STIGMA AND DISCRIMINATION AMONG HEALTH CARE PROVIDERS, PEOPLE LIVING WITH HIV AND KEY POPULATIONS IN THAILAND:

EXTRAPOLATION PROCESS FOR NATIONAL ESTIMATES

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Department of Disease Control,
Ministry of Public Health

Foreword

Since 2012, Thailand has prioritized Stigma and Discrimination (S&D) reduction as one of the primary goals in its National AIDS Strategy. In addition, Thailand has reinforced its commitment to reduce S&D under the National Operational Plan for Ending AIDS 2015-2019 and the current national strategy to End AIDS 2017-2030.

To complement Thailand's strategies to end AIDS, a comprehensive and sustainable framework to measure S&D has been developed to provide evidence to generate commitment and interventions to reduce S&D in Thailand. Measuring S&D in key populations (KP), People living with HIV (PLHIV) and health care providers serving those populations, presents a meaningful picture for developing effective interventions and monitoring national progress in S&D reduction in health care settings.

This effort was led by the Department of Disease Control, Ministry of Public Health, with collaboration from the Research Institutes for Health Sciences (RIHES), Chiang Mai University, International Health Policy Program (IHPP), Division of Epidemiology, and technical support from UNAIDS. This report is important as it is for the first time ever that Thailand has developed baseline estimates on an HIV related S&D reduction response in health care settings for PLHIV and KPs.

The report describes the findings from S&D surveys on health care provider and PLHIV and HIV integrated biological and behavioral surveillance (IBBS) among female and male sex workers, men who have sex with men and transgender women. Also described within this report are the methodologies used to collect data from 19 provinces and the extrapolation process of provincial level data to provide national estimates. Of additional importance is that the process of data collection and extrapolation involved national capacity building to ensure technical expertise exists at the country level for follow up S&D surveys of PLHIV, KP, and health care providers.

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ACRONYMS

ART	Antiretroviral therapy
BMA	Bangkok Metropolitan Administration
BOE	Bureau of Epidemiology
FSW	Female sex workers
HCP	Health care providers
IBBS	Integrated Biological and Behavioural Surveillance
IHPP	International Health Policy Program
MSW	Male sex workers
MSM	Men who have sex with men
MOPH	Thai Ministry of Public Health
NAMC	National AIDS Management Center
PLHIV	People living with or affected by HIV
RIHES	Research Institutes for Health Sciences
RDS	Respondent driven sampling
S&D	Stigma and discrimination
TLS	Time-location sampling
TGW	Transgender women

EXECUTIVE SUMMARY

BACKGROUND

The following report describes the methodologies used to collect Stigma and Discrimination (S&D) data, the extrapolation process of provincial level data to national level estimates and the final national estimates for the S&D surveys on health care provider (HCP), people living with HIV (PLHIV) and HIV integrated biological behavioral surveillance (IBBS) of female sex workers (FSW), male sex workers (MSW), men who have sex with men (MSM) and transgender women (TGW), which included embedded S&D questions. Given that these surveys were conducted using different sampling methodologies, the extrapolation process varied.

METHODS

HCP and PLHIV

Surveys of HCP (n=18, one survey was dropped due to bias in sampling) and PLHIV found at health care centers were conducted in Bangkok and Chiang Mai using purposeful sampling of clusters; in Chiang Rai, Chonburi, Udonthani, Nakorn Ratchasima and Song Khla using unweighted multilevel cluster sampling under the supervision of the Ministry of Public Health (MOPH) and in Sumutprakan, Lumpang, Rayong, Chantaburi, Chachoengsao, Trat, Prachinburi, Trang, Pattani, Patalung, Satul using unweighted multilevel cluster sampling under the supervision of the provinces themselves. Based on having only a few data points and size of province, all surveys were placed in one of three strata based on number of HCP or PLHIV. From these strata, a mean estimate for each indicator was computed and imputed into the non-sampled provinces based on which strata they belonged (based on number of HCP or the number of PLHIV). Once a complete dataset of provinces was compiled, data were weighted by population sizes of HCP or PLHIV to calculate a weighted mean average for each indicator.

IBBS surveys among FSW, MSW, MSM and TGW

Data for FSW were available from only eight (Bangkok, Lopburi, Rayong, Udonthani, Nakhonsawan, Phitsanulok, Phuket and Song Khla) of 12 provinces and for MSM, MSW and TGW were available from Chiang Mai (Muang district), Phuket, Bangkok, Khonkhen (Muang district) and Chonburi (Muang and Lam Chabang districts), MSW and TGW only. Given that there are so few data points available for FSW, MSM, MSW and TGW, that the sampling did not follow a probability based sampling approach and data were not adjusted to account the sampling method, the options for deriving national estimations were limited. One correction to using these data was to obtain a weighted mean by simply weighting sampled provinces by the corresponding estimated population size. This output does not represent a national estimate of FSW, MSM, MSW and TGW but is merely an aggregate of estimates, weighted by population size, and characterize visible, urban, establishment based and perhaps higher risk members of the population.

FINDINGS

Findings from the HCP survey:

Twenty four percent of HCP reported observing stigma or discriminatory practices towards PLHIV and between 4.2% and 4.8% reported observing HCP unwilling to care for a patient who is or thought to be a man who has sex with men, transgender or female sex worker in the past 12 months. Almost 8% of HCP reported observing HCP unwilling to care for a patient who is or thought to someone who injects drugs in the past 12 months; 12.2% reported observing HCP unwilling to care for a patient who is or thought to a migrant in the past 12 months. Just under 70% of HCP experienced personal fear of infection from a patient living with HIV and 53.1% reported using unnecessary precautions to avoid being infected with HIV from a patient living with HIV. Eighty four percent of HCP reported having stigmatizing attitudes towards PLHIV.

Findings from the PLHIV survey:

Thirteen percent of PLHIV reported avoiding or delaying health care because of fear of S&D in the past 12 months. Among females who became pregnant since learning of their HIV status, 12% reported avoiding or delaying health care because of fear of S&D in the past 12 months. Twelve percent of PLHIV reported experiencing S&D in a health care setting and 24.5% reported HIV disclosure and non-confidentiality in a health care facility in the past 12 months. Five percent of PHLIV reported being coerced or advised to terminate a pregnancy in the past 12 months. Almost one third of PLHIV reported experiencing internal stigma in the past 12 months.

Findings from the IBBS surveys:

Few FSW (1.7%) reported experiencing S&D in their family and 6.2% reported experiencing S&D in a health care setting in the past 12 months. Only 1.8% reported delaying going to a health care in the past 12 months. Over half (55.2) of FSW reported experiencing self-stigma and 5.6% reported being forced to have sex in the past 12 months. A slightly higher percentage of MSM (3.5%) compared to MSW (1.4%) and TGW (2.3%) reported experiencing S&D in their family, 12.8% of MSM (no data for MSW) and 18.9% of TGW reported experiencing S&D at workplace or education institutes and 8.9% of MSM, 6.6% of MSW and 9.9% of TGW reported experiencing S&D in a health care setting in the past 12 months. Just under 8% of MSM, 10% of MSW and 7.4% of TGW reported delaying health care because of fear of S&D in the past 12 months. Between 19% and 20% of MSM, MSW and TGW reported experiencing self-stigma and 10.7% of MSM, 8.7% of MSW and 13.2% of TGW reported being forced to have sex in the past 12 months.

DISCUSSION

Thailand has been a global leader in formulating national monitoring systems to measure S&D and creating an evidence base for S&D reduction program. This document presents efforts to use provincial level data to produce national estimates. Although there are some limitations in the survey methodologies and extrapolation process these data will be extremely useful for developing an effective response to S&D in health care settings, as well as S&D experienced by PLHIV, FSW, MSM, MSW and TGW. Recommendations to improve future surveys of S&D are provided in the appendix of this report.

BACKGROUND

Thailand is committed to an "AIDS Zero" focus (zero new HIV infections, zero AIDS related deaths, and zero stigma and discrimination (S&D) against people living with or affected by HIV (PLHIV) and key populations. S&D reduction is prioritized as a key goal in the National HIV and AIDS Strategy 2012-2016 and further reinforced under the National Operational Plan for Ending AIDS 2015-2019. Thailand is a global leader in formulating national monitoring systems to measure S&D and creating an evidence base for S&D reduction program. In an effort to obtain strategic information on S&D, Thailand has conducted surveys among Health Care Providers (HCP) and PLHIV and included S&D indicators in HIV Integrated Biological and Behavioural Surveillance (IBBS) surveys among key populations of female sex workers (FSW), male sex workers (MSW), men who have sex with men (MSM) and male to female transgender persons (TGW). These surveys gathered data from these populations in key strategic areas, limiting the findings to select provinces (of which Thailand has 77) throughout the country (Figure 1).

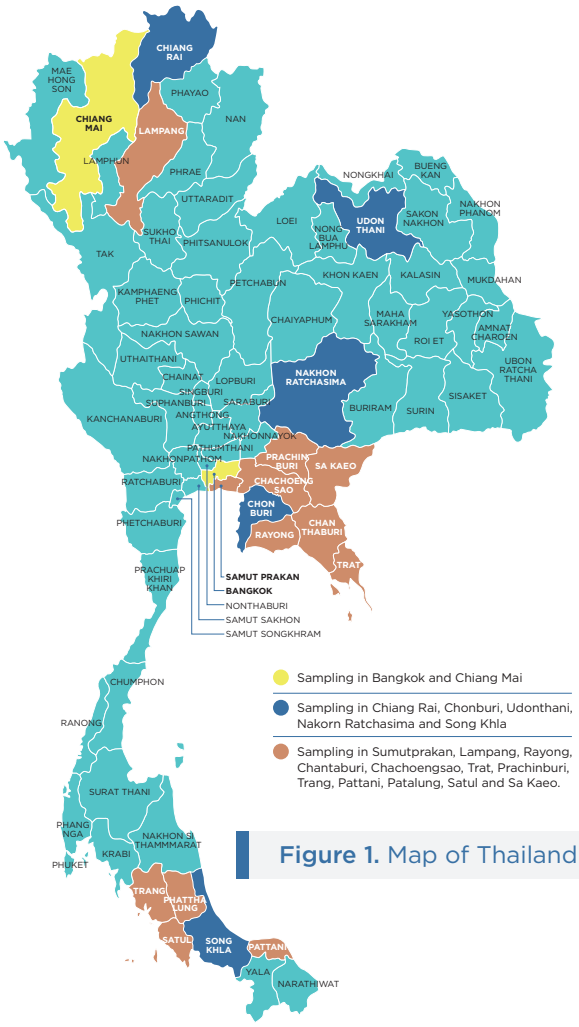


Figure 1. Map of Thailand Provinces.

