) were in the Southern province, while the remaining one spot in Colombo. In this round, more beach boys were found than in 2013 – without adjustments 2355, and with adjustments 3357 (range: 2989-3725). In Galle, the multiplier method estimated the size of the BB population to be 1022 (95% CI 859-1515). After extrapolating mapping data to the

[b] Information on how many spots were found is not available in the 2013 report
[c] Information on how many spots were found is not available in the 2013 report

national level, the estimated number of BB in Sri Lanka is 11,056 (9,821 – 12,291), which is higher than the 2013 estimates.

13. Final estimates based on consensus of key stakeholders

Based on the understanding of different biases and strengths and weaknesses of the methods, key stakeholders discussed and determined the most plausible estimates of KPs.

The workshop started with the description of results of the mapping, enumeration and multiplier methods, as well as previous round of PSE conducted in 2013 and the regional UNAIDS estimates for Asia and Pacific region.

The workshop followed a modified Delphi method to achieve consensus. Workshop participants provided their own estimates using google forms (in Appendix 4). The estimates of all participants were collated and presented to the group. After the discussion, additional rounds of estimations followed when needed, until a consensus estimate was no longer likely to change.

13.1. Female sex workers

There were two rounds of Delphi estimations to reach the consensus estimation. The group agreed on the national estimate of 30,000 (20,000 – 35,000) FSW in Sri Lanka. This estimation includes easy-to-reach FSW at hotspots and hard-to-reach FSW who are using other means of seeking clients; earlier estimation conducted in 2013 only included easy-to-reach FSW at hotspots.

There was a discussion about district level estimation, in particular about the Colombo and Gampaha districts. In the last round of the Delphi process, Colombo was the only district with the consensus density of "high" for FSW among adult females in Sri Lanka. This has allowed for a higher number of FSW in the Colombo district, as most participants considered that FSW are mostly concentrated in Colombo.

Table 13.1.1: Comparison of various estimates, FSW

	No. of FSW			**% among female general population aged 15-49 years**		
	Average	Low estimate	High estimate	Average	Low estimate	High estimate
Mapping & enumeration, 2018	31,748	27,148	37,131	0.63%	0.54%	0.73%
Multiplier, 2018 (Colombo)	2,155	1,812	2,660	0.35%	0.29%	0.43%

	No. of FSW			% among female general population aged 15-49 years		
Multiplier, 2018 (Kandy)	-	685	1,364	-	0.21%	0.43%
Multiplier, 2018 (Galle)	1,134	983	1,342	0.45%	0.39%	0.53%
Mapping & enumeration, 2013	14,132	12,329	15,935	0.28%	0.24%	0.31%
UNAIDS estimates for Asia and Pacific	17,739	9,123	118,094	0.35%	0.18%	2.33%
Consensus meeting 2018	**30,000**	**20,000**	**35,000**	**0.59%**	**0.39%**	**0.69%**

Table 13.1.2: District-level estimates based on the consensus meeting, FSW

District	Average density*	%	Number of females aged 15-49 years	Estimated number of FSW
Ampara	Low	0,39%	163.285	**769**
Anuradhapura District	Medium	0,59%	223.562	**1.579**
Badulla district	Low	0,39%	193.872	**913**
Batticaloa	Low	0,39%	129.042	**608**
Colombo District	High	0,69%	620.499	**5.112**
Galle district	Medium	0,59%	252.717	**1.785**
Gampaha District	Medium	0,59%	603.484	**4.262**
Hambantota district	Low	0,39%	149.068	**702**
Jaffna District	Low	0,39%	136.615	**643**
Kaluthara District	Low	0,39%	301.989	**1.422**
Kandy district	Medium	0,59%	319.779	**2.258**
Kegalle District	Low	0,39%	194.763	**917**
Kilinochchi District	Low	0,39%	28.205	**133**
Kurunegala district	Low	0,39%	391.311	**1.842**
Mannar District	Low	0,39%	26.723	**126**
Matale District	Low	0,39%	115.837	**545**
Matara district	Low	0,39%	189.715	**893**
Moneragala district	Low	0,39%	119.036	**560**
Mullaitivu District	Low	0,39%	24.052	**113**
Nuwara Eliya District	Low	0,39%	163.547	**770**

District	Average density*	%	Number of females aged 15-49 years	Estimated number of FSW
Polonnaruwa District	Low	0,39%	105.944	**499**
Puttalam	Low	0,39%	193.923	**913**
Ratnapura District	Medium	0,59%	277.482	**1.960**
Trincomalee	Low	0,39%	97.487	**459**
Vavuniya District	Low	0,39%	46.482	**219**

*Average density is a result of the consensus meeting participants' classification of districts into low/medium/high proportion of a KP among a specific adult population.

13.2. Men who have sex with men

Participants discussing the MSM data provided diverging estimates, ranging from 12,000 to 700,000 of MSM in Sri Lanka. Lower estimates were mostly provided by those involved in planning HIV programmes for MSM and higher estimates were driven by LGBT activists. Other sources of potential MSM population size were taken into account: MSM using dating websites and apps (40.000 at LankaLove, 2,109 at PlanetRomeo, 2,000 MSM on Grindr in the Colombo city) and the number of MSM tested at STI clinics (n=2,469). It was noted that only a fraction of MSM are using these services.

Three rounds of a Delphi process were conducted. A consensus estimate of 40,000 (30,000 – 50,0000) MSM was reached using the median estimated number participants provided in the third round.

As the mapping and enumeration method is likely to underestimate MSM, the consensus meeting estimate is a more probable one. In addition, the consensus meeting estimate for the Colombo and Galle districts is almost compatible with the multiplier estimate for those districts. The consensus national estimate of MSM aligns with the number of MSM using dating apps, though presumably only a fraction of MSM are using those service. Therefore, it is likely that the number of MSM in Sri Lanka is larger.

Table 13.2.1: Comparison of various estimates, MSM

	No. of MSM			% among male general population aged 15-49 years		
	Average	Low	High	Average	Low	High
Mapping & enumeration, 2018	8,120	6,739	9,381	0.15%	0.13%	0.18%
Multiplier, 2018 (Colombo)	2,960	2,621	3,365	0.48%	0.43%	0.55%
Multiplier, 2018 (Galle)	2,491	2,045	3,214	0.92%	0.75%	1.18%
Multiplier, 2018 (Anuradhapura)	-	145	2,238	-	0.06%	0.96%
Mapping & enumeration, 2013	7,551	6,547	8,554	0.14%	0.12%	0.16%
UNAIDS estimates (Asia and Pacific)	90,501	4,820	217,417	1.69%	0.09%	4.06%
Consensus meeting 2018	**40,000**	**30,000**	**50,000**	**0.75%**	**0.56%**	**0.93%**

Table 13.2.2: District-level estimates based on the consensus meeting, MSM

District	Average density	%	Number of males aged 15-49 years	Estimated number of MSM
Ampara	Low	0,56%	180.130	**1.002**
Anuradhapura District	Medium	0,75%	234.254	**1.737**
Badulla district	Low	0,56%	213.317	**1.186**
Batticaloa	Low	0,56%	147.794	**822**
Colombo District	High	0,93%	616.405	**5.714**
Galle district	High	0,93%	271.385	**2.516**
Gampaha District	High	0,93%	619.984	**5.747**
Hambantota district	Low	0,56%	154.148	**857**
Jaffna District	Medium	0,75%	155.998	**1.157**
Kaluthara District	Medium	0,75%	313.950	**2.328**
Kandy district	Medium	0,75%	358.351	**2.657**
Kegalle District	Medium	0,75%	212.718	**1.577**
Kilinochchi District	Low	0,56%	29.181	**162**
Kurunegala district	Medium	0,75%	420.408	**3.117**
Mannar District	Low	0,56%	26.125	**145**
Matale District	Low	0,56%	125.675	**699**
Matara district	Medium	0,75%	206.511	**1.531**
Moneragala district	Low	0,56%	121.383	**675**
Mullaitivu District	Low	0,56%	23.995	**133**
Nuwara Eliya District	Low	0,56%	182.259	**1.014**
Polonnaruwa District	Medium	0,75%	108.821	**807**
Puttalam	Medium	0,75%	201.796	**1.496**
Ratnapura District	Medium	0,75%	283.118	**2.099**
Trincomalee	Low	0,56%	100.189	**557**
Vavuniya District	Low	0,56%	47.197	**262**

13.3. Male sex workers

A simplified approach to estimate the MSW population was used at the consensus meeting by estimating the proportion of MSM who sell sex. Only one round of estimation was conducted for this KP. The group discussed whether the HIV prevention needs of MSW were different than those of MSM. The final agreement was that 15% (10% - 21%) of MSM engage in SW. This translates to 6,000 (4,000 – 8,400) MSW in Sri Lanka. This estimate is slightly higher compared to the estimate from mapping and enumeration.

Table 13.3.1: Comparison of various estimates, MSW

	# MSW			% among the male general population aged 15-49 years		
	Average	Low	High	Average	Low	High
Mapping & enumeration, 2018	4,024	3,240	4,848	0.08%	0.06%	0.09%
Mapping & enumeration, 2013	2,627	2,317	3,027	0.05%	0.04%	0.06%
Consensus meeting, 2018 (% of MSM)	**6,000 15%**	**4,000 10%**	**8,400 21%**	**0.11%**	**0.07%**	**0.16%**

Table 13.3.2: District-level estimates based on the consensus meeting, MSW

District	Average density	%	Number of males aged 15-49 years	Estimated number of MSW
Ampara	Low	0,06%	180.130	**98**
Anuradhapura District	Medium	0,11%	234.254	**257**
Badulla district	Low	0,06%	213.317	**116**
Batticaloa	Low	0,06%	147.794	**81**
Colombo District	High	0,20%	616.405	**1.174**
Galle district	High	0,20%	271.385	**517**
Gampaha District	High	0,20%	619.984	**1.181**
Hambantota district	Medium	0,11%	154.148	**169**
Jaffna District	Low	0,06%	155.998	**85**
Kaluthara District	Medium	0,11%	313.950	**344**
Kandy district	Medium	0,11%	358.351	**393**
Kegalle District	Low	0,06%	212.718	**116**
Kilinochchi District	Low	0,06%	29.181	**16**
Kurunegala district	Medium	0,11%	420.408	**461**
Mannar District	Low	0,06%	26.125	**14**
Matale District	Low	0,06%	125.675	**69**
Matara district	Low	0,06%	206.511	**113**
Moneragala district	Low	0,06%	121.383	**66**

District	Average density	%	Number of males aged 15-49 years	Estimated number of MSW
Mullaitivu District	Low	0,06%	23.995	**13**
Nuwara Eliya District	Medium	0,11%	182.259	**200**
Polonnaruwa District	Low	0,06%	108.821	**59**
Puttalam	Medium	0,11%	201.796	**221**
Ratnapura District	Low	0,06%	283.118	**155**
Trincomalee	Low	0,06%	100.189	**55**
Vavuniya District	Low	0,06%	47.197	**26**

13.4. Transwomen

There is not much experience or existing data about this population in Sri Lanka. The estimates were reached after the first round of the Delphi process: 2,200 (2,000 – 3,500) of transwomen in Sri Lanka – the number which is consistent with the mapping and enumeration estimates.

Table 13.4.1 Comparison of various estimates, transwomen

	# transwomen			% among the male general population aged 15-49 years		
	Average	Low	High	Average	Low	High
Mapping & enumeration, 2018	1,711	1,393	1,966	0.03%	0.03%	0.04%
Multiplier, 2018 (Colombo)	531	467	614	0.09%	0.08%	0.10%
Multiplier, 2018 (Jaffna)	117	110	126	0.08%	0.07%	0.08%
Mapping & enumeration, 2013*	2,693	2,335	3,051	0.05%	0.04%	0.06%
UNAIDS estimates (Asia and Pacific)	1,071	1,071	3,213	0.02%	0.02%	0.06%
Consensus meeting, 2018	**2,200**	**2,000**	**3,500**	**0.04%**	**0.04%**	**0.07%**

*In the 2013 PSE study, nanchis were sampled, and some of those were transwomen

Table 13.4.2 District-level estimates based on the consensus meeting, transwomen

District	Average density	%	Number of males aged 15-49 years	Estimated number of transwomen
Ampara	Low	0.04%	180.130	**65**
Anuradhapura District	Low	0.04%	234.254	**84**
Badulla district	Low	0.04%	213.317	**77**
Batticaloa	Low	0.04%	147.794	**53**
Colombo District	High	0.07%	616.405	**388**
Galle district	Medium	0.04%	271.385	**107**
Gampaha District	Medium	0.04%	619.984	**245**
Hambantota district	Low	0.04%	154.148	**55**
Jaffna District	High	0.07%	155.998	**98**
Kaluthara District	Medium	0.04%	313.950	**124**
Kandy district	Medium	0.04%	358.351	**142**
Kegalle District	Low	0.04%	212.718	**76**
Kilinochchi District	Low	0.04%	29.181	**10**
Kurunegala district	Low	0.04%	420.408	**151**
Mannar District	Low	0.04%	26.125	**9**
Matale District	Low	0.04%	125.675	**45**
Matara district	Low	0.04%	206.511	**74**
Moneragala district	Low	0.04%	121.383	**44**
Mullaitivu District	Low	0.04%	23.995	**9**
Nuwara Eliya District	Low	0.04%	182.259	**66**
Polonnaruwa District	Low	0.04%	108.821	**39**
Puttalam	Low	0.04%	201.796	**73**
Ratnapura District	Medium	0.04%	283.118	**112**
Trincomalee	Low	0.04%	100.189	**36**
Vavuniya District	Low	0.04%	47.197	**17**

13.5. People Who Inject Drugs

The consensus estimates were reached after the first round of the Delphi process. An additional study was taken into account during the discussion, which estimated that there were 957 PWID in Colombo (*Source: Report on trends, patterns and prevalence of injecting drug users in Sri Lanka. Colombo: National Dangerous Drug Control Board, Ministry of Law and Order & Southern Development,*

2015). According to this report, the highest prevalence of PWID is in the Colombo district. This report strongly influenced the discussion. There was also an agreement that Colombo had the highest prevalence of PWID, resulting in addition of a "weight" for the Colombo district (4x), while proportionately decreasing estimates for other districts.

The estimate for Sri Lanka is 900 (650 – 1,200) PWID, and the largest number of PWID lives in the Colombo district (677). The Colombo district consensus estimate is consistent with the multiplier method estimate, while the national estimate is three times lower in comparison with the mapping and enumeration estimate. This shows that the consensus meeting might have underestimated the number of PWID in Sri Lanka.

Table 13.5.1 Comparison of various estimates, PWID

	No. of PWID				**% among the general population aged 15-49 years**		
	Average	Low	High		Average	Low	High
Mapping & enumeration, 2018	2,672	2,333	3,012		0.03%	0.02%	0.03%
Multiplier, 2018 (Colombo)	682	542	916		0.06%	0.04%	0.07%
Mapping & enumeration, 2013	423	328	516		0.004%	0.003%	0.005%
UNAIDS estimates (Asia and Pacific)	6,254	104	108,405		0.06%	0.001%	1.04%
Consensus meeting - 2018	**900**	**650**	**1,200**		**0.009**	**0.006**	**0.012**

Table 13.5.2: District-level estimates based on the consensus meeting, PWID

District	Average density	%	Number of the general population aged 15-49	Estimated number of PWID	Estimated number of PWID with weighting
Ampara	Low	0.006%	343,415	25	**8**
Anuradhapura District	Low	0.006%	457,816	34	**10**
Badulla district	Low	0.006%	407,189	30	**9**
Batticaloa	Low	0.006%	276,836	21	**6**
Colombo District	High	0.012%	1,236,904	169	**677**
Galle district	Medium	0.009%	524,102	54	**16**
Gampaha District	Medium	0.009%	1,223,468	126	**38**
Hambantota district	Low	0.006%	303,216	22	**7**
Jaffna District	Low	0.006%	292,613	22	**7**
Kaluthara District	Low	0.006%	615,939	46	**14**
Kandy district	Low	0.006%	678,130	50	**15**
Kegalle District	Low	0.006%	407,481	30	**9**
Kilinochchi District	Low	0.006%	57,386	4	**1**
Kurunegala district	Low	0.006%	811,719	60	**18**
Mannar District	Low	0.006%	52,848	4	**1**
Matale District	Low	0.006%	241,512	18	**5**
Matara district	Low	0.006%	396,226	29	**9**
Moneragala district	Low	0.006%	240,419	18	**5**
Mullaitivu District	Low	0.006%	48,047	4	**1**
Nuwara Eliya District	Low	0.006%	345,806	26	**8**
Polonnaruwa District	Low	0.006%	214,765	16	**5**
Puttalam	Low	0.006%	395,719	29	**9**
Ratnapura District	Low	0.006%	560,600	42	**13**
Trincomalee	Low	0.006%	197,676	15	**4**
Vavuniya District	Low	0.006%	93,679	7	**2**

13.6 Beach Boys

The significant part of the discussion about BB population was focused on estimates at the district level since the BB population is unevenly spread across the districts. To facilitate the discussion, districts were divided into those who have an active BB population and those where BB were not present.

The national estimate of BBs was reached after the first round of the Delphi process; however an additional round was conducted to reach higher quality estimate at a district level. Also, an additional weight was added to the Galle district (4x) while keeping Kaluthara district constant and proportionally decreasing estimates for other districts. There was a strong agreement that most BB are based in the Galle and Kaluthara districts.

The national consensus median estimate was 4,500 (3,000 – 6,000) BBs. The range is larger than for other KPs, and that shows a higher uncertainty of the estimates.

Table 13.6.1 Comparison of various estimates, BBs

	# BB				**% among the general male population aged 15-49 years**		
	Average	Min	Max		Average	Min	Max
Mapping & enumeration 2018*	11.056	9.821	12.291		0,21%	0,18%	0,23%
Multiplier 2018 (Galle)	1.022	859	1.515		0,38%	0,32%	0,56%
Mapping & enumaration 2013	1.314	1.142	1.486		0,02%	0,02%	0,03%
Consensus meeting 2018	**4.500**	**3.000**	**6.000**		**0,08%**	**0,06%**	**0,11%**

*The extrapolation is limited to only those districts were BB were found during mapping and enumeration.

