

HIV, SYPHILIS, HEPATITIS  
B AND C SURVEYS  
AMONG PEOPLE WHO  
INJECT DRUGS

BANGKOK,  
CHIANG MAI,  
AND  
SONGKHLA,  
THAILAND-  
2019-2020

## INVESTIGATORS AND INSTITUTIONAL AFFILIATIONS

### Country Thailand AIDS Commission (CXAC)

#### Principal Investigators:

- Dr. Dusita Phuengsamran, Institute for Population and Social Research, Mahidol University,
- Assistant Prof. Dr. Apinun Aramrattana, Department of Family Medicine, Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand, responsible for protocol development, supervision on protocol implementation
- Dr. Taweessap Siraprasiri, Bureau of AIDS, TB and STI, Department of Disease Control, Ministry of Public Health, Thailand

#### Co investigators:

- Dr. Muhammadfahmee Talek, Faculty of Nurse, Prince of Songkla University, Pattani, Thailand
- Niphon Darawutthimaprakorn, Institute for Population and Social Research, Mahidol University, Nakorn Pathom, Thailand
- Kanittha Thaikla, Research Institute for Health Sciences, Chiang Mai University, Chiang Mai, Thailand
- Porntip Khemngern, National AIDS Management Center, Department of Disease Control, Ministry of Public Health, Thailand

### Non-governmental Organizations

Ozone Foundation

Raks Thai Foundation

Planned Parenthood Association of Thailand

Operational provincial ending AIDS plan (PRDDC)

### Funding and institutional involvement

Technical assistance was provided by UNAIDS for the preparation of the study protocol, the training, analysis and preparation of a final report.

## Technical Assistance and Report preparation

Technical Assistance during data collection and analysis and preparation of the report were provided by Lisa G. Johnston, Independent Consultant, LGJ Consultants, Inc., ([lsjohnston.global@gmail.com](mailto:lsjohnston.global@gmail.com), [www.lisagjohnston.com](http://www.lisagjohnston.com)) with funding from UNAIDS.

## Acknowledgements

We would like to thank all of those who participated in this survey, as well as:

- The Ozone foundation in Songkhla for helping us to select seeds
- Chana Hospital for helping us with the RDS site addition in Chana district as well as sharing benchmark data for population size estimation
- Planned Parenthood Association of Thailand (PPAT) for providing their Clinic at Dindaeng to be site for data collection.

## ABBREVIATIONS/ACRONYMS

HIV	Human Immunodeficiency Virus
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
HTC	HIV Testing and Counseling
MMT	Methadone Maintenance Treatment
MoPH	Ministry of Public Health
NHSO	National Health Security Office
NGO	Non-Governmental Organization
OST	Opioid substitution treatment
PEP	Post exposure prophylactic
PrEP	Pre exposure Prophylactic
RDS	Respondent Driven Sampling
STI	Sexually Transmitted Infection
UNAIDS	Joint United Nations Programme on HIV/AIDS
WHO	World Health Organization

## EXECUTIVE SUMMARY

### Background

This report presents findings of an survey to measure HIV, Syphilis, Hepatitis B (HBV) and C (HCV) among people who inject drugs (PWID) in Bangkok, Chiang Mai, and Songkhla, Thailand, conducted in May and June 2019. While the HIV prevalence in Thailand is just over one percent in the general population according to UNAIDS, prevalence has been found to be much higher among people who inject drugs (PWID). An HIV survey conducted in 2011 found HIV prevalence to be 20.5% among PWID, almost two times higher than that found among men who have sex with men (11.9%) and almost ten times higher than that found among female sex workers (1.7%). The primary objectives of this survey are to measure HIV prevalence and associated risk factors among PWID to inform programmatic and policy responses and provide a baseline from which to monitor epidemic trends.

### Methods

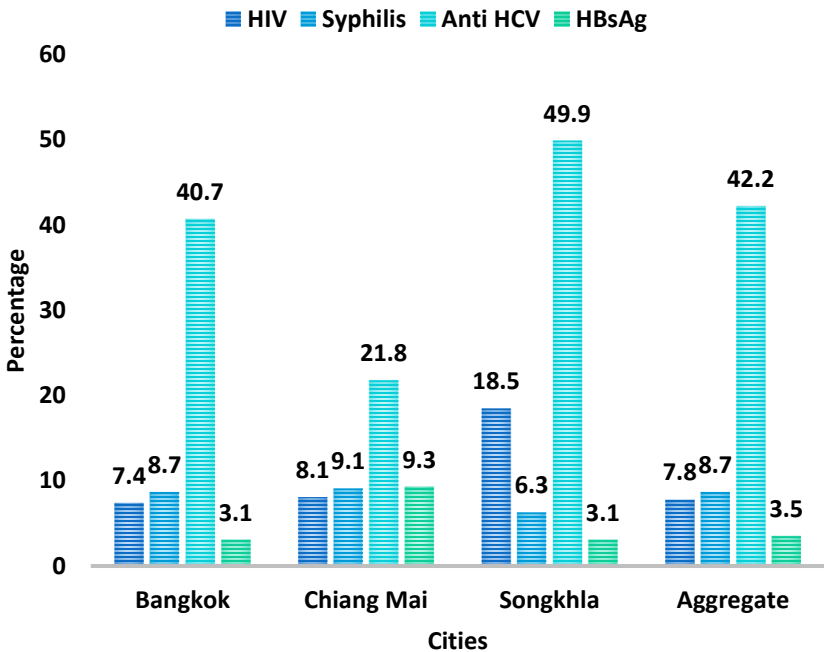
This surveillance survey used respondent-driven sampling (RDS) to obtain a sample of 261 PWID in Bangkok, 300 in Chiang Mai and 282 in Songkhla. Eligible persons were male or female, injected drugs for non-medical purposes in the past six months, aged 15 years and above, living in the survey area and being of Thai nationality. RDS is a chain-referral sampling method specifically designed to obtain probability-based samples of ‘hidden’ and hard-to-reach populations that are socially networked. After providing informed consent, respondents completed an interview and provided blood specimens for HIV, syphilis, hepatitis B (HBV, HBsAg) and Anti hepatitis C testing (HCV). Proportion estimates and corresponding 95% confidence bounds were adjusted for respondents’ probability of recruitment and differential network sizes and were calculated using RDS Analyst ([www.hpmrg.org](http://www.hpmrg.org)).

### Findings

Most PWID in each of the cities were male, had ever attended school, had at least a secondary education, were either single/never married or married as couple/living together and earned any income. The median age was highest in Songkhla (42 years) and lowest in Bangkok (24 years). Most PWID in each of the cities ever used Heroin, also known as “Putaw”, and Amphetamines, also known as “Yabaa”. PWID in Songkhla started injecting when they were older, had the highest number of years injecting and injected more often compared to PWID in Bangkok and Chiang Mai. The majority of PWID injected in the past month, among which most shared a needle or syringe during

their last injection. Most have tried to give up drugs in the past six months. Almost all PWID ever had sexual intercourse, with most reporting having their first intercourse between the ages of 15 and 19 years. The lowest percentages of PWID in all cities reported using condoms with a regular partner and the highest percentages reported using condoms with paid sex partners. Around 50% of PWID ever had an HIV test, among which almost all received their test results; 4% of which were positive in Bangkok and Chiang Mai and 25% of which were positive in Songkhla. Of those living with HIV, most initiated Antiretroviral therapy (ART). Low percentages of PWID have heard of post or pre exposure prophylactic (PEP or PREP) and reported being discriminated against or treated unequally when accessing different types of services because of injecting drugs.

**Table: Biological test results**



HIV prevalence ranged from 18% in Songkhla to 7% in Bangkok; Syphilis prevalence ranged from 6% in Songkhla to 9% in Bangkok and Chiang Mai; HCV prevalence ranged from 22% in Chiang Mai to 50% in Songkhla; and, HBV ranged from 3% in Songkhla and Bangkok to 9% in Chiang Mai.