In November 2016, under the leadership of the Thai Ministry of Public Health (MOPH), an expert workshop involving key persons involved in the planning, implementation and analysis of the surveys (National AIDS Management Center [NAMC], Bureau of Epidemiology [BOE], Research Institutes for Health Sciences [RIHES], Chiang Mai University and an international consultant) was held to assess the quality of the surveys, survey questions and to determine the best methodology to produce national level estimates of S&D, using data from provincial level estimates. The overall goal of this workshop was to accelerate Thailand's evidence-informed response to S&D experienced by PLHIV and key populations through the development of a simplified research methodology leading to improve strategic information and routine monitoring on a sub-national level and to allow for extrapolation of these data to the national level. This report describes the methodologies used to collect S&D data, the extrapolation process of provincial level data to national level data and the final national estimates.

SURVEYS USED TO COLLECT S&D DATA

Surveys were conducted among HCP and PLHIV in 2014 and 2015 and among FSW, MSW, MSM, TGW, and migrant workers in 2016 in the IBBS surveys. Given that these surveys were conducted using different sampling methodologies, the survey methodologies, limitations, extrapolation process and results are presented three parts:

1) Health care provider S&D survey
2) PLHIV S&D survey
3) HIV IBBS surveys among FSW, MSW, MSM and TGW which included embedded S&D questions

1 Health care provider S&D survey

The health care provider S&D surveys were conducted under the leadership of the Thai MOPH, HIV civil society organizations, PLHIV and key population networks, researchers from the International Health Policy Program (IHPP) and RIHES of Chiang Mai University with technical support by Research Triangle International/USAID and UN Joint Team on AIDS/ Thailand. The health policy project/USAID[1] adapted the global measurement tools to the Thailand context. Tools were piloted in two provinces (Bangkok and Chiang Mai) in 2014 and refined according to the local context and monitoring purpose. The refined measurement tool was then used in the national monitoring system under the supervision of the MOPH in five more provinces in 2015. An 11 additional provincial surveys using the same questionnaire and methodology were conducted by the provinces themselves in 2015-2016.

Sampling methods

In total, 19 purposively selected provinces were sampled for the health care provider S&D survey. Bangkok and Chiang Mai, the largest provinces in Thailand, were selected to pilot the surveys. Five provinces (Chiang Rai, Chonburi, Udonthani, Nakorn Ratchasima and Song Khla) were selected because they are considered to have the highest HIV burden and represent the five geographical regions. The additional 12 provinces (Sumutprakan, Lumpang, Rayong, Chantaburi, Chachoengsao, Trat, Prachinburi, Trang, Pattani, Patalung, Satul and Sa Kaeo) surveyed are those that voluntarily agreed to conduct the surveys.

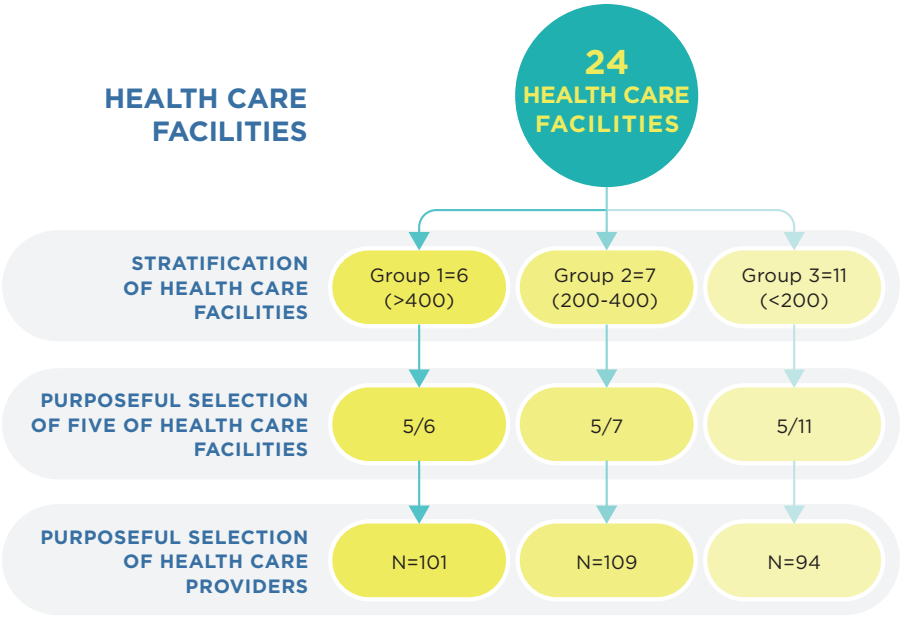
1 Health Policy Project. 2013. "Measuring HIV Stigma and Discrimination among Health Facility Staff: Brief/comprehensive questionnaire." Washington, DC: Futures Group, Health Policy Project.

Sampling in Bangkok and Chiang Mai

The sampling methods differed between Bangkok and Chiang Mai. In Bangkok, HCP were sampled from both government (under MOPH and Bangkok Metropolitan Administration [BMA]) and private health care facilities that operated antiretroviral therapy (ART) clinics and volunteered to participate. Only the government hospitals were included in the final extrapolation to attain national estimates in an effort to mitigate any potential significant differences between HCP in public and private settings[2]. Of these, 11 health facilities were selected. Facilities provided a list of departments[3], including surgery, medicine in-patient wards, dental clinics, pharmacy clinics, emergency medicine, gynecological, outpatient for medicine, registration units, receptions, and orderly/stretcher, as the first step in a sampling frame. From each department, facilities provided the number of staff members disaggregated by position (nurses, doctors, etc.). Sampling consisted of gathering data from at least 20 HCP in each facility through a systematic random selection of positions from among those departments that agreed to take part in the survey.

In Chiang Mai, 15 of 24 health care facilities were conveniently selected. These selected facilities were divided into three groups based on number of PLHIV clients registered to that facility (group 1 = >400 PLHIV clients, group 2 = 200 to 400 PLHIV clients, and group 3 = <200 PLHIV clients) (Figure 2). Facilities provided a list of all staff with potential direct contact with patients regardless of HIV status. Staff without direct patient contact, such as administrative, accounting and book keeping, and engineering/maintenance staff were excluded.

Figure 2. Sampling process for Health Care Facilities in Chiang Mai.



2 Ideally it would have been best to measure whether there were differences between public and private health care workers. However, the limited amount of time available for this exercise did not allow for this and the decision was made to only include public health care providers to maintain a more homogeneous denominator and because of their importance as a target for S&D intervention.

3 These departments were considered to contain health care workers that were most likely to come into direct contact with someone living with HIV.

All staff, organized by name, profession and department, on the sampling list were sampled based on a systematic random sampling method whereby from 5-10 HCP were sampled from each health facility. Both provinces were sampled to achieve a sample size of 300-400 respondents[4].

Sampling in Chiang Rai, Chonburi, Udonthani, Nakorn Ratchasima and Song Khla

In 2015, HCP were sampled in Chiang Rai, Chonburi, Udonthani, Nakorn Ratchasima and Song Khla using random and non-random selection processes as described in Table 1[5].

Table 1. Sampling of health care providers in Chiang Rai, Chonburi, Udonthani, Nakorn Ratchasima and Song Khla

STEP	
1	Non-random selection of five provinces (high burden provinces from each of five geographical regions)
2	Develop list of all health care facilities under MOPH that have ARV clinic in each of the selected provinces
3	Selection of all listed health care facilities in each of the selected provinces
4	Develop a list of all staff members in each health care facility (not including back office staff, but including staff that would not necessarily touch a patient living with HIV).
5	Calculate a sample size for each province[6]
6	Using the list of the number of staff members in each health care facility, calculate a sample size using population proportional to size based on the size of the facility
7	Use the list of staff members in each facility to collect a random sample until the sample size was reached

4 To see the sample size calculations see: International Health Policy Program, Ministry of Public Health. Measuring HIV-related Stigma and Discrimination in Health Care Settings in Thailand: Report of a Pilot: Developing Tools and Methods to Measure HIV-related Stigma and Discrimination in Health Care Settings in Thailand. Bangkok, Thailand. 2014. http://pdf.usaid.gov/pdf_docs/PA00KHKM.pdf.

5 For more detail see IBID.

6 IBID.

Sampling in 11 other provinces

In 2015 and 2016, the following provinces volunteered to conduct S&D surveys of HCP: Sumutprakan, Lampang, Rayong, Chantaburi, Chachoengsao, Trat, Prachinburi, Trang, Pattani, Patalung, Satul and Sa Kaeo. The intention was that these provinces use the same guidelines as used in the MOPH monitored S&D surveys conducted in Chiang Rai, Chonburi, Udonthani, Nakorn Ratchasima and Song Khla and described in the Manual to measure HIV-related Stigma and Discrimination in Health Care Settings in Thailand[7]. Because these surveys were not monitored by the MOPH, their quality cannot be assured.

2 PLHIV S&D survey

PLHIV were defined as being 18 years or older and living with HIV[8]. The PLHIV S&D surveys were conducted under the leadership of the Thai MOPH, HIV civil society organizations, PLHIV and key population networks, researchers from IHPP, RIHES and with technical support by Research Triangle International/USAID and UN Joint Team on AIDS/Thailand. The health policy project/USAID developed the preliminary tool by selecting some questions in the questionnaire used in the Stigma Index survey and added questions that were relevant to the Thai context. Tools were piloted in two provinces (Bangkok and Chiang Mai in 2014) and refined according to the local context and monitoring purpose. The refined measurement tool was then used in the national monitoring system under the supervision of the MOPH in five more provinces in 2015. An 11 additional provincial surveys were conducted under the supervision of the provinces themselves in 2016.

Sampling in Bangkok and Chiang Mai

In 2014 in Bangkok PLHIV respondents were recruited from six purposively selected government hospitals (all three MOHP hospitals and one each from small, medium, and large hospitals from among the 8 BMA hospitals). The goal was to sample 30 to 45 PLHIV at each hospital. On the day of data collection, PLHIV were approached and those agreeing to participate were interviewed in a private room. This process continued until the sample size of 300 were attained (not based on a calculated sample size). In Chiang Mai, 6 hospitals used for the S&D surveys among HCP (2 large, 2 middle, and 2 small size hospitals according to PLHIV clients registered at the facilities described above) were used for the S&D survey if PLHIV. The goal was to sample 350 PLHIV (not based on a sample size calculation), with roughly 300 from the health care facilities and 50 from PLHIV and key population networks. At the health care facilities, on the day of data collection, PLHIV were approached by ART clinic staff during their scheduled appointments, provided a brief overview of the research and invited to participate in an interview. For data coming from the PLHIV and key population networks, of which there are four in Chiang Mai, the networks were simply asked to interview between 10 and 15 PLHIV.

7 NAMC, MOPH. HIV Stigma and Discrimination Survey Guidelines and Procedures Manual. 2014. http://pdf.usaid.gov/pdf_docs/PA00KHKK.pdf
8 In the context of sampling, these PLHIV should be those registered with a health care facility, thereby missing information about those PLHIV who are not registered with a health care facility.