Table 13.6.2 District level estimates based on the consensus meeting, BBs

District	Average density	%	Number of the general male population aged 15-49	Estimated number of BBs	Estimated number of BBs with weighting
Ampara	Low	0,06%	180.130	219	**86**
Anuradhapura District	No	0,00%	234.254	0	**0**
Badulla district	No	0,00%	213.317	0	**0**
Batticaloa	Low	0,06%	147.794	180	**71**
Colombo District	Low	0,06%	616.405	749	**295**
Galle district	High	0,11%	271.385	660	**2639**
Gampaha District	Medium	0,08%	619.984	1.131	**446**
Hambantota district	Low	0,06%	154.148	187	**74**
Jaffna District	No	0,00%	155.998	0	**0**
Kaluthara District	Medium	0,08%	313.950	572	**572**
Kandy district	No	0,00%	358.351	0	**0**
Kegalle District	No	0,00%	212.718	0	**0**
Kilinochchi District	No	0,00%	29.181	0	**0**
Kurunegala district	No	0,00%	420.408	0	**0**
Mannar District	No	0,00%	26.125	0	**0**
Matale District	No	0,00%	125.675	0	**0**
Matara district	Low	0,06%	206.511	251	**99**
Moneragala district	No	0,00%	121.383	0	**0**
Mullaitivu District	No	0,00%	23.995	0	**0**
Nuwara Eliya District	No	0,00%	182.259	0	**0**
Polonnaruwa District	No	0,00%	108.821	0	**0**
Puttalam	Medium	0,08%	201.796	368	**145**
Ratnapura District	No	0,00%	283.118	0	**0**
Trincomalee	Medium	0,08%	100.189	183	**72**
Vavuniya District	No	0,00%	47.197	0	**0**

14. Strengths and Weaknesses of the Data

Methods based on mapping tend to underestimate hidden populations. To address this weakness of the method, community guides were part of the mapping teams as that ensured a better access to information about KPs as well as KP themselves. In addition, mapping should be completed in a

short enough time to compensate for migration so that individuals are not counted more than ones. To adjust for migration in this study, information was collected on mobility across spots and its frequency. Final estimates are also adjusted for a part of a population that is "hidden" i.e. unlikely to visit outdoor venues using data from IBBS based on RDS. However, the quality of data on a sub-set of population that do not visit outdoor venues depends on the representativeness of RDS.

Mapping method requires a reliable sample frame of venues so the final quality of estimates depends heavily on how successful field work was in identifying the universe of venues visited by KPs. In some DSs, the estimated size of KPs as reported by respondents is very low, and that is in particular the case with MSM, MSW and PWID. Also, the number of spots found is low for some populations, such as PWID, BBs and transwomen.

An advantage of the approach used in this round of mapping is that the random selection of DSs provided a good basis for the national-level extrapolation procedure.

The key source of a bias in the multiplier estimates in general is the selection bias in the survey leading to dependence between data sources. This could happen if those in contact with the service provider are more likely to be included in the survey than those not in the programme.
Efforts were done to ensure that in both data sources populations are defined in the same way, in terms of time-periods and geographic areas, and that unique objects were not distributed to ineligible individuals.

Data provided by NGOs on the number of KP individuals who got a certain service could have been to some extent inaccurate as the numbers were often rounded (for example, FSW, beach boys, transgender and MSM who were clients of NGOs). Some data for the multiplier were not obtained, such as police arrests in PWID, and the number of PWID who were clients of the rehabilitation centre in Colombo.

The selected data extrapolation method assumes a linear relationship between the total general population and the number of KPs in DSs, i.e. the proportion of a KP is constant in all geographical areas in a country. This may not be true for areas where some geographical characteristics are related to the number of KPs, such as the number of tourists (increased proportion of BBs and FSW), larger cities (more opportunity for PWID to inject, also MSM often migrate to larger cities) and other characteristic. A statistical test of the relationship was conducted for each KP, showing no evidence for a linear relationship for BBs and strong evidence for a linear relationship for other KPs.

The accuracy of the Delphi method depends on the knowledge of participants about a certain KP, the type of work they are involved in and their level of expertise. If the existing knowledge or perception of participants is far from the true number of KP individuals, the consensus estimates

reached will reflect those biases. The bias may be stronger at a district level, as meeting was held in one district and there was not enough representation from remaining districts. The Delphi method can also result in a "forced consensus", when the group has vastly different opinions. Also, a median as a measure can always be calculated even though most participants disagree with the estimate, resulting in a "forced consensus".

15. Conclusions and recommendations

The overall goal of this study was to provide evidence on the size of KPs for HIV in in Sri Lanka using different approaches, with a view to improving the scale, coverage, and aligned roll-out of HIV prevention programmes among these populations.

This provides an important point for macro- and micro-level planning of HIV services and for allocating programme resources, including the prioritization of districts, determining the volume of services required, and coordinating the provision of HIV prevention programmes throughout the country. Repeated size estimation along with programme data can improve ongoing assessment of programme coverage and quality, and informs effective program scale up.

Following are the recommendations based on the study results:

- Efforts should be done to improve the quality of programmatic data from NGOs and other service providers. This is important not only for the purpose of the size estimation, but for understanding the coverage with specific services.
- NGOs in Kandy and Anuradhapura should in particular improve the quality of data on services for KPs.
- Some programme data are not useful for the multiplier method, such as individual KP members who are escorted to STI services by NGO staff, since the numbers provided by NGOs are too low.
- If the multiplier method will be done in the next round of PSE, it is crucial that more programmatic indicators are collected and that their quality is at the appropriate level. For example, HIV testing data could not be used for this round of size estimation as there are no individual-level records.
- Due to the small number of MSM found in mapping and much higher estimates obtained via the multiplier method, it is likely that the methods based on mapping are not suitable for the MSM population. However, mapping spots visited by MSM remains important for planning outreach prevention services.
- As there are various perceptions of the number of MSM, it is recommended that diverse stakeholders work more closely together to facilitate exchange of knowledge about the MSM

population. Also, additional studies about MSM are recommended, such as a national-level survey that would determine the extent of the same-sex sexual behaviour in men.

- Similarly, formative research is necessary to understand a range of issues relevant for conducting HIV-related studies in transwomen, as little is known about this population in Sri Lanka.
- Since a small number of spots were found for PWID, BB and transwomen, organisations that provide outreach or other services should be asked to collect data on locations visited by those KPs.
- According to IBBS data, large proportions of KPs do not socialise (find partners, inject dugs) at outdoor places. That has implications for programme planning in terms of finding mechanism for HIV prevention service delivery for those hidden sub-groups. This is in particular relevant for KPs in Galle and transwomen in Jaffna.
- This study found that mobility for BBs is low. Since this is an unexpected finding, it should be researched further in other studies.
- NAP should explore whether a network-scale up survey can be done in conjunction with another general population-based survey. That would provide another useful source of data for population size estimation purposes.

Appendix 1: Random Integer Set Generator for selection of high-density, medium-density and low-density DSs

Do you own an iOS or Android device? Check out our app!

Random Integer Set Generator

You requested 1 set with 28 unique random integers, taken from the [1,110] range. The integers were sorted in ascending order.

Here is your set:

```
Set 1: 1, 2, 3, 6, 14, 16, 19, 28, 34, 40, 45, 49, 58, 61, 81, 87, 88, 91, 92, 93, 94, 95, 97,
105, 106, 108, 109, 110
```

Timestamp: 2017-09-29 07:21:32 UTC

Do you own an iOS or Android device? Check out our app!

Random Integer Set Generator

You requested 1 set with 14 unique random integers, taken from the [111,220] range. The integers were sorted in ascending order.

Here is your set:

```
Set 1: 114, 134, 136, 169, 170, 177, 178, 180, 183, 189, 209, 214, 215, 219
```

Timestamp: 2017-09-29 07:27:16 UTC

Do you own an iOS or Android device? Check out our app!

Random Integer Set Generator

You requested 1 set with 7 unique random integers, taken from the [221,331] range. The integers were sorted in ascending order.

Here is your set:

```
Set 1: 236, 255, 265, 266, 297, 325, 326
```

Timestamp: 2017-09-29 07:35:30 UTC

Appendix 2: Selection of DSs (the selected ones are marked in bold; orange color is for high-density areas, yellow for medium-density and blue for low-density)

No.	Division	Capital	Pop-2012
1	**Colombo**	**Colombo**	**323.257**
2	**Kaduwela**	**Malabe**	**252.041**
3	**Kesbewa**	**Piliyandala**	**245.232**
4	Thimbirigasyaya	Narahempita	238.057
5	Homagama	Homogama	237.905
6	**Katana**	**Kadirana**	**235.291**
7	Nuwara Eliya	Nuwara Eliya	212.094
8	Mahara	Ranmutugala	207.782
9	Ambagamuwa	Ginigattena	205.723
10	Ja-Ela	Tudalla	201.521
11	Gampaha	Brandiyamulla	197.667
12	Maharagama	Maharagama	196.423
13	Kolonnawa	Kolonnawa	191.687
14	**Biyagama**	**Sapugaskanda**	**186.585**
15	Panadura	Panadura	182.285
16	**Aththanagalla cannot find**	**Nitabuwa**	**179.565**
17	Minuwangoda	Minuwangoda	178.331
18	Waththala	Waththala	175.525
19	**Beruwala**	**Beruwala**	**164.969**
20	Kaluthara	Kalutara	159.697
21	Gangawata Korale	Kandy	158.561
22	Dompe	Dompe	154.005
23	Diulapitiya	Divulapitiya	144.506
24	Negambo	Munakkaraya	142.136
25	Kelaniya	Talawatuhana	137.339
26	Embilipitiya	Embilipitiya	134.713
27	Pannala	Pannala	124.225
28	**Ratnapura**	**Ratnapura**	**120.212**
29	Vavuniya	Vavuniya	117.533
30	Matara Four Gravets	Matara	115.805
31	Hanwella	Hanwella	113.807
32	Horana	Horana	113.364
33	Warakapola	Ambepussa	113.056
34	**Mawanella**	**Mawanella**	**111.727**
35	Udunuwara	Dawulagala	110.905
36	Bandaragama	Bandaragama	109.236

37	Sri Jayawardanapura Kotte	Rajagiriya	107.925
38	Yatinuwara	Akmimana South	106.027
39	Walapane	Nildandahinna	104.119
40	**Hikkaduwa**	**Hikkaduwa**	**101.909**
41	Galle Four Gravets	Galle	101.749
42	Welimada	Welimada	100.808
43	Trincomalee Town and Gravets	Trincomalee	97.487
44	Kuruwita	Kuruvita	95.646
45	**Ratmalana**	**Rathmalana**	**95.506**
46	Udapalatha	Angammana West	91.716
47	Kegalle	Kegalle	90.854
48	Hali Ela	Hali-Ela	90.571
49	**Pelmadulla**	**Pelmadulla**	**89.469**
50	Dehiwala	Dehiwala	88.962
51	Pathadumbara	Pitiyegedara	88.725
52	Rideegama	Ridigama	88.714
53	Hanguranketha	Hanguranketha	88.528
54	Harispattuwa	Nugawela	88.177
55	Kalpitiya	Pudukudirippu	86.405
56	Manmunai North	Batticaloa	86.227
57	Ibbagamuwa	Ibbagamuwa	85.309
58	**Rambukkana**	**Rambukkana**	**82.769**
59	Puttalam	Puttalam	82.443
60	Thamankaduwa	Thamankaduwa New Town	82.426
61	**Balangoda**	**Balangoda**	**81.563**
62	Dehiovita	Dehiovita	81.315
63	Mathugama	Mathugama	81.286
64	Kurunegala	Kurunegala	80.755
65	Dimbulagala	Manampitiya	79.661
66	Uva Paranagama	Uva-Paranagama	77.998
67	Akmeemana	Walahanduwa	77.776
68	Kuliyapitiya West		77.316
69	Godakawela	Godakawela	76.469
70	Polpithigama	Polpithigama	76.139
71	Mahiyanganaya	Mahiyanganaya	75.776
72	Eravur Pattu	Chenkalady	75.478
73	Badulla	Badulla	75.042
74	Baddegama	Baddegama	75.008
75	Matale	Matale	74.864
76	Valikamam East	Kopay	73.225
77	Ambalantota	Malpattewa	72.943
78	Weligama	Weligama	72.843
79	Tangalle	Tangalle	72.507
80	Dambulla	Dambulla	72.306

81	**Eheliyagoda**	**Eheliyagoda**	**70.839**
82	Galewela	Galewela	70.042
83	Nuwaragam Palatha East	Anuradhapura	69.737
84	Tissamaharama	Wiravila	68.606
85	Aranayaka	Aranayaka	68.464
86	Nallur	Nallur	68.142
87	**Wennappuwa**	**Ulhitiyawa**	**68.111**
88	**Ukuwela**	**Ukuwela**	**68.027**
89	Balapitiya	Balapitiya	67.432
90	Medirigiriya	Medirigiriya	65.575
91	**Bandarawela**	**Bandarawela**	**65.502**
92	**Padukka**	**Padukka**	**65.267**
93	**Polgahawela**	**Polgahawela**	**65.156**
94	**Mawathagama**	**Mawathagama**	**64.904**
95	**Elpitiya**	**Elpitiya**	**64.726**
96	Thenmaradchi	Chavakachcheri	64.704
97	**Kinniya**		**64.613**
98	Hingurakgoda	Hingurakgoda	64.289
99	Ruwanwella	Ruwanwella	63.913
100	Panduwasnuwara	Hettipola	63.742
101	Alawwa	Alawwa	63.667
102	Akurana	Akurana	63.397
103	Kotapola	Kotapola	63.255
104	Chilaw	Pitipana	62.515
105	**Karandeniya**	**Karandeniya**	**62.498**
106	**Dankotuwa**	**Dankotuwa**	**62.399**
107	Habaraduwa	Habaraduwa	62.389
108	**Bingiriya**	**Bingiriya**	**62.349**
109	**Nattandiya**	**Wirahena**	**62.145**
110	**Mundel**	**Mundalam**	**61.638**
111	Karachchi		61.484
112	Wariyapola	Wariyapola	61.425
113	Nuwaragam Palatha Central	Pandulagama	61.223
114	**Yatiyanthota**	**Yatiyanthota**	**61.096**
115	Medadumbara	Vilamuna	61.034
116	Manmunai South and Eruvil Pattu		60.807
117	Sammanthurai	Sammanthurai	60.465
118	Dehiattakandiya	Dehiattakandiya	60.178
119	Pasbage Korale	Balanthota North	59.917

120	Imbulpe	Imbulpe	59.477
121	Kekirawa	Malawa	59.241
122	Uhana	Uhana	58.325
123	Pathahewaheta	Thalathuoya East	58.188
124	Poojapitiya	Palipana	57.914
125	Thalawa	Ihala Thalawa	57.793
126	Maho	Maho	57.485
127	Hambantota	Hambantota	57.264
128	Ambalangoda	Ambalangoda	56.961
129	Muttur		56.621
130	Narammala	Narammala	56.279
131	Beliatta	Beliatta	55.992
132	Ganga Ihala Korale	Malwatthagama	55.254
133	Galgamuwa	Galgamuwa	55.078
134	**Dickwella**	**Dickwella**	**54.672**
135	Walallawita	Walallavita	54.628
136	**Kuliyapitiya East**	**Nakkawatta**	**54.062**
137	Ingiriya	Ingiriya	53.896
138	Nagoda	Nagoda	53.829
139	Buttala	Buttala	53.084
140	Valikamam South	Uduvil	53.016
141	Akuressa	Akuressa	52.912
142	Mallawapitiya	Mallawapitiya	52.634
143	Valikamam South-West	Sandilipay	52.269
144	Udubaddawa	Udubaddawa	52.231
145	Millaniya	Millaniya	52.176
146	Welipitiya	Welipitiya	52.098
147	Minipe	Hasalaka	51.883
148	Rideemaliyadda	Rideemaliyadda	51.618
149	Raththota	Rattota	51.354
150	Kalawana	Kalawana	51.307
151	Pitabeddara	Pitabeddara	51.186
152	Mahawewa	Ihala Mahawewa	51.078
153	Mannar Town	Mannar	51.078
154	Palindanuwara	Baduraliya	50.801
155	Jaffna	Jaffna	50.491
156	Bope Poddala	Labuduwa	50.331
157	Mulatiyana	Mulatiyana	50.261
158	Benthota	Benthota	49.975
159	Nochchiyagama	Nochchiyagama	49.886
160	Doluwa	Doluwa	49.842
161	Haputhale	Haputale	49.798
162	Passara	Passara	48.807
163	Angunukolapelessa	Angunakolapelessa	48.301
164	Devinuwara	Devinuwara	48.253
165	Vadamaradchi North	Point Pedro	47.565