**Conclusion**

The availability of ‘PWID friendly’

HIV testing and counseling settings, with access to HCV, Syphilis and HBV should be scaled up. Comprehensive treatment and harm reduction programs should include engaging psychiatric, psychological and mental health care, social services (for housing and job skills and employment and, other specialist health care (such as services, care and treatment for HIV, HCV, TB and other infections). Continued expansion of outreach and NGO drop-in services are needed to ensure PWID have access to a full range of harm reduction services.

# TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY</b>	<b>3</b>
BACKGROUND	3
METHODS	3
FINDINGS	3
CONCLUSION	4
<b>TABLE OF CONTENTS</b>	<b>5</b>
<b>BACKGROUND</b>	<b>7</b>
<b>SPECIFIC OBJECTIVES</b>	<b>9</b>
<b>METHODS</b>	<b>10</b>
RESPONDENT DRIVEN SAMPLING (RDS)	10
<b>SAMPLE SIZE CALCULATION</b>	<b>11</b>
RECRUITMENT PROCESS	11
STAFFING	12
BIOLOGICAL TESTING AND PROVISION OF TEST RESULTS	12
<b>DATA MANAGEMENT AND ANALYSIS</b>	<b>12</b>
<b>POPULATION SIZE ESTIMATION</b>	<b>13</b>
MULTIPLIER CALCULATION	14
SS PSE	14
<b>LIMITATIONS</b>	<b>14</b>
<b>USING THESE DATA TO BUILD KNOWLEDGE</b>	<b>15</b>
<b>FINDINGS</b>	<b>15</b>
OVERVIEW: PWID	15
SOCIO-DEMOGRAPHIC CHARACTERISTICS	15
DRUG USE BEHAVIORS	17
<i>General profile of PWID</i>	<i>17</i>
<i>Frequency of injection drug use</i>	<i>18</i>
<i>First drug use</i>	<i>19</i>
<i>First injection drug use</i>	<i>19</i>
<i>Drug use in past six months</i>	<i>21</i>
<i>Injection drug use behaviors-Ever and past month</i>	<i>23</i>
<i>Injection drug use behaviors-Past six months</i>	<i>23</i>
<i>Overdose</i>	<i>25</i>
TREATMENTS FOR PWID	25
SEXUAL RISK	27
<i>Sexual intercourse</i>	<i>27</i>
<i>Sexual partner types in the past 12 months</i>	<i>28</i>
<i>Sexual partner types in the past month</i>	<i>29</i>
<i>Last partner type in last 12 months</i>	<i>30</i>
<i>Number of sexual partners by type</i>	<i>30</i>
<i>Condom use in the past one months</i>	<i>31</i>
<i>Drug use and sex</i>	<i>32</i>
<i>Frequency of condom use in the past month by partner type</i>	<i>32</i>
<i>Males who have sex with males</i>	<i>33</i>
PRISON AND DETENTION IN THE PAST 12 MONTHS	34
SEXUALLY TRANSMITTED INFECTIONS	35
HIV TESTING AND TREATMENT	36
HIV PREVENTION	38
HEPATITIS TESTING AND TREATMENT	40
PREP AND PEP	41
STIGMA AND DISCRIMINATION	41
HIV, SYPHILIS, HBSAG AND ANTI HCV TESTING PREVALENCE	44

<i>HIV, Syphilis, HCV and HBV Prevalence by sex</i>	44
<i>HIV, Syphilis, HBV and HCV Prevalence by age group</i>	45
<b>POPULATION SIZE ESTIMATIONS</b>	<b>46</b>
LIMITATIONS TO SIZE ESTIMATIONS	47
ALL POPULATION SIZE ESTIMATIONS	48
<b>DISCUSSION AND RECOMMENDATIONS</b>	<b>48</b>
CONCENTRATED HIV EPIDEMIC AMONG PWID	48
HIV STATUS AND ART	48
HIGH PREVALENCE OF HEPATITIS C INFECTION.	49
LOW SCREENING FOR STI; SYPHILIS INFECTION	49
INJECTION BEHAVIORS VARY BY CITY.	49
<i>Types of drugs</i>	49
<i>Sharing</i>	50
<i>Songkhla has some notable patterns</i>	50
TREATMENT PATTERNS VARY BY CITY	50
FEMALES AT HIGH RISK OF HIV	51
HIGH RISK SEXUAL PRACTICES	51
HIV TESTING AMONG PWID IS LOW.	52
PREP AND PEP	52
ACCESS TO HIV PREVENTIONS DIFFER BY CITY	52
PWID POPULATION SIZES OF PWID	53
<b>SUMMARY OF KEY RECOMMENDATIONS</b>	<b>53</b>
<b>APPENDIX A</b>	<b>55</b>
<b>APPENDIX B</b>	<b>56</b>
<b>APPENDIX C</b>	<b>58</b>
<b>APPENDIX D</b>	<b>61</b>

## BACKGROUND

According to Thailand's National AIDS Strategy, the country aims to End AIDS by 2030 through three goals and targets: (1) reduce new HIV infections fewer than 1,000 cases per year, (2) reduce AIDS-related deaths fewer than 4 000 cases per year, and (3) reduce HIV and gender related discrimination by 90%. To effectively design HIV/AIDS policies and interventions, reliable estimates and trends of HIV and sexually transmitted infections (STI) prevalence and related behavioral, social, and environmental factors that affect HIV and STI transmission among key populations most likely to acquire or transmit HIV in Thailand are needed. Currently, the estimate HIV prevalence among the general population in Thailand is about 1.1%, the highest in the South East Asia region. Thailand's commitment to accelerating an end to AIDS and achieving HIV infection rates below 1,000 cases per year by 2030 is challenged by persistently high HIV infection burdens and substantial service access gaps in key populations most likely to acquire or transmit HIV, including people who inject drugs (PWID). Based on seizures, the most abused illicit drug in Thailand is reported to be tablet methamphetamine ("Yaaba"); crystallized methamphetamine (Ice), heroin, ketamine and cannabis are smuggled through Thailand to the third countries .

As of 2014, there are an estimated 42,652 PWID in Thailand, among which one quarter are in Bangkok, with an estimated HIV prevalence of 20.5%; this is almost two times higher than that found among males who have sex with males (11.9%) and almost ten times higher than that found among females sex workers (1.7%). Sixty one percent of PWID reported having an HIV test and receiving their results in the past year. Hepatitis C (HCV) prevalence among PWID is reported to be 60-70%. Although, 95% of PWID have reported using clean needles and syringes during their last injection, most were accessing their needles and syringes from pharmacies and friends, rather than from outreach services.

Government efforts to provide services to PWID are improving. Thailand is one of the only countries in Asia which allocated domestic resources for methadone maintenance treatment (MMT) as well as drug use treatment. In 2016, the National Health Security Office (NHSO) alone reported 6,400 people on MMT; data from other health insurance agencies are not available. Publicly funded needles and syringes has been contentious. However, the government implemented a pilot harm reduction



program in 19 provinces in 2014. This was scaled up to 36 provinces in 2017<sup>1</sup>. In addition, the Ministry of Public Health (MoPH) provided policy directions ordering all hospitals to provide voluntary drug dependence treatment and rehabilitation services<sup>2</sup>. For HCV, interferon-based HCV treatment is reimbursable by the NHSO. Nevertheless, there are multiple challenges in ensuring universal diagnosis and treatment among PWID. There are also ongoing challenges around adherence and ensuring that PWID can access multiple services to address their other health needs ranging from hepatitis and other co infections, ongoing substance use (particularly the use of amphetamines and benzodiazepines), mental health issues and criminalization.