Sampling in Chiang Rai, Chonburi, Udonthani, Nakorn Ratchasima and Song Khla

In 2015, PLHIV were sampled in Chiang Rai, Chonburi, Udonthani, Nakorn Ratchasima and Song Khla from health care facilities selected based on random and non-random selection processes as described in Table 2[9].

Table 2. Sampling of PLHIV in Chiang Rai, Chonburi, Udonthani, Nakorn Ratchasima and Song Khla

STEP	
1	Non-random selection of five provinces (high burden provinces from five geographical regions)
2	Develop a list of all health care facilities under MOPH that have ARV clinic in each of the selected provinces
3	Select all health care facilities with an ARV clinic in each of the selected provinces
4	Obtain the total number of PLHIV registered at each health care facility
5	Using the list of the number of PLHIV registered at each health care facility calculate a sample size using use population proportional to size based on the size of the total number PLHIV in each facility
6	Sample over the course of one month based on the number of ARV clinics provided by month in each facility in order to obtain the final sample size

Sampling in 11 other provinces

In 2015 and 2016, the following provinces volunteered to conduct S&D surveys of PLHIV: Sumutprakan, Lampang, Rayong, Chantaburi, Chachoengsao, Trat, Prachinburi, Trang, Pattani, Patalung, Satul and Sa Kaeo. The intention was that these provinces use the same guidelines as used in the MOPH monitored S&D surveys conducted in Chiang Rai, Chonburi, Udonthani, Nakorn Ratchasima and Song Khla and described in the Manual to Measure HIV-related Stigma and Discrimination in Health Care Settings in Thailand[10]. Because these surveys were not monitored by the MOPH, their quality cannot be assured.

9 For more detail see IBID.
10 NAMC/MOPH. HIV Stigma and Discrimination Survey Guidelines and Procedures Manual. 2014. http://pdf.usaid.gov/pdf_docs/PA00KHKK.pdf

EXTRAPOLATION

1 Health care provider S&D survey

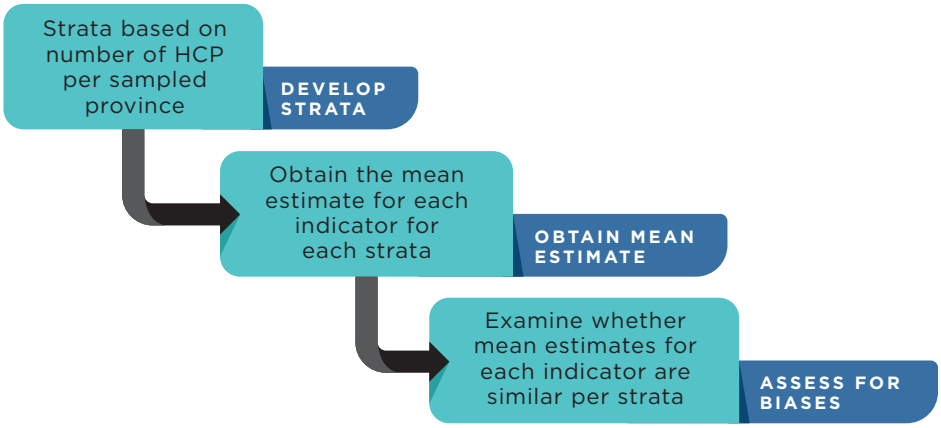
The first step in the extrapolation of health care provider data was to assess each of the data sets. During the sampling, private hospitals were included in Bangkok, Chiang Mai, Chiang Rai, Chonburi, Udonthani, Nakorn Ratchasima and Song Khla but not in the other sampled provinces. To make the sampled population the same, data from the private hospitals were not included. In a table, the highest and lowest estimates for each indicator for each sampled area were assessed to determine if any patterns emerged. Sa Kaeo had high outliers for seven of nine indicators and on closer scrutiny it was revealed that this site may not have conducted its sampling as rigorously as the other sites due to time constraints. Data from Sa Kaeo were eliminated from the extrapolation process. Again high and low estimates for each indicator for each sampled area were assessed and no patterns emerged[11].

The next step was to develop three strata for the existing data based on the number of HCP in each sampled province to account for there being only 17 data points for each indicator. Bangkok, however, was not included in the mean estimate given it is considered to be unique with regards to population and setting. These strata were based on the following:

1 = >3500 (n=7 provinces)
2 = 2500-3500 (n=6 provinces)
3 = <2500 (n=5 provinces) (Figure 3)

Mean estimates for each indicator for each strata (i.e., the mean of all seven provinces in group 1) were calculated and assessed for outliers, of which none were found.

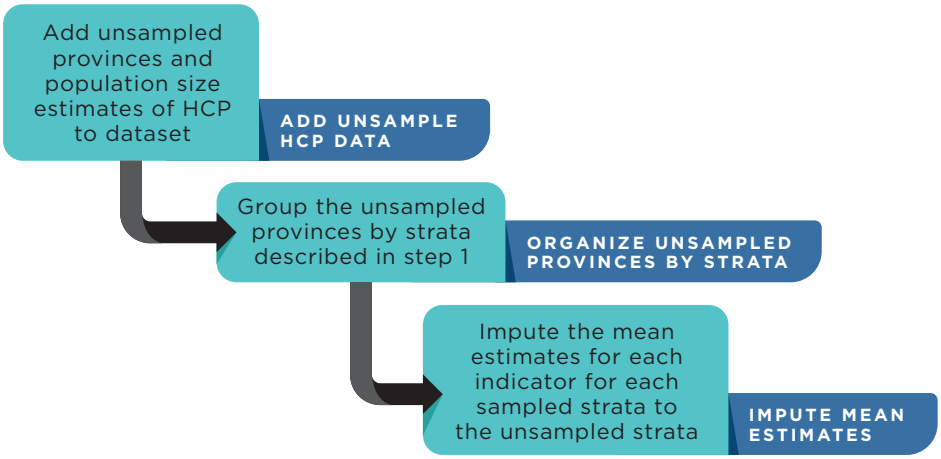
Figure 3. Step 1. Extrapolation process with available health care provider (HCP) data



11 The assumption here was that if all mean estimates in each strata fell within a small range (+ or – 10%), that they would be more likely to be accurate.

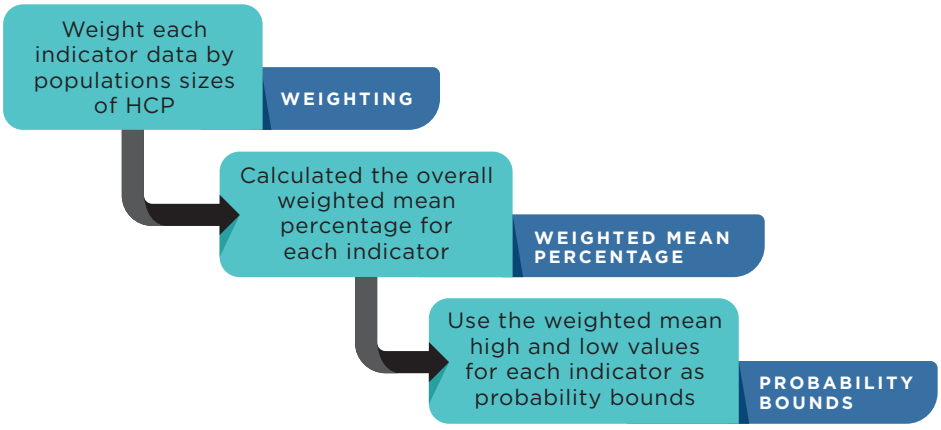
The next step for the extrapolation was to add all provinces and the population sizes of HCP to the data base and to group unsampled provinces by the three strata developed based on the number of HCP in the provinces of the sampled provinces (Figure 4). This step was followed by imputing the mean estimate calculated for each indicator for each strata from the available data to the unsampled provinces based on in which strata they were[12]. The exact estimates (rather than the mean estimate) for each indicator were kept for the sampled provinces.

Figure 4. Step 2. Imputation of data from sampled areas to unsampled areas



Once all the data were imputed, all data were weighted by the population sizes of HCP within each strata (with the exception of Bangkok which was not in a Stratum) in each province and a final percentage was calculated for each indicator (Figure 5). Probability bounds[13] were used from the higher and lower bounds of the actual estimates from the sampled provinces each indicator.

Figure 5. Step 3. Obtaining final national estimates.



12 The assumption being that the size of the province (the strata into which they fell) would account for some similarity in the final estimates.
13 The assumption here is that probability bounds based on actual data from the sampled provinces would more accurately reflect the variation in the estimates than would confidence bounds.

2 Final national estimates for S&D by Health Care Providers

The final estimates, plausibility bounds and standard deviations for nine select S&D indicators for HCP are provided below[14] (Table 3). S&D data for specific provinces sampled are provided in Appendix D.

Table 3. National estimates for S&D by HCP

INDICATOR	ESTIMATE (PLAUSIBILITY BOUNDS), SD
Observed stigma or discriminatory practices towards PLHIV in the past 12 months	23.7 (9.7, 34.9), 3.9
Observed HCW unwilling to care for a patient who is or thought to be a man who has sex with men in the past 12 months	4.2 (1.4, 7.8), 1.3
Observed HCW unwilling to care for a patient who is or thought to be transgender in the past 12 months	4.2 (1.3, 8.6), 1.3
Observed HCW unwilling to care for a patient who is or thought to be a female sex worker in the past 12 months	4.8 (1.0, 10.8), 1.6
Observed HCW unwilling to care for a patient who is or thought to be a person who inject drugs in the past 12 months	7.9 (3.6, 15.5), 2.3
Observed HCW unwilling to care for a patient who is or thought to be a migrant in the past 12 months	12.2 (3.1, 20.4), 6.2
Reported personal worry or fear of infection while caring for a client living with HIV	60.9 (31.9, 90.7), 11.4
Reported personal use of unnecessary infection control precautions to avoid being infected with HIV from a client living with HIV	53.1 (43.2, 65.7), 3.9
Ever had stigmatizing attitude towards PLHIV	84.5 (71.3, 92.8), 3.8

14 A description of each indicator and its construction are described in Appendix A.

3 PLHIV S&D survey

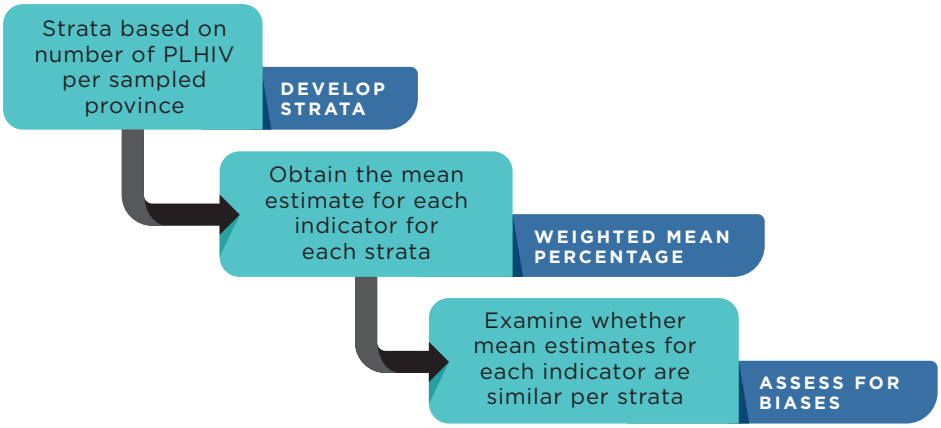
The first step in the extrapolation of PLHIV data was to assess each of the data sets. During the sampling, private hospitals were included in Bangkok and Chiang Mai but not in the other sampled provinces. (Chiang Rai, Chonburi, Udonthani, Nakorn Ratchasima and Song Khla). To make the sampled population the same, data from the private hospitals were excluded. In a table, the highest and lowest estimates for each indicator for each sampled area were assessed to determine if any patterns emerged. Again, Sa Kaeo had some outliers and on closer scrutiny it was revealed that this site may not have conducted its sampling as rigorously as the other sites due to time constraints. Data from Sa Kaeo were eliminated from the extrapolation process. Again high and low estimates for each indicator for each sampled area were assessed and no patterns emerged[15].