166	Bulathkohupitiya	Bulathkohupitiya	47.095
167	Galenbindunuwewa	Galenbindunuwewa	46.992
168	Medawachchiya	Medawachchiya	46.906
169	**Kantalai**		**46.802**
170	**Katuwana**	**Katuwana**	**46.772**
171	Valikamam West	Chankanai	46.438
172	Kolonna	Kolonna	45.954
173	Yakkalamulla	Yakkalamulla	45.946
174	Deraniyagala	Deraniyagala	45.869
175	Ella	Ella	45.181
176	Kalmunai	Kalmunai	44.632
177	**Elahera**	**Bakamuna**	**43.915**
178	**Ampara**	**Ampara**	**43.829**
179	Kahawaththa	Kahawatta	43.298
180	**Sooriyawewa**	**Suriyawewa**	**43.102**
181	Thambuttegama	Thambuttegama	42.437
182	Walasmulla	Walasmulla	42.274
183	**Addalachchenai**	**Addalachchenai**	**41.968**
184	Weeraketiya	Wiraketiya	41.565
185	Arachchikattuwa	Arachchikattuwa	40.999
186	Kamburupitiya	Kamburupitiya	40.969
187	Nikaweratiya	Nikaweratiya	40.452
188	Kattankudy	Kattakundy	40.356
189	**Kahatagasdigiliya**	**Kahatagasdigiliya**	**40.339**
190	Bibile	Bibile	40.329
191	Ganewatta	Ganewatta	40.137
192	Badalkumbura	Badalkumbura	40.103
193	Akkaraipattu	Akkaraipattu	39.166
194	Ipalogama	Kunchikulama	38.862
195	Damana	Damana	38.692
196	Anamaduwa	Anamaduwa	38.286
197	Elapatha	Elapatha	37.853
198	Thumpane	Haddapitiya	37.642
199	Haldummulla	Haldumulla	37.558
200	Rambewa	Rambewa	36.782
201	Agalawatta	Agalawatta	36.669
202	Lankapura	Thalpatha	36.452
203	Porativu Pattu		36.222
204	Bamunakotuwa	Bamunakotuwa	36.217
205	Kobeigane	Kobeigane	35.975
206	Medagama	Medagama	35.881
207	Niyagama	Niyagama	35.574
208	Mihinthale	Mihinthale	35.293

209	**Malimbada**	**Malimbada**	**34.856**
210	Pothuvil	Pottuvil	34.809
211	Galnewa	Galnewa	34.756
212	Madurawala	Madurawala	34.381
213	Weerambugedara	Weerambugedara	34.339
214	**Maspotha**	**Maspotha**	**34.262**
215	**Palagala**	**Palagala**	**34.002**
216	Rajanganaya	Rajanganaya	33.543
217	Thihagoda	Thihagoda	33.535
218	Kuchchaveli		33.218
219	**Kiriella**	**Kiriella**	**32.613**
220	Thawalama	Thawalama	32.609
221	Panduwasnuwara East	Katupotha	32.386
222	Athuraliya	Athuraliya	32.304
223	Hakmana	Hakmana	31.648
224	Lunugamvehera	Lunugamvehera	31.559
225	Giribawa	Giribawa	31.412
226	Lunugala	Lunugala	31.381
227	Madulla	Madulla	31.238
228	Weligepola	Weligepola	30.983
229	Ayagama	Ayangama	30.894
230	Naula	Naula	30.884
231	Manmunai Pattu	Araipattai	30.694
232	Delthota	Karagaskada North	30.345
233	Yatawatta	Yatawatta	30.242
234	Hatharaliyadda	Hatharaliyadda	29.986
235	Vengalacheddikulam	Cheddikulam	29.886
236	**Pallepola**	**Pallepola**	**29.565**
237	Valikamam North	Tellippalai	29.518
238	Wilgamuwa	Wilgamuwa	29.494
239	Welivitiya Divithura	Welivitiya-Divithura	29.347
240	Maritimepattu		28.973
241	Thambalagamuwa		28.527
242	Manmunai West	Vellaveli	28.489
243	Thirappane	Thirappane	27.044
244	Thanamalvila	Thanamalvila	26.683
245	Opanayaka	Opanayaka	26.587
246	Ninthavur	Ninthavur	26.361
247	Panwila	Panvila	26.294
248	Koralai Pattu South	Kiran	26.143
249	Ehetuwewa	Ehetuwewa	25.781
250	Koralai Pattu Central		25.687
251	Sainthamaruthu	Sainthamarathu	25.461
252	Nachchadoowa	Kudanelubewa	25.377

253	Thirukkovil	Thirukkovil	25.277
254	Manmunai South-West		24.726
255	**Eravur Town**	**Erawur**	**24.643**
256	Pallama	Nandimithrapura	24.441
257	Puthukudiyiruppu		23.824
258	Koralai Pattu	Valachchenai	23.376
259	Kandavalai		23.194
260	Kandaketiya	Kandaketiya	23.075
261	Padaviya	Bisokotowa	22.998
262	Ambanpola	Ambanpola	22.878
263	Soranathota	Ridipana	22.571
264	Udadumbara	Kirigankubura	22.505
265	**Mahavilachchiya**	**Paymaduwa**	**22.467**
266	**Alayadiwembu**	**Alayadiwempu**	**22.458**
267	Kebithigollewa	Kebithigollewa	22.325
268	Koralai Pattu West	Oddamavadi	22.182
269	Rasnayakapura	Rasnayakapura	21.893
270	Gonapeenuwala	Gonapinuwala	21.755
271	Koralai Pattu North	Vakarai	21.537
272	Kotavehera	Kotavehera	21.263
273	Mahaoya	Mahaoya	20.828
274	Poonakary		20.302
275	Kirinda Puhulwella	Kirinda Puhulwella	20.291
276	Meegahakivula	Meegahakivula	19.719
277	Okewela	Okewela Junction	19.018
278	Navithanveli	Navithanveli	18.727
279	Mahakumbukkadawala	Mahakumbukkadawala	18.633
280	Nanaddan	Nanaddan	17.891
281	Karaitheevu	Karaitivu	16.839
282	Moratuwa	Moratuwa	16.828
283	Island South	Velanai	16.742
284	Merigama	Mirigama	16.458
285	Oddusuddan		15.721
286	Ambanganga	Pallethenna	15.643
287	Palugaswewa	Palugaswewa	15.582
288	Manthai West	Adampan	14.771
289	Nawagattegama	Kirimatiyawa	14.483
290	Irakkamam	Irakkaman	14.383
291	Seruvila		13.632
292	Vavuniya South	Vavuniya	13.118
293	Vadamaradchi East	Muruthankerni	12.766
294	Kundasale	Maharathenna East	12.707
295	Padavi Sri Pura		11.882
296	Vavuniya North	Nerdunkeny	11.578

297	**Echchilampattu**	**Echchilampattu**	**11.409**
298	Kothmale	Kothmale	10.118
299	Island North	Kayts	9.876
300	Thunukkai		9.699
301	Karainagar	Valanthalai	9.576
302	Lahugala	Lahugala	8.914
303	Musalai	Chilawathurai	8.119
304	Morawewa		7.968
305	Madhu	Periyapandivirichchan	7.711
306	Galigamuwa	Galigamuwa	7.449
307	Gomarankadawala		7.382
308	Manthai East		7.117
309	Welioya		6.904
310	Dodangoda	Dodangoda	6.396
311	Nivithigala	Nivithigala	6.013
312	Wellawaya	Wellawaya	6.006
313	Pasgoda	Pasgoda	5.916
314	Siyambalanduwa	Siyambalanduwa	5.404
315	Moneragala	Moneragala	4.952
316	Madampe	Uraliyagara	4.792
317	Vadamaradchi South-west	Karaveddy	4.573
318	Imaduwa	Imaduwa	4.488
319	Delft	Delft	3.824
320	Horowpothana	Horowupothana	3.699
321	Welikanda	Welikanda	3.377
322	Neluwa	Neluwa	2.864
323	Karuwalagaswewa	Karuwalagaswewa	2.344
324	Padiyathalawa	Padiyathalawa	1.829
325	**Katharagama**	**Katharagama**	**1.822**
326	**Vanathavilluwa**	**Vanathavilluwa**	**1.746**
327	Laggala Pallegama	Laggala-Pallegama	1.211
328	Pachchilaipalli		853
329	Bulathsinhala	Bulathsinhala	646
330	Sevanagala	Sevanagala	419
331	Kalmunai Tamil	Kalmunai Tamil	298

Appendix 3. DS mapping estimates and extrapolated results

Note: these tables only illustrate extrapolation calculation process. The extrapolated DS estimates of a KP should not be used for planning purpose. Instead province and national level estimates are more reliable.

Table A3.1: Estimated number of FSW per DS using mapping estimates among sampled DSs

Division	DS population	Sampled estimate	Sampled %	Estimated FSW	FSW lower bound	FSW upper bound
Addalachchenai	41,968	25	0,060%	65	56	77
Agalawatta	36,669	-	-	57	49	67
Akkaraipattu	39,166	-	-	61	52	71
Akmeemana	77,776	-	-	121	104	142
Akurana	63,397	-	-	99	85	116
Akuressa	52,912	-	-	83	71	96
Alawwa	63,667	-	-	99	85	116
Alayadiwembu	22,458	52	0,233%	35	30	41
Ambagamuwa	205,723	-	-	321	274	375
Ambalangoda	56,961	-	-	89	76	104
Ambalantota	72,943	-	-	114	97	133
Ambanganga	15,643	-	-	24	21	29
Ambanpola	22,878	-	-	36	31	42
Ampara	43,829	0	0,000%	68	58	80
Anamaduwa	38,286	-	-	60	51	70
Angunukolapelessa	48,301	-	-	75	64	88
Arachchikattuwa	40,999	-	-	64	55	75
Aranayaka	68,464	-	-	107	91	125
Aththanagalla	179,565	202	0,113%	280	239	327
Athuraliya	32,304	-	-	50	43	59
Ayagama	30,894	-	-	48	41	56
Badalkumbura	40,103	-	-	63	53	73
Baddegama	75,008	-	-	117	100	137
Badulla	75,042	-	-	117	100	137
Balangoda	81,563	115	0,140%	127	109	149
Balapitiya	67,432	-	-	105	90	123
Bamunakotuwa	36,217	-	-	56	48	66
Bandaragama	109,236	-	-	170	146	199
Bandarawela	65,502	140	0,214%	102	87	119
Beliatta	55,992	-	-	87	75	102
Benthota	49,975	-	-	78	67	91
Beruwala	164,969	62	0,038%	257	220	301
Bibile	40,329	-	-	63	54	74
Bingiriya	62,349	29	0,046%	97	83	114
Biyagama	186,585	244	0,131%	291	249	340
Bope Poddala	50,331	-	-	78	67	92
Bulathkohupitiya	47,095	-	-	73	63	86

Division	DS population	Sampled estimate	Sampled %	Estimated FSW	FSW lower bound	FSW upper bound
Bulathsinhala	64,600	-	-	101	86	118
Buttala	53,084	-	-	83	71	97
Chilaw	62,515	-	-	97	83	114
Colombo	323,257	1771	0,548%	504	431	590
Damana	38,692	-	-	60	52	71
Dambulla	72,306	-	-	113	96	132
Dankotuwa	62,399	150	0,241%	97	83	114
Dehiattakandiya	60,178	-	-	94	80	110
Dehiovita	81,315	-	-	127	108	148
Dehiwala	88,962	-	-	139	119	162
Delft	3,824	-	-	6	5	7
Delthota	30,345	-	-	47	40	55
Deraniyagala	45,869	-	-	72	61	84
Devinuwara	48,253	-	-	75	64	88
Dickwella	54,672	344	0,629%	85	73	100
Dimbulagala	79,661	-	-	124	106	145
Diulapitiya	144,506	-	-	225	193	264
Dodangoda	63,960	-	-	100	85	117
Doluwa	49,842	-	-	78	66	91
Dompe	154,005	-	-	240	205	281
Echchilampattu	11,409	88	0,775%	18	15	21
Eheliyagoda	70,839	120	0,169%	110	94	129
Ehetuwewa	25,781	-	-	40	34	47
Elahera	43,915	17	0,039%	68	59	80
Elapatha	37,853	-	-	59	50	69
Ella	45,181	-	-	70	60	82
Elpitiya	64,726	19	0,030%	101	86	118
Embilipitiya	134,713	-	-	210	180	246
Eravur Pattu	75,478	-	-	118	101	138
Eravur Town	24,643	0	0,000%	38	33	45
Galenbindunuwewa	46,992	-	-	73	63	86
Galewela	70,042	-	-	109	93	128
Galgamuwa	55,078	-	-	86	73	100
Galigamuwa	74,490	-	-	116	99	136
Galle Four Gravets	101,749	-	-	159	136	186
Galnewa	34,756	-	-	54	46	63
Gampaha	197,667	-	-	308	264	360
Ganewatta	40,137	-	-	63	54	73
Ganga Ihala Korale	55,254	-	-	86	74	101
Gangawata Korale	158,561	-	-	247	211	289
Giribawa	31,412	-	-	49	42	57
Godakawela	76,469	-	-	119	102	139
Gomarankadawala	7,382	-	-	12	10	13
Gonapeenuwala	21,755	-	-	34	29	40

Division	DS population	Sampled estimate	Sampled %	Estimated FSW	FSW lower bound	FSW upper bound
Habaraduwa	62,389	-	-	97	83	114
Hakmana	31,648	-	-	49	42	58
Haldummulla	37,558	-	-	59	50	68
Hali Ela	90,571	-	-	141	121	165
Hambantota	57,264	-	-	89	76	104
Hanguranketha	88,528	-	-	138	118	161
Hanwella	113,807	-	-	177	152	208
Haputhale	49,798	-	-	78	66	91
Harispattuwa	88,177	-	-	138	118	161
Hatharaliyadda	29,986	-	-	47	40	55
Hikkaduwa	101,909	208	0,204%	159	136	186
Hingurakgoda	64,289	-	-	100	86	117
Homagama	237,905	-	-	371	317	434
Horana	113,364	-	-	177	151	207
Horowpothana	36,990	-	-	58	49	67
Ibbagamuwa	85,309	-	-	133	114	156
Imaduwa	44,880	-	-	70	60	82
Imbulpe	59,477	-	-	93	79	108
Ingiriya	53,896	-	-	84	72	98
Ipalogama	38,862	-	-	61	52	71
Irakkamam	14,383	-	-	22	19	26
Island North	9,876	-	-	15	13	18
Island South	16,742	-	-	26	22	31
Ja-Ela	201,521	-	-	314	269	368
Jaffna	50,491	-	-	79	67	92
Kaduwela	252,041	405	0,161%	393	336	460
Kahatagasdigiliya	40,339	1	0,002%	63	54	74
Kahawaththa	43,298	-	-	68	58	79
Kalawana	51,307	-	-	80	68	94
Kalmunai	44,632	-	-	70	60	81
Kalmunai Tamil	29,800	-	-	46	40	54
Kalpitiya	86,405	-	-	135	115	158
Kaluthara	159,697	-	-	249	213	291
Kamburupitiya	40,969	-	-	64	55	75
Kandaketiya	23,075	-	-	36	31	42
Kandavalai	23,194	-	-	36	31	42
Kantalai	46,802	71	0,152%	73	62	85
Karachchi	61,484	-	-	96	82	112
Karainagar	9,576	-	-	15	13	17
Karaitheevu	16,839	-	-	26	22	31
Karandeniya	62,498	0	0,000%	97	83	114
Karuwalagaswewa	23,440	-	-	37	31	43
Katana	235,291	377	0,160%	367	314	429
Katharagama	18,220	106	0,579%	28	24	33

Division	DS population	Sampled estimate	Sampled %	Estimated FSW	FSW lower bound	FSW upper bound
Kattankudy	40,356	-	-	63	54	74
Katuwana	46,772	0	0,000%	73	62	85
Kebithigollewa	22,325	-	-	35	30	41
Kegalle	90,854	-	-	142	121	166
Kekirawa	59,241	-	-	92	79	108
Kelaniya	137,339	-	-	214	183	250
Kesbewa	245,232	86	0,035%	382	327	447
Kinniya	64,613	0	0,000%	101	86	118
Kiriella	32,613	10	0,031%	51	43	59
Kirinda Puhulwella	20,291	-	-	32	27	37
Kobeigane	35,975	-	-	56	48	66
Kolonna	45,954	-	-	72	61	84
Kolonnawa	191,687	-	-	299	256	350
Koralai Pattu	23,376	-	-	36	31	43
Koralai Pattu Central	25,687	-	-	40	34	47
Koralai Pattu North	21,537	-	-	34	29	39
Koralai Pattu South	26,143	-	-	41	35	48
Koralai Pattu West	22,182	-	-	35	30	40
Kotapola	63,255	-	-	99	84	115
Kotavehera	21,263	-	-	33	28	39
Kothmale	101,180	-	-	158	135	185
Kuchchaveli	33,218	-	-	52	44	61
Kuliyapitiya East	54,062	0	0,000%	84	72	99
Kuliyapitiya West	77,316	-	-	121	103	141
Kundasale	127,070	-	-	198	169	232
Kurunegala	80,755	-	-	126	108	147
Kuruwita	95,646	-	-	149	128	174
Laggala Pallegama	12,110	-	-	19	16	22
Lahugala	8,914	-	-	14	12	16
Lankapura	36,452	-	-	57	49	66
Lunugala	31,381	-	-	49	42	57
Lunugamvehera	31,559	-	-	49	42	58
Madampe	47,920	-	-	75	64	87
Madhu	7,711	-	-	12	10	14
Madulla	31,238	-	-	49	42	57
Madurawala	34,381	-	-	54	46	63
Mahakumbukkadawala	18,633	-	-	29	25	34
Mahaoya	20,828	-	-	32	28	38
Mahara	207,782	-	-	324	277	379
Maharagama	196,423	-	-	306	262	358
Mahavilachchiya	22,467	0	0,000%	35	30	41
Mahawewa	51,078	-	-	80	68	93
Mahiyanganaya	75,776	-	-	118	101	138
Maho	57,485	-	-	90	77	105