There is little current information about the HIV prevalence and risk behaviors among PWID in Bangkok, Chiang Mai or Songkhla. Nationwide, it is estimated that as of 2015, there are 42,000 PWID, of which 20.5% are living with HIV, in Thailand (UNAIDS/atlas). Bangkok, Thailand's capital, and most populous city has the most information about injection drug use given that several important studies have been carried out there. The last HIV survey of PWID conducted in Bangkok in 2009, found HIV prevalence to be 23.6%<sup>3</sup>. The Bangkok Tenofovir Study, a pre-exposure prophylaxis (PEP) trial conducted among PWID from 2005 to 2013, found that 44.3% of PWID had anti-HCV antibodies<sup>4</sup>. Chiang Mai is a major city in the mountainous northern region of Thailand. The city is situated near the 'Golden Triangle', a major source of opium production in the past, and more recently an entry route for both heroin and methamphetamine from bordering countries. The last HIV survey of PWID conducted in Chiang Mai in 2009, found HIV prevalence to be 10.9%.<sup>5</sup> Songkhla is in Southern Thailand, near the border of Malaysia, and considered a major route for drug trafficking. The last HIV survey of PWID conducted in Songkhla in 2010, found HIV prevalence to be 22%<sup>6</sup>

---

<sup>1</sup> See Order of the National Command Centre for Combatting Drugs No. 2/2017.

<sup>2</sup> MoPH 0228.13/32744, 17 October 2016

<sup>3</sup> Prybylski D, Manopaiboon C, Visavakum P, Yongvanitjitt K, Aramrattana A, Manomaipiboon P, et al. Diverse HIV epidemics among people who inject drugs in Thailand: Evidence from respondent-driven sampling surveys in Bangkok and Chiang Mai. *Drug Alcohol Depend.* 2015;148:126–35.

<sup>4</sup> Martin M, Vanichseni S, Leelawiwat W, Anekvorapong R, Raengsakulrach B, Cherdtrakulkiat T, et al. Hepatitis C virus infection among people who inject drugs in Bangkok, Thailand, 2005-2010. *WHO South-East Asia J public Heal.* 2019;8(1):50–5.

<sup>5</sup> Prybylski D, Manopaiboon C, Visavakum P, Yongvanitjitt K, Aramrattana A, Manomaipiboon P, et al. Diverse HIV epidemics among people who inject drugs in Thailand: Evidence from respondent-driven sampling surveys in Bangkok and Chiang Mai. *Drug Alcohol Depend.* 2015;148:126–35.

<sup>6</sup> Visavakum P, Punsuwan N, Manopaiboon C, Pattanasin S, Thiengtham P, Tanpradech S, et al. HIV prevalence and risk behaviors among people who inject drugs in Songkhla, Thailand: A respondent-driven sampling survey. *Int J Drug Policy.* 2016;31:163–7. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4935539/>

Given PWID high-risk behaviors and the efficient transmission of HIV through the sharing of needles, syringes and other injecting paraphernalia, actionable and representative data a survey was conducted in Bangkok from February to March 2020, in Chiang Mai from May and June 2019 and in Songkhla from December 2019 to March 2020. This survey used a peer to peer recruitment method, respondent driven sampling (RDS), to sample socially networked PWID. This report presents findings from this survey as well as population size estimations calculated through service multiplier and successive sampling population size estimation techniques.

## **SPECIFIC OBJECTIVES**

Specific objectives of the survey were to measure the prevalence of HIV and syphilis and associated risk behaviors (sexual and injecting), among PWID in Bangkok, Chiang Mai and Songkhla. Additional survey objectives include:

- Measuring Syphilis, HBsAg and Anti HCV.
- Measuring key socio-demographic characteristics.
- Quantifying alcohol and non-injection and injection drug use.
- Assessing the use of and access to HIV and STI related and health programs.
- Assessing the knowledge of and attitudes towards HIV/AIDS.
- Evaluating stigma and discrimination in health care settings.
- Measuring STI occurrence and treatment seeking behaviors.
- Evaluating knowledge of and access to prevention services.
- Estimating the size of the PWID population.
- Strengthening the research capacities of national teams.
- Developing recommendations to guide programs and expand services and identify means to increase PWID programs coverage and uptake.
- Establishing evidence to increase resources available to and organizations that serve PWID.

## METHODS

### Respondent Driven Sampling (RDS)

This survey used RDS to sample PWID. RDS is a variant of chain referral sampling method which, when implemented and analysed properly, yields data representative of the population networks from which the samples were gathered<sup>7,8</sup>. Several theoretical and mathematical techniques borrowed from various disciplines are used to develop a sampling frame and to mitigate several well-known biases common with chain referral methods. RDS is specifically designed to sample hard-to-reach and hidden populations that form social networks. Recruitment in RDS is initiated with a few purposefully selected members of the study population referred to as “seeds”. After enrolling and completing the steps in the survey, each seed is given a fixed amount (usually no more than three) of uniquely numbered coupons with which to recruit peers (other eligible PWID) into the survey. These recruited peers, who also enrol in and complete the survey steps, are the first wave of respondents. Each respondent in the first wave who enrolls in and completes the survey steps is then provided a fixed number of coupons with which to recruit their peers into the survey. Successive waves of recruitment, ideally resulting in long recruitment chains of respondents, continue until the sample size is reached. Each respondent is asked their social network size which is measured using the survey eligibility criteria and sets up the probability of each recruit’s selection into the sample. Self-reported social network sizes are considered the sampling frame used to produce weights for deriving estimates. Weights are applied inversely whereby those with larger social network sizes (the ability to recruit more participants and normally overrepresented in a standard snowball sampling method) are provided relatively less weight and those with smaller social network sizes are provided relatively more weight. Furthermore, data are analysed with mathematical modelling of the recruitment process (social network ties of recruits-recruiters) to generate relative inclusion probabilities. The recruitment process of who recruited who is monitored through the unique numbers on each participant’s recruitment coupon. The unique coupon numbers also ensure respondents’ anonymity by linking each respondent to their questionnaire and biological test results, thereby avoiding the

---

<sup>7</sup>Heckathorn DD. (1997) Respondent-driven sampling: A new approach to the study of hidden populations. *Sociological Problems*. 44 (2), 174-199.

<sup>8</sup>Heckathorn, DD. (2002). Respondent driven sampling II: deriving valid population estimates from Chain-Referral samples of hidden populations. *Sociological Problems*, 49(1), 11-34.

need to collect names, addresses or other personal information. When all methodological and theoretical requirements are fulfilled, RDS yields estimates of population parameters upon which inferences can be made about characteristics and behaviors of the network of the population sampled.

## Sample Size Calculation

Because this survey is intended to be conducted repeatedly (every few years), the sample size calculation was based on the prediction of a change over time in a specific variable of interest using the following formula:  $n = D ((z\alpha + z\beta)^2 (p1q1 + p2q2) / (p2 - p1)^2)$ .

This survey used the indicator of 60% for Bangkok and Songkhla and 30% for Chiang Mai for the percent of PWID estimated to have received HIV test and learned their results in past year to detect a 15% change over time between this survey and the following survey round (i.e., an increase in HIV testing from 60% [p1] to 65% [p2] or 30% to 45%). In addition, the sample size was calculated using an alpha ( $Z\alpha$ ) of 1.65 (the value used for a confidence level of 95%), a beta ( $Z\beta$ ) of 0.84 (the value used for a power of 80%) and a design effect (D) of two (Table 1). The final sample size was calculated to be 325.