The next step was to develop three strata for the existing data based on the number of PLHIV in each sampled province to account for there being only 17 data points for each indicator. Bangkok, however, was not included in the mean estimate given it is considered to be unique with regards to population and setting. These strata were based on the following:

1 = >10,000 (n=6 provinces)
2 = 5000-10,000 (n=5 provinces)
3 = <5000 (n=4 provinces) (Figure 6)

Mean estimates for each indicator for each strata (i.e., the mean of all seven provinces in group 1) were calculated and assessed for outliers, of which none were found.

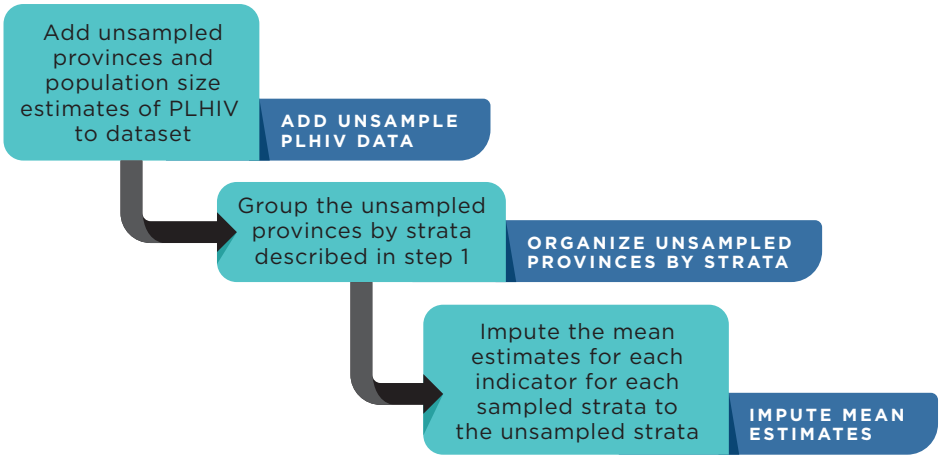
Figure 6. Step 1. Extrapolation process with available PLHIV data



15 The assumption here was that if all mean estimates in each strata fell within a small range (+ or – 10%), that they would be more likely to be accurate.

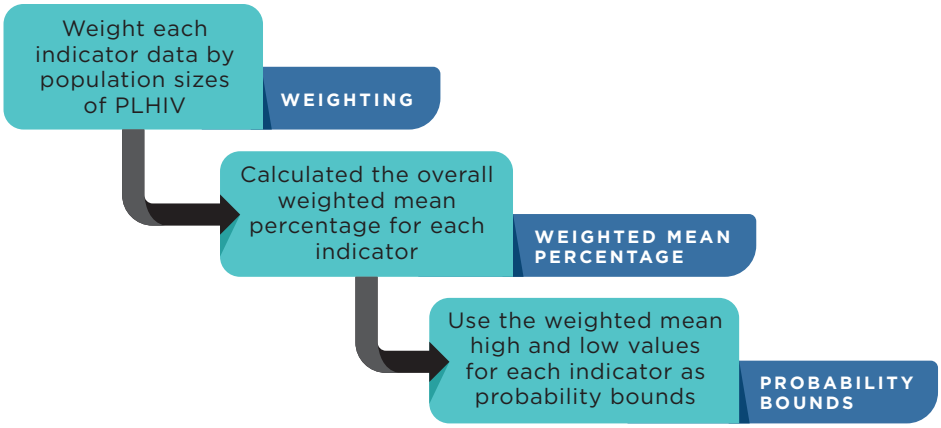
The next step was to add all provinces and the population sizes of PLHIV in all provinces to the data base and to group unsampled provinces by the three strata developed based on the number of PLHIV in the provinces of the sampled provinces (Figure 7). This step was followed by imputing the mean estimate calculated for each indicator for each strata from the available data to the unsampled provinces based on in which strata they were[16]. The exact estimates (rather than the mean estimate) for each indicator were kept for the sampled provinces.

Figure 7. Step 2. Imputation of data from sampled areas to unsampled areas



Once all the data were imputed, data were weighted by the population sizes of PLHIV in each province in each strata (with the exception of Bangkok which was not in a Stratum) and a final percentage was calculated for each indicator (Figure 8). Probability bounds[17] were used from the higher and lower bounds of the actual estimates from the sampled provinces each indicator.

Figure 8. Step 3. Obtaining final national estimates.



16 The assumption being that the size of the province (the strata into which they fell) would account for some similarity in the final estimates.
17 The assumption here is that probability bounds based on actual data from the sampled provinces would more accurately reflect the variation in the estimates than would confidence bounds.

4 Final national estimates for S&D by PLHIV

The final estimates, plausibility bounds and standard deviations for select S&D indicators for PLHIV are provided below[18] (Table 4). S&D data for specific provinces sampled are provided in Appendix D.

Table 4. National estimates for S&D by PLHIV

INDICATOR	ESTIMATE (PLAUSIBILITY BOUNDS), SD
Avoided or delayed health care because of fear of S&D in the past 12 months	13.0 (5.2, 26.1), 7.9
Ever avoided or delayed health care because of fear of S&D, among ever pregnant females PLHIV[19]	12.0 (0.1, 33.3), 7.0
Experienced S&D in a health care setting in the past 12 months	12.1 (4.4, 23.8), 8.1
Experienced HIV disclosure and non-confidentiality in a health care facility in the past 12 months	24.5 (3.9, 39.4), 11.8
Was advised/coerced termination of pregnancy and sterilization in the past 12 months	5.0 (0.1, 9.1), 3.9
Decided not to go health facility because of internalized stigma in the past 12 months	31.4 (10.7, 44.4), 7.2

5 Limitations

One of the goals of this exercise to obtain national estimations was to develop a straightforward approach that could be easily reutilized in the future by local staff. However, in conducting this exercise and due to limited time, a less rigorous approach was used. If more time and resources were available, it is recommended that strata be considered and developed on factors correlated with higher and lower levels of S&D in addition to the population sizes of HCP or PLHIV. For instance, are there factors which influence whether HCP (i.e., number of years working with PLHIV or working as a health care provider or type of position or percentage of time working with PLHIV or number of contacts with PLHIV) or PLHIV (i.e., number of years living with HIV or number of contacts with a health care provider or number of visits to a health care facility) for building strata for the imputation process or for developing a final composite weight? Another consideration was whether HIV prevalence in a province affected S&D percentages with the assumption being that higher HIV prevalence would result in lower S&D. However, for the few estimates available, this was not the case. Nevertheless, this factor warrants more attention. Additional recommendations for future S&D surveys among HCP and PLHIV conducted in Thailand are included in Appendix C.

18 A description of each indicator is described in Appendix A.
19 Excluding data from Bangkok and Chiang Mai.

IBBS SURVEYS

The 2016 HIV IBBS surveys, conducted among FSW, MSW, MSM and TGW, included questions to measure S&D. All surveys were conducted in purposively selected provinces (usually those having the highest HIV burden or those willing to cooperate in conducting the surveys) from Bangkok and 12 administrative zones: 12 provinces for FSW (one province purposively selected from each of the 12 administrative zones), and five for MSW, MSM, and TGW.

1 FSW

Sampling

Data from only eight (Bangkok, Lopburi, Rayong, Udonthani, Nakhonsawan, Phitsanulok, Phuket and Song Khla) of 12 provinces were available at the time of this exercise. FSW were defined 18 years or older, who sold sex (sex not defined) for money or goods within the last month. The definition did not include sex although the survey was of females who sell sex. FSW were sampled using a type of "venue-day-time" sampling method. This included, mapping private establishments in a district (usually that having the largest urban population) of the selected province and enumerating[20] the estimated number of FSW frequenting the private establishment to be used as a measure to determine how many private establishments needed to be sampled to reach the sample size. Once the private establishments were defined and enumerated they were put into a box and then randomly selected. Selection stopped once the number of establishments and persons enumerated in those establishments were sufficient to attain the calculated sample size. Establishments were sampled in the order in which they were selected from the box. Data collection involved a take all approach whereby all FSW in a private establishment who met the eligibility criteria and were willing to participate were interviewed. Most of the sampling took place during early afternoon in order to interview participant before the busiest time of sex work. The final estimates were neither weighted by frequency of FSW visits (i.e., number of times in a day, week, etc.), which is now recommended[21], nor size of venue, which is standard practice[22]. Interviews were conducted by health staff using tablets[23].

20 The manner in which this measurement was obtained was not standardized (e.g., among current FSW, during specific times, etc.) and in some cases was based on the knowledge of the establishment owner. Different methods for enumeration could lead to bias. See section C for recommendations.
21 Karon JM, Wejnert C. Statistical methods for the analysis of time-location sampling data. J Urban Heal. 2012. 89(3):565–86.
22 San Francisco Department of Public Health. Resource Guide: Time Location Sampling. 2007. Available from: http://globalhealthsciences.ucsf.edu/sites/default/files/content/pphg/surveillance/modules/global-trainings/tls-res-guide-2nd-edition.pdf.
23 The S&D questions related to treatment by health care providers could be biased given that health care workers were asking these questions.

2 Population size estimation for FSW

Population size estimations of FSW were based on mapping data with an inflation factor of 1.8, which is a mean factor based on the study in Bangkok for the population size estimation data[24]. This size estimation is used in the AIDS Epidemic Models.