Division	DS population	Sampled estimate	Sampled %	Estimated FSW	FSW lower bound	FSW upper bound
Malimbada	34,856	0	0,000%	54	46	64
Mallawapitiya	52,634	-	-	82	70	96
Manmunai North	86,227	-	-	134	115	157
Manmunai Pattu	30,694	-	-	48	41	56
Manmunai South and Eruvil Pattu	60,807	-	-	95	81	111
Manmunai South-West	24,726	-	-	39	33	45
Manmunai West	28,489	-	-	44	38	52
Mannar Town	51,078	-	-	80	68	93
Manthai East	7,117	-	-	11	9	13
Manthai West	14,771	-	-	23	20	27
Maritimepattu	28,973	-	-	45	39	53
Maspotha	34,262	0	0,000%	53	46	62
Matale	74,864	-	-	117	100	137
Matara Four Gravets	115,805	-	-	181	154	211
Mathugama	81,286	-	-	127	108	148
Mawanella	111,727	76	0,068%	174	149	204
Mawathagama	64,904	108	0,167%	101	87	118
Medadumbara	61,034	-	-	95	81	111
Medagama	35,881	-	-	56	48	65
Medawachchiya	46,906	-	-	73	63	86
Medirigiriya	65,575	-	-	102	87	120
Meegahakivula	19,719	-	-	31	26	36
Merigama	164,580	-	-	257	219	300
Mihinthale	35,293	-	-	55	47	64
Millaniya	52,176	-	-	81	70	95
Minipe	51,883	-	-	81	69	95
Minuwangoda	178,331	-	-	278	238	325
Moneragala	49,520	-	-	77	66	90
Moratuwa	168,280	-	-	262	224	307
Morawewa	7,968	-	-	12	11	15
Mulatiyana	50,261	-	-	78	67	92
Mundel	61,638	17	0,027%	96	82	112
Musalai	8,119	-	-	13	11	15
Muttur	56,621	-	-	88	75	103
Nachchadoowa	25,377	-	-	40	34	46
Nagoda	53,829	-	-	84	72	98
Nallur	68,142	-	-	106	91	124
Nanaddan	17,891	-	-	28	24	33
Narammala	56,279	-	-	88	75	103
Nattandiya	62,145	18	0,029%	97	83	113
Naula	30,884	-	-	48	41	56
Navithanveli	18,727	-	-	29	25	34
Nawagattegama	14,483	-	-	23	19	26

Division	DS population	Sampled estimate	Sampled %	Estimated FSW	FSW lower bound	FSW upper bound
Negambo	142,136	-	-	222	190	259
Neluwa	28,640	-	-	45	38	52
Nikaweratiya	40,452	-	-	63	54	74
Ninthavur	26,361	-	-	41	35	48
Nivithigala	60,130	-	-	94	80	110
Niyagama	35,574	-	-	55	47	65
Nochchiyagama	49,886	-	-	78	67	91
Nuwara Eliya	212,094	-	-	331	283	387
Nuwaragam Palatha Central	61,223	-	-	95	82	112
Nuwaragam Palatha East	69,737	-	-	109	93	127
Oddusuddan	15,721	-	-	25	21	29
Okewela	19,018	-	-	30	25	35
Opanayaka	26,587	-	-	41	35	48
Pachchilaipalli	8,530	-	-	13	11	16
Padavi Sri Pura	11,882	-	-	19	16	22
Padaviya	22,998	-	-	36	31	42
Padiyathalawa	18,290	-	-	29	24	33
Padukka	65,267	77	0,119%	102	87	119
Palagala	34,002	0	0,000%	53	45	62
Palindanuwara	50,801	-	-	79	68	93
Pallama	24,441	-	-	38	33	45
Pallepola	29,565	85	0,286%	46	39	54
Palugaswewa	15,582	-	-	24	21	28
Panadura	182,285	-	-	284	243	332
Panduwasnuwara	63,742	-	-	99	85	116
Panduwasnuwara East	32,386	-	-	51	43	59
Pannala	124,225	-	-	194	166	227
Panwila	26,294	-	-	41	35	48
Pasbage Korale	59,917	-	-	93	80	109
Pasgoda	59,160	-	-	92	79	108
Passara	48,807	-	-	76	65	89
Pathadumbara	88,725	-	-	138	118	162
Pathahewaheta	58,188	-	-	91	78	106
Pelmadulla	89,469	88	0,099%	140	119	163
Pitabeddara	51,186	-	-	80	68	93
Polgahawela	65,156	17	0,025%	102	87	119
Polpithigama	76,139	-	-	119	102	139
Poojapitiya	57,914	-	-	90	77	106
Poonakary	20,302	-	-	32	27	37
Porativu Pattu	36,222	-	-	56	48	66
Pothuvil	34,809	-	-	54	46	63
Puthukudiyiruppu	23,824	-	-	37	32	43
Puttalam	82,443	-	-	129	110	150

Division	DS population	Sampled estimate	Sampled %	Estimated FSW	FSW lower bound	FSW upper bound
Rajanganaya	33,543	-	-	52	45	61
Rambewa	36,782	-	-	57	49	67
Rambukkana	82,769	28	0,034%	129	110	151
Rasnayakapura	21,893	-	-	34	29	40
Raththota	51,354	-	-	80	68	94
Ratmalana	95,506	716	0,749%	149	127	174
Ratnapura	120,212	69	0,057%	187	160	219
Rideegama	88,714	-	-	138	118	162
Rideemaliyadda	51,618	-	-	80	69	94
Ruwanwella	63,913	-	-	100	85	117
Sainthamaruthu	25,461	-	-	40	34	46
Sammanthurai	60,465	-	-	94	81	110
Seruvila	13,632	-	-	21	18	25
Sevanagala	41,900	-	-	65	56	76
Siyambalanduwa	54,040	-	-	84	72	99
Sooriyawewa	43,102	85	0,196%	67	57	79
Soranathota	22,571	-	-	35	30	41
Sri Jayawardanapura Kotte	107,925	-	-	168	144	197
Tangalle	72,507	-	-	113	97	132
Thalawa	57,793	-	-	90	77	105
Thamankaduwa	82,426	-	-	129	110	150
Thambalagamuwa	28,527	-	-	44	38	52
Thambuttegama	42,437	-	-	66	57	77
Thanamalvila	26,683	-	-	42	36	49
Thawalama	32,609	-	-	51	43	59
Thenmaradchi	64,704	-	-	101	86	118
Thihagoda	33,535	-	-	52	45	61
Thimbirigasyaya	238,057	-	-	371	317	434
Thirappane	27,044	-	-	42	36	49
Thirukkovil	25,277	-	-	39	34	46
Thumpane	37,642	-	-	59	50	69
Thunukkai	9,699	-	-	15	13	18
Tissamaharama	68,606	-	-	107	91	125
Trincomalee Town and Gravets	97,487	-	-	152	130	178
Udadumbara	22,505	-	-	35	30	41
Udapalatha	91,716	-	-	143	122	167
Udubaddawa	52,231	-	-	81	70	95
Udunuwara	110,905	-	-	173	148	202
Uhana	58,325	-	-	91	78	106
Ukuwela	68,027	70	0,103%	106	91	124
Uva Paranagama	77,998	-	-	122	104	142
Vadamaradchi East	12,766	-	-	20	17	23
Vadamaradchi North	47,565	-	-	74	63	87

Division	DS population	Sampled estimate	Sampled %	Estimated FSW	FSW lower bound	FSW upper bound
Vadamaradchi South-west	45,730	-	-	71	61	83
Valikamam East	73,225	-	-	114	98	134
Valikamam North	29,518	-	-	46	39	54
Valikamam South	53,016	-	-	83	71	97
Valikamam South-West	52,269	-	-	82	70	95
Valikamam West	46,438	-	-	72	62	85
Vanathavilluwa	17,460	0	0,000%	27	23	32
Vavuniya	117,533	-	-	183	157	214
Vavuniya North	11,578	-	-	18	15	21
Vavuniya South	13,118	-	-	20	17	24
Vengalacheddikulam	29,886	-	-	47	40	55
Walallawita	54,628	-	-	85	73	100
Walapane	104,119	-	-	162	139	190
Walasmulla	42,274	-	-	66	56	77
Warakapola	113,056	-	-	176	151	206
Wariyapola	61,425	-	-	96	82	112
Waththala	175,525	-	-	274	234	320
Weeraketiya	41,565	-	-	65	55	76
Weerambugedara	34,339	-	-	54	46	63
Weligama	72,843	-	-	114	97	133
Weligepola	30,983	-	-	48	41	57
Welikanda	33,770	-	-	53	45	62
Welimada	100,808	-	-	157	134	184
Welioya	6,904	-	-	11	9	13
Welipitiya	52,098	-	-	81	69	95
Welivitiya Divithura	29,347	-	-	46	39	54
Wellawaya	60,060	-	-	94	80	110
Wennappuwa	68,111	43	0,064%	106	91	124
Wilgamuwa	29,494	-	-	46	39	54
Yakkalamulla	45,946	-	-	72	61	84
Yatawatta	30,242	-	-	47	40	55
Yatinuwara	106,027	-	-	165	141	193
Yatiyanthota	61,096	0	0,000%	95	81	111
Total	**20,359,439**			**31,748**	**27,148**	**37,131**
%				**0.156%**	**0.133%**	**0.182%**

Table A3.2: Estimated number of MSM per DS using mapping estimates among sampled DSs

Division	DS Population	Sampled estimate	Sampled %	Estimated MSM	Upper bound	Lower bound
Addalachchenai	41968	17	0,041%	17	14	19
Agalawatta	36669	-	-	15	12	17
Akkaraipattu	39166	-	-	16	13	18
Akmeemana	77776	-	-	31	26	36
Akurana	63397	-	-	25	21	29
Akuressa	52912	-	-	21	18	24
Alawwa	63667	-	-	25	21	29
Alayadiwembu	22458	0	0,000%	9	7	10
Ambagamuwa	205723	-	-	82	68	95
Ambalangoda	56961	-	-	23	19	26
Ambalantota	72943	-	-	29	24	34
Ambanganga	15643	-	-	6	5	7
Ambanpola	22878	-	-	9	8	11
Ampara	43829	29	0,067%	17	15	20
Anamaduwa	38286	-	-	15	13	18
Angunukolapelessa	48301	-	-	19	16	22
Arachchikattuwa	40999	-	-	16	14	19
Aranayaka	68464	-	-	27	23	32
Aththanagalla	179565	106	0,059%	72	59	83
Athuraliya	32304	-	-	13	11	15
Ayagama	30894	-	-	12	10	14
Badalkumbura	40103	-	-	16	13	18
Baddegama	75008	-	-	30	25	35
Badulla	75042	-	-	30	25	35
Balangoda	81563	30	0,037%	33	27	38
Balapitiya	67432	-	-	27	22	31
Bamunakotuwa	36217	-	-	14	12	17
Bandaragama	109236	-	-	44	36	50
Bandarawela	65502	10	0,015%	26	22	30
Beliatta	55992	-	-	22	19	26
Benthota	49975	-	-	20	17	23
Beruwala	164969	21	0,013%	66	55	76
Bibile	40329	-	-	16	13	19
Bingiriya	62349	0	0,000%	25	21	29
Biyagama	186585	64	0,034%	74	62	86
Bope Poddala	50331	-	-	20	17	23
Bulathkohupitiya	47095	-	-	19	16	22
Bulathsinhala	64600	-	-	26	21	30
Buttala	53084	-	-	21	18	24
Chilaw	62515	-	-	25	21	29
Colombo	323257	491	0,152%	129	107	149
Damana	38692	-	-	15	13	18
Dambulla	72306	-	-	29	24	33

Division	DS Population	Sampled estimate	Sampled %	Estimated MSM	Upper bound	Lower bound
Dankotuwa	62399	19	0,031%	25	21	29
Dehiattakandiya	60178	-	-	24	20	28
Dehiovita	81315	-	-	32	27	37
Dehiwala	88962	-	-	35	29	41
Delft	3824	-	-	2	1	2
Delthota	30345	-	-	12	10	14
Deraniyagala	45869	-	-	18	15	21
Devinuwara	48253	-	-	19	16	22
Dickwella	54672	29	0,052%	22	18	25
Dimbulagala	79661	-	-	32	26	37
Diulapitiya	144506	-	-	58	48	67
Dodangoda	63960	-	-	26	21	29
Doluwa	49842	-	-	20	16	23
Dompe	154005	-	-	61	51	71
Echchilampattu	11409	0	0,000%	5	4	5
Eheliyagoda	70839	21	0,030%	28	23	33
Ehetuwewa	25781	-	-	10	9	12
Elahera	43915	0	0,000%	18	15	20
Elapatha	37853	-	-	15	13	17
Ella	45181	-	-	18	15	21
Elpitiya	64726	36	0,055%	26	21	30
Embilipitiya	134713	-	-	54	45	62
Eravur Pattu	75478	-	-	30	25	35
Eravur Town	24643	0	0,000%	10	8	11
Galenbindunuwewa	46992	-	-	19	16	22
Galewela	70042	-	-	28	23	32
Galgamuwa	55078	-	-	22	18	25
Galigamuwa	74490	-	-	30	25	34
Galle Four Gravets	101749	-	-	41	34	47
Galnewa	34756	-	-	14	12	16
Gampaha	197667	-	-	79	65	91
Ganewatta	40137	-	-	16	13	18
Ganga Ihala Korale	55254	-	-	22	18	25
Gangawata Korale	158561	-	-	63	52	73
Giribawa	31412	-	-	13	10	14
Godakawela	76469	-	-	30	25	35
Gomarankadawala	7382	-	-	3	2	3
Gonapeenuwala	21755	-	-	9	7	10
Habaraduwa	62389	-	-	25	21	29
Hakmana	31648	-	-	13	10	15
Haldummulla	37558	-	-	15	12	17
Hali Ela	90571	-	-	36	30	42
Hambantota	57264	-	-	23	19	26
Hanguranketha	88528	-	-	35	29	41

Division	DS Population	Sampled estimate	Sampled %	Estimated MSM	Upper bound	Lower bound
Hanwella	113807	-	-	45	38	52
Haputhale	49798	-	-	20	16	23
Harispattuwa	88177	-	-	35	29	41
Hatharaliyadda	29986	-	-	12	10	14
Hikkaduwa	101909	55	0,054%	41	34	47
Hingurakgoda	64289	-	-	26	21	30
Homagama	237905	-	-	95	79	110
Horana	113364	-	-	45	38	52
Horowpothana	36990	-	-	15	12	17
Ibbagamuwa	85309	-	-	34	28	39
Imaduwa	44880	-	-	18	15	21
Imbulpe	59477	-	-	24	20	27
Ingiriya	53896	-	-	21	18	25
Ipalogama	38862	-	-	15	13	18
Irakkamam	14383	-	-	6	5	7
Island North	9876	-	-	4	3	5
Island South	16742	-	-	7	6	8
Ja-Ela	201521	-	-	80	67	93
Jaffna	50491	-	-	20	17	23
Kaduwela	252041	88	0,035%	101	83	116
Kahatagasdigiliya	40339	31	0,077%	16	13	19
Kahawaththa	43298	-	-	17	14	20
Kalawana	51307	-	-	20	17	24
Kalmunai	44632	-	-	18	15	21
Kalmunai Tamil	29800	-	-	12	10	14
Kalpitiya	86405	-	-	34	29	40
Kaluthara	159697	-	-	64	53	74
Kamburupitiya	40969	-	-	16	14	19
Kandaketiya	23075	-	-	9	8	11
Kandavalai	23194	-	-	9	8	11
Kantalai	46802	0	0,000%	19	15	22
Karachchi	61484	-	-	25	20	28
Karainagar	9576	-	-	4	3	4
Karaitheevu	16839	-	-	7	6	8
Karandeniya	62498	0	0,000%	25	21	29
Karuwalagaswewa	23440	-	-	9	8	11
Katana	235291	75	0,032%	94	78	108
Katharagama	18220	17	0,095%	7	6	8
Kattankudy	40356	-	-	16	13	19
Katuwana	46772	29	0,061%	19	15	22
Kebithigollewa	22325	-	-	9	7	10
Kegalle	90854	-	-	36	30	42
Kekirawa	59241	-	-	24	20	27
Kelaniya	137339	-	-	55	45	63
Kesbewa	245232	0	0,000%	98	81	113

Division	DS Population	Sampled estimate	Sampled %	Estimated MSM	Upper bound	Lower bound
Kinniya	64613	25	0,038%	26	21	30
Kiriella	32613	0	0,000%	13	11	15
Kirinda Puhulwella	20291	-	-	8	7	9
Kobeigane	35975	-	-	14	12	17
Kolonna	45954	-	-	18	15	21
Kolonnawa	191687	-	-	76	63	88
Koralai Pattu	23376	-	-	9	8	11
Koralai Pattu Central	25687	-	-	10	9	12
Koralai Pattu North	21537	-	-	9	7	10
Koralai Pattu South	26143	-	-	10	9	12
Koralai Pattu West	22182	-	-	9	7	10
Kotapola	63255	-	-	25	21	29
Kotavehera	21263	-	-	8	7	10
Kothmale	101180	-	-	40	33	47
Kuchchaveli	33218	-	-	13	11	15
Kuliyapitiya East	54062	0	0,000%	22	18	25
Kuliyapitiya West	77316	-	-	31	26	36
Kundasale	127070	-	-	51	42	59
Kurunegala	80755	-	-	32	27	37
Kuruwita	95646	-	-	38	32	44
Laggala Pallegama	12110	-	-	5	4	6
Lahugala	8914	-	-	4	3	4
Lankapura	36452	-	-	15	12	17
Lunugala	31381	-	-	13	10	14
Lunugamvehera	31559	-	-	13	10	15
Madampe	47920	-	-	19	16	22
Madhu	7711	-	-	3	3	4
Madulla	31238	-	-	12	10	14
Madurawala	34381	-	-	14	11	16
Mahakumbukkadawala	18633	-	-	7	6	9
Mahaoya	20828	-	-	8	7	10
Mahara	207782	-	-	83	69	96
Maharagama	196423	-	-	78	65	91
Mahavilachchiya	22467	0	0,000%	9	7	10
Mahawewa	51078	-	-	20	17	24
Mahiyanganaya	75776	-	-	30	25	35
Maho	57485	-	-	23	19	26
Malimbada	34856	25	0,072%	14	12	16
Mallawapitiya	52634	-	-	21	17	24
Manmunai North	86227	-	-	34	29	40
Manmunai Pattu	30694	-	-	12	10	14
Manmunai South and Eruvil Pattu	60807	-	-	24	20	28
Manmunai South-West	24726	-	-	10	8	11
Manmunai West	28489	-	-	11	9	13