**Table 1. Definitions for the sample size calculation formula to survey PWID**

Formula term	Calculation for Chiang Mai	Calculation for Bangkok and Songkhla
<b>D (design effect)</b>	2	2
<b>p1 (baseline)-Proportion at baseline</b>	0.30	0.60
<b>p2 (final evaluation) Proportion expected in the next round</b>	0.45	0.65
<b>Z<math>\alpha</math> (95%)-standard error associated with a level of confidence of 95%</b>	1.64	1.64
<b>Z<math>\beta</math> (80%)-level of power in for the analysis</b>	0.84	0.84
<b>n (sample size)</b>	325	300

## Recruitment Process

The survey began with three seeds, selected to recruit diverse eligible PWID from their social networks. Each seed received three uniquely coded coupons which were used to recruit their peers into the survey. Respondents who presented a valid recruitment coupon to the survey site were screened for eligibility and provided informed consent for a face-to-face interview, HIV pre-test

counseling and a blood extraction for HIV, syphilis, HBsAg and Anti HCV testing. Interviews were conducted in Thai by trained interviewers and took approximately 45 minutes to complete. The questionnaire collected data on socio-demographic characteristics, sexual and drug risk behaviors, HIV transmission, HIV and STI signs and symptoms, HIV knowledge, stigma and discrimination, information on respondents' social network sizes, as well as access to and utilization of HIV and STI related services. Following the interview, each respondent received up to three coupons to use to recruit eligible peers. Respondents received a primary compensation of 300 Baht for transportation costs and a secondary compensation worth 100 Baht for each eligible recruit who completed the survey. Survey completion consisted of completing the behavioral questionnaire and the biological testing. No personal identifying information was collected. To ensure confidentiality, respondents' questionnaires and biological tests were identified using a unique study identification number provided on the recruitment coupons.

## **Staffing**

All staff members were trained for five days on their staff roles and responsibilities, seed selection and respondent recruitment, the ethical consent process, coupon and respondent tracking, incentive compensation, administration of the behavioral questionnaire, collection of biological samples, biological sample processing and transport and provision of biological test results and referrals. Staff members in each site comprised a team of six persons: one field supervisor, one screener/coupon manager, three interviewers, and one nurse or other lab professional.

## **Biological testing and provision of test results**

Pre and posttest counseling and the blood draw were conducted by the nurse. Participants received their HIV, syphilis, HBsAg and Anti HCV test results on the same day of enrollment, with confirmatory tests available either on the same day or within one week. Participants with positive test results were referred for appropriate care and treatment.

## **DATA MANAGEMENT AND ANALYSIS**

Data were entered daily and stored into three databases: 1) to monitor recruitment progress, track coupon numbers; 2) to store data from the biological test results; and, 3) to store data from the behavioral survey. Double entry procedures, data cleaning and quality control were conducted, and

final datasets were merged and underwent consistency checks. Data were formatted and coded in SPSS and Microsoft Excel before being transferred to RDS Analyst ([www.hpmsg.org](http://www.hpmsg.org)). Convergence and bottlenecks were assessed on several key variables. Population proportions and 95% confidence intervals were derived using the successive sampling estimator<sup>9</sup> and adjusted for differential recruitment and social network sizes. Significant differences between the cities can be determined by looking at whether the confidence intervals do not overlap. Aggregated analysis was conducted in STATA using an aggregated network size weight from RDS Analyst, generated for each city, and by each city's population size.

## POPULATION SIZE ESTIMATION

The PWID population sizes were estimated using the service multiplier method<sup>10</sup> and the successive sampling population size estimation (SS-PSE)<sup>11</sup> technique. Service multipliers use service data consisting of the unique counts of PWID who received a service during a specific six months period prior to initiating the RDS study. The second multiplier was enumerated during the RDS survey by asking each respondent whether they had exposure to the service at least one time during the same six-month period.

The assumptions for the multiplier are:

- Two overlapping data sources (specific to the group being counted)
- Population being counted must have non-zero probability of inclusion in both sources
- One data source (i.e. the survey) must be random and include the group in the multiplier
- Second data source (multiplier) need not be random but must be specific to group estimated
- No individual accounted for more than once in the multiplier
- Two data sources must be independent of each other
- Limited in- and out-migration

---

<sup>9</sup>Gile KJ, Handcock MS. Respondent-driven sampling: an assessment of current methodology. *Sociol Methodol.* 2010;40(1):285–327. Available from: <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=3437336&tool=pmcentrez&rendertype=abstract>

<sup>10</sup>UNAIDS. Guidelines on Estimating the Size of Populations Most at Risk to HIV. Accessed on August 15, 2012 at: [http://whqlibdoc.who.int/publications/2010/9789241599580\\_eng.pdf](http://whqlibdoc.who.int/publications/2010/9789241599580_eng.pdf).

<sup>11</sup>Handcock MS, Gile KJ, Mar CM. Estimating hidden population size using Respondent-Driven Sampling data. *Electron J Stat.* 2014;8(1):1491–521. Available from: <http://projecteuclid.org/euclid.ejs/1409619420>; Johnston LG, McLaughlin KR, Rhilani HE, Latifi A, Toufik A, Bennani A, et al. Estimating the size of hidden populations using respondent-driven sampling data: Case examples from Morocco. *Epidemiology.* 2015;26(6).

## Multiplier Calculation

The number of PWID who accessed the service was used as a numerator (M) and the proportion who reported accessing the service was used as the denominator (P). The formula to calculate the size of the population is:  $N = M/P$

Where: N=Estimated Size; P=Proportion of PWID in survey who reported accessing the service; and, M=Number of PWID reported by services to have accessed the service.

## SS PSE

The SS-PSE method uses each participants' social network size data gathered during the RDS survey to quantify population sizes by assuming that the network size distribution of successive waves reflects a depletion of the population. The estimates use a Bayesian framework (i.e., quantifies uncertainty about unknown quantities by relating them to known quantities) incorporating information about a "guess" or prior knowledge of the size of the sampled population. The Bayesian framework also allows the computation of probability intervals.

## LIMITATIONS

This survey was subject to several limitations. Because behavioral data were self-reported in a face-to-face interview, social desirability bias may have resulted in misreports of risky sexual practices and drug use behaviors. To prevent double-enrolment and ensure all respondents met eligibility criteria, recruits attending the survey sites were screened by a trained screener with experience working with the PWID population. PWID who tried to enrol in the survey and were found to have already participated or who were found to be ineligible, had their coupon taken away by a staff member and were asked to leave the premises. Although the estimates presented here may be considered representative of the population network from which respondents were recruited, the small number of values for certain variables may limit the ability to derive accurate estimates. In some cases, confidence intervals are too wide for meaningful interpretation. Further, as analysis in RDS Analyst depends on the integrity of recruitment chains to adjust estimates, missing values may distort adjusted proportion estimates. Finally, data collection in Bangkok and Songkhla were conducted during the months of government restrictions caused by COVID 19 which may have impact on the representativeness of these data.

## USING THESE DATA TO BUILD KNOWLEDGE

Estimates and confidence intervals presented here should represent the network of the population. For some variables, the confidence intervals are very wide or cannot be computed. Estimates with wide or no confidence intervals should be interpreted with extreme caution. Data from this survey should be triangulated with other relevant data from sentinel surveillance, HIV testing and counseling (HTC) centers, non-governmental organizations (NGO) working with high risk populations, one time studies and mapping and other qualitative exercises to build the most optimal understanding of how HIV is affecting PWID. In addition, these data should be used, along with other data, to model epidemic trends in the country.

## FINDINGS

### Overview: PWID

The three HIV surveys were conducted between 2019 and 2020. In Bangkok 261 PWID (including four seeds), in Chiang Mai 300 PWID (including three seeds) and, in Songkhla 282 PWID (including four seeds) were sampled. The maximum number of waves reached in the Bangkok and Songkhla recruitment chains was 14 and maximum number of waves reached in the Chiang Mai chains was 11.

### Socio-demographic characteristics

Most PWID are male, ever attended school, have at least a secondary education, are either single and never married or married as couple or living together and earning any income (Table 2). Only 5% in Songkhla are female and 6% are under the age of 25 years. The highest percentage of divorced or widowed PWID are in Songkhla (19%) and the highest percentage of single PWID are in Bangkok (47%). The median age is highest in Songkhla (42 years) and lowest in Bangkok (24 years).

