Mapping and size estimation of female sex workers and men who have sex with men in Sri Lanka

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Background

Sri Lanka is a middle-income country, with a population of around 20 million. Sri Lanka is classified as a country with a low level epidemic of HIV in the Southeast Asia region, with an estimated HIV prevalence of less than 0.1% among adults.

As at December 2010, a cumulative total of 1,317 HIV infections have been reported to the National STD/AIDS Control Programme (NSACP) since the detection of the first case of HIV infection in 1987. Over the years a slow but a gradual increase in the number of reported cases has been observed. Of the total number of HIV cases reported as of end 2010, almost 82.5% were due to heterosexual contacts and 11.3% were due to homo or bisexual behaviours. Vertical transmission and injecting drug use accounted for 4.4% and 0.6% respectively from the total reported cases. HIV infection due to blood and blood products has been extremely low (0.3%). (1)

A routine surveillance among antenatal mothers carried out in an urban setting showed that HIV prevalence among urban antenatal mothers was 2/10,180 (0.019%) and 2/10,437 (0.019%) respectively for the year 2009 and 2010.(2)x

The data from annual sentinel HIV sero-surveillance 2009 showed a sero-prevalence of 0.2% among men who have sex with men (MSM) and 0.15% among STD clinic attendees. HIV prevalence among female sex workers (FSWs) and their clients, MSM and injecting drug users (IDUs) has consistently been below 1%.(3) Although the surveillance data shows low prevalence, behavioural surveillance surveys have shown that FSW and MSM are practicing high risk behaviours, exposing them to the risk of HIV infection. (4) Therefore, to prevent the establishment and potential expansion of an HIV epidemic in Sri Lanka, a key strategy will be to reduce the potential for transmission in important networks of vulnerable key populations. Only modest information is available on the size of these populations. The first key step in developing targeted interventions for vulnerable key populations is assessing their location, size and basic operational characteristics. Experience in diverse settings of South Asia has shown that structured mapping can provide accurate estimates of the size and location of key populations and thereby provide guidance for the scoping and targeting of HIV prevention programs and services.

Method

The methodology was largely based on a geographic approach, which identified locations where key population members were found and quantified. The design team, after reviewing the risk situation along with NSACP, suggested that in terms of risks for HIV, FSW and MSM in Sri Lanka were among the priority groups in the transmission of HIV and these two groups were selected for the study. Based on the availability of time and resources, two districts, Colombo and Anuradhapura districts were selected initially and subsequently scaled up to Batticaloa and Nuwara Eliya districts. The study was conducted during September 2009 and March 2010.

Field work was implemented by the local implementation teams, with supportive supervision from the University of Manitoba (UoM) technical team. Each most at-risk Population (MARP) group was mapped by three field teams, each team consisting of 12 field researchers (including members

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of the MARPs themselves), supported by three field supervisors and an overall research coordinator. The field teams were trained and the participants included members of the data collection teams, data management personnel, field supervisors, and members of the NSACP. The approach involved the target community individuals and peer group members at every stage of the study, thus gaining their support and endorsement.

The existing Medical Officer of Health (MOH) areas within each target district served as smaller data collection geographical units referred to as “zones”. These zones were demarcated on district topographic maps to ease the data collection process.

Two levels of data collection were carried out. In level 1 (L1), secondary and tertiary level key informants (KI) interviews were conducted to identify location of hotspots with associated maximum and minimum estimates of the numbers of high risk group members at each spot. Level 1 key informant interviews produced a list of the name and location of the hotspot(s) encoded by zone, and district. The possible multiplications of spots were avoided during the preparation of final spot list after L1 interviews through group consensus. Tables generated from the lists indicated the estimated maximum, minimum and mean number of FSWs or MSM mentioned at each spot.

The Level 2 (L2) data collection involved conducting key informant interviews and group consensus meeting at the key identified hotspots within each zone. This process, called site profiling or L2 interviews, involved mainly primary key informants (key population members and those closely related; FSWs, MSM, pimps, madams, brokers, etc.) and focused on validating the information collated and collected in the L1 and inclusion of newly identified spots in L2 data collection process. The details of the site profiling were recorded in Level 2 data collection forms. Data tables were analysed by using Ms Excel facility.

Results - mapping and size estimation of female sex workers

A total number of 1,884 interviews were conducted in Colombo during the L1 process, while 725 interviews were conducted in Anuradhapura. The number of L1 interviews done in Batticaloa and Nuwara Eliya was respectively 882 and 967 (Table 1). At Level one, a greater number of secondary and/or tertiary informants were interviewed. This was meant to provide direction to the field team about the various specific places where FSWs exist. The profile of KIs interviewed is given in the Table 1 by the type and gender of the key informants.

During L1, a total of 2,830 spots (1,429 in Colombo, 626 in Anuradhapura, 244 in Batticaloa and 531 in Nuwara Eliya) were shared by the KIs. However, during the profiling of spots (L2), a number of spots identified at L1 were found either inactive or non-existent. It was found that 1,066, 311, 191 and 370 spots respectively in Colombo, Anuradhapura, Batticaloa and Nuwara Eliya were active and Primary KIs were interviewed from most of the active spots (1,911 spots out of 1,938 active spots). In spots, where primary KIs were not contacted for profiling, secondary KIs were further interviewed to ensure that the spot is an active one.