Division	DS Population	Sampled estimate	Sampled %	Estimated MSM	Upper bound	Lower bound
Mannar Town	51078	-	-	20	17	24
Manthai East	7117	-	-	3	2	3
Manthai West	14771	-	-	6	5	7
Maritimepattu	28973	-	-	12	10	13
Maspotha	34262	0	0,000%	14	11	16
Matale	74864	-	-	30	25	34
Matara Four Gravets	115805	-	-	46	38	53
Mathugama	81286	-	-	32	27	37
Mawanella	111727	6	0,005%	45	37	51
Mawathagama	64904	0	0,000%	26	21	30
Medadumbara	61034	-	-	24	20	28
Medagama	35881	-	-	14	12	17
Medawachchiya	46906	-	-	19	16	22
Medirigiriya	65575	-	-	26	22	30
Meegahakivula	19719	-	-	8	7	9
Merigama	164580	-	-	66	54	76
Mihinthale	35293	-	-	14	12	16
Millaniya	52176	-	-	21	17	24
Minipe	51883	-	-	21	17	24
Minuwangoda	178331	-	-	71	59	82
Moneragala	49520	-	-	20	16	23
Moratuwa	168280	-	-	67	56	78
Morawewa	7968	-	-	3	3	4
Mulatiyana	50261	-	-	20	17	23
Mundel	61638	0	0,000%	25	20	28
Musalai	8119	-	-	3	3	4
Muttur	56621	-	-	23	19	26
Nachchadoowa	25377	-	-	10	8	12
Nagoda	53829	-	-	21	18	25
Nallur	68142	-	-	27	23	31
Nanaddan	17891	-	-	7	6	8
Narammala	56279	-	-	22	19	26
Nattandiya	62145	5	0,008%	25	21	29
Naula	30884	-	-	12	10	14
Navithanveli	18727	-	-	7	6	9
Nawagattegama	14483	-	-	6	5	7
Negambo	142136	-	-	57	47	65
Neluwa	28640	-	-	11	9	13
Nikaweratiya	40452	-	-	16	13	19
Ninthavur	26361	-	-	11	9	12
Nivithigala	60130	-	-	24	20	28
Niyagama	35574	-	-	14	12	16
Nochchiyagama	49886	-	-	20	17	23
Nuwara Eliya	212094	-	-	85	70	98

Division	DS Population	Sampled estimate	Sampled %	Estimated MSM	Upper bound	Lower bound
Nuwaragam Palatha Central	61223	-	-	24	20	28
Nuwaragam Palatha East	69737	-	-	28	23	32
Oddusuddan	15721	-	-	6	5	7
Okewela	19018	-	-	8	6	9
Opanayaka	26587	-	-	11	9	12
Pachchilaipalli	8530	-	-	3	3	4
Padavi Sri Pura	11882	-	-	5	4	5
Padaviya	22998	-	-	9	8	11
Padiyathalawa	18290	-	-	7	6	8
Padukka	65267	29	0,044%	26	22	30
Palagala	34002	0	0,000%	14	11	16
Palindanuwara	50801	-	-	20	17	23
Pallama	24441	-	-	10	8	11
Pallepola	29565	0	0,000%	12	10	14
Palugaswewa	15582	-	-	6	5	7
Panadura	182285	-	-	73	60	84
Panduwasnuwara	63742	-	-	25	21	29
Panduwasnuwara East	32386	-	-	13	11	15
Pannala	124225	-	-	50	41	57
Panwila	26294	-	-	10	9	12
Pasbage Korale	59917	-	-	24	20	28
Pasgoda	59160	-	-	24	20	27
Passara	48807	-	-	19	16	22
Pathadumbara	88725	-	-	35	29	41
Pathahewaheta	58188	-	-	23	19	27
Pelmadulla	89469	15	0,016%	36	30	41
Pitabeddara	51186	-	-	20	17	24
Polgahawela	65156	27	0,041%	26	22	30
Polpithigama	76139	-	-	30	25	35
Poojapitiya	57914	-	-	23	19	27
Poonakary	20302	-	-	8	7	9
Porativu Pattu	36222	-	-	14	12	17
Pothuvil	34809	-	-	14	12	16
Puthukudiyiruppu	23824	-	-	10	8	11
Puttalam	82443	-	-	33	27	38
Rajanganaya	33543	-	-	13	11	15
Rambewa	36782	-	-	15	12	17
Rambukkana	82769	4	0,004%	33	27	38
Rasnayakapura	21893	-	-	9	7	10
Raththota	51354	-	-	20	17	24
Ratmalana	95506	207	0,217%	38	32	44
Ratnapura	120212	0	0,000%	48	40	55
Rideegama	88714	-	-	35	29	41

Division	DS Population	Sampled estimate	Sampled %	Estimated MSM	Upper bound	Lower bound
Rideemaliyadda	51618	-	-	21	17	24
Ruwanwella	63913	-	-	25	21	29
Sainthamaruthu	25461	-	-	10	8	12
Sammanthurai	60465	-	-	24	20	28
Seruvila	13632	-	-	5	5	6
Sevanagala	41900	-	-	17	14	19
Siyambalanduwa	54040	-	-	22	18	25
Sooriyawewa	43102	61	0,141%	17	14	20
Soranathota	22571	-	-	9	7	10
Sri Jayawardanapura Kotte	107925	-	-	43	36	50
Tangalle	72507	-	-	29	24	33
Thalawa	57793	-	-	23	19	27
Thamankaduwa	82426	-	-	33	27	38
Thambalagamuwa	28527	-	-	11	9	13
Thambuttegama	42437	-	-	17	14	20
Thanamalvila	26683	-	-	11	9	12
Thawalama	32609	-	-	13	11	15
Thenmaradchi	64704	-	-	26	21	30
Thihagoda	33535	-	-	13	11	15
Thimbirigasyaya	238057	-	-	95	79	110
Thirappane	27044	-	-	11	9	12
Thirukkovil	25277	-	-	10	8	12
Thumpane	37642	-	-	15	12	17
Thunukkai	9699	-	-	4	3	4
Tissamaharama	68606	-	-	27	23	32
Trincomalee Town and Gravets	97487	-	-	39	32	45
Udadumbara	22505	-	-	9	7	10
Udapalatha	91716	-	-	37	30	42
Udubaddawa	52231	-	-	21	17	24
Udunuwara	110905	-	-	44	37	51
Uhana	58325	-	-	23	19	27
Ukuwela	68027	0	0,000%	27	23	31
Uva Paranagama	77998	-	-	31	26	36
Vadamaradchi East	12766	-	-	5	4	6
Vadamaradchi North	47565	-	-	19	16	22
Vadamaradchi South-west	45730	-	-	18	15	21
Valikamam East	73225	-	-	29	24	34
Valikamam North	29518	-	-	12	10	14
Valikamam South	53016	-	-	21	18	24
Valikamam South-West	52269	-	-	21	17	24
Valikamam West	46438	-	-	19	15	21
Vanathavilluwa	17460	0	0,000%	7	6	8
Vavuniya	117533	-	-	47	39	54

Division	DS Population	Sampled estimate	Sampled %	Estimated MSM	Upper bound	Lower bound
Vavuniya North	11578	-	-	5	4	5
Vavuniya South	13118	-	-	5	4	6
Vengalacheddikulam	29886	-	-	12	10	14
Walallawita	54628	-	-	22	18	25
Walapane	104119	-	-	42	34	48
Walasmulla	42274	-	-	17	14	19
Warakapola	113056	-	-	45	37	52
Wariyapola	61425	-	-	24	20	28
Waththala	175525	-	-	70	58	81
Weeraketiya	41565	-	-	17	14	19
Weerambugedara	34339	-	-	14	11	16
Weligama	72843	-	-	29	24	34
Weligepola	30983	-	-	12	10	14
Welikanda	33770	-	-	13	11	16
Welimada	100808	-	-	40	33	46
Welioya	6904	-	-	3	2	3
Welipitiya	52098	-	-	21	17	24
Welivitiya Divithura	29347	-	-	12	10	14
Wellawaya	60060	-	-	24	20	28
Wennappuwa	68111	0	0,000%	27	23	31
Wilgamuwa	29494	-	-	12	10	14
Yakkalamulla	45946	-	-	18	15	21
Yatawatta	30242	-	-	12	10	14
Yatinuwara	106027	-	-	42	35	49
Yatiyanthota	61096	0	0,000%	24	20	28
Total	**20,359,439**	**1,570**		**8,120**	**6,739**	**9,381**
%				**0.040%**	**0.033%**	**0.046%**

Table A3.3: Estimated number of MSW per DS using mapping estimates among sampled DSs

Division	Division population	Sampled estimates	Sampled %	Estimated MSW	MSW lower bound	MSW upper bound
Addalachchenai	41968	3	0,008%	8	7	10
Agalawatta	36669	-	-	7	6	9
Akkaraipattu	39166	-	-	8	6	9
Akmeemana	77776	-	-	15	12	19
Akurana	63397	-	-	13	10	15
Akuressa	52912	-	-	10	8	13
Alawwa	63667	-	-	13	10	15
Alayadiwembu	22458	0	0,000%	4	4	5
Ambagamuwa	205723	-	-	41	33	49
Ambalangoda	56961	-	-	11	9	14
Ambalantota	72943	-	-	14	12	17
Ambanganga	15643	-	-	3	2	4
Ambanpola	22878	-	-	5	4	5
Ampara	43829	6	0,013%	9	7	10
Anamaduwa	38286	-	-	8	6	9
Angunukolapelessa	48301	-	-	10	8	12
Arachchikattuwa	40999	-	-	8	7	10
Aranayaka	68464	-	-	14	11	16
Aththanagalla	179565	55	0,031%	35	29	43
Athuraliya	32304	-	-	6	5	8
Ayagama	30894	-	-	6	5	7
Badalkumbura	40103	-	-	8	6	10
Baddegama	75008	-	-	15	12	18
Badulla	75042	-	-	15	12	18
Balangoda	81563	7	0,009%	16	13	19
Balapitiya	67432	-	-	13	11	16
Bamunakotuwa	36217	-	-	7	6	9
Bandaragama	109236	-	-	22	17	26
Bandarawela	65502	3	0,005%	13	10	16
Beliatta	55992	-	-	11	9	13
Benthota	49975	-	-	10	8	12
Beruwala	164969	15	0,009%	33	26	39
Bibile	40329	-	-	8	6	10
Bingiriya	62349	0	0,000%	12	10	15
Biyagama	186585	38	0,020%	37	30	44
Bope Poddala	50331	-	-	10	8	12
Bulathkohupitiya	47095	-	-	9	7	11
Bulathsinhala	64600	-	-	13	10	15
Buttala	53084	-	-	10	8	13
Chilaw	62515	-	-	12	10	15
Colombo	323257	291	0,090%	64	51	77
Damana	38692	-	-	8	6	9

Division	Division population	Sampled estimates	Sampled %	Estimated MSW	MSW lower bound	MSW upper bound
Dambulla	72306	-	-	14	12	17
Dankotuwa	62399	4	0,006%	12	10	15
Dehiattakandiya	60178	-	-	12	10	14
Dehiovita	81315	-	-	16	13	19
Dehiwala	88962	-	-	18	14	21
Delft	3824	-	-	1	1	1
Delthota	30345	-	-	6	5	7
Deraniyagala	45869	-	-	9	7	11
Devinuwara	48253	-	-	10	8	11
Dickwella	54672	3	0,006%	11	9	13
Dimbulagala	79661	-	-	16	13	19
Diulapitiya	144506	-	-	29	23	34
Dodangoda	63960	-	-	13	10	15
Doluwa	49842	-	-	10	8	12
Dompe	154005	-	-	30	25	37
Echchilampattu	11409	0	0,000%	2	2	3
Eheliyagoda	70839	13	0,019%	14	11	17
Ehetuwewa	25781	-	-	5	4	6
Elahera	43915	0	0,000%	9	7	10
Elapatha	37853	-	-	7	6	9
Ella	45181	-	-	9	7	11
Elpitiya	64726	5	0,008%	13	10	15
Embilipitiya	134713	-	-	27	21	32
Eravur Pattu	75478	-	-	15	12	18
Eravur Town	24643	0	0,000%	5	4	6
Galenbindunuwewa	46992	-	-	9	7	11
Galewela	70042	-	-	14	11	17
Galgamuwa	55078	-	-	11	9	13
Galigamuwa	74490	-	-	15	12	18
Galle Four Gravets	101749	-	-	20	16	24
Galnewa	34756	-	-	7	6	8
Gampaha	197667	-	-	39	31	47
Ganewatta	40137	-	-	8	6	10
Ganga Ihala Korale	55254	-	-	11	9	13
Gangawata Korale	158561	-	-	31	25	38
Giribawa	31412	-	-	6	5	7
Godakawela	76469	-	-	15	12	18
Gomarankadawala	7382	-	-	1	1	2
Gonapeenuwala	21755	-	-	4	3	5
Habaraduwa	62389	-	-	12	10	15
Hakmana	31648	-	-	6	5	8
Haldummulla	37558	-	-	7	6	9
Hali Ela	90571	-	-	18	14	22
Hambantota	57264	-	-	11	9	14

Division	Division population	Sampled estimates	Sampled %	Estimated MSW	MSW lower bound	MSW upper bound
Hanguranketha	88528	-	-	17	14	21
Hanwella	113807	-	-	22	18	27
Haputhale	49798	-	-	10	8	12
Harispattuwa	88177	-	-	17	14	21
Hatharaliyadda	29986	-	-	6	5	7
Hikkaduwa	101909	18	0,018%	20	16	24
Hingurakgoda	64289	-	-	13	10	15
Homagama	237905	-	-	47	38	57
Horana	113364	-	-	22	18	27
Horowpothana	36990	-	-	7	6	9
Ibbagamuwa	85309	-	-	17	14	20
Imaduwa	44880	-	-	9	7	11
Imbulpe	59477	-	-	12	9	14
Ingiriya	53896	-	-	11	9	13
Ipalogama	38862	-	-	8	6	9
Irakkamam	14383	-	-	3	2	3
Island North	9876	-	-	2	2	2
Island South	16742	-	-	3	3	4
Ja-Ela	201521	-	-	40	32	48
Jaffna	50491	-	-	10	8	12
Kaduwela	252041	48	0,019%	50	40	60
Kahatagasdigiliya	40339	3	0,007%	8	6	10
Kahawaththa	43298	-	-	9	7	10
Kalawana	51307	-	-	10	8	12
Kalmunai	44632	-	-	9	7	11
Kalmunai Tamil	29800	-	-	6	5	7
Kalpitiya	86405	-	-	17	14	21
Kaluthara	159697	-	-	32	25	38
Kamburupitiya	40969	-	-	8	7	10
Kandaketiya	23075	-	-	5	4	5
Kandavalai	23194	-	-	5	4	6
Kantalai	46802	0	0,000%	9	7	11
Karachchi	61484	-	-	12	10	15
Karainagar	9576	-	-	2	2	2
Karaitheevu	16839	-	-	3	3	4
Karandeniya	62498	8	0,013%	12	10	15
Karuwalagaswewa	23440	-	-	5	4	6
Katana	235291	39	0,017%	47	37	56
Katharagama	18220	6	0,032%	4	3	4
Kattankudy	40356	-	-	8	6	10
Katuwana	46772	5	0,011%	9	7	11
Kebithigollewa	22325	-	-	4	4	5
Kegalle	90854	-	-	18	14	22
Kekirawa	59241	-	-	12	9	14

Division	Division population	Sampled estimates	Sampled %	Estimated MSW	MSW lower bound	MSW upper bound
Kelaniya	137339	-	-	27	22	33
Kesbewa	245232	0	0,000%	48	39	58
Kinniya	64613	8	0,012%	13	10	15
Kiriella	32613	0	0,000%	6	5	8
Kirinda Puhulwella	20291	-	-	4	3	5
Kobeigane	35975	-	-	7	6	9
Kolonna	45954	-	-	9	7	11
Kolonnawa	191687	-	-	38	31	46
Koralai Pattu	23376	-	-	5	4	6
Koralai Pattu Central	25687	-	-	5	4	6
Koralai Pattu North	21537	-	-	4	3	5
Koralai Pattu South	26143	-	-	5	4	6
Koralai Pattu West	22182	-	-	4	4	5
Kotapola	63255	-	-	13	10	15
Kotavehera	21263	-	-	4	3	5
Kothmale	101180	-	-	20	16	24
Kuchchaveli	33218	-	-	7	5	8
Kuliyapitiya East	54062	0	0,000%	11	9	13
Kuliyapitiya West	77316	-	-	15	12	18
Kundasale	127070	-	-	25	20	30
Kurunegala	80755	-	-	16	13	19
Kuruwita	95646	-	-	19	15	23
Laggala Pallegama	12110	-	-	2	2	3
Lahugala	8914	-	-	2	1	2
Lankapura	36452	-	-	7	6	9
Lunugala	31381	-	-	6	5	7
Lunugamvehera	31559	-	-	6	5	8
Madampe	47920	-	-	9	8	11
Madhu	7711	-	-	2	1	2
Madulla	31238	-	-	6	5	7
Madurawala	34381	-	-	7	5	8
Mahakumbukkadawala	18633	-	-	4	3	4
Mahaoya	20828	-	-	4	3	5
Mahara	207782	-	-	41	33	49
Maharagama	196423	-	-	39	31	47
Mahavilachchiya	22467	0	0,000%	4	4	5
Mahawewa	51078	-	-	10	8	12
Mahiyanganaya	75776	-	-	15	12	18
Maho	57485	-	-	11	9	14
Malimbada	34856	3	0,008%	7	6	8
Mallawapitiya	52634	-	-	10	8	13
Manmunai North	86227	-	-	17	14	21
Manmunai Pattu	30694	-	-	6	5	7

Division	Division population	Sampled estimates	Sampled %	Estimated MSW	MSW lower bound	MSW upper bound
Manmunai South and Eruvil Pattu	60807	-	-	12	10	14
Manmunai South-West	24726	-	-	5	4	6
Manmunai West	28489	-	-	6	5	7
Mannar Town	51078	-	-	10	8	12
Manthai East	7117	-	-	1	1	2
Manthai West	14771	-	-	3	2	4
Maritimepattu	28973	-	-	6	5	7
Maspotha	34262	0	0,000%	7	5	8
Matale	74864	-	-	15	12	18
Matara Four Gravets	115805	-	-	23	18	28
Mathugama	81286	-	-	16	13	19
Mawanella	111727	7	0,006%	22	18	27
Mawathagama	64904	0	0,000%	13	10	15
Medadumbara	61034	-	-	12	10	15
Medagama	35881	-	-	7	6	9
Medawachchiya	46906	-	-	9	7	11
Medirigiriya	65575	-	-	13	10	16
Meegahakivula	19719	-	-	4	3	5
Merigama	164580	-	-	33	26	39
Mihinthale	35293	-	-	7	6	8
Millaniya	52176	-	-	10	8	12
Minipe	51883	-	-	10	8	12
Minuwangoda	178331	-	-	35	28	42
Moneragala	49520	-	-	10	8	12
Moratuwa	168280	-	-	33	27	40
Morawewa	7968	-	-	2	1	2
Mulatiyana	50261	-	-	10	8	12
Mundel	61638	0	0,000%	12	10	15
Musalai	8119	-	-	2	1	2
Muttur	56621	-	-	11	9	13
Nachchadoowa	25377	-	-	5	4	6
Nagoda	53829	-	-	11	9	13
Nallur	68142	-	-	13	11	16
Nanaddan	17891	-	-	4	3	4
Narammala	56279	-	-	11	9	13
Nattandiya	62145	3	0,006%	12	10	15
Naula	30884	-	-	6	5	7
Navithanveli	18727	-	-	4	3	4
Nawagattegama	14483	-	-	3	2	3
Negambo	142136	-	-	28	23	34
Neluwa	28640	-	-	6	5	7
Nikaweratiya	40452	-	-	8	6	10
Ninthavur	26361	-	-	5	4	6

Division	Division population	Sampled estimates	Sampled %	Estimated MSW	MSW lower bound	MSW upper bound
Nivithigala	60130	-	-	12	10	14
Niyagama	35574	-	-	7	6	8
Nochchiyagama	49886	-	-	10	8	12
Nuwara Eliya	212094	-	-	42	34	51
Nuwaragam Palatha Central	61223	-	-	12	10	15
Nuwaragam Palatha East	69737	-	-	14	11	17
Oddusuddan	15721	-	-	3	3	4
Okewela	19018	-	-	4	3	5
Opanayaka	26587	-	-	5	4	6
Pachchilaipalli	8530	-	-	2	1	2
Padavi Sri Pura	11882	-	-	2	2	3
Padaviya	22998	-	-	5	4	5
Padiyathalawa	18290	-	-	4	3	4
Padukka	65267	17	0,026%	13	10	16
Palagala	34002	0	0,000%	7	5	8
Palindanuwara	50801	-	-	10	8	12
Pallama	24441	-	-	5	4	6
Pallepola	29565	0	0,000%	6	5	7
Palugaswewa	15582	-	-	3	2	4
Panadura	182285	-	-	36	29	43
Panduwasnuwara	63742	-	-	13	10	15
Panduwasnuwara East	32386	-	-	6	5	8
Pannala	124225	-	-	25	20	30
Panwila	26294	-	-	5	4	6
Pasbage Korale	59917	-	-	12	10	14
Pasgoda	59160	-	-	12	9	14
Passara	48807	-	-	10	8	12
Pathadumbara	88725	-	-	18	14	21
Pathahewaheta	58188	-	-	12	9	14
Pelmadulla	89469	8	0,009%	18	14	21
Pitabeddara	51186	-	-	10	8	12
Polgahawela	65156	5	0,008%	13	10	16
Polpithigama	76139	-	-	15	12	18
Poojapitiya	57914	-	-	11	9	14
Poonakary	20302	-	-	4	3	5
Porativu Pattu	36222	-	-	7	6	9
Pothuvil	34809	-	-	7	6	8
Puthukudiyiruppu	23824	-	-	5	4	6
Puttalam	82443	-	-	16	13	20
Rajanganaya	33543	-	-	7	5	8
Rambewa	36782	-	-	7	6	9
Rambukkana	82769	3	0,004%	16	13	20

Division	Division population	Sampled estimates	Sampled %	Estimated MSW	MSW lower bound	MSW upper bound
Rasnayakapura	21893	-	-	4	3	5
Raththota	51354	-	-	10	8	12
Ratmalana	95506	132	0,139%	19	15	23
Ratnapura	120212	7	0,006%	24	19	29
Rideegama	88714	-	-	18	14	21
Rideemaliyadda	51618	-	-	10	8	12
Ruwanwella	63913	-	-	13	10	15
Sainthamaruthu	25461	-	-	5	4	6
Sammanthurai	60465	-	-	12	10	14
Seruvila	13632	-	-	3	2	3
Sevanagala	41900	-	-	8	7	10
Siyambalanduwa	54040	-	-	11	9	13
Sooriyawewa	43102	13	0,031%	9	7	10
Soranathota	22571	-	-	4	4	5
Sri Jayawardanapura Kotte	107925	-	-	21	17	26
Tangalle	72507	-	-	14	12	17
Thalawa	57793	-	-	11	9	14
Thamankaduwa	82426	-	-	16	13	20
Thambalagamuwa	28527	-	-	6	5	7
Thambuttegama	42437	-	-	8	7	10
Thanamalvila	26683	-	-	5	4	6
Thawalama	32609	-	-	6	5	8
Thenmaradchi	64704	-	-	13	10	15
Thihagoda	33535	-	-	7	5	8
Thimbirigasyaya	238057	-	-	47	38	57
Thirappane	27044	-	-	5	4	6
Thirukkovil	25277	-	-	5	4	6
Thumpane	37642	-	-	7	6	9
Thunukkai	9699	-	-	2	2	2
Tissamaharama	68606	-	-	14	11	16
Trincomalee Town and Gravets	97487	-	-	19	16	23
Udadumbara	22505	-	-	4	4	5
Udapalatha	91716	-	-	18	15	22
Udubaddawa	52231	-	-	10	8	12
Udunuwara	110905	-	-	22	18	26
Uhana	58325	-	-	12	9	14
Ukuwela	68027	0	0,000%	13	11	16
Uva Paranagama	77998	-	-	15	12	19
Vadamaradchi East	12766	-	-	3	2	3
Vadamaradchi North	47565	-	-	9	8	11
Vadamaradchi South-west	45730	-	-	9	7	11
Valikamam East	73225	-	-	14	12	17

Division	Division population	Sampled estimates	Sampled %	Estimated MSW	MSW lower bound	MSW upper bound
Valikamam North	29518	-	-	6	5	7
Valikamam South	53016	-	-	10	8	13
Valikamam South-West	52269	-	-	10	8	12
Valikamam West	46438	-	-	9	7	11
Vanathavilluwa	17460	0	0,000%	3	3	4
Vavuniya	117533	-	-	23	19	28
Vavuniya North	11578	-	-	2	2	3
Vavuniya South	13118	-	-	3	2	3
Vengalacheddikulam	29886	-	-	6	5	7
Walallawita	54628	-	-	11	9	13
Walapane	104119	-	-	21	17	25
Walasmulla	42274	-	-	8	7	10
Warakapola	113056	-	-	22	18	27
Wariyapola	61425	-	-	12	10	15
Waththala	175525	-	-	35	28	42
Weeraketiya	41565	-	-	8	7	10
Weerambugedara	34339	-	-	7	5	8
Weligama	72843	-	-	14	12	17
Weligepola	30983	-	-	6	5	7
Welikanda	33770	-	-	7	5	8
Welimada	100808	-	-	20	16	24
Welioya	6904	-	-	1	1	2
Welipitiya	52098	-	-	10	8	12
Welivitiya Divithura	29347	-	-	6	5	7
Wellawaya	60060	-	-	12	10	14
Wennappuwa	68111	0	0,000%	13	11	16
Wilgamuwa	29494	-	-	6	5	7
Yakkalamulla	45946	-	-	9	7	11
Yatawatta	30242	-	-	6	5	7
Yatinuwara	106027	-	-	21	17	25
Yatiyanthota	61096	0	0,000%	12	10	15
Total	**20359439**	**778**		**4024**	**3240**	**4848**
%				**0.020%**	**0.016%**	**0.024%**

Table A3.4 Estimated number of PWID per DS using mapping estimates among sampled DSs

District	District population	Sampled estimation	Sampled %	Estimated PWID	PWID lower bound	PWID upper bound
Hambantota	41968	39	0,093%	6	5	6
Puttalam	36669	-	-	5	4	5
Ampara	39166	-	-	5	4	6
Kalutara	77776	-	-	10	9	12
Trincomalee	63397	-	-	8	7	9
Hambantota	52912	-	-	7	6	8
Jaffna	63667	-	-	8	7	9
Ampara	22458	0	0,000%	3	3	3
Nuwara Eliya	205723	-	-	27	24	30
Kandy	56961	-	-	7	7	8
Badulla	72943	-	-	10	8	11
Anuradhapura	15643	-	-	2	2	2
Batticaloa	22878	-	-	3	3	3
Jaffna	43829	0	0,000%	6	5	6
Anuradhapura	38286	-	-	5	4	6
Puttalam	48301	-	-	6	6	7
Ratnapura	40999	-	-	5	5	6
Matale	68464	-	-	9	8	10
Gampaha	179565	0	0,000%	24	21	27
Kurunegala	32304	-	-	4	4	5
Kalutara	30894	-	-	4	4	5
Polonnaruwa	40103	-	-	5	5	6
Kurunegala	75008	-	-	10	9	11
Ratnapura	75042	-	-	10	9	11
Kurunegala	81563	0	0,000%	11	9	12
Hambantota	67432	-	-	9	8	10
Batticaloa	36217	-	-	5	4	5
Kegalle	109236	-	-	14	13	16
Jaffna	65502	0	0,000%	9	8	10
Matara	55992	-	-	7	6	8
Kandy	49975	-	-	7	6	7
Colombo	164969	0	0,000%	22	19	24
Galle	40329	-	-	5	5	6
Kurunegala	62349	0	0,000%	8	7	9
Gampaha	186585	0	0,000%	24	21	28
Kalutara	50331	-	-	7	6	7
Jaffna	47095	-	-	6	5	7
Mullaitivu	64600	-	-	8	7	10
Trincomalee	53084	-	-	7	6	8
Polonnaruwa	62515	-	-	8	7	9
Colombo	323257	425	0,131%	42	37	48
Hambantota	38692	-	-	5	4	6

District	District population	Sampled estimation	Sampled %	Estimated PWID	PWID lower bound	PWID upper bound
Kegalle	72306	-	-	9	8	11
Kegalle	62399	0	0,000%	8	7	9
Kilinochchi	60178	-	-	8	7	9
Kegalle	81315	-	-	11	9	12
Kandy	88962	-	-	12	10	13
Trincomalee	3824	-	-	1	0	1
Anuradhapura	30345	-	-	4	3	4
Badulla	45869	-	-	6	5	7
Mannar	48253	-	-	6	6	7
Kandy	54672	0	0,000%	7	6	8
Ratnapura	79661	-	-	10	9	12
Kandy	144506	-	-	19	17	21
Mannar	63960	-	-	8	7	9
Matale	49842	-	-	7	6	7
Kalutara	154005	-	-	20	18	23
Badulla	11409	0	0,000%	1	1	2
Jaffna	70839	0	0,000%	9	8	10
Batticaloa	25781	-	-	3	3	4
Puttalam	43915	0	0,000%	6	5	6
Hambantota	37853	-	-	5	4	6
Hambantota	45181	-	-	6	5	7
Polonnaruwa	64726	0	0,000%	8	7	10
Gampaha	134713	-	-	18	15	20
Kurunegala	75478	-	-	10	9	11
Matale	24643	12	0,047%	3	3	4
Galle	46992	-	-	6	5	7
Hambantota	70042	-	-	9	8	10
Kandy	55078	-	-	7	6	8
Jaffna	74490	-	-	10	9	11
Kandy	101749	-	-	13	12	15
Ampara	34756	-	-	5	4	5
Gampaha	197667	-	-	26	23	29
Ampara	40137	-	-	5	5	6
Ampara	55254	-	-	7	6	8
Gampaha	158561	-	-	21	18	23
Anuradhapura	31412	-	-	4	4	5
Polonnaruwa	76469	-	-	10	9	11
Mullaitivu	7382	-	-	1	1	1
Batticaloa	21755	-	-	3	2	3
Kurunegala	62389	-	-	8	7	9
Moneragala	31648	-	-	4	4	5
Moneragala	37558	-	-	5	4	6
Ratnapura	90571	-	-	12	10	13
Moneragala	57264	-	-	8	7	8

District	District population	Sampled estimation	Sampled %	Estimated PWID	PWID lower bound	PWID upper bound
Ratnapura	88528	-	-	12	10	13
Ratnapura	113807	-	-	15	13	17
Ratnapura	49798	-	-	7	6	7
Colombo	88177	-	-	12	10	13
Anuradhapura	29986	-	-	4	3	4
Colombo	101909	0	0,000%	13	12	15
Kurunegala	64289	-	-	8	7	10
Colombo	237905	-	-	31	27	35
Vavuniya	113364	-	-	15	13	17
Jaffna	36990	-	-	5	4	5
Nuwara Eliya	85309	-	-	11	10	13
Vavuniya	44880	-	-	6	5	7
Anuradhapura	59477	-	-	8	7	9
Hambantota	53896	-	-	7	6	8
Ratnapura	38862	-	-	5	4	6
Kurunegala	14383	-	-	2	2	2
Ampara	9876	-	-	1	1	1
Kurunegala	16742	-	-	2	2	2
Gampaha	201521	-	-	26	23	30
Kurunegala	50491	-	-	7	6	7
Colombo	252041	10	0,004%	33	29	37
Badulla	40339	0	0,000%	5	5	6
Kegalle	43298	-	-	6	5	6
Moneragala	51307	-	-	7	6	8
Matara	44632	-	-	6	5	7
Jaffna	29800	-	-	4	3	4
Kandy	86405	-	-	11	10	13
Kalutara	159697	-	-	21	18	24
Galle	40969	-	-	5	5	6
Galle	23075	-	-	3	3	3
Mullaitivu	23194	-	-	3	3	3
Galle	46802	0	0,000%	6	5	7
Puttalam	61484	-	-	8	7	9
Ampara	9576	-	-	1	1	1
Badulla	16839	-	-	2	2	2
Kalutara	62498	0	0,000%	8	7	9
Ampara	23440	-	-	3	3	3
Gampaha	235291	0	0,000%	31	27	35
Mannar	18220	0	0,000%	2	2	3
Jaffna	40356	-	-	5	5	6
Anuradhapura	46772	0	0,000%	6	5	7
Kandy	22325	-	-	3	3	3
Trincomalee	90854	-	-	12	10	13
Kegalle	59241	-	-	8	7	9

District	District population	Sampled estimation	Sampled %	Estimated PWID	PWID lower bound	PWID upper bound
Gampaha	137339	-	-	18	16	20
Colombo	245232	0	0,000%	32	28	36
Colombo	64613	0	0,000%	8	7	10
Polonnaruwa	32613	0	0,000%	4	4	5
Batticaloa	20291	-	-	3	2	3
Anuradhapura	35975	-	-	5	4	5
Badulla	45954	-	-	6	5	7
Colombo	191687	-	-	25	22	28
Galle	23376	-	-	3	3	3
Kandy	25687	-	-	3	3	4
Ampara	21537	-	-	3	2	3
Matale	26143	-	-	3	3	4
Batticaloa	22182	-	-	3	3	3
Kalutara	63255	-	-	8	7	9
Anuradhapura	21263	-	-	3	2	3
Hambantota	101180	-	-	13	12	15
Kalutara	33218	-	-	4	4	5
Kurunegala	54062	0	0,000%	7	6	8
Kurunegala	77316	-	-	10	9	11
Ampara	127070	-	-	17	15	19
Polonnaruwa	80755	-	-	11	9	12
Galle	95646	-	-	13	11	14
Mannar	12110	-	-	2	1	2
Moneragala	8914	-	-	1	1	1
Matara	36452	-	-	5	4	5
Matara	31381	-	-	4	4	5
Galle	31559	-	-	4	4	5
Matale	47920	-	-	6	5	7
Ampara	7711	-	-	1	1	1
Ampara	31238	-	-	4	4	5
Puttalam	34381	-	-	5	4	5
Batticaloa	18633	-	-	2	2	3
Ampara	20828	-	-	3	2	3
Gampaha	207782	-	-	27	24	31
Colombo	196423	-	-	26	23	29
Ratnapura	22467	0	0,000%	3	3	3
Matara	51078	-	-	7	6	8
Galle	75776	-	-	10	9	11
Ratnapura	57485	-	-	8	7	9
Ampara	34856	0	0,000%	5	4	5
Kandy	52634	-	-	7	6	8
Kurunegala	86227	-	-	11	10	13
Kurunegala	30694	-	-	4	4	5
Puttalam	60807	-	-	8	7	9

District	District population	Sampled estimation	Sampled %	Estimated PWID	PWID lower bound	PWID upper bound
Ampara	24726	-	-	3	3	4
Hambantota	28489	-	-	4	3	4
Kurunegala	51078	-	-	7	6	8
Matale	7117	-	-	1	1	1
Anuradhapura	14771	-	-	2	2	2
Matara	28973	-	-	4	3	4
Kandy	34262	0	0,000%	4	4	5
Badulla	74864	-	-	10	9	11
Kurunegala	115805	-	-	15	13	17
Puttalam	81286	-	-	11	9	12
Colombo	111727	0	0,000%	15	13	17
Galle	64904	0	0,000%	9	7	10
Kurunegala	61034	-	-	8	7	9
Moneragala	35881	-	-	5	4	5
Matara	46906	-	-	6	5	7
Kegalle	65575	-	-	9	8	10
Puttalam	19719	-	-	3	2	3
Badulla	164580	-	-	22	19	24
Moneragala	35293	-	-	5	4	5
Kalutara	52176	-	-	7	6	8
Moneragala	51883	-	-	7	6	8
Gampaha	178331	-	-	23	20	26
Jaffna	49520	-	-	7	6	7
Anuradhapura	168280	-	-	22	19	25
Puttalam	7968	-	-	1	1	1
Matara	50261	-	-	7	6	7
Matara	61638	0	0,000%	8	7	9
Mannar	8119	-	-	1	1	1
Ratnapura	56621	-	-	7	6	8
Kandy	25377	-	-	3	3	4
Galle	53829	-	-	7	6	8
Ratnapura	68142	-	-	9	8	10
Kilinochchi	17891	-	-	2	2	3
Anuradhapura	56279	-	-	7	6	8
Kandy	62145	0	0,000%	8	7	9
Kurunegala	30884	-	-	4	4	5
Puttalam	18727	-	-	2	2	3
Batticaloa	14483	-	-	2	2	2
Gampaha	142136	-	-	19	16	21
Jaffna	28640	-	-	4	3	4
Kegalle	40452	-	-	5	5	6
Ratnapura	26361	-	-	3	3	4
Puttalam	60130	-	-	8	7	9
Kurunegala	35574	-	-	5	4	5

District	District population	Sampled estimation	Sampled %	Estimated PWID	PWID lower bound	PWID upper bound
Badulla	49886	-	-	7	6	7
Nuwara Eliya	212094	-	-	28	24	31
Puttalam	61223	-	-	8	7	9
Matara	69737	-	-	9	8	10
Kandy	15721	-	-	2	2	2
Mullaitivu	19018	-	-	2	2	3
Moneragala	26587	-	-	3	3	4
Trincomalee	8530	-	-	1	1	1
Kilinochchi	11882	-	-	2	1	2
Trincomalee	22998	-	-	3	3	3
Kilinochchi	18290	-	-	2	2	3
Puttalam	65267	0	0,000%	9	7	10
Badulla	34002	0	0,000%	4	4	5
Jaffna	50801	-	-	7	6	8
Jaffna	24441	-	-	3	3	4
Trincomalee	29565	0	0,000%	4	3	4
Ampara	15582	-	-	2	2	2
Kalutara	182285	-	-	24	21	27
Galle	63742	-	-	8	7	9
Kurunegala	32386	-	-	4	4	5
Gampaha	124225	-	-	16	14	18
Ratnapura	26294	-	-	3	3	4
Kurunegala	59917	-	-	8	7	9
Trincomalee	59160	-	-	8	7	9
Matara	48807	-	-	6	6	7
Kegalle	88725	-	-	12	10	13
Batticaloa	58188	-	-	8	7	9
Colombo	89469	0	0,000%	12	10	13
Jaffna	51186	-	-	7	6	8
Matale	65156	0	0,000%	9	7	10
Badulla	76139	-	-	10	9	11
Ampara	57914	-	-	8	7	9
Batticaloa	20302	-	-	3	2	3
Kurunegala	36222	-	-	5	4	5
Anuradhapura	34809	-	-	5	4	5
Matale	23824	-	-	3	3	4
Puttalam	82443	-	-	11	9	12
Anuradhapura	33543	-	-	4	4	5
Hambantota	36782	-	-	5	4	5
Kandy	82769	0	0,000%	11	9	12
Kurunegala	21893	-	-	3	3	3
Galle	51354	-	-	7	6	8
Nuwara Eliya	95506	31	0,033%	13	11	14
Ratnapura	120212	0	0,000%	16	14	18

District	District population	Sampled estimation	Sampled %	Estimated PWID	PWID lower bound	PWID upper bound
Badulla	88714	-	-	12	10	13
Kalutara	51618	-	-	7	6	8
Kurunegala	63913	-	-	8	7	9
Matale	25461	-	-	3	3	4
Puttalam	60465	-	-	8	7	9
Galle	13632	-	-	2	2	2
Mullaitivu	41900	-	-	5	5	6
Vavuniya	54040	-	-	7	6	8
Anuradhapura	43102	0	0,000%	6	5	6
Anuradhapura	22571	-	-	3	3	3
Kegalle	107925	-	-	14	12	16
Matale	72507	-	-	10	8	11
Ampara	57793	-	-	8	7	9
Batticaloa	82426	-	-	11	9	12
Matara	28527	-	-	4	3	4
Anuradhapura	42437	-	-	6	5	6
Badulla	26683	-	-	4	3	4
Batticaloa	32609	-	-	4	4	5
Badulla	64704	-	-	8	7	10
Anuradhapura	33535	-	-	4	4	5
Colombo	238057	-	-	31	27	35
Kurunegala	27044	-	-	4	3	4
Vavuniya	25277	-	-	3	3	4
Ampara	37642	-	-	5	4	6
Puttalam	9699	-	-	1	1	1
Hambantota	68606	-	-	9	8	10
Galle	97487	-	-	13	11	14
Moneragala	22505	-	-	3	3	3
Badulla	91716	-	-	12	11	14
Matara	52231	-	-	7	6	8
Kalutara	110905	-	-	15	13	16
Kandy	58325	-	-	8	7	9
Anuradhapura	68027	0	0,000%	9	8	10
Kegalle	77998	-	-	10	9	12
Kurunegala	12766	-	-	2	1	2
Kalutara	47565	-	-	6	5	7
Trincomalee	45730	-	-	6	5	7
Batticaloa	73225	-	-	10	8	11
Ratnapura	29518	-	-	4	3	4
Kurunegala	53016	-	-	7	6	8
Kurunegala	52269	-	-	7	6	8
Kandy	46438	-	-	6	5	7
Trincomalee	17460	0	0,000%	2	2	3
Kandy	117533	-	-	15	13	17

District	District population	Sampled estimation	Sampled %	Estimated PWID	PWID lower bound	PWID upper bound
Matara	11578	-	-	2	1	2
Batticaloa	13118	-	-	2	2	2
Matara	29886	-	-	4	3	4
Anuradhapura	54628	-	-	7	6	8
Kalutara	104119	-	-	14	12	15
Trincomalee	42274	-	-	6	5	6
Matara	113056	-	-	15	13	17
Galle	61425	-	-	8	7	9
Gampaha	175525	-	-	23	20	26
Jaffna	41565	-	-	5	5	6
Ratnapura	34339	-	-	5	4	5
Galle	72843	-	-	10	8	11
Anuradhapura	30983	-	-	4	4	5
Mullaitivu	33770	-	-	4	4	5
Nuwara Eliya	100808	-	-	13	12	15
Anuradhapura	6904	-	-	1	1	1
Kurunegala	52098	-	-	7	6	8
Kurunegala	29347	-	-	4	3	4
Ampara	60060	-	-	8	7	9
Matale	68111	0	0,000%	9	8	10
Galle	29494	-	-	4	3	4
Moneragala	45946	-	-	6	5	7
Polonnaruwa	30242	-	-	4	3	4
Kandy	106027	-	-	14	12	16
Galle	61096	0	0,000%	8	7	9
Total	**20359439**	**517**		**2672**	**2333**	**3012**
				0.013%	**0.011%**	**0.015%**

Table A3.5 Estimated number of TGW per DS using mapping estimates among sampled DSs

Division	DS population	Sampled estimates	Sampled%	Estimated TGW	Lower bound	Upper bound
Addalachchenai	41968	0	0,000%	4	3	4
Agalawatta	36669	-	-	3	3	4
Akkaraipattu	39166	-	-	3	3	4
Akmeemana	77776	-	-	7	5	8
Akurana	63397	-	-	5	4	6
Akuressa	52912	-	-	4	4	5
Alawwa	63667	-	-	5	4	6
Alayadiwembu	22458	0	0,000%	2	2	2
Ambagamuwa	205723	-	-	17	14	20
Ambalangoda	56961	-	-	5	4	6
Ambalantota	72943	-	-	6	5	7
Ambanganga	15643	-	-	1	1	2
Ambanpola	22878	-	-	2	2	2
Ampara	43829	0	0,000%	4	3	4
Anamaduwa	38286	-	-	3	3	4
Angunukolapelessa	48301	-	-	4	3	5
Arachchikattuwa	40999	-	-	3	3	4
Aranayaka	68464	-	-	6	5	7
Aththanagalla	179565	20	0,011%	15	12	17
Athuraliya	32304	-	-	3	2	3
Ayagama	30894	-	-	3	2	3
Badalkumbura	40103	-	-	3	3	4
Baddegama	75008	-	-	6	5	7
Badulla	75042	-	-	6	5	7
Balangoda	81563	0	0,000%	7	6	8
Balapitiya	67432	-	-	6	5	7
Bamunakotuwa	36217	-	-	3	2	3
Bandaragama	109236	-	-	9	7	11
Bandarawela	65502	0	0,000%	6	4	6
Beliatta	55992	-	-	5	4	5
Benthota	49975	-	-	4	3	5
Beruwala	164969	0	0,000%	14	11	16
Bibile	40329	-	-	3	3	4
Bingiriya	62349	0	0,000%	5	4	6
Biyagama	186585	15	0,008%	16	13	18
Bope Poddala	50331	-	-	4	3	5
Bulathkohupitiya	47095	-	-	4	3	5
Bulathsinhala	64600	-	-	5	4	6
Buttala	53084	-	-	4	4	5
Chilaw	62515	-	-	5	4	6
Colombo	323257	136	0,042%	27	22	31
Damana	38692	-	-	3	3	4

Division	DS population	Sampled estimates	Sampled%	Estimated TGW	Lower bound	Upper bound
Dambulla	72306	-	-	6	5	7
Dankotuwa	62399	0	0,000%	5	4	6
Dehiattakandiya	60178	-	-	5	4	6
Dehiovita	81315	-	-	7	6	8
Dehiwala	88962	-	-	7	6	9
Delft	3824	-	-	0	0	0
Delthota	30345	-	-	3	2	3
Deraniyagala	45869	-	-	4	3	4
Devinuwara	48253	-	-	4	3	5
Dickwella	54672	0	0,000%	5	4	5
Dimbulagala	79661	-	-	7	5	8
Diulapitiya	144506	-	-	12	10	14
Dodangoda	63960	-	-	5	4	6
Doluwa	49842	-	-	4	3	5
Dompe	154005	-	-	13	11	15
Echchilampattu	11409	0	0,000%	1	1	1
Eheliyagoda	70839	0	0,000%	6	5	7
Ehetuwewa	25781	-	-	2	2	2
Elahera	43915	0	0,000%	4	3	4
Elapatha	37853	-	-	3	3	4
Ella	45181	-	-	4	3	4
Elpitiya	64726	0	0,000%	5	4	6
Embilipitiya	134713	-	-	11	9	13
Eravur Pattu	75478	-	-	6	5	7
Eravur Town	24643	0	0,000%	2	2	2
Galenbindunuwewa	46992	-	-	4	3	5
Galewela	70042	-	-	6	5	7
Galgamuwa	55078	-	-	5	4	5
Galigamuwa	74490	-	-	6	5	7
Galle Four Gravets	101749	-	-	9	7	10
Galnewa	34756	-	-	3	2	3
Gampaha	197667	-	-	17	14	19
Ganewatta	40137	-	-	3	3	4
Ganga Ihala Korale	55254	-	-	5	4	5
Gangawata Korale	158561	-	-	13	11	15
Giribawa	31412	-	-	3	2	3
Godakawela	76469	-	-	6	5	7
Gomarankadawala	7382	-	-	1	1	1
Gonapeenuwala	21755	-	-	2	1	2
Habaraduwa	62389	-	-	5	4	6
Hakmana	31648	-	-	3	2	3
Haldummulla	37558	-	-	3	3	4
Hali Ela	90571	-	-	8	6	9
Hambantota	57264	-	-	5	4	6

Division	DS population	Sampled estimates	Sampled%	Estimated TGW	Lower bound	Upper bound
Hanguranketha	88528	-	-	7	6	9
Hanwella	113807	-	-	10	8	11
Haputhale	49798	-	-	4	3	5
Harispattuwa	88177	-	-	7	6	9
Hatharaliyadda	29986	-	-	3	2	3
Hikkaduwa	101909	6	0,006%	9	7	10
Hingurakgoda	64289	-	-	5	4	6
Homagama	237905	-	-	20	16	23
Horana	113364	-	-	10	8	11
Horowpothana	36990	-	-	3	3	4
Ibbagamuwa	85309	-	-	7	6	8
Imaduwa	44880	-	-	4	3	4
Imbulpe	59477	-	-	5	4	6
Ingiriya	53896	-	-	5	4	5
Ipalogama	38862	-	-	3	3	4
Irakkamam	14383	-	-	1	1	1
Island North	9876	-	-	1	1	1
Island South	16742	-	-	1	1	2
Ja-Ela	201521	-	-	17	14	19
Jaffna	50491	-	-	4	3	5
Kaduwela	252041	31	0,012%	21	17	24
Kahatagasdigiliya	40339	3	0,006%	3	3	4
Kahawaththa	43298	-	-	4	3	4
Kalawana	51307	-	-	4	4	5
Kalmunai	44632	-	-	4	3	4
Kalmunai Tamil	29800	-	-	3	2	3
Kalpitiya	86405	-	-	7	6	8
Kaluthara	159697	-	-	13	11	15
Kamburupitiya	40969	-	-	3	3	4
Kandaketiya	23075	-	-	2	2	2
Kandavalai	23194	-	-	2	2	2
Kantalai	46802	0	0,000%	4	3	5
Karachchi	61484	-	-	5	4	6
Karainagar	9576	-	-	1	1	1
Karaitheevu	16839	-	-	1	1	2
Karandeniya	62498	0	0,000%	5	4	6
Karuwalagaswewa	23440	-	-	2	2	2
Katana	235291	21	0,009%	20	16	23
Katharagama	18220	18	0,101%	2	1	2
Kattankudy	40356	-	-	3	3	4
Katuwana	46772	5	0,011%	4	3	5
Kebithigollewa	22325	-	-	2	2	2
Kegalle	90854	-	-	8	6	9
Kekirawa	59241	-	-	5	4	6
Kelaniya	137339	-	-	12	9	13

Division	DS population	Sampled estimates	Sampled%	Estimated TGW	Lower bound	Upper bound
Kesbewa	245232	0	0,000%	21	17	24
Kinniya	64613	0	0,000%	5	4	6
Kiriella	32613	0	0,000%	3	2	3
Kirinda Puhulwella	20291	-	-	2	1	2
Kobeigane	35975	-	-	3	2	3
Kolonna	45954	-	-	4	3	4
Kolonnawa	191687	-	-	16	13	19
Koralai Pattu	23376	-	-	2	2	2
Koralai Pattu Central	25687	-	-	2	2	2
Koralai Pattu North	21537	-	-	2	1	2
Koralai Pattu South	26143	-	-	2	2	3
Koralai Pattu West	22182	-	-	2	2	2
Kotapola	63255	-	-	5	4	6
Kotavehera	21263	-	-	2	1	2
Kothmale	101180	-	-	9	7	10
Kuchchaveli	33218	-	-	3	2	3
Kuliyapitiya East	54062	0	0,000%	5	4	5
Kuliyapitiya West	77316	-	-	6	5	7
Kundasale	127070	-	-	11	9	12
Kurunegala	80755	-	-	7	6	8
Kuruwita	95646	-	-	8	7	9
Laggala Pallegama	12110	-	-	1	1	1
Lahugala	8914	-	-	1	1	1
Lankapura	36452	-	-	3	2	4
Lunugala	31381	-	-	3	2	3
Lunugamvehera	31559	-	-	3	2	3
Madampe	47920	-	-	4	3	5
Madhu	7711	-	-	1	1	1
Madulla	31238	-	-	3	2	3
Madurawala	34381	-	-	3	2	3
Mahakumbukkadawala	18633	-	-	2	1	2
Mahaoya	20828	-	-	2	1	2
Mahara	207782	-	-	17	14	20
Maharagama	196423	-	-	17	13	19
Mahavilachchiya	22467	0	0,000%	2	2	2
Mahawewa	51078	-	-	4	3	5
Mahiyanganaya	75776	-	-	6	5	7
Maho	57485	-	-	5	4	6
Malimbada	34856	0	0,000%	3	2	3
Mallawapitiya	52634	-	-	4	4	5
Manmunai North	86227	-	-	7	6	8
Manmunai Pattu	30694	-	-	3	2	3
Manmunai South and Eruvil Pattu	60807	-	-	5	4	6

Division	DS population	Sampled estimates	Sampled%	Estimated TGW	Lower bound	Upper bound
Manmunai South-West	24726	-	-	2	2	2
Manmunai West	28489	-	-	2	2	3
Mannar Town	51078	-	-	4	3	5
Manthai East	7117	-	-	1	0	1
Manthai West	14771	-	-	1	1	1
Maritimepattu	28973	-	-	2	2	3
Maspotha	34262	0	0,000%	3	2	3
Matale	74864	-	-	6	5	7
Matara Four Gravets	115805	-	-	10	8	11
Mathugama	81286	-	-	7	6	8
Mawanella	111727	0	0,000%	9	8	11
Mawathagama	64904	0	0,000%	5	4	6
Medadumbara	61034	-	-	5	4	6
Medagama	35881	-	-	3	2	3
Medawachchiya	46906	-	-	4	3	5
Medirigiriya	65575	-	-	6	4	6
Meegahakivula	19719	-	-	2	1	2
Merigama	164580	-	-	14	11	16
Mihinthale	35293	-	-	3	2	3
Millaniya	52176	-	-	4	4	5
Minipe	51883	-	-	4	4	5
Minuwangoda	178331	-	-	15	12	17
Moneragala	49520	-	-	4	3	5
Moratuwa	168280	-	-	14	12	16
Morawewa	7968	-	-	1	1	1
Mulatiyana	50261	-	-	4	3	5
Mundel	61638	0	0,000%	5	4	6
Musalai	8119	-	-	1	1	1
Muttur	56621	-	-	5	4	5
Nachchadoowa	25377	-	-	2	2	2
Nagoda	53829	-	-	5	4	5
Nallur	68142	-	-	6	5	7
Nanaddan	17891	-	-	2	1	2
Narammala	56279	-	-	5	4	5
Nattandiya	62145	0	0,000%	5	4	6
Naula	30884	-	-	3	2	3
Navithanveli	18727	-	-	2	1	2
Nawagattegama	14483	-	-	1	1	1
Negambo	142136	-	-	12	10	14
Neluwa	28640	-	-	2	2	3
Nikaweratiya	40452	-	-	3	3	4
Ninthavur	26361	-	-	2	2	3
Nivithigala	60130	-	-	5	4	6
Niyagama	35574	-	-	3	2	3