**Table 2. Sociodemographic characteristics among PWID**

	Bangkok n=261		Chiang Mai n=300		Songkhla n=282		Aggregated n=843	
	n	95% CI	n	95% CI	n	95% CI	n	95% CI
<b>Sex</b>								
Male	213	81 (75.7, 86.3)	255	83.6 (78.9, 88.4)	268	95.2 (92.9, 97.4)	736	81.6 (76.1, 86.1)
Female	48	19 (13.7, 24.3)	45	16.4 (11.6, 21.1)	14	4.8 (2.6, 7.1)	107	18.4 (14.0, 23.9)
<b>Age (mean, median, range)</b>								
	261	29.6, 24, (15-68)	300	34.5, 34, (15- 68)	282	41.7, 42 (16 -71)	843	30.4, 36 (15-71)
<b>Age</b>								
15-24	125	52 (36.6, 67.3)	81	26.7 (18.4, 34.8)	13	5.9 (2.8, 9)	219	48.6 (42.1, 55.2)
25+	136	48 (32.7, 63.4)	219	73.3 (65.2, 81.6)	269	94.1 (91, 97.2)	624	51.4 (44.8, 57.9)

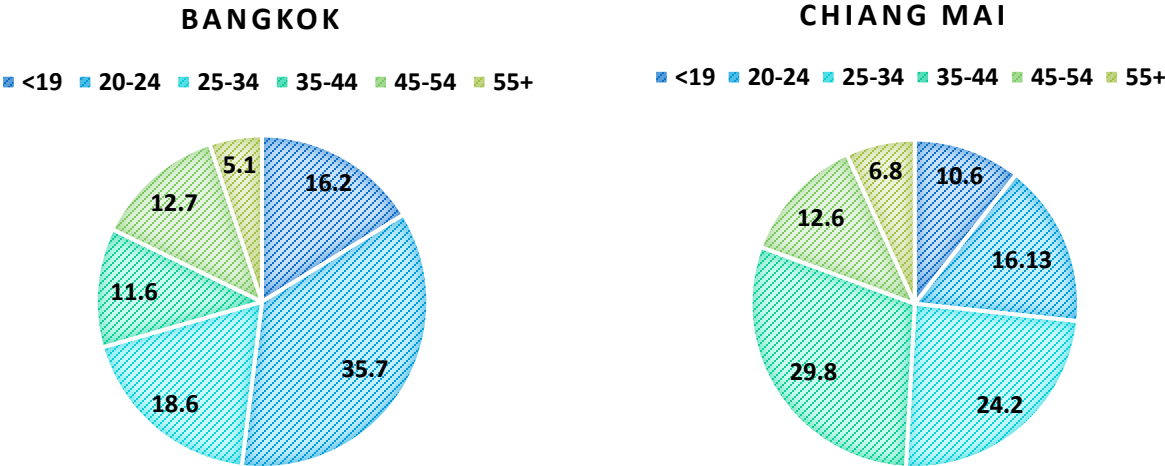


<b>Ever attended school</b>									
	260	99.5 (98.7, 100)	237	80.2 (75.0, 85.3)	281	99.4 (98.3, 100)	778	98.0 (96.8, 98.7)	
<b>Education Level *</b>									
Primary level	92	33.9 (29.2, 38.6)	112	48.3 (41.7, 54.9)	125	46.5 (41.9, 51.1)	329	35.3 (29.3, 41.8)	
Secondary level	95	35.2 (28.4, 42.1)	75	32.0 (25.5, 38.5)	91	32.3 (27.6, 37)	261	34.8 (28.8, 41.2)	
High school Diploma or equivalent	69	29 (21.4, 36.6)	45	18.1 (11.9, 24.1)	59	19.9 (15.7, 24.1)	173	28.1 (22.3, 34.8)	
Bachelor's degree/ College and Above	4	1.9 (0, 3.7)	5	1.7 (0.2, 3.3)	4	1.3 (0.1, 2.5)	13	1.9 (0.7, 4.6)	
<b>Current relationship status</b>									
Single, never married	125	46.6 (38.4, 54.8)	128	43.9 (39.0, 48.7)	90	33 (28.6, 37.3)	343	45.9 (39.5, 52.5)	
Married as couple/ living together	99	40.5 (32, 48.8)	120	38.3 (33.9, 42.8)	114	41.5 (36.4, 46.7)	333	40.3 (34.0, 47.0)	
married as couple/ living separately	23	7 (3.7, 10.4)	17	5.9 (3.3, 8.4)	16	6.1 (3.4, 8.9)	56	6.9 (4.6, 10.3)	
Divorced/widowed	14	6 (2.7, 9.4)	35	11.9 (8.3, 15.6)	55	19.4 (15, 23.7)	104	6.9 (4.4, 10.6)	
<b>Earn any income</b>									
	174	66.5 (59.7, 73.4)	221	73.6 (68.6, 78.8)	196	74 (69.4, 78.7)	591	67.3 (60.8, 73.2)	
<b>Amount earned in THB/Month (of those who earn any income)</b>									
<5, 000	17	9.6 (4.8, 14.4)	40	18.6 (13.3, 24.0)	83	42.1 (34.8, 49.1)	140	11.4 (7.7, 16.5)	
5, 001-10, 000	53	28.4 (20.8, 36.1)	136	61.4 (54.7, 68.0)	88	46.2 (39.4, 53.1)	277	31.9 (25.3, 39.2)	
10, 001-20, 000	93	58.1 (49.6, 66.6)	38	17.3 (12.5, 22.2)	18	10 (4.7, 15.5)	149	53.1 (45.3, 60.7)	
>20, 000	11	3.9 (1.2, 6.5)	6	2.7 (0.6, 4.7)	4	1.8 (0.2, 3.3)	21	3.7 (2.0, 6.9)	

\*No one reported being ordained/studied Buddhist temples or Koranic school.

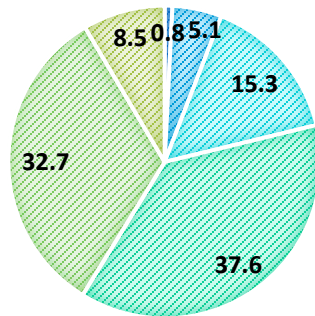
The largest percentage of PWID in Bangkok are between the ages of 20 and 24 years, whereas the largest percentage of PWID in Chiang Mai and Songkhla are between 35 and 44 years (Figure 1). The largest aggregated percentage, weighted by population size, are between 20 and 24 years.

Figure 1. Age groups among PWID



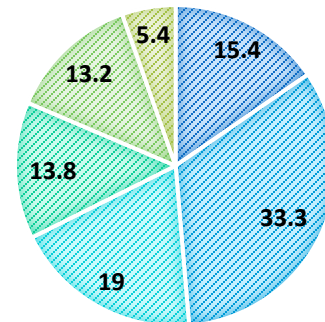
## SONGKHLA

■ <19 ■ 20-24 ■ 25-34 ■ 35-44 ■ 45-54 ■ 55+



## AGGREGATE

■ <19 ■ 20-24 ■ 25-34 ■ 35-44 ■ 45-54 ■ 55+



## Drug use behaviors

### General profile of PWID

Most PWID in each of the cities ever used Heroin, also known as “Putaw”, and Amphetamines, also known as “Yabaa” (Table 3). PWID in Chiang Mai had higher usage of Amphetamine (shabu) and Opium and Morphine compared to Bangkok and Songkhla and PWID in Bangkok had a higher usage of cannabis compared to Chiang Mai and Songkhla.