The number of FSWs per spot in Colombo and Batticaloa was 7.8 and 4.6 whereas in Anuradhapura and Nuwara Eliya the respective figure was 3.6 (Table 1). There is a percentage of FSWs who solicit multiple sites therefore, final estimates of FSWs adjusted accordingly.

Based on the data collected during L1 and validated in L2, the mapping estimate 8,332 (7,367-9,297) in Colombo district where as corresponding figure for Anuradhapura, Batticaloa and Nuwara Eliya was 1,138 (991-1,285), 880 (777-987), 1,333 (1,151-1,515) respectively. (Table 1)
Table 1: Results of mapping of female sex workers in the four districts

| Categories | Colombo | Anuradhapura | Batticaloa | Nuwara Eliya | Total |
|------------|---------|--------------|------------|--------------|-------|
| No of Interviews L1 | 1884 | 725 | 882 | 967 | 4,458 |
| Type Key Informants | Primary | 3% | 1% | 0% | 2% | - |
| | Secondary | 93% | 83% | 85% | 81% | - |
| | Tertiary | 4% | 14% | 15% | 17% | - |
| Gender of the Key Informants | Male | 85% | 84% | 83% | 74% | - |
| | Female | 14% | 16% | 17% | 26% | - |
| | Transgender | 1% | 0.1% | 0.0% | 0.0% | - |
| No of spots identified in L1 | 1429 | 626 | 244 | 531 | 2,830 |
| No of active spots | 1066 | 311 | 191 | 370 | 1,938 |
| No of primary KIs in L2 | 1048 | 305 | 190 | 368 | 1,911 |
| FSWs per spot | 7.8 | 3.6 | 4.6 | 3.6 | - |
| % of FSWs who solicit at multiple sites | 39.7% | 37.7% | 26.8% | 11.4% | - |
| Estimate of FSWs in each district | 8,332 | 1,138 | 880 | 1,333 | 11,683 |

Results - mapping and size estimation of men who have sex with men

The total number of key informant interviews conducted for identifying geographical spots where MSM activity takes place, were 4,344 with 2,057, 834, 506 and 947 respectively in Colombo, Anuradhapura, Batticaloa and Nuwara Eliya districts. At level one greater number of secondary and tertiary informants was interviewed to locate the MSM spots (Table 2). The profile of Key Informants interviewed during L1 are given in Table 2 by their type and gender.

During L1, the Key Informants shared a total of 1000 spots in the 4 districts, with a major number of spots in Colombo district (653). While profiling the spots (L2) identified in L1, it was found that most of the spots identified in L1 were active. In addition, the Key Informants also shared some new spots at the time of profiling. Overall, 946 active spots were profiled in these districts, with 652 active spots in Colombo, 77 active spots in Anuradhapura, 95 active spots in Batticaloa and 122 active spots in Nuwara Eliya districts. Primary KI were interviewed to profile the characteristics of the MSM and conducted a group discussion with the MSM to arrive at an estimated number of MSM in the spots. In spots, where primary KIs were not contacted for profiling, secondary KIs were further interviewed to ensure that the spot is an active one (Table 2).

The number of MSM per spot in Colombo and Anuradhapura was 13.2 and 9.5 whereas in Anuradhapura and Nuwara Eliya the respective figure was 6.0 and 8.2 (Table 1). There is a considerable percentage of MSM who solicit in multiple sites. Therefore, the final estimates of MSM adjusted accordingly (Table 2).

The mapping estimates a total of 10,937 (9,244 to 12,623) MSM from a total of 946 spots in 4 districts mapped. The estimated MSM in Colombo District is much higher than those in other mapped districts. Based on the data collected during L1 and validated in L2, the mapping estimate 8,630 (7,339-9,918) in Colombo District where as corresponding figure for Anuradhapura, Batticaloa and Nuwara Eliya was 729 (615-844), 570 (467-672), and 1,007 (823-1189). The estimated MSM for the mapped 4 districts are shown in Table 2.
Table 2: Results of mapping of men who have sex with men in the four districts

| Categories               | Men who have Sex with Men (MSM) | Colombo | A. pura | Batticaloa | N. Eliya | Total |
|--------------------------|----------------------------------|---------|---------|------------|----------|-------|
| No of Interviews L1      |                                  | 2057    | 834     | 506        | 947      | 4,344 |
| Type of Key Informants   |                                  |         |         |            |          |       |
| Primary                  |                                  | 6%      | 2%      | 3%         | 1%       | -     |
| Secondary                |                                  | 92%     | 91%     | 75%        | 91%      | -     |
| Tertiary                 |                                  | 2%      | 7%      | 22%        | 8%       | -     |
| Gender of the Informants | Male                             | 95%     | 91%     | 98%        | 96%      | -     |
| Female                   |                                 | 5%      | 9%      | 2%         | 4%       | -     |
| Transgender              | 0.1%                             | 75%     | 0%      | 0%         | 0%       | -     |
| No of spots identified in L1 |                                | 653     | 75      | 118        | 154      | 1000  |
| No of active spots       |                                  | 652     | 77      | 95         | 122      | 946   |
| No of primary KIs in L2  |                                  | 594     | 71      | 77         | 96       | 838   |
| MSM per spot             |                                  | 13.2    | 9.5     | 6.0        | 8.2      | -     |
| % of MSM who solicit at multiple sites |                | 78%     | 72%     | 35%        | 75%      | -     |
| Estimate of MSM in each district |                               | (7,339-9,918) | (615-844) | (467-672) | (823-1189) | (9,244-12,023) |