Division	DS population	Sampled estimates	Sampled%	Estimated TGW	Lower bound	Upper bound
Nochchiyagama	49886	-	-	4	3	5
Nuwara Eliya	212094	-	-	18	15	20
Nuwaragam Palatha Central	61223	-	-	5	4	6
Nuwaragam Palatha East	69737	-	-	6	5	7
Oddusuddan	15721	-	-	1	1	2
Okewela	19018	-	-	2	1	2
Opanayaka	26587	-	-	2	2	3
Pachchilaipalli	8530	-	-	1	1	1
Padavi Sri Pura	11882	-	-	1	1	1
Padaviya	22998	-	-	2	2	2
Padiyathalawa	18290	-	-	2	1	2
Padukka	65267	0	0,000%	5	4	6
Palagala	34002	0	0,000%	3	2	3
Palindanuwara	50801	-	-	4	3	5
Pallama	24441	-	-	2	2	2
Pallepola	29565	0	0,000%	2	2	3
Palugaswewa	15582	-	-	1	1	2
Panadura	182285	-	-	15	12	18
Panduwasnuwara	63742	-	-	5	4	6
Panduwasnuwara East	32386	-	-	3	2	3
Pannala	124225	-	-	10	8	12
Panwila	26294	-	-	2	2	3
Pasbage Korale	59917	-	-	5	4	6
Pasgoda	59160	-	-	5	4	6
Passara	48807	-	-	4	3	5
Pathadumbara	88725	-	-	7	6	9
Pathahewaheta	58188	-	-	5	4	6
Pelmadulla	89469	0	0,000%	8	6	9
Pitabeddara	51186	-	-	4	4	5
Polgahawela	65156	0	0,000%	5	4	6
Polpithigama	76139	-	-	6	5	7
Poojapitiya	57914	-	-	5	4	6
Poonakary	20302	-	-	2	1	2
Porativu Pattu	36222	-	-	3	2	3
Pothuvil	34809	-	-	3	2	3
Puthukudiyiruppu	23824	-	-	2	2	2
Puttalam	82443	-	-	7	6	8
Rajanganaya	33543	-	-	3	2	3
Rambewa	36782	-	-	3	3	4
Rambukkana	82769	0	0,000%	7	6	8
Rasnayakapura	21893	-	-	2	1	2
Raththota	51354	-	-	4	4	5
Ratmalana	95506	66	0,070%	8	7	9

Division	DS population	Sampled estimates	Sampled%	Estimated TGW	Lower bound	Upper bound
Ratnapura	120212	3	0,003%	10	8	12
Rideegama	88714	-	-	7	6	9
Rideemaliyadda	51618	-	-	4	4	5
Ruwanwella	63913	-	-	5	4	6
Sainthamaruthu	25461	-	-	2	2	2
Sammanthurai	60465	-	-	5	4	6
Seruvila	13632	-	-	1	1	1
Sevanagala	41900	-	-	4	3	4
Siyambalanduwa	54040	-	-	5	4	5
Sooriyawewa	43102	7	0,016%	4	3	4
Soranathota	22571	-	-	2	2	2
Sri Jayawardanapura Kotte	107925	-	-	9	7	10
Tangalle	72507	-	-	6	5	7
Thalawa	57793	-	-	5	4	6
Thamankaduwa	82426	-	-	7	6	8
Thambalagamuwa	28527	-	-	2	2	3
Thambuttegama	42437	-	-	4	3	4
Thanamalvila	26683	-	-	2	2	3
Thawalama	32609	-	-	3	2	3
Thenmaradchi	64704	-	-	5	4	6
Thihagoda	33535	-	-	3	2	3
Thimbirigasyaya	238057	-	-	20	16	23
Thirappane	27044	-	-	2	2	3
Thirukkovil	25277	-	-	2	2	2
Thumpane	37642	-	-	3	3	4
Thunukkai	9699	-	-	1	1	1
Tissamaharama	68606	-	-	6	5	7
Trincomalee Town and Gravets	97487	-	-	8	7	9
Udadumbara	22505	-	-	2	2	2
Udapalatha	91716	-	-	8	6	9
Udubaddawa	52231	-	-	4	4	5
Udunuwara	110905	-	-	9	8	11
Uhana	58325	-	-	5	4	6
Ukuwela	68027	0	0,000%	6	5	7
Uva Paranagama	77998	-	-	7	5	8
Vadamaradchi East	12766	-	-	1	1	1
Vadamaradchi North	47565	-	-	4	3	5
Vadamaradchi South-west	45730	-	-	4	3	4
Valikamam East	73225	-	-	6	5	7
Valikamam North	29518	-	-	2	2	3
Valikamam South	53016	-	-	4	4	5
Valikamam South-West	52269	-	-	4	4	5

Division	DS population	Sampled estimates	Sampled%	Estimated TGW	Lower bound	Upper bound
Valikamam West	46438	-	-	4	3	4
Vanathavilluwa	17460	0	0,000%	1	1	2
Vavuniya	117533	-	-	10	8	11
Vavuniya North	11578	-	-	1	1	1
Vavuniya South	13118	-	-	1	1	1
Vengalacheddikulam	29886	-	-	3	2	3
Walallawita	54628	-	-	5	4	5
Walapane	104119	-	-	9	7	10
Walasmulla	42274	-	-	4	3	4
Warakapola	113056	-	-	10	8	11
Wariyapola	61425	-	-	5	4	6
Waththala	175525	-	-	15	12	17
Weeraketiya	41565	-	-	3	3	4
Weerambugedara	34339	-	-	3	2	3
Weligama	72843	-	-	6	5	7
Weligepola	30983	-	-	3	2	3
Welikanda	33770	-	-	3	2	3
Welimada	100808	-	-	8	7	10
Welioya	6904	-	-	1	0	1
Welipitiya	52098	-	-	4	4	5
Welivitiya Divithura	29347	-	-	2	2	3
Wellawaya	60060	-	-	5	4	6
Wennappuwa	68111	0	0,000%	6	5	7
Wilgamuwa	29494	-	-	2	2	3
Yakkalamulla	45946	-	-	4	3	4
Yatawatta	30242	-	-	3	2	3
Yatinuwara	106027	-	-	9	7	10
Yatiyanthota	61096	0	0,000%	5	4	6
Total	**20,359,439**	**331**		**1,711**	**1,393**	**1,966**
%				**0.008%**	**0.007%**	**0.010%**

Appendix 4. Forms used at the consensus meeting

Consensus PSE meeting (FSW)

Please fill-out this form as preparation for the consensus meeting on 11 July 2018 in Colombo, Sri Lanka. The results from this form will be used as starting point for discussion and start of Delphi/consensus process.

Using your existing knowledge, available data and experience please provide an estimated total number of female sex workers (FSW) in Sri Lanka (median, lower bound and upper bound). Also, for each district, estimate proportion of FSW among adult female population (high/medium/low).

* Required

Your name: *

Your answer

FSW definition:

Any female who has sold sex in exchange of money or goods in the previous six months. This includes the following sub-types of FSW: street, lodge/hotel, brothel, home/shanty, karaoke/casino/nightclub, and vehicle based FSW.

Estimate most likely number of FSW in Sri Lanka *

Your answer

Estimate minimum number of FSW in Sri Lanka (lower bound) *

Your answer

Estimate maximum number of FSW in Sri Lanka (upper bound) *

Your answer

Estimate high/medium/low proportion of FSW among adult female population in each district

	High	Medium	Low
Ampara	◯	◯	◯
Anuradhapura	◯	◯	◯
Badulla	◯	◯	◯
Batticaloa	◯	◯	◯
Colombo	◯	◯	◯
Galle	◯	◯	◯
Gampaha	◯	◯	◯
Hambantota	◯	◯	◯
Jaffna	◯	◯	◯
Kalutara	◯	◯	◯
Kandy	◯	◯	◯
Kegalle	◯	◯	◯

Kilinochchi	◯	◯	◯
Kurunegala	◯	◯	◯
Mannar	◯	◯	◯
Matale	◯	◯	◯
Matara	◯	◯	◯
Moneragala	◯	◯	◯
Mullaitivu	◯	◯	◯
Nuwara Eliya	◯	◯	◯
Polonnaruwa	◯	◯	◯
Puttalam	◯	◯	◯
Ratnapura	◯	◯	◯
Trincomalee	◯	◯	◯
Vavuniya	◯	◯	◯

Write short explanation about your estimates

Your answer

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Consensus PSE meeting (MSM)

Please fill-out this form as preparation for the consensus meeting on 11 July 2018 in Colombo, Sri Lanka. The results from this form will be used as starting point for discussion and start of Delphi/consensus process.

Using your existing knowledge, available data and experience please provide an estimated total number of MSM in Sri Lanka (median, lower bound and upper bound). Also, for each district, estimate proportion of MSM among adult male population (high/medium/low).

* Required

Your name: *

Your answer

MSM definition:

Man who has had anal sex with another man in the previous six months, irrespective of sexual orientation. This includes nachchis (effeminate males who have sex with other males) and male sex workers

Estimate most likely number of MSM in Sri Lanka *

Your answer

Estimate minimum number of MSM in Sri Lanka (lower bound) *

Your answer

Estimate maximum number of MSM in Sri Lanka (upper bound) *

Your answer

Estimate high/medium/low proportion of MSM among adult male population in each district

	High	Medium	Low
Ampara	○	○	○
Anuradhapura	○	○	○
Badulla	○	○	○
Batticaloa	○	○	○
Colombo	○	○	○
Galle	○	○	○
Gampaha	○	○	○
Hambantota	○	○	○
Jaffna	○	○	○
Kalutara	○	○	○
Kandy	○	○	○
Kegalle	○	○	○

Kilinochchi	◯	◯	◯
Kurunegala	◯	◯	◯
Mannar	◯	◯	◯
Matale	◯	◯	◯
Matara	◯	◯	◯
Moneragala	◯	◯	◯
Mullaitivu	◯	◯	◯
Nuwara Eliya	◯	◯	◯
Polonnaruwa	◯	◯	◯
Puttalam	◯	◯	◯
Ratnapura	◯	◯	◯
Trincomalee	◯	◯	◯
Vavuniya	◯	◯	◯

Write short explanation about your estimates

Your answer

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Consensus PSE meeting (MSW)

Please fill-out this form as preparation for the consensus meeting on 11 July 2018 in Colombo, Sri Lanka. The results from this form will be used as starting point for discussion and start of Delphi/consensus process.

Using your existing knowledge, available data and experience please provide an estimated proportion (%) of men who have sex with men (MSM) who sell sex to men (MSW) in Sri Lanka (median, lower bound and upper bound). Also, for each district, estimate proportion of male sex workers (MSW) among adult male population (high/medium/low).

* Required

Your name: *

Your answer

MSW definition:

Male sex workers (MSW) - men who sold sex to a man in the past 12 months.

Estimate most likely proportion of MSM who sold sex to men (%) in Sri Lanka *

Your answer

Estimate minimum proportion of MSM who sold sex to men (%) in Sri Lanka (lower bound) *

Your answer

Estimate maximum proportion of MSM who sold sex to men (%) in Sri Lanka (upper bound) *

Your answer

Estimate high/medium/low proportion of MSW (male sex workers) among adult male population in each district

	High	Medium	Low
Ampara	○	○	○
Anuradhapura	○	○	○
Badulla	○	○	○
Batticaloa	○	○	○
Colombo	○	○	○
Galle	○	○	○
Gampaha	○	○	○
Hambantota	○	○	○
Jaffna	○	○	○
Kalutara	○	○	○
Kandy	○	○	○
Kegalle	○	○	○

Kilinochchi	◯	◯	◯
Kurunegala	◯	◯	◯
Mannar	◯	◯	◯
Matale	◯	◯	◯
Matara	◯	◯	◯
Moneragala	◯	◯	◯
Mullaitivu	◯	◯	◯
Nuwara Eliya	◯	◯	◯
Polonnaruwa	◯	◯	◯
Puttalam	◯	◯	◯
Ratnapura	◯	◯	◯
Trincomalee	◯	◯	◯
Vavuniya	◯	◯	◯

Write short explanation about your estimates

Your answer

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Consensus PSE meeting (TGW)

Please fill-out this form as preparation for the consensus meeting on 11 July 2018 in Colombo, Sri Lanka. The results from this form will be used as starting point for discussion and start of Delphi/consensus process.

Using your existing knowledge, available data and experience please provide an estimated total number of transgender women who had sex with men (TGW) in Sri Lanka (median, lower bound and upper bound). Also, for each district, estimate proportion of TGW among adult population (high/medium/low).

* Required

Your name: *

Your answer

TWG definition:

A person who was assigned to be a male at birth but who self-identifies as a transgender/transwoman and has had penetrative sex with men in the past 12 months

Estimate most likely number of TGW in Sri Lanka *

Your answer

Estimate minimum number of TGW in Sri Lanka (lower bound) *

Your answer

Estimate maximum number of TGW in Sri Lanka (upper bound) *

Your answer

Estimate high/medium/low proportion of TGW among adult population in each district

	High	Medium	Low
Ampara	○	○	○
Anuradhapura	○	○	○
Badulla	○	○	○
Batticaloa	○	○	○
Colombo	○	○	○
Galle	○	○	○
Gampaha	○	○	○
Hambantota	○	○	○
Jaffna	○	○	○
Kalutara	○	○	○
Kandy	○	○	○
Kegalle	○	○	○

Kilinochchi	◯	◯	◯
Kurunegala	◯	◯	◯
Mannar	◯	◯	◯
Matale	◯	◯	◯
Matara	◯	◯	◯
Moneragala	◯	◯	◯
Mullaitivu	◯	◯	◯
Nuwara Eliya	◯	◯	◯
Polonnaruwa	◯	◯	◯
Puttalam	◯	◯	◯
Ratnapura	◯	◯	◯
Trincomalee	◯	◯	◯
Vavuniya	◯	◯	◯

Write short explanation about your estimates

Your answer

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Consensus PSE meeting (PWID)

Please fill-out this form as preparation for the consensus meeting on 11 July 2018 in Colombo, Sri Lanka. The results from this form will be used as starting point for discussion and start of Delphi/consensus process.

Using your existing knowledge, available data and experience please provide an estimated total number of people who inject drugs (PWID) in Sri Lanka (median, lower bound and upper bound). Also, for each district, estimate proportion of PWID among adult population (high/medium/low).

* Required

Your name: *

Your answer

PWID definition:

A person who has been injecting drugs for non-medical purposes in the previous 12 months

Estimate most likely number of PWID in Sri Lanka *

Your answer

Estimate minimum number of PWID in Sri Lanka (lower bound) *

Your answer

Estimate maximum number of PWID in Sri Lanka (upper bound) *

Your answer

Estimate high/medium/low proportion of PWID among adult population in each district

	High	Medium	Low
Ampara	○	○	○
Anuradhapura	○	○	○
Badulla	○	○	○
Batticaloa	○	○	○
Colombo	○	○	○
Galle	○	○	○
Gampaha	○	○	○
Hambantota	○	○	○
Jaffna	○	○	○
Kalutara	○	○	○
Kandy	○	○	○
Kegalle	○	○	○

Kilinochchi	◯	◯	◯
Kurunegala	◯	◯	◯
Mannar	◯	◯	◯
Matale	◯	◯	◯
Matara	◯	◯	◯
Moneragala	◯	◯	◯
Mullaitivu	◯	◯	◯
Nuwara Eliya	◯	◯	◯
Polonnaruwa	◯	◯	◯
Puttalam	◯	◯	◯
Ratnapura	◯	◯	◯
Trincomalee	◯	◯	◯
Vavuniya	◯	◯	◯

Write short explanation about your estimates

Your answer

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Consensus PSE meeting (BB)

Please fill-out this form as preparation for the consensus meeting on 11 July 2018 in Colombo, Sri Lanka. The results from this form will be used as starting point for discussion and start of Delphi/consensus process.

Using your existing knowledge, available data and experience please provide an estimated total number of beach boys (BB) in Sri Lanka (median, lower bound and upper bound). Also, for each district, estimate proportion of BB among adult male population (high/medium/low/no BB).

* Required

Your name: *

Your answer

BB definition:

Beach boys are defined as men (homosexual, heterosexual or bisexual) who cruise in and around beach areas and who had anal and/or vaginal sex with tourists in the previous 12 months

Estimate most likely number of BB in Sri Lanka *

Your answer

Estimate minimum number of BB in Sri Lanka (lower bound) *

Your answer

Estimate maximum number of BB in Sri Lanka (upper bound) *

Your answer

Kurunegala	◯	◯	◯	◯
Mannar	◯	◯	◯	◯
Matale	◯	◯	◯	◯
Matara	◯	◯	◯	◯
Moneragala	◯	◯	◯	◯
Mullaitivu	◯	◯	◯	◯
Nuwara Eliya	◯	◯	◯	◯
Polonnaruwa	◯	◯	◯	◯
Puttalam	◯	◯	◯	◯
Ratnapura	◯	◯	◯	◯
Trincomalee	◯	◯	◯	◯
Vavuniya	◯	◯	◯	◯

Write short explanation about your estimates

Your answer

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