Enumerating

Given that there are so few data points available for FSW, that the sampling did not follow a probability based sampling approach and data were not adjusted to account for frequency of visits or venue size, the options for deriving national estimations are limited. One correction to using these data is to simply weight them based on equivalent population size and getting a weighted mean. This output is not representing a national estimate of FSW but is merely an aggregate of estimates, weighted by population size, and characterize visible, urban and establishment based FSW.

Findings

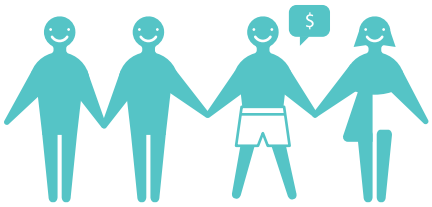
The final estimates, plausibility bounds and standard deviations for nine select S&D indicators for HCP are provided below[25] (Table 5). S&D data for specific provinces sampled are provided in Appendix D.

Table 5. National estimates for S&D for FSW

INDICATOR	ESTIMATE (PLAUSIBILITY BOUNDS), SD
Experienced S&D in family in past 12 months	1.7 (0.4, 8.6), 1.7
Experienced S&D in health care setting in the past 12 months	6.2 (2.9, 10.7), 2.5
Decided not to go for health services because of stigma in the past 12 months	1.8 (0.6, 6.4), 1.5
Reported internalized stigma	52.2 (22.5, 76.7), 8.9
Experienced sexual violence in the past 12 months	5.6 (1.8, 10.7), 1.1

24 2016 Thailand Global AIDS Progress Report, National AIDS Management Center (NAMC), Ministry of Public Health
25 A description of each indicator and its construction are described in Appendix B.

3 MSM, MSW and TGW



Sampling

THE PROVINCES/ DISTRICTS SELECTED FOR SAMPLING

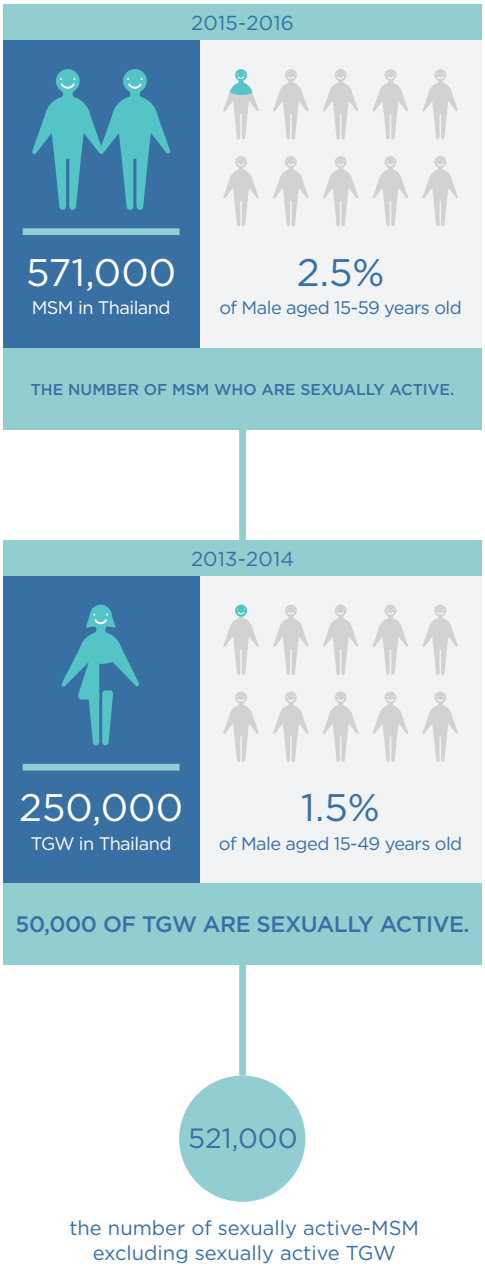
MSM, MSW AND TGW
Chiang Mai (Muang district), Phuket, Bangkok, Khonkhen (Muang district).

MSW AND TGW
Chonburi (Muang and Lam Chabang districts).

Provinces were sampled based on the probability of being able to sample all three groups of MSM, MSW and TGW. MSM, MSW and TGW were defined as being male at birth, 15 years or older, having Thai nationality, residing or working in the study site for at least one month and having had oral or anal sex in the last six months. However, there was no exclusion for those MSM who might also be MSW and TGW so these groupings may not be distinctly sampled. In addition, MSW were defined as having had oral or anal sex in exchange for money or goods, in last year and TGW self-identified (or were identified by research staff) as TGW (i.e., dressed and/or made up like a woman, having breasts)[26]. MSM, MSW and TGW from Bangkok, Chiang Mai and Phuket were sampled using a type of "venue-day-time" sampling method[27]. This included, using provincial or district level mapping data of MSM frequented private establishments from a 2010 mapping exercise[28]. For the 2016 IBBS, the 2010 mapping data underwent a cursory update. MSM, MSW and TGW in each of the mapped establishments were enumerated[29] by direct counts made by the research staff or by asking establishment owners of the number of MSM, MSW and TGW frequenting the establishment. This was used as a measure to determine how many establishments needed to be sampled in order to reach the sample size. In Chiang Mai, Phuket and Bangkok, all mapped and enumerated establishments were put into a box and then randomly selected. Selection stopped once the number of establishments and persons enumerated in those establishments were sufficient to attain the calculated sample size. Establishments were sampled in the order in which they were selected from the box. For TGW in Bangkok, establishments were purposively selected based on size (beginning with the largest), mostly in large entertainment establishments. This resulted in only a few establishments being sampled. Data collection involved a take all approach whereby all MSM, MSW or TGW[30] in an establishment who met the eligibility criteria and were willing to participate were interviewed.

26 There is no indication that TGW were not merely mistaken as transvestites who may have behaviors different from TGW.
27 In addition to Chiang Mai, Phuket, and Bangkok MSM data are available for Khonkhan (Muang district) and Chonburi (Muang and Lam Chabang districts). However, these other locations used respondent-driven sampling (RDS) and the results had much wider standard deviations for the S&D indicators than the locations that used "venue-day-time" sampling. This may be an indication that the sampled populations might be substantially different. Further evaluation of these data sets (RDS vs. "venue-day-time") is recommended to explore these differences.
28 The 2010 mapping exercise was apparently carefully conducted using a standardized protocol with enumerations conducted during specific times and days during which venues were most crowded.
29 The manner in which this measurement was obtained was not standardized (e.g., among current FSW, during specific times, etc.) and in some cases was based on the knowledge of the establishment owner. Different methods for enumeration could lead to bias. See Appendix C for recommendations.
30 TGW in Bangkok had overall lower prevalence of S&D compared to other locations. One rationale for this may be that TGW in Bangkok were sampled in only two establishments, one of which was located in an area of high NGO outreach and, perhaps, higher resiliency to S&D. Furthermore, for all locations, TGW may be only similar to those found at cabarets, rather than all TGW in general.

4 Population size estimation for MSM and TGW



Based on the 2015 AIDS Epidemic Model (AEM) and 2016 Thailand Global AIDS progress report, there are an estimated 571,000 MSM in Thailand. This number was calculated using age-specific same sex behaviors in the past 12 months as a multiplier of sexually active 15-59 year olds, for which the average was 2.5%[31]. Prevalence of same sex behavior in the last 12 months among males was based on results from Behavioral Sentinel Surveys among high school and vocational students, military conscripts and factory workers, as well as the 2004 national behavioral survey in 24 provinces. The number of those aged 15-59 years old by province (used as the denominator) was obtained from the National Economic Social Development Broad's (NESDB) 2015 population estimations and projections.

The estimated proportion of 1.5% TGW among males aged 15-49 years come from the Military Recruit screening survey conducted during 2013-2014. This results in an estimated number of 250,000 (number of male age 15-49 years X 0.015) TGW. An additional calculation using data from the Behavioral Surveillance Survey among factory workers was made to account for not all TGW being sexually active. This survey found that the proportion of male workers who admitted to being TGW and had sex in the last 12 month was 20%. This 20% was used to estimate TGW who are sexually active, which is about 50,000 (250,000 X 0.2). TGW who were sexually active in the last 12 months was estimated at 50,000 based on data from the military recruit screening survey. Therefore, the number of sexually active-MSM excluding sexually active TGW was 521,000.

31 Prevalence of same sex behavior by age group are 3% (15-19 yr.), 5.1% (20-24 yr), 4.7% (25-29 yr.) 4% (30-34 yr), 2% (40-44 yr), 1.5% (45-49 yr.), 1.3% (50-54 yr) and 1.1% (55-59 yr) data source: 2004 BSS, Bureau of Epidemiology, 2015

Estimate higher risk MSM and TGW population size

Estimated higher risk MSM and TGW were assessed for adjusting the weights for the S&D national estimate exercise. Using information from the IBBS, the proportion of MSM and TGW estimated to be at higher risk was divided into the following 3 categories:

1. 50% of MSM | 40% of TGW — in tourist provinces namely Bangkok, Chonburi, Chiang Mai and Phuket.
2. 30% of MSM | 25% of TGW — in municipality areas.
3. 20% of MSM | 10% of TGW — in less urban areas.

Enumerating

Given that there are so few data points available for MSM, MSW and TGW, that the sampling did not follow a probability based sampling approach and data were not adjusted to account for frequency of visits or venue size, the options for deriving national estimations are limited. One correction to using these data is to simply weight them based on equivalent population size and getting a weighted mean. This output is not representing a national estimate of MSM, MSW and TGW but is merely an aggregate of estimates, weighted by population size, and characterize visible, urban, establishment based and perhaps higher risk MSM, MSW and TGW.

Findings

The final estimates, plausibility bounds and standard deviations for nine select S&D indicators for HCP are provided below[32] (Table 6). S&D data for specific provinces sampled are provided in Appendix D.

32 A description of each indicator and its construction are described in Appendix B.

Table 6. National estimates for S&D for MSM, MSW and TGW

INDICATOR	MSM	MSW	TGW
	ESTIMATE (PLAUSIBILITY BOUNDS), SD		
Experienced S&D in family in the past 12 months	3.5 (3.1, 5.4), 0.8	1.4 (0, 5.0), 1.4	2.3 (1.8, 4.9), 1.1
Experienced S&D at workplace or education institutes in the past 12 months	12.8 (12.0, 19.2), 1.8	N/A	18.9 (15.1, 33.8), 6.1
Experienced stigma and discrimination in health care setting in the past 12 months	8.9 (7.7, 16.1), 2.5	6.6 (2.8, 13.8), 3.6	9.9 (8.0, 11.3), 1.0
Decided not to go for health services because of stigma and discrimination in the past 12 months	7.9 (5.9, 25.6), 4.7	10.0 (8.5, 25.0) 4.2	7.4 (3.8, 21.0), 6.0
Reported internalized stigma	19.4 (18.5, 24.6), 1.8	19.9 (16.7, 31.9), 4.3	22.1 (14.7, 38.0), 6.8
Experienced sexual violence in the past 12 months	10.7 (9.1, 23.2), 3.5	8.7 (4.2, 21.5), 5.1	13.2 (9.3, 28.9), 6.8

5 Limitations

The final "national" estimates for IBBS data are not nationally representative of S&D among FSW, MSM, MSW, or TGW in Thailand. There are too few data points to extrapolate from a provincial level to a national level. In addition, the sampling approach (non-probability) used to sample these populations are not necessarily representative of any of the populations in any of the areas sampled. A more rigorous sampling approach should be incorporated into the IBBS along with the numerous types of population size estimations that can be incorporated into IBBS if using a probability sampling method (i.e., RDS or TLS). As mentioned above, these findings should be interpreted as an aggregate of estimates, weighted by population sizes and showing information from specific key populations. Despite these limitations the results presented here will be extremely useful for developing an effective response to S&D in health care settings, as well as S&D experienced by PLHIV, FSW, MSM, MSW and TGW.