FSWs and MSM per 1000 Population

The mapping estimates of both FSWs and MSM helps in understanding the number of FSWs per 1000 adult females and number of MSM per 1000 adult males for each MOH area, which often referred as the population rate of high risk groups (HRGs). The adult male population of each MOH area was used as a denominator, while the estimated total number of FSWs or MSM within that MOH area was used as the numerator. The MOH estimate produced a rate developed for each group for that MOH area. Estimates from all MOH areas were finally rolled up to produce a district rate for each most at risk population (Table 3).

Table 3: Rate of most-at-risk population per 1000 general population

| District       | Population | Number of FSW | Number of MSM | Number of FSWs per 1000 adult females | Number of MSM per 1000 adult males |
|----------------|------------|---------------|---------------|---------------------------------------|-----------------------------------|
| Anuradhapura   | 800,000    | 1,138         | 729           | 4.9                                   | 3.1                               |
| Colombo        | 2,456,000  | 8,332         | 8,630         | 11.9                                  | 12.7                              |
| Batticaloa     | 523,000    | 880           | 570           | 5.9                                   | 3.8                               |
| Nuwara Eliya   | 742,000    | 1333          | 1007          | 6.3                                   | 4.7                               |

As expected, the rates for both MSM and FSWs were higher in Colombo district and it was approximately 12 per 1000 for both FSWs and MSM (Table 3). In other districts FSW rate vary from 5-6 per 1000 adult females whereas as MSM rate changes from 3-5 per 1000 adult males.

National Estimates of High Risk Group Numbers

This study has allowed making more robust estimates of FSWs and MSM numbers, using the actual estimates from the four districts discussed in this report (Colombo, Anuradhapura, Batticaloa and Nuwara Eliya districts). These 4 districts comprise 55 of the approximately 300 MoH areas in the country, and account for about 22 per cent of the total population of Sri Lanka. Two different approaches were used to estimate the number of high risk groups in the country, with the help of statistical models: a regression model approach and a percentile approach. Using the regression model approach, a mean number of 41,285 FSWs was estimated for the country (range 33,429 to 49,141), and a mean of 32,796 MSM (range 25,677 to 39,915). Using the 33rd, 50th and 67th percentiles of the number of HRGs per 1000 adult
population of the mapped areas and suggest 26,759 FSWs at lower range, 38,614 FSWs at medium range and 50,848 FSWs at a higher range for the country. Similarly, the estimated MSMs for the country are 17,103 at lower range, 24,600 at medium range and 36,505 at higher range (Table 4). These estimates can be used for planning purposes, until such time as all districts are mapped and the actual numbers can be used; or at least until additional districts are mapped, and national estimates can then be recalculated with more accuracy.

| Method             | Category          | Female Sex Workers | Men who have Sex with Men (MSM) |
|--------------------|-------------------|--------------------|---------------------------------|
| Regression model   | Estimate          | 41,285             | 32,796                          |
|                    | Range             | 33,249-49,141      | 25,677-39,915                   |
| Percentile approach| Low estimate (33rd percentile) | 26,795             | 17,103                          |
|                    | Median estimate (50th percentile) | 38,614             | 24,600                          |
|                    | High estimate (67th percentile) | 50,848             | 36,505                          |

**Study Limitations**

A few limitations of this project should be noted. Given the small time available for the study, there is a possibility that we could have slightly underestimated the full extent of sex work, especially within the typology of home and shanty-based FSWs. We have however supplemented information regarding this group by mapping specific networks and involving a number of group members into data collection, which we believe addressed the issue of population size under-estimation for this specific typology. In a study of this nature, while arriving at estimates of participants involved in high-risk activity, there is a possibility of double counting because of the movement of the participants. We have however tried to limit this duplication by adjusting the overall figures for the number of participants who solicit clients at more than one spot, and we are confident that the element of duplication was minimal in final estimations.

**Conclusion**

This study has identified a large number of FSWs and MSM within the four targeted districts in Sri Lanka, and has provided valuable information on high-risk activities related to sex work in these locations. It is important to note that there is still much left to learn about other geographical settings, and to extend this research to other districts in the country. The approach used has been shown to work exceedingly well in the cultural context of Sri Lanka, and should be utilized within other districts of the country with minor modifications to estimate population sizes, understand geographical distribution of MARPs, and recognize the various operational typologies and dynamics of these populations for developing effective HIV prevention strategies. These populations need to be reached with high coverage, and provided with services specific enough to meet their requirements in order to reduce transmission of HIV to and from other key population members and the general population.

**References**

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