



## Outbreak, Surveillance and Investigation Reports

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# Identifying Female Sex Worker Sites and Gaps of HIV Prevention Programs Using a Programmatic Mapping Method in 9 Provinces of Thailand

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### Abstract

Programmatic mapping is an internationally recommended and systematic method of providing crucial data for human immunodeficiency virus (HIV) prevention programs. It identifies the “hot spots” or gathering sites of key populations such as female sex workers (FSWs) and estimates their population size. This mapping was conducted in nine selected provinces of Thailand during 2015–2016 to identify and characterize hot spots of FSWs and gaps of HIV prevention. The mapping included two major steps: “site identification”, interviewing various key informants in and around the areas to extensively compile lists of potential hot spots; and “site validation”, visiting these hot spots, using a mobile application to geographically map their locations, and collecting data on characteristics and estimated number of FSWs at each site. In the nine selected provinces, 1,039 explicit and non-explicit venues where FSWs employed were successfully mapped. Of which, 357 (34%) had no available HIV service. The estimated number of FSWs was 15,092, of which approximately 24% were working in venues where HIV services were not available. This mapping identified areas where HIV service delivery is needed and the number of FSWs that the services should accommodate thus allowing for the establishment of strategic programs and planning of budgets. It is therefore recommended that this mapping program be expanded and regularly conducted.

**Keywords:** programmatic mapping, HIV services, female sex worker, Thailand, size estimation

### Introduction

Human immunodeficiency virus (HIV) infections are still a very challenging public health problem in many parts of the world, including Thailand. Female sex workers (FSWs), with an HIV prevalence rate of 1.9%, are one of the key populations who continuously play an important role in the HIV epidemic in the country.<sup>1</sup> Thailand's Spectrum and Aids Epidemic Model, established in July 2016, estimated that 10% of new infections in 2016 occurred among FSWs and their clients.<sup>2</sup> An analysis on the level of risk behavior and service utilization of FSWs found that over 50% were at moderate to high risk (i.e. not using a condom during sex) and had less access to HIV services.<sup>3</sup> Importantly, random police crackdowns on their trade made them harder to reach and consequently, became one of the main factors affecting their access to HIV services and their own health.

In 2015, with financial support from the Global Fund to fight against acquired immune deficiency syndrome

(AIDS), tuberculosis and malaria, the national AIDS Management Center at the Department of Disease Control implemented a programmatic mapping exercise which has been recommended as a method for obtaining information to improve service delivery for HIV-related key, yet hard-to-reach and highly dynamic, populations, including female and male sex workers. Conceptually, the aims of the mapping exercise, which include identifying and characterizing hot spots and estimating the magnitude of key populations, are comparable to the “active case finding” procedure usually conducted during a traditional outbreak investigation. This was the first time the mapping exercise was implemented in Thailand, which was an exercise focusing on the sites where key populations could be reached or in particular ‘hot spots’ of the key populations<sup>4</sup>. A ‘hot spot’ refers to any place where key populations congregate, arrange to meet prior to having sexual activities with their lovers or sexual partners, or use or sell injecting drug equipment, including sharing injecting drugs and its equipment or

other similar types of activities. It was simultaneously conducted in 12 provinces, representing 12 health service regions and the capital city of Bangkok. The objectives of the overall exercise were to map and characterize the hot spots, i.e. gathering sites, where key populations (men having sex with men, transgenders, sex workers and people injecting drugs) could be reached, as well as to identify the areas where HIV services were not available. The size estimation of key populations reachable at the mapped sites was also obtained.

This study utilized data from the programmatic mapping performed for FSWs in nine provinces during 2015. Defined by United Nations Programme on HIV/AIDS and applied by this study, FSWs were consenting females who regularly or occasionally receive money or goods in exchange for providing sexual services<sup>4</sup>. In particular, for FSWs, a 'hot spot' was defined as any venue where FSWs regularly frequent to meet potential clients. The categorization of a FSW hot spot was based on that defined by the Department of Disease Control<sup>5</sup>. This procedure had four categorizations for FSW venues: explicit sex establishments (brothels, massage parlors and go-go bars), non-explicit sex establishments (Thai massage parlors, karaoke clubs), explicit non-venue sex work sites (public parks, bus stations, cattle and buffalo markets), and online sex sites (internet websites and social networks).

This paper presented an analysis on FSWs, which was part of the stated mapping exercise, to identify types of venues frequented by FSWs, find out gaps in HIV prevention programs within these venues, and estimate the population size of FSWs in the mapped sites.

## Methods

This analysis utilized data obtained from the programmatic mapping exercise for FSWs done in nine provinces. As mentioned earlier, this was a pilot exercise, these nine provinces were selected by the Department of Disease Control and represented nine regions of the Ministry of Public Health. The mapping was a systematic combination of qualitative method and cross-sectional survey. The process included two steps.

### Site Identification

A number of key informants were interviewed to compile a list of hot spots and HIV service delivery points which were accessible to FSWs. Key informants were defined as either FSWs themselves or anyone knowledgeable about where to reach FSWs such as taxi drivers, street vendors, bar workers and outreach

workers. The number and types of key informants varied by study site.

### Site Validation

The listed places were mapped and data concerning the places where key populations congregated as well as available HIV services were collected. The data were collected by interviewing one key informant from each site. The selection criteria was assessed by screening likely candidates via a structured set of questions. The selection criteria included being involved with sex workers at the hot spot by some means, being sex workers themselves or frequenting the hot spot often enough to be knowledgeable about the hot spot. At this step, the mobile application containing a structured questionnaire and a geographical information system were used to collect data by the data collection teams in each province.

The interview with the key informant at each site collected data concerning the locational characteristics (busiest time, number of FSWs and type of venue), and visibility of commodities for the prevention of HIV and other sexually transmitted infections (STI) such as free condoms, mobile voluntary counselling and testing clinics, and outreach and referral systems. For each hot spot, the data collection team selected one respondent deemed to be most reliable in answering questions about the hot spot. For FSWs, the interview was performed with FSWs, bar owners, managers or gatekeepers as well as clients. The geographical locations of the hot spots were automatically recorded at the same time as the interview.

Data from the site validation were stored in a spreadsheet file format and were downloaded after the data collection was complete. Descriptive analyses of the hot spot characteristics was conducted in Microsoft Excel.

The estimated number of FSWs at the mapped sites were calculated in the spreadsheet software using the data collected during the site validation process. This included minimum and maximum number of FSWs at each venue during the peak times. The minimum and maximum numbers were summed separately across all sites. The crude estimate of key population size was calculated by using the average of the minimum and maximum summations.

The location and characteristics of the hot spots were visualized in the geographic information system (GIS) mapping application and accessed via the internet under the control of central-level authorities and other stakeholders with password protection to restrict the accessibility of data for different levels according to necessity of data utilization. The programmatic

mapping website was linked with other national AIDS data to encourage data utilization at all levels.

The programmatic mapping research protocol was approved by the Ethical Review Committee of the Institution for Population and Social Research, Mahidol University. The certificate of ethical approval no. 2015/1-1-32, was dated 30 Apr 2015.

## Results

A total of 1,039 sites were mapped, including 757 non-explicit establishments, 258 explicit establishments and 24 explicit non-venue sex work sites. The mapping could not identify any online sex sites. In three provinces where the mapping covered a whole province, the number of mapped sites was 342 (average 114) which included 124 non-explicit establishments, 207 explicit establishments and 11 explicit non-venue sex work sites. For the other six provinces where the mapping covered only some selected areas of the province, there were 697 sites mapped (average 116), including 134 non-explicit establishments, 550 explicit establishments and 13 explicit non-venue sex work sites (Table 1).

The crude estimated number of FSWs at 1,039 mapped sites was 15,092. Of which, 11,424 (75.7%) worked in the 757 non-explicit establishments (15 on average). In addition, 258 explicit establishments employed 3,049 sex workers (12 on average) and 24 explicit non-venue sex work sites having 619 sex workers (26 on average) (Table 1).

This mapping found that during the data collection period, about one in three (357/1,039) mapped venues were not covered by any HIV-related prevention service (Table 2). This accounted approximately 24.6% (3,720/15,092) of sex workers who were not working where HIV services were available. These included venues that had never had any HIV service available at all and those where services used to exist, yet were no longer available during the data collection period. HIV services existed mainly among the explicit establishments while less than half of the non-explicit establishments and explicit non-venue sex work sites had no available HIV service in the vicinity. Free condoms and outreach activities were the most obtainable type of service, mostly for sex workers at explicit establishments (Table 3).

Figure 1 presents two examples of data visualizations from the mapping software showing the size of the population and the location of hot spots for each population. Other information visualized included results of size estimation, hot spots by population group, types of hot spots and hot spots with and without HIV services.

## Discussion

The pilot mapping exercise conducted in nine out of total 77 provinces found that FSWs existed in both explicit and non-explicit venue and non-venue sex work sites. Based on the estimates, most FSWs congregated at non-explicit venue-based establishments. Comparing the average number of sex workers at each venue, the non-explicit venue-based establishments, including street-based venues were the biggest sites, with average number of 26 sex workers at each sites. According to the Bureau of AIDS, Tuberculosis, and STI (BATS) of Thailand, the latest annual surveys of sex workers and sex establishments in all provinces across Thailand during 2015 reported a total of 57,066 sex workers of all genders<sup>6</sup>. The estimated number of FSWs in the whole country was 123,530, with possibly one-fourth working at explicit non-venue sex work sites such as public parks, bus stations and cattle and buffalo markets.<sup>1</sup>

The BATS annual survey is carried out throughout each province, and thus, the estimated number of sex workers and sex establishments are intended to reflect the provincial level. Our programmatic mapping exercise was conducted thoroughly in three provinces while merely some districts or municipal areas in the other six study provinces were included. A comparison of the BATS annual survey in 2015 with our programmatic mapping suggested that advantage from the site identification step of the programmatic mapping might help the provincial team to discover new sex work venues as well as relocation of other venues.

The analysis of trends during 2006-2015 revealed an increase in the number of sex workers employed in karaoke clubs and beer bars.<sup>6</sup> This rise in numbers was probably due to the government enforcement on anti-drug trafficking and prostitution suppression laws. Random police raids of known sex establishments had caused a change in the market places where sex worker now prefer to work in non-explicit sex establishments for fear of being arrested. Information on service availability was the key information that made this programmatic mapping different from the annual surveys conducted by the Department of Disease Control. This programmatic mapping revealed that about half of all non-explicit establishments and explicit non-venue sex work sites were lacked with HIV services.

FSWs employed by non-explicit establishments and explicit non-venue sex work sites had higher risk behaviors than other FSWs, as measured by their level of condom use and experiences on STI.<sup>3</sup> Those employed by explicit non-venue sex work sites had a

**Table 1. Distribution of female sex worker (FSW) venues in 9 provinces of Thailand by type of venue and province, 2015**

| Province <sup>†</sup> | Venue type (n)                    | Number of mapped venues | Crude estimated number of FSW |
|-----------------------|-----------------------------------|-------------------------|-------------------------------|
| Total                 | Explicit establishment            | 258                     | 3,049                         |
|                       | Non-explicit establishment        | 757                     | 11,424                        |
|                       | Explicit non-venue sex work sites | 24                      | 619                           |
|                       | Total                             | 1,039                   | 15,092                        |
| A                     | Explicit establishment            | 32                      | 970                           |
|                       | Non-explicit establishment        | 115                     | 3,936                         |
|                       | Explicit non-venue sex work sites | 11                      | 571                           |
|                       | Total                             | 158                     | 5,477                         |
| B                     | Explicit establishment            | 82                      | 848                           |
|                       | Non-explicit establishment        | 79                      | 588                           |
|                       | Total                             | 161                     | 1,436                         |
| C                     | Explicit establishment            | 10                      | 141                           |
|                       | Non-explicit establishment        | 13                      | 58                            |
|                       | Total                             | 23                      | 199                           |
| D                     | Explicit establishment            | 56                      | 606                           |
|                       | Non-explicit establishment        | 457                     | 6351                          |
|                       | Total                             | 513                     | 6957                          |
| E                     | Explicit establishment            | 4                       | 38                            |
|                       | Non-e establishment               | 14                      | 112                           |
|                       | Total                             | 18                      | 150                           |
| F                     | Explicit establishment            | 11                      | 63                            |
|                       | Non-explicit establishment        | 24                      | 120                           |
|                       | Explicit non-venue sex work sites | 1                       | 7                             |
|                       | Total                             | 36                      | 190                           |
| G                     | Explicit establishment            | 16                      | 120                           |
|                       | Non-explicit establishment        | 2                       | 20                            |
|                       | Explicit non-venue sex work sites | 8                       | 21                            |
|                       | Total                             | 26                      | 161                           |
| H                     | Explicit establishment            | 36                      | 220                           |
|                       | Non-explicit establishment        | 34                      | 173                           |
|                       | Explicit non-venue sex work sites | 4                       | 20                            |
|                       | Total                             | 74                      | 413                           |
| I                     | Explicit establishment            | 11                      | 43                            |
|                       | Non-explicit establishment        | 19                      | 66                            |
|                       | Total                             | 30                      | 109                           |

<sup>†</sup> Provinces A, B and C did the programmatic mapping at full-scale throughout the whole province while other provinces selected only some areas (district or municipality).

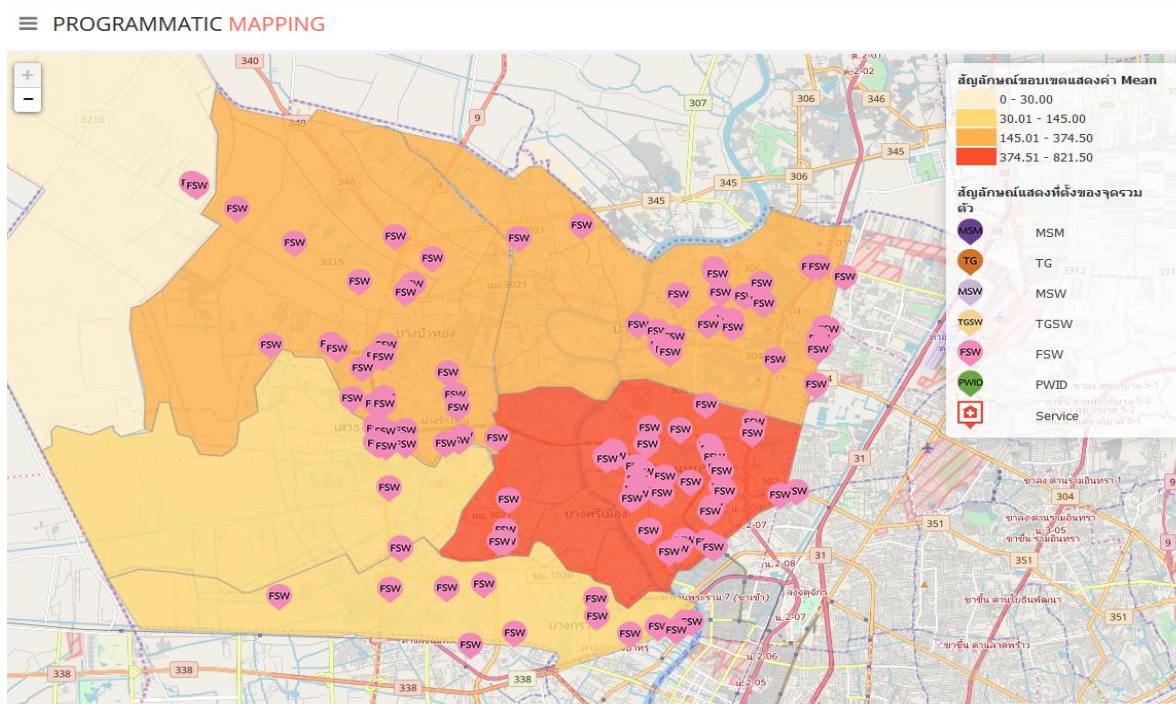
**Table 2. Estimated number of female sex workers in 9 provinces of Thailand, 2015**

| Type of venue                     | Mapped venues |                             |             | Estimated number of FSWs |                                       |             |
|-----------------------------------|---------------|-----------------------------|-------------|--------------------------|---------------------------------------|-------------|
|                                   | All           | Venues with no HIV services | Percent     | All mapped sites         | All mapped sites with no HIV services | Percent     |
| Non-explicit establishment        | 258           | 129                         | 50.0        | 3,049                    | 1,248                                 | 40.9        |
| Explicit establishment            | 757           | 218                         | 28.8        | 11,424                   | 2,318                                 | 20.3        |
| Explicit non-venue sex work sites | 24            | 10                          | 41.7        | 619                      | 154                                   | 24.9        |
| <b>Total</b>                      | <b>1,039</b>  | <b>357</b>                  | <b>34.4</b> | <b>15,092</b>            | <b>3,720</b>                          | <b>24.6</b> |

**Table 3. Mapped venues for female sex workers (FSWs) and availability of HIV-related services in 9 provinces of Thailand, 2015**

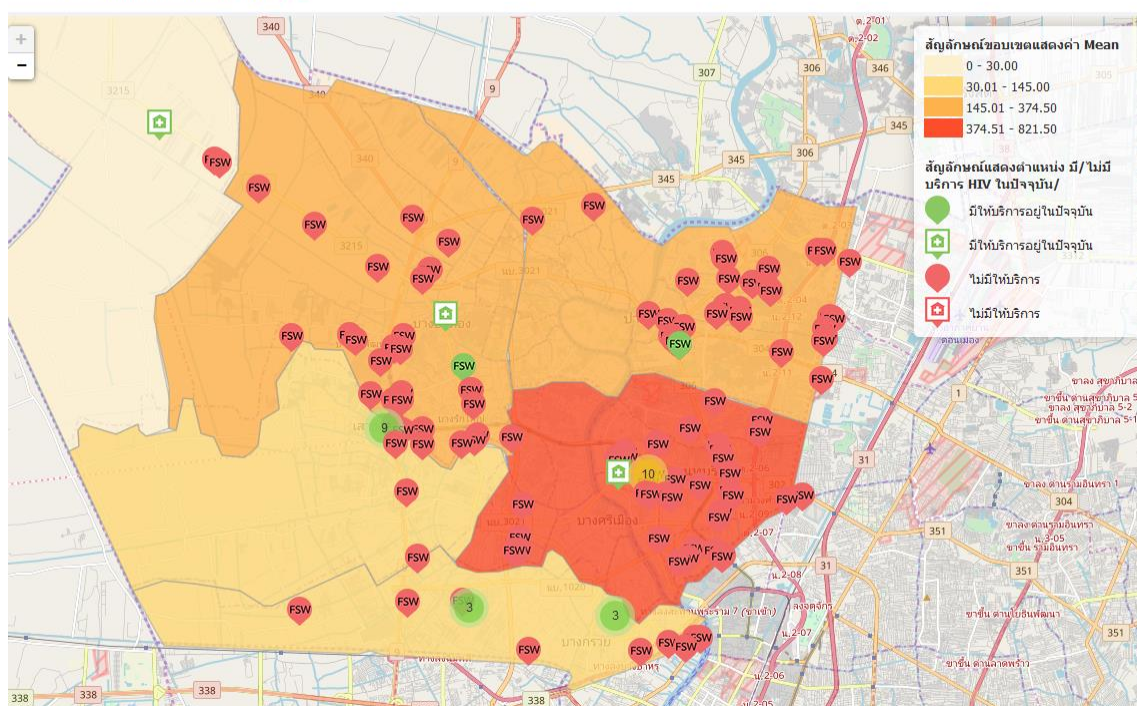
| Type of venues/<br>Availability of HIV services | % of mapped venues by type of HIV services |          |            |            |                     | No HIV service (Percent) |                        |
|---|--|----------|------------|------------|---------------------|--------------------------|------------------------|
|   | Condom                                     | Outreach | Mobile STI | Mobile VCT | Referring services* | Mapped venues            | FSWs                   |
| Non-explicit establishment (n=258)              |  |          |            |            |                     | 50.0<br>(n=129)          | 40.9<br>(1,248/3,049)  |
| Currently available                             | 46.3                                       | 30.1     | 20.8       | 21.6       | 18.5                |                          |                        |
| May be available but not currently              | 44.0                                       | 64.5     | 73.7       | 72.6       | 76.1                |                          |                        |
| Never will be available or unknown              | 9.7  | 5.4      | 5.4        | 5.8        | 5.4                 |                          |                        |
| Explicit establishment (n=757)                  |  |          |            |            |                     | 28.8<br>(n=218)          | 20.3<br>(2,318/11,424) |
| Currently available                             | 68.1                                       | 51.1     | 37.7       | 34.2       | 26.6                |                          |                        |
| May be available but not currently              | 28.1                                       | 46.4     | 60.2       | 63.6       | 70.8                |                          |                        |
| Never will be available or unknown              | 3.8  | 2.5      | 2.1        | 2.2        | 2.5                 |                          |                        |
| Explicit non-venue sex work sites (n=24)        |  |          |            |            |                     | 41.7<br>(n=10)           | 24.9<br>(154/619)      |
| Currently available                             | 54.2                                       | 45.8     | 29.2       | 37.5       | 29.2                |                          |                        |
| May be available but not currently              | 41.7                                       | 45.8     | 62.5       | 50.0       | 58.3                |                          |                        |
| Never will be available or unknown              | 4.2  | 8.3      | 8.3        | 12.5       | 12.5                |                          |                        |

\*Referring services could be done by outreach workers visiting the hot spots and helping any key populations at the hot spots to access any services they may need, especially HIV testing or STI screening and treatment9+



**Note:** The two descriptions in Thai language shown in the legend are: first, the shading of the map represents the different numbers of FSWs based on crude estimates; second, markers for each key population.

## PROGRAMMATIC MAPPING



**Note:** The markers in green represent the venues where HIV-related services were available, and those in red represent those without HIV-related services. Two descriptions in Thai language shown in the legend are: first, the shading of the map represents the different size estimation of FSWs based on crude estimates; second, the markers for each key population.

**Figure 1. Examples of web-based visualization of programmatic mapping results in 9 provinces of Thailand, 2015**

higher HIV prevalence compared to those employed by explicit and non-explicit sex establishments.<sup>7,8</sup> Apart from HIV-related risk behaviors, about one-third of FSWs working at explicit non-venue sex work sites reported client violence during their work.<sup>9</sup> Areas where FSWs work and HIV services are non-existent as well as the number of FSWs being unable to access HIV services (about 34% overall). Therefore, the data could be useful for program planning and policy making.

### Limitations

This programmatic mapping exercise was a pilot study in Thailand during 2015. The selection of study sites or provinces was conducted purposively as to represent the administrative regions of the Department of Disease Control. The different scales of programmatic mapping in nine provinces were important as it affected the interpretation of the results and implications to program management. However, the community and stakeholder engagement that took place in all provinces is crucial for effectiveness of the implementation and can also maximize the data utilization.

### Conclusion and Recommendations

After the programmatic mapping was performed, the provincial teams made arrangements for HIV services

at the sites where HIV services were non-existent or unavailable to be reachable by key populations at the sites. This programmatic mapping thus served as an important tool for HIV program planning. The findings demonstrated the need to increase the coverage of HIV service delivery in areas lacking HIV services. Our study also indicated the type and scale of HIV services required in these areas. Size estimation obtained by this programmatic mapping was the number of FSWs reachable by HIV program, in contrast to other estimation methods which provided the size of a population, yet with no information on where FSWs actually worked. It was reported by all provincial teams that the size estimation obtained by this programmatic mapping exercise was used by the provincial team in their HIV program and budget planning.

Moreover, the mapping identified venues where HIV services were not available, which filled the gaps of the BATS annual surveys. Therefore, this programmatic mapping exercise should be conducted regularly or routinely across the whole country to monitor the coverage of HIV services accessible by this particular population.

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