Additional recommendations for future S&D surveys among key populations conducted in Thailand are included in Appendix C.

APPENDIX A.
S&D CORE INDICATORS

Health care providers (HCP)

CORE INDICATOR	QUESTIONS	MEASUREMENT
Core behavioral indicators		
1. Observed stigma or discriminatory practices towards PLHIV in the past 12 months	**PART 3:** **Q4 In the past year, how often have you observed the following in your health facility?** Q4.1 HCW were unwilling to care for a patient living with or thought to be living with HIV. Q4.2 HCW were providing poorer[33] quality of care to a patient living with or thought to be living with HIV compared to other patients.	**NUMERATOR:** Those who answered "once or twice", or "several times", or "most of the time" to either of two questions: 4.1 or 4.2 **DENOMINATOR:** All respondents
2. Observed stigma practices towards key populations in the past 12 months[34]	**PART 6:** **Q12 In the past 12 months, how often have you observed HCW unwilling to care for a patient who is or thought to be:** Q12.2 Transgender Q12.3 Sex worker Q12.4 Drug user Q12.5 Migrant	**NUMERATOR:** Those who answered "once" and "more time (>1)" to question 12.1 **DENOMINATOR:** All applicable respondents (excluding those who answered N/A)

33 "Poorer quality" was defined by HCW's perception of other HCWs providing an inferior quality of service to PLHIV compared to patients who were not living with HIV.
34 No opportunity to respond "N/A" or no opportunity to see such a person. May be an underestimate since those who did not have an opportunity, may have said no making the denominator larger.

CORE INDICATOR	QUESTIONS	MEASUREMENT
Key drivers of S&D		
3. Personal worry and fear of infection (Composite of 3 questions)	**PART 2:** **Q2 How worried would you be about getting HIV infection if you did the following?** Q2.1 Touched the clothing, bedding or belongings of a patient living with HIV or AIDS patient Q2.2 Dressed the wounds of a patient living with HIV or AIDS patient Q2.3 Drew blood from a patient living with HIV and AIDS patient	**NUMERATOR:** Those who answered "a little worried" or "worried" or "very worried" to either of three questions: 2.1 or 2.2 or 2.3 **DENOMINATOR:** All respondents
4. Reported using unnecessary precautions (composite of 2 questions)	**PART 2:** **Q3 Do you typically do any the following measures when providing care or services for PLHIV** Q3.1 Wear double gloves Q3.2 Use any special infection control/ prevention measure that you do not use with other patients	**NUMERATOR:** Those who answered YES to either of two questions: 3.1 or 3.2 **DENOMINATOR:** All respondents
5. Stigmatizing attitude towards PLHIV (Composite of 4 questions)	**PART 5:** **Q10 What is your opinion about the following statements?** Q10.1 Most PLHIV do not care that they could infect other people Q10.2 PLHIV should be ashamed about their HIV status Q10.3 People get infected with HIV because they engage in irresponsible/immoral behaviors Q10.5 Women living with HIV should be allowed to have babies if they wish	**NUMERATOR:** Those who answered "agree" or "strongly agree" to either of three questions: 10.1 or 10.2 or 10.3 Or Who answered "disagree" and "strongly disagree" for question 10.5 **DENOMINATOR:** All respondents

People living with HIV (PLHIV) in health care settings

CORE INDICATOR	QUESTIONS	MEASUREMENT
Manifestations outcome of HIV related discrimination in the past 12 months		
1. Avoided or delayed heath care		
1.1 Avoided or delayed heath care because of S&D among all PLHIV in the past 12 months	**PART 2:** **Q6 In the past 12 months, have you *avoided* going to or delayed going to a health care facility near your home for HIV specific services or general health issues/problems?** Q6.1 Yes because of fear of disclosure of HIV status Q6.2 Yes because of quality of services related HIV stigma	**NUMERATOR:** Those who answered YES to either of two questions: 6.1 or 6.2 **DENOMINATOR:** All respondents
1.2 Avoided or delayed of heath care because of S&D among pregnant HIV positive women (note: no specific time frame)	**PART 2:** **Q7.1 Have you ever avoided or delayed going to antenatal care or seeking or adhering to services to prevent transmission of HIV from mother to child?** Q7.21 Yes because of fear of disclosure of HIV status Q7.22 Yes because of quality of services related HIV stigma	**NUMERATOR:** Those who answered YES to either of two questions: 7.21 or 7.22 **DENOMINATOR:** Those who answered YES who were pregnant since learning they were HIV positive
2. Experienced S&D in health care settings in the past 12 months	**PART 2:** **Q8 In the past 12 months, have any of the following happened to you in any health care facility because of your HIV status?** Q8.1.1 Health provider refused or denied services or treatment Q8.1.2 Health care provider told you to come back, put in the last queue or made to wait longer than other patients Q8.1.3 Health care provider was rude, or scolded or blamed you	**NUMERATOR:** Those who answered Yes to either of four questions: 8.1.1 or 8.1.2 or 8.1.3 or 8.1.5 **DENOMINATOR:** Those who answered YES who have been to a health care facility in the past year

CORE INDICATOR	QUESTIONS	MEASUREMENT
	Q8.1.5 (For those admitted to hospital) Health care provider asked you to place your hospital robe in an area/ basket specifically designated for HIV patients	
3. Experienced non-confidentiality and human rights violation in the past 12 months		
3.1 Disclosed HIV status and non-confidentiality in the past 12 months	**PART 3:** **Q11 In the past 12 months, have any of following happened to you in any health care facility?** Q11.2. Has a health care provider ever disclosed your HIV status to other people without your consent? Q11.3 Your medical record was marked as being HIV positive in a way that let people around know you are living with HIV	**NUMERATOR:** Those who answered YES to either of two questions: 11.2 or 11.3 **DENOMINATOR:** All respondents
3.2 Advised/coerced termination of pregnancy and sterilization in the past 12 months	**PART 4:** **Q16 Have you/your partner ever been advised or coerced to terminate any pregnancy due to your/your partner's HIV status?**	**NUMERATOR:** Those who answered YES in past 12 months to question 16 **DENOMINATOR:** All respondents who answered YES in the past 12 months, over the past 12 months and none (excluding those who answered N/A)
4. Internalized stigma as key driver to denial of heath care		
4.1 Internalized stigma in the past 12 months	**PART 2:** **Q9 In the past 12 months, have you ever decided not to go health facility because of the following** Q9.1 Feeling ashamed of your HIV status Q9.2 Being afraid that health facility staff will stare or gossip about you Q9.3 Feeling guilty about your HIV status	**NUMERATOR:** Those who answered YES to one of three questions: 9.1 or 9.2 or 9.3 **DENOMINATOR:** All respondents

APPENDIX B. S&D CORE INDICATORS FOR ANALYSIS FROM IBBS

FSW

CORE INDICATOR	QUESTIONS	MEASUREMENT
1. Experienced S&D in family in the past 12 months	**Q51 Do any of your family members (even only one) express aversion to you, for example, not wishing to speak with you or speaking sarcastically about you, blaming you, scolding you, or gossiping about you because you are a female sex worker?**	**NUMERATOR:** Those who answered YES to question 51: "My family members currently express aversion" **DENOMINATOR:** Those who answered to responses 1, 2 or 3. Excluded are those who answered codes 4 or "Don't know/unsure from analysis"
2. Experienced stigma and discrimination in health care setting in the past 12 months	**Q52 In the past 12 months, have you ever been so sick that you had to go to a hospital or clinic?** ***52.1 If yes,*** did the attending physician, nurse or staff of the clinic/hospital refuse to treat you because you are female sex worker? ***52.2 If yes,*** did you receive poorer care and services from the doctor, nurse or staff of the clinic/hospital compared to other patients because you are female sex worker?	**NUMERATOR:** Those who answered YES to questions 52.1 or 52.2 **DENOMINATOR:** All respondents

CORE INDICATOR	QUESTIONS	MEASUREMENT
3. Decided not to go for health services in the past 12 months	**Q53 In the past 12 months, did you ever decide not to go for treatment at the clinic/hospital, even if necessary, because you feared negative prejudice toward female sex workers?**	**NUMERATOR:** Those who answered YES to question 53 **DENOMINATOR:** All respondents
4. Reported internalized stigma	**Q54 How much shame do you feel for being female sex worker?**	**NUMERATOR:** Those who answered to levels of feeling shame **DENOMINATOR:** All respondents
5. Experienced sexual violence	**Q55 In the past 12 months, have you ever been forced to perform oral sex, or have anal (or vaginal) sex because you are female sex worker?**	**NUMERATOR:** Those who answered YES to question 55 **DENOMINATOR:** All respondents

MSM, TGW and MSW

CORE INDICATOR	QUESTIONS	MEASUREMENT
1. Experienced S&D in family in the past 12 months	**Q68 Do any of your family members (even only one) express aversion to you, for example, not wishing to speak with you or speaking sarcastically about you, blaming you, scolding you, or gossiping about you because you are gay, a sex worker or TGW?**	**NUMERATOR:** Those who answered YES to question 68: "My family members currently express aversion" **DENOMINATOR:** Those who answered to responses 1, 2 or 3. Excluded are those who answered codes 4 or "Don't know/Unsure from analysis"

CORE INDICATOR	QUESTIONS	MEASUREMENT
2. Denied employment or expelled from school or the workplace in the past 12	**Q69 In the past 12 months, have you ever been denied employment or expelled from school or the workplace because you are gay or TGW?**	**NUMERATOR:** Those who answered YES to questions 68 **DENOMINATOR:** All respondents
3. Experienced stigma and discrimination in health care setting in the past 12 months	**Q70 In the past 12 months, have you ever been so sick that you had to go to a hospital or clinic?** ***70.1 If yes,*** did the attending physician, nurse or staff of the clinic/hospital refuse to treat you because you are gay, a sex worker, TGW? ***70.2 If yes,*** did you receive poorer care and services from clinic/hospital doctor, nurse or staff compared to other patients because you are gay, a sex worker, or TGW?	**NUMERATOR:** Those who answered YES to questions 70.1 or 70.2 **DENOMINATOR:** All respondents
4. Decided not to go for health services in the past 12 months	**Q73 In the past 12 months, did you ever decide not to go for treatment at the clinic/hospital, even if necessary, because you feared negative prejudice toward gays, sex workers, or TGW?**	**NUMERATOR:** Those who answered YES to question 73 **DENOMINATOR:** All respondents
5. Reported internalized stigma	**Q74 How much shame do you feel for being (gay, sex worker, or TGW)?**	**NUMERATOR:** Those who answered to levels of feeling shame **DENOMINATOR:** All respondents
6. Experienced sexual violence in the past 12 months	**Q75 In the past 12 months, have you ever been forced to perform oral sex, or have anal (or vaginal) sex because you are (gay, a sex worker, TGW)?**	**NUMERATOR:** Those who answered YES to question 75 **DENOMINATOR:** All respondents

APPENDIX C. RECOMMENDATIONS FOR FUTURE S&D SURVEYS AND SURVEYS IN GENERAL

Health care providers and PLHIV

Capacity building

1. The current financial and management limitations, does not allow for adequate supervision of surveys for all provinces (only national sentinel sites are supervised). In the end the quality of the data are not known and this compromises the interpretation and precision of the final national estimates. Future training to conduct future surveys on S&D should include provinces in both sentinel sizes and non-sentinel sites. In addition, tools are simple enough to reach acceptable quality.

2. Building capacity and standardized protocols to conduct robust sampling (attempts to use a random sampling method) in all provinces will improve the reliability of national estimates and to measure change over time.

Sampling

1. To have national estimates that are more likely to be representative, randomly sample provinces from the 13 regions of the country. Furthermore, sampling methods should be similar in each province to ensure comparability. In the current sampling strategies, there are a number of levels for ensuring that randomness takes place. For instance, once provinces are randomly selected, then facilities should be randomly selected (unless all facilities are sampled) within the entire province. If the entire province is not sampled, then cities or areas in that province should be randomly sampled. Similarly, the participants interviewed should be randomly sampled from a sampling list of eligible participants. When using a probability based sampling method, such as random sampling, all the units (provinces, facilities and individuals) have an equal chance of being selected and can therefore be considered being representative. If a non-probability based sampling method is used, such a purposively sampling provinces, facilities and individuals, then the direction of the bias is unknown and the data are only able to provide a biased representation of the units it sampled.

2. Given that provinces, facilities and the number of people in the denominator are of different sizes it is essential for weight data to ensure comparability.

3. When the focus is to obtain national estimates, a standardized random sampling strategy of provinces is always recommended. However, this needs to be balanced with the need to meet statistical goals and the need to obtain programmatic goals. It is essential to consider whether it more important to have representative national estimates vs. obtaining information from purposively selected provinces that may benefit from targeted intervention or other programmatic activities?

4. Try to sample all locations similarly and ensure that the same populations are sampled.

National estimates

1. Consider developing strata not on the number of HCP or PLHIV (as was done here) but on factors correlated with higher and lower levels of S&D. Possible factors include:
   a. **health care provider:** number of years working with PHLIV, number of years working as a health care provider, type of position, percentage of time working with PLHIV, number of contacts with PLHIV.
   b. **PLHIV:** number of years living with HIV, number of contacts with a health care provider, number of visits to a health care facility

2. Consider whether HIV prevalence in a province affected S&D percentages with the assumption being that higher HIV prevalence would result in lower S&D. However, for the few estimates available, this was not the case. Nevertheless, this factor warrants more attention.

3. Continue to weight data by population sizes.

S&D Questionnaire

1. In light of the recommendation about creating better strata, add one or two questions to the questionnaire such as:
   a. **HCP:**
      How many years have you worked with PLHIV?

      How many years have you been a health care provider?

      What percentage of time in a month do you work with PLHIV?

      What is the number of contacts you have with PLHIV in a month?

   b. **PLHIV:**
      For how many years have you been living with HIV?

      In the last month (six months, year, etc.) how many encounters with a health care provider (list the types that are eligible here) have you had?

      How many times have you visits a health care facility in the past month, year?

2. It appears that in an attempt to shorten the questionnaire that some key filter questions were excluded from the final questionnaire used in the non-pilot provinces.

IBBS among FSW, MSM, TGW, MSW

Sampling

1. Randomly select provinces to sample in order to get a more accurate national estimate. However, this needs to be balanced with the need to meet statistical goals and the need to obtain programmatic goals. Consider whether it is more important to have representative national estimates vs. obtaining information from purposively selected provinces.

2. The sampling procedure used "venue-day-time" based sampling. Although there was an enumeration of participants at venues, this appears to be used as a means to estimate the number of venues needed to reach the sample size and for sampling the largest venues in Bangkok. The enumeration can and should be used for weighting by cluster (venue) size as is now recommended. Furthermore, it is recommended that "venue-day-time" based sampling be weighted by frequency of attendance to venues to account for the probability that those who attend a venue more frequently have a higher probability of selection[35].

3. If enumerating the population, have a standardized method for doing this and do it for all venues. For instance, in some venues, enumeration was based on asking the owner in some non-specified way, and in others, enumeration was based on counting. Pay attention to enumerating during consistent times and days.

4. Ensure a more thorough and standardization of mapping of venues/establishments and, in the case of some locations, a more random sampling of venues. It appears that large venues are more likely to be sampled in Bangkok MSM, TGW and MSW and that the accumulation of the sample may occur in only a couple of places thereby biasing the final sample. Also provide clear definitions of what a venue/establishment is, how to ask enumeration questions, etc. Find out the difference in enumerations for different times (do these differ?). All of this should be specifically written out in a protocol.

5. Define the population clearly. For instance, it appears that based on the types of venues mapped, the provinces selected for mapping (mostly urban areas) and the types of people sampled that the population is of high risk, urbanized and visible populations. This should be clearly stated when presenting and interpreting results. Important indications, such as HIV and S&D (due to more visibility) may be overrepresented.

6. Clearly define venues, clearly define the important indicators such as direct and indirect.

35 Karon JM, Wejnert C. Statistical methods for the analysis of time-location sampling data. J Urban Heal.;89(3):565–86.

7 Update the definition of male to female transgender and keep in mind that many TGW do not always dress as females and that many "transvestites" are heterosexuals. This needs consideration in light of the Thailand context.

8 Avoid addressing the population by the research terms we use such as "female sex worker", "men who have sex with men", "male sex worker", etc. These are useful for researchers to communicate to each other but may not be what the population groups prefers to call themselves. It is recommended to use the behavior of interest to describe these populations: "exchanged money for sex", "had anal sex with a male in the past year". There are many women and men who have sex for money but would never consider themselves as a female or male "sex worker".

9 Understand the sampling methods used and how to interpret data from them. Recently, Thailand had used respondent driven sampling ([RDS] a network based sampling method) to sample key populations. It has worked well in FSW and MSM. However, in looking at the results, many risky behavior estimates are much lower for the FSW and MSM in RDS surveys than for FSW and MSM in the TLS surveys. Although more investigation is needed to determine if this is true for all variables of interest, this is most likely due to "venue-day-time" based sampling picking up a different type of population (higher risk, visible, hanging out at establishments which are also cruising sites, etc.) than RDS (more hidden, less visible as well as visible, etc.). RDS will tend to capture both hidden and those that would be captured through "venue-day-time" based sampling.

10 Conduct population size estimation techniques when conducting a probability based sample (i.e., "venue-day-time" based sampling with proper implementation and weighting of data and RDS with proper weighting of data). It costs little to no extra money to conduct service and unique object multipliers and wisdom of the crowds[36]. If conducting RDS, it is possible to do a Bayesian method called successive sampling population size estimation[37] which is found in the open source RDS Analyst software (www.hpmrg.org).

11 Clearly document all steps in the sampling strategy.

12 There is no need to conduct IBBS every two years. Every three, four or five years should be sufficient. Furthermore, it would be more useful to take the time to improve the sampling and analysis methods used in these surveys in order to have more representative samples.

36 UNAIDS. Guidelines on Estimating the Size of Populations Most at Risk to HIV. Geneva, Switzerland; 2010. Available from: http://www.unaids.org/en/resources/documents/2011/2011_Estimating_Populations; Johnston LG, Prybylski D, Raymond HF, Mirzazadeh A, Manopaiboon C, McFarland W. Incorporating the service multiplier method in respondent-driven sampling surveys to estimate the size of hidden and hard-to-reach populations: case studies from around the world. Sex Transm Dis. 2013; 40(4):304–10.

37 Johnston LG, McLaughlin KR, El Rhilani et al. A novel method for estimating the size of hidden populations using respondent-driven sampling data: Case examples from Morocco. 2015. Epidemiology. 26 (6), 846–852.

S&D Questionnaire

1. It appears that in an attempt to keep the questionnaire short that some key filter questions were excluded from the final questionnaire.

2. Avoid the label, FSW, MSM, MSW and TGW, in the questionnaire. Avoid: "Have you been discriminated against because you are a FSW?" Use: "Have you been discriminated against because you have exchanged sex for money or goods?"

3. Questionnaires for IBBS are often very long and can be shortened. In an effort to reduce the questionnaire avoid losing important filter questions and do not confuse questions by asking two questions as one question. Instead, have a working group go through the questionnaire with specific questions about which questions are most useful. This may involve looking at data over the past several rounds of IBBS to see if some questions are no longer changing over time. Furthermore, if responses to questions are no longer useful to evaluate programs, then get rid of those questions. The criteria for getting rid of questions should be whether they are useful for:
   1) program planning and evaluation.
   2) reporting purposes (i.e., GARPR).
   3) building the AEM.
   4) helping to stop HIV.

4. For the measurement for MSM of "Denied employment or expelled from school or the workplace in the past 12", question: In the last 12 months, have you ever been denied employment or expelled from school or the workplace because you are gay or TGW?, add a filter to exclude those who were not in the situation for this to happen and also add n/a, especially for MSW.

Analysis

1. If true venue-time-day sampling, two adjustment schemes should be added to account for sampling bias. These include adjustments for frequency of attendance to a venue[38] and size of venue. Furthermore, venue-time-day sampling follows a strict procedure of random selections of venues, times and days which should be followed to ensure a probability based sample[39]

2. Conduct more analysis on the data to see if the samples are different by cities. Try to determine if there are other factors that may be associated with higher or lower S&D in the areas sampled and include this in a composite weight.

3. Conduct analysis to see if the samples are different based on the sampling method used. RDS and venue-time-day are likely capturing different populations and therefore should not be directly compared to each other.

4. Provide confidence intervals when looking at differences within a sample (i.e., direct vs. indirect FSW). It is impossible to seeing meaningful differences without confidence intervals and p values.

38 Karon JM, Wejnert C. Statistical methods for the analysis of time-location sampling data. J Urban Heal. 2012;89(3):565–86.

39 San Francisco Department of Public Health. Resource Guide: Time Location Sampling. 2007. Available from: http://globalhealthsciences.ucsf.edu/sites/default/files/content/pphg/surveillance/modules/global-trainings/tls-res-guide-2nd-edition.pdf

APPENDIX D. PROVINCIAL ESTIMATES OF S&D

Provincial estimations of S&D among health care providers (%)

PROVINCE	NUMBER OF SAMPLE SIZE	OBSERVED STIGMA OR DISCRIMINATORY PRACTICES TOWARDS PLHIV IN THE PAST 12 MONTHS	OBSERVED HCW UNWILLING TO CARE FOR A PATIENT WHO IS OR THOUGHT TO BE IN THE PAST 12 MONTHS,					REPORTED PERSONAL WORRY AND FEAR OF INFECTION FROM A PATIENT LIVING WITH HIV IN THE PAST 12 MONTHS	REPORTED PERSONAL USE OF UNNECESSARY INFECTION CONTROL PRECAUTIONS TO AVOID BEING INFECTED WITH HIV FROM A CLIENT LIVING WITH HIV IN THE PAST 12 MONTHS	STIGMATIZING ATTITUDE TOWARDS PLHIV
			MSM	TGW	FSW	PWID	Migrant			
Bangkok	289	25.3	5.1	4.2	3.8	7.6	20.4	64.8	54.2	87.5
ChiangMai	304	15.8	1.6	1.3	0.9	3.6	16.1	66.4	47.1	84.2
ChiangRai	201	17.4	2.0	2.0	1.5	3.6	3.1	66.6	56.0	88.4
Chonburi	208	29.9	6.5	7.5	8.6	11.4	6.4	73.0	60.1	88.6
Udonthani	187	19.7	6.9	8.6	6.9	15.2	14.8	80.6	65.7	87.3
Nakhonratchasima	189	23.8	1.6	1.6	4.3	6.3	3.2	67.6	55.8	87.8
Songkhla	236	30.4	5.8	5.3	6.2	13.0	17.8	69.4	48.4	83.2
Lumpang	186	9.7	3.2	3.8	2.7	5.4	4.8	69.5	58.7	80.1
Chantaburi	188	17.0	4.3	3.7	5.3	5.3	11.7	46.3	53.7	75.5
Chachoengsao	239	25.4	2.1	2.5	5.5	6.7	8.4	35.4	43.4	80.3
Rayong	207	29.5	4.8	5.3	4.8	9.2	12.6	33.8	48.3	78.3
Trang	166	31.1	7.8	7.8	10.8	9.0	6.6	90.7	45.8	92.8
Pattani	130	19.2	2.3	3.1	2.3	3.9	4.6	76.7	57.6	87.7
Sumutprakan	208	31.1	3.4	3.4	3.9	6.2	7.8	35.9	44.7	86.4
Trat	209	24.4	2.4	2.4	2.9	7.7	16.3	44.5	63.2	71.3
Prachinburi	168	34.9	6.0	7.1	8.3	15.5	10.7	31.9	43.2	81.9
Phattalung	119	15.9	5.9	5.0	7.6	10.1	10.1	68.5	60.2	90.8
Satul	139	18.7	1.4	2.2	5.8	5.8	7.2	65.1	47.5	75.5

DATA SOURCE: Research Institutes for Health Sciences, Chiang Mai University and National AIDS Management Center, MOPH
NOTE: Data collection period: Bangkok and Chiang Mai in 2014, Chonburi, Udonthani,Nakhonratchasima, Songkla, Chiang Rai in 2015 the least of provinces during 2015-2016.

Provincial estimations of S&D among PLHIV (%)

PROVINCE	NUMBER OF SAMPLE SIZE	AVOIDED OR DELAYED HEALTH CARE BECAUSE OF FEAR OF S&D IN THE PAST 12 MONTHS	AVOIDED OR DELAYED HEALTH CARE BECAUSE OF FEAR OF S&D, AMONG EVER PREGNANT FEMALES LIVING WITH HIV	EXPERIENCED S&D IN A HEALTH CARE SETTING IN THE PAST 12 MONTHS	HIV DISCLOSURE AND NON-CONFIDENTIALITY IN A HEALTH CARE FACILITY IN THE PAST 12 MONTHS	WAS ADVISED/ COERCED TERMINATION OF PREGNANCY AND STERILIZATION IN THE PAST 12 MONTHS	DECIDED NOT TO GO HEALTH FACILITY BECAUSE OF INTERNALIZED STIGMA IN THE PAST 12 MONTHS
Bangkok	365	24.4	13.8	23.8	39.4	9.1	34.5
ChiangMai	344	8.4	13.8	13.7	18.3	9.1	19.1
ChiangRai	176	11.4	10.7	6.6	17.7	2.6	15.8
Sumutprakan	173	5.2	5.6	4.7	7.1	4.3	27.3
Chonburi	178	10.7	33.3	6.8	12.3	0.0	44.4
Nakhonratchasima	178	12.4	5.4	10.6	17.5	4.8	30.5
Rayong	177	10.7	23.1	12.2	16.7	0.0	30.0
Songkhla	193	9.8	5.7	7.1	12.5	2.6	31.0
Chantaburi	176	26.1	18.1	5.7	3.9	0.6	10.7
Chachoengsao	189	7.9	9.1	4.8	13.4	0.0	17.8
Trat	200	5.5	0.0	7.6	8.4	1.0	12.3
Prachinburi	183	5.5	4.0	4.4	10.9	0.0	24.7
Sa Khaw	157	7.5	7.3	6.5	24.1	6.0	32.8
Trang	663	8.5	10.0	6.8	31.3	8.8	40.0
Pattani		8.5	10.0	6.8	31.3	8.8	40.0
Patalung		8.5	10.0	6.8	31.3	8.8	40.0
SaTul		8.5	10.0	6.8	31.3	8.8	40.0

DATA SOURCE: Research Institutes for Health Sciences, Chiang Mai University and National AIDS Management Center, MOPH
NOTE: Data collection period: Bangkok and Chiang Mai in 2014, Chonburi, Udonthani,Nakhonratchasima, Songkla, Chiang Rai in 2015 the least of provinces during 2015-2016.

Provincial estimations of S&D among key populations (2016)

Male have sex with men (MSM, %)

PROVINCE	NUMBER OF SAMPLE SIZE	EXPERIENCED S&D IN FAMILY IN THE PAST 12 MONTHS	EXPERIENCED S&D AT WORKPLACE OR EDUCATION INSTITUTES IN THE PAST 12 MONTHS	EXPERIENCED STIGMA AND DISCRIMINATION IN HEALTH CARE SETTING IN THE PAST 12 MONTHS	DECIDED NOT TO GO FOR HEALTH SERVICES IN THE PAST 12 MONTHS	REPORTED INTERNALIZED STIGMA	EXPERIENCED SEXUAL VIOLENCE IN THE PAST 12 MONTHS
Bangkok	297	3.1	11.9	7.7	5.9	18.5	9.1
Chiang Mai	306	5.0	15.4	13.1	13.5	22.3	15.4
Phuket	279	5.4	19.2	16.1	25.6	24.6	23.2

DATA SOURCE: 2016 Integrated Biological and Behavioral Survey, Bureau of Epidemiology

Transgender women (TGW, %)

PROVINCE	NUMBER OF SAMPLE SIZE	EXPERIENCED S&D IN FAMILY IN THE PAST 12 MONTHS	EXPERIENCED S&D AT WORKPLACE OR EDUCATION INSTITUTES IN THE PAST 12 MONTHS	EXPERIENCED STIGMA AND DISCRIMINATION IN HEALTH CARE SETTING IN THE PAST 12 MONTHS	DECIDED NOT TO GO FOR HEALTH SERVICES IN THE PAST 12 MONTHS	REPORTED INTERNALIZED STIGMA	EXPERIENCED SEXUAL VIOLENCE IN THE PAST 12 MONTHS
Bangkok	150	1.8	16.0	10.0	3.8	20.7	9.3
Chiang Mai	150	2.4	20.0	8.0	10.9	14.7	16.0
Phuket	147	2.7	15.1	10.9	21.0	18.5	19.9
Chonburi	142	4.9	33.8	11.3	18.9	38.0	28.9

DATA SOURCE: 2016 Integrated Biological and Behavioral Survey, Bureau of Epidemiology

Male Sex Worker (MSW, %)

PROVINCE	NUMBER OF SAMPLE SIZE	EXPERIENCED S&D IN FAMILY IN THE PAST 12 MONTHS	EXPERIENCED STIGMA AND DISCRIMINATION IN HEALTH CARE SETTING IN THE PAST 12 MONTHS	DECIDED NOT TO GO FOR HEALTH SERVICES IN THE PAST 12 MONTHS	REPORTED INTERNALIZED STIGMA	EXPERIENCED SEXUAL VIOLENCE IN THE PAST 12 MONTHS
Bangkok	150	0	7.3	8.5	16.7	8.7
Chiang Mai	116	5	13.8	12.6	31.9	21.6
Phuket	166	1.9	12.7	25.0	21.7	15.7
Chonburi	144	1.3	2.8	8.5	20.8	4.2

DATA SOURCE: 2016 Integrated Biological and Behavioral Survey, Bureau of Epidemiology

Female Sex Worker (FSW, %)

PROVINCE	NUMBER OF SAMPLE SIZE	EXPERIENCED S&D IN FAMILY IN THE PAST 12 MONTHS	EXPERIENCED STIGMA AND DISCRIMINATION IN HEALTH CARE SETTING IN THE PAST 12 MONTHS	DECIDED NOT TO GO FOR HEALTH SERVICES IN THE PAST 12 MONTHS	REPORTED INTERNALIZED STIGMA	EXPERIENCED SEXUAL VIOLENCE IN THE PAST 12 MONTHS
Bangkok	477	0.4	4.6	0.8	57.0	5.5
Lopburi	89	8.6	8.9	2.3	49.4	8.9
Rayong	253	1.3	8.3	4.4	45.1	10.7
Udonthani	187	1.4	8.6	6.4	60.9	8.6
Nakhonsawan	271	3.2	2.9	1.1	22.5	6.3
Pitsanulok	162	2.9	4.9	0.6	74.7	1.9
Phuket	319	3.1	10.7	4.1	49.5	5.6
Songkla	249	3.7	5.2	1.2	34.1	4.8

DATA SOURCE: 2016 Integrated Biological and Behavioral Survey, Bureau of Epidemiology

STIGMA AND DISCRIMINATION AMONG HEALTH CARE PROVIDERS, PEOPLE LIVING WITH HIV AND KEY POPULATIONS IN THAILAND:

EXTRAPOLATION PROCESS FOR NATIONAL ESTIMATES