**Table 3. Types of drugs ever used**

	Bangkok n=261		Chiang Mai n=300		Songkhla n=282		Aggregated n=843	
	n	95% CI	n	95% CI	n	95% CI	n	95% CI
<b>Types of drugs ever used</b>								
Heroin (Putaw)	199	73.6 (66.8, 80.3)	250	82.2 (77.4, 87)	176	61.6 (56.1, 67.2)	625	73.8 (67.3, 79.5)
Diazepam (Valium)	44	18 (12.2, 23.9)	17	5.3 (3.2, 7.3)	23	7.8 (5, 0.6)	84	16.7 (12.1, 22.6)
Amphetamine, Shabu	98	33.8 (26.2, 41.5)	232	77.1 (73, 81.2)	126	43.5 (38.3, 48.6)	456	37.6 (31.7, 43.8)
Suboxone	2	0.3 (0.1, 0.8)	2	0.6 (0, 1.2)	2	0.6 (0, 1.1)	6	0.4 (0.1, 1.3)
Methadone	49	16.8 (11.5, 22.1)	123	39.5 (33, 46)	69	24.6 (19.8, 29.4)	241	18.8 (14.7, 23.7)
Codeine	11	2.5 (1, 3.9)	15	4.4 (2.4, 6.4)	3	0.8 (0.2, 1.4)	29	2.6 (1.5, 4.5)
Ketamine	81	29.7 (22.9, 36.5)	15	5.2 (2.7, 7.8)	4	1.3 (0.2, 2.3)	100	26.9 (21.3, 33.3)
Methamphetamine /Ecstasy	123	45.9 (37.7, 54.1)	90	28.8 (24.4, 33.3)	65	24.2 (19.1, 29.2)	278	43.9 (37.5, 50.5)
Amitriptyline	8	3.2 (0.7, 5.8)	6	1.5 (0.5, 2.5)	0	--	14	3.0 (1.4, 6.3)
LSD	6	3.3 (0.3, 6.3)	8	2.6 (0.4, 4.8)	0	--	14	3.2 (1.2, 7.8)
Benzodiazepine/ alprazolam	58	23.2 (17, 29.2)	60	18.2 (14, 22.3)	1	0.3 (0.1, 0.6)	119	22.0 (16.8, 28.4)
Marijuana*	189	71.5 (65.6, 77.6)	164	53.7(48.5, 58.9)	168	60.3 (55.2, 65.4)	521	69.8 (63.8, 75.2)
Alcohol	68	24.3 (18, 30.6)	119	40.8 (34.9, 46.6)	77	27.7 (23, 32.4)	264	25.7 (20.5, 31.7)
Fentanyl^	12	3.7 (1.4, 6)	7	2.6 (0.8, 4.4)	5	1.5 (0.3, 2.7)	24	3.5 (1.9, 6.4)
Gorilla**	0	--	11	3.2 (1.5, 5)	5	1.4 (0.6, 2.2)	16	0.3 (0.2, 0.5)
Opium/Morphine	24	8.4 (3.8, 13)	110	34.2 (28.4, 40.1)	13	4.3 (2.3, 6.4)	147	10.3 (7.1, 14.8)
Leaf	100	39 (31.7, 46.2)	51	17.5 (13.8, 21.2)	88	31.7 (26.9, 36.5)	239	37.1 (30.9, 43.7)

\*Also known as Hash, Ganja, cimeng, gele, gelok; \*\*Also known as Synthetic marijuana/ Cannabinoids; ^ Synthetic heroin.

### Frequency of injection drug use

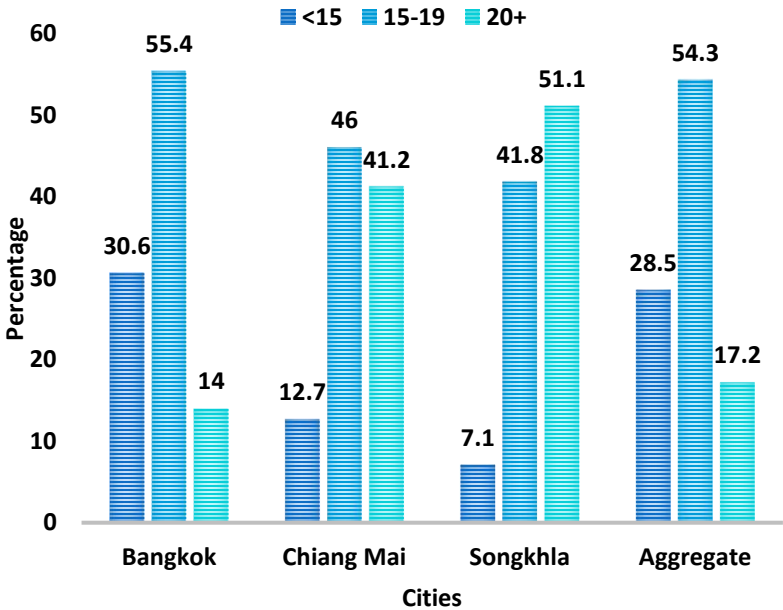
Almost 50% of PWID in Songkhla have been injecting drugs for 11 or more years, whereas over 50% of PWID in Bangkok and Chiang Mai have been injecting drugs five years or less (Table 4). Over 50% of PWID in Songkhla injected in the past 24 hours, just over 50% of PWID in Bangkok injected in the past week and just over 50% of PWID in Chiang Mai injected in the past 30 days. Among those injecting in the last day, PWID in Bangkok and Chiang Mai injected a median of two times and in Songkhla a median of once. Of those who injected in the past week, PWID in Songkhla injected a median of seven days, in Bangkok a median of four days and in Chiang Mai a median of three days. Of those injecting in the past week, PWID in Bangkok and Songkhla injected a median of seven times and in Chiang Mai a median of six times.

**Table 4. Frequency of injecting drugs**

	Bangkok n=261		Chiang Mai n=300		Songkhla n=282		Aggregated n=843	
	n	95% CI	n	95% CI	n	95% CI	n	95% CI
<b>Years injecting (mean, median, range)</b>	231	9.1, 4.0, (1-55)	250	8.3, 5.0 (1-47)	190	14.3, 11.5 (1-43)	671	9.1, 6 (1 – 55)
<b>Length of time injecting in years</b>								
6 months to year	30	10.6 (6.2, 14.9)	46	15.0 (10.7, 19.3)	6	3.5 (1, 6.1)	82	10.8 (7.6, 15.1)
1 to 5 years	130	50.4 (39.7, 61.4)	133	46.2 (41.1, 51.4)	46	26.4 (19.8, 34)	309	49.7 (43.2, 56.3)
6 to 10 years	32	14.2 (9.1, 19.3)	50	15.8 (12.0, 19.5)	40	21.2 (15.5, 27.2)	122	14.5 (10.2, 20.1)
11+ years	69	24.8 (13.6, 35.8)	67	23.1 (18.4, 27.6)	104	49 (39.8, 56.7)	173	23.2 (18.2, 28.9)
<b>Last time injected drugs</b>								
Today	47	15.4 (9.6, 21.1)	23	6.5 (4.2, 8.9)	62	22.1 (17.6, 26.5)	132	14.8 (10.8, 19.9)
Yesterday	51	22.9 (14.9, 30.7)	42	13.5 (9.5, 17.5)	90	33.4 (27.8, 39)	183	22.4 (17.2, 28.6)
2-7 days ago	56	19.2 (13.6, 24.9)	67	21.7 (17.3, 26)	55	20.2 (15.2, 25.2)	178	19.4 (15.0, 24.8)
8-30 days ago	31	12.9 (6.9, 18.8)	42	13.1 (9.6, 16.7)	23	9.2 (5.8, 12.7)	96	12.8 (8.9, 18.0)
1-3 months ago	58	23.6 (15.5, 31.7)	85	30.8 (25.6, 35.9)	18	7.1 (4, 10.2)	161	23.8 (18.6, 29.9)
4-6 months ago	18	6.1 (2.8, 9.5)	40	14.4 (9.6, 19.1)	23	8.1 (5.3, 10.8)	81	6.8 (4.5, 10.3)
<b>Times injecting, last day (mean, median, range)</b>	97	2.2, 2 (1-7)	65	2.5, 2 (1-12)	142	1.6, 1 (1–5)	304	2.2, 2 (1 -12)
<b>Days injecting, last week (mean, median, range)</b>	148	4.5, 4 (1-7)	131	3.8, 3 (1-7)	196	5.2, 7 (1–20)	475	4.5, 5 (1 -20)
<b>Times injecting, last week (mean, median, range)</b>	147	9.8, 7 (1-42)	131	8.4, 6 (1-45)	185	8.7, 7 (1–42)	463	9.7, 7 (1 -45)

*First drug use*

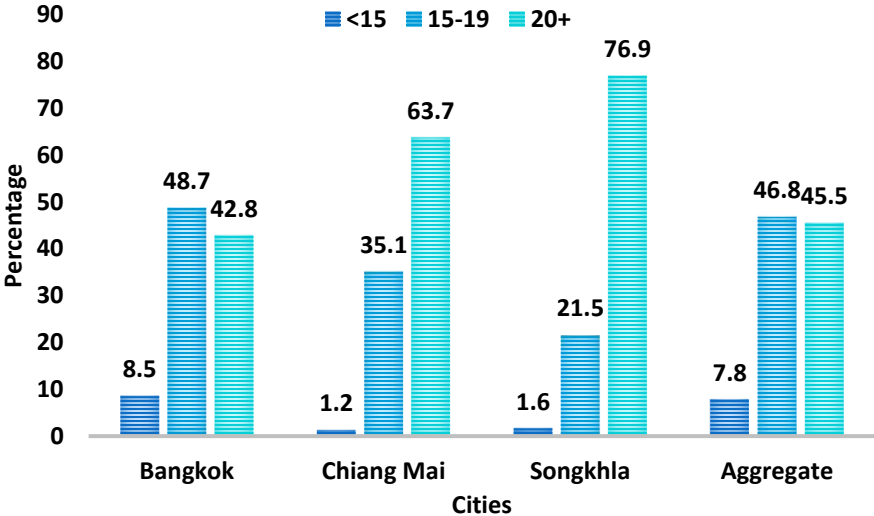
**Figure 2. Age of first drug use among PWID.**



PWID in Bangkok have the youngest median age of first drug use (16 years [range: 11-54], followed by Chiang Mai (18 years [range: 10 to 56]) and Songkhla (20 years [range 1 to 45]). The aggregate median age of first drug use is 18 years. The largest percentage of PWID in Bangkok first used drugs when they were below the age of 15 years (31%), followed by Chiang Mai (13%) and Songkhla (7%) (Figure 2).

*First injection drug use*

**Figure 3. Age first injection drug use among PWID**



The median age of first injection drug use among PWID in Bangkok was 19 years (range: 13 to 54 years) and for Chiang Mai (range: 13 to 68) and Songkhla (range: 5 to 54) was 21 years (Figure 3).

Over 90% of PWID in Bangkok and Songkhla and 63% in Chiang Mai first injected Heroin (Table 5).

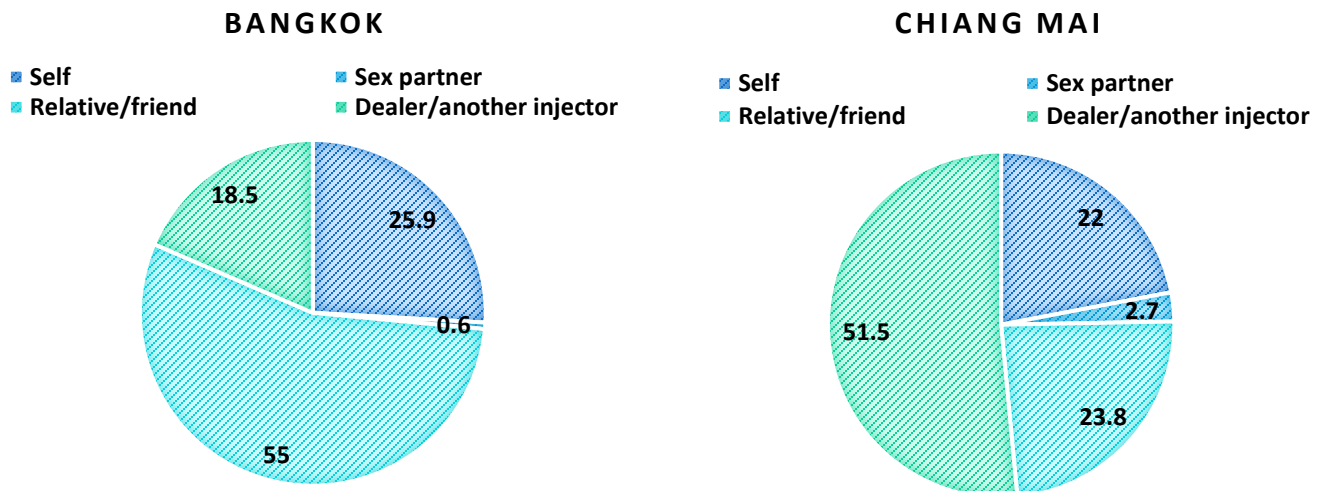
**Table 5. First injection drug use among PWID**

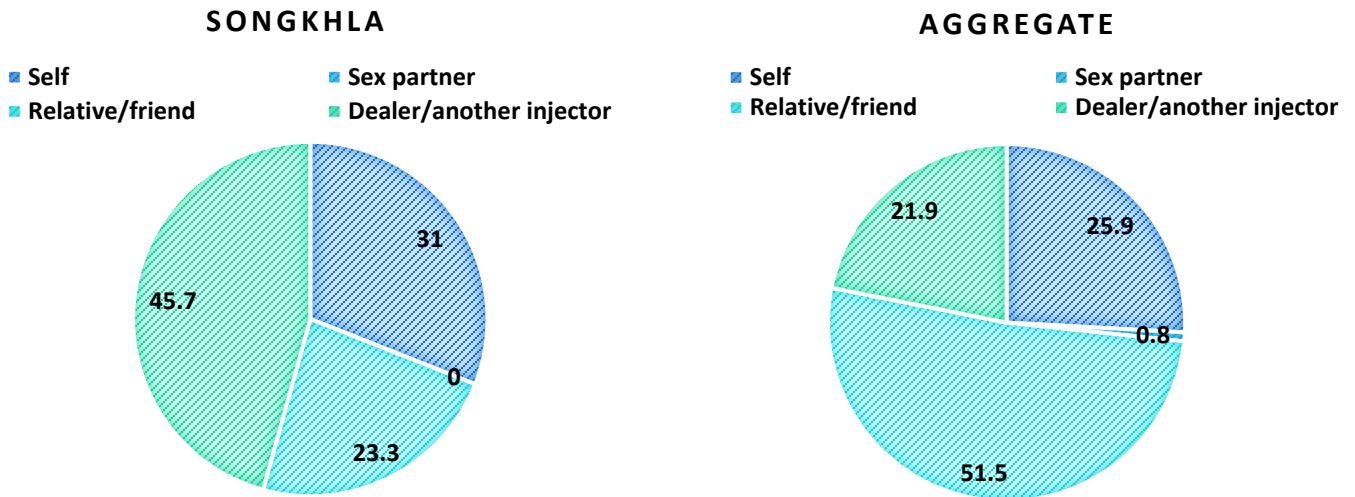
	Bangkok n=261		Chiang Mai n=300		Songkhla n=282		Aggregated n=843	
	n	95% CI	n	95% CI	n	95% CI	n	95% CI
<b>Drug first injected*</b>								
Heroin ( <i>Putaw</i> )	241	93.2 (89.6, 96.7)	193	63 (55.4, 70.6)	262	92.7 (89.6, 95.7)	722	91.4 (87.9, 94.0)
Amphetamine type stimulants	1	0.2 (0.2, 0.7)	59	21 (14.3, 27.7)	4	1 (0.4, 1.6)	6	0.3 (0, 1.3)
Heroin with another drug	18	6.9 (3.4, 10.4)	26	8.6 (5.9, 11.3)	40	15.3 (11.2, 19.4)	121	8.3 (5.7, 12.1)
Methadone/opium/morphine	5	1.9 (0.2, 4)	10	3.4 (1.4, 5.4)	6	2 (0.6, 3.3)	30	2.3 (1.0, 5.0)
Opium/Morphine	16	6 (2.9, 9)	10	3.4 (0.3, 6.5)	8	3 (1.2, 4.8)	35	5.7 (3.4, 9.3)
Cocaine	1	0.7 (0.4, 1.8)	1	0.3 (0, 0.8)	0	--	1	0.6 (0, 4.2)
benzodiazepine (alprazolam)	13	5.2 (2.2, 8.2)	1	0.3 (0, 0.7)	0	--	22	4.9 (2.7, 8.7)
Gorilla**	0	--	1	0.3(0.1, 0.8)	5	1.6 (0.4, 2.8)	6	0.3 (0, 1.3)
Heroin mixed with another drug	2	0.4 (0.2, 0.9)	0	--	7	2.4 (0.9, 3.9)	9	0.4 (0.1, 1.4)
Opium/Morphine	1	0.4 (0.1, 0.9)	16	5.2 (1.1, 9.3)	2	0.3 (0.1, 0.6)	19	0.7 (0.3, 1.8)

\*No responses for Fentanyl (synthetic heroin). \*\*Also known as Synthetic marijuana/ Cannabinoids.

The largest percentage of PWID in Bangkok were first injected by a relative or friend, whereas the largest percentage in Chiang Mai and Songkhla were injected by a dealer or another injector (Figure 4). Few or no PWID were first injected by a sex partner and roughly one quarter first injected themselves.

**Figure 4. By whom injected first time among PWID**





### Drug use in past six months

Of all drugs taken or injected in the past six months, most PWID in each of the cities used Heroin (Table 6). Notable differences in drug use in the past six months include a significantly lower percentage of Amphetamine (“Shabu”) and Methadone use in Bangkok compared to Chiang Mai and Songkhla and a significantly higher percentage of Methamphetamine/Ecstasy and a non-significant higher use of cannabis and leaf in Bangkok compared to Chiang Mai and Songkhla. Notable drug injection patterns included a significantly higher percentage of PWID in Chiang Mai and Songkhla injecting Heroin with another drug compared to Bangkok and a significantly higher percentage in Chiang Mai injecting Methadone, opium, morphine, and other similar drugs compared to Bangkok and Songkhla. A larger percentage of PWID in Songkhla injected more than one drug compared to Bangkok and Chiang Mai, among which most in Bangkok and Songkhla injected heroin with other drugs and most in Chiang Mai injected methadone with other drugs. Of those who injected in the previous six months, one quarter in Songkhla and Bangkok and 14% in Chiang Mai injected more than once a day.

**Table 6. Drug use in the past six months.**

	Bangkok n=261		Chiang Mai n=300		Songkhla n=282		Aggregated n=843	
	n	95% CI	n	95% CI	n	95% CI	n	95% CI
<b>Drugs used in past six months</b>								
Heroin (Putaw)	241	93.4 (89.2, 97.6)	208	69.1 (63.5, 74.6)	243	85.1 (81.1, 89)	692	91.2 (87.9, 93.7)
Diazepam (Valium)	10	3.4 (1, 5.7)	4	1.2 (0.2, 2.1)	4	1 (0.4, 1.7)	18	3.1 (1.5, 6.2)
Amphetamine	37	12.7 (7.4, 18.1)	146	48.3 (42.4, 54.2)	124	43.8 (38.4, 49.3)	307	16.5 (12.6, 21.2)
Suboxone	0	--	0	--	2	1 (0.3, 2.2)	2	--

Methadone	15	3.9 (1.8, 6)	90	28.7 (22.3, 35.1)	50	16.2 (12.5, 19.9)	155	6.2 (4.4, 8.7)
Codeine	3	0.6 (0.1, 1.3)	3	1.2 (0.1, 2.3)	0	--	9	0.7 (0.2, 1.9)
Ketamine	37	17.1 (9.8, 24.2)	4	1.6 (0, 3.2)	0	--	42	15.4 (10.6, 21.9)
Methamphetamine /Ecstasy	78	29.8 (23, 36.6)	30	9.5 (6.2, 12.7)	45	15.6 (11.8, 19.4)	153	27.8 (22.2, 34.0)
Amitriptyline	3	1 (0.2, 2.2)	3	0.9 (0, 1.9)	0	--	6	0.9 (0.3, 3.5)
LSD	1	1.4 (0.5, 3.3)	2	0.8 (0, 1.7)	0	--	3	1.3 (0.2, 8.0)
Benzodiazepine/ alprazolam	26	10.4 (5.8, 14.9)	46	13.9 (10.2, 17.6)	0	--	72	10.3 (7.0, 14.9)
Marijuana*	58	21.9 (16, 27.8)	46	13.9 (10.2, 17.6)	54	17.8 (14.2, 21.3)	173	21.5 (16.7, 27.2)
Alcohol	25	9.4 (4.6, 14.1)	46	15.9 (11.8, 20)	35	12.8 (9.2, 16.3)	106	10.0 (6.5, 15.1)
Fentanyl^	5	1.5 (0, 2.9)	2	0.7 (0, 1.6)	4	1.2 (0.1, 2.3)	11	1.4 (0.6, 3.5)
Gorilla**	2	0.6 (0.3, 1.5)	3	0.7 (0.1, 1.3)	1	0.2 (0.1, 0.4)	6	0.6 (0.1, 2.5)
Opium/Morphine	2	1.5 (-1.4, 4.4)	25	7.4 (4.6, 10.3)	2	0.3 (0.1, 0.6)	29	2.0 (0.6, 6.6)
Leaf	60	23 (16.6, 29.5)	10	3.2 (1.5, 4.9)	50	17.1 (13.3, 20.9)	120	21.3 (16.1, 27.6)
<b>Drugs injected in past six months</b>								
Heroin (Putaw)	244	94.3 (90.2, 98.3)	203	67 (61.1, 73)	239	82.7 (78.2, 87.2)	686	91.8 (88.6, 94.1)
Amphetamine type stimulants	4	1.1 (0, 2.1)	2	0.7 (0, 1.3)	2	0.6 (0.1, 1.2)	8	1.0 (0.4, 2.7)
Heroin/other drug	22	10 (5.4, 14.7)	75	26.2 (18.6, 33.6)	102	35.8 (30.8, 40.7)	199	12.1 (8.5, 16.9)
Methadone/opium/ morphine/ +other	6	2.9 (0.1, 6)	70	22.7 (15.5, 29.9)	16	6 (3.6, 8.4)	92	4.6 (2.5, 8.4)
Opium/Morphine	38	14.2 (8.8, 19.6)	11	3.4 (1.3, 5.4)	18	7.1 (4.2, 10)	67	13.1 (9.2, 18.3)
Cocaine	3	0.6 (0.1, 1.3)	0	--	0	--	3	0.5 (0.2, 1.7)
benzodiazepine (alprazolam)	13	6.2 (2.1, 10.4)	37	11.6 (8.1, 15)	1	0.2 (0, 0.4)	51	6.5 (3.7, 11.1)
Gorilla **	0	--	2	0.5 (0, 1.1)	7	2.5 (1, 3.9)	9	0.1 (0, 2)
Fentanyl ^	0	--	0	--	1	0.2 (0, 0.3)	1	--
Mixture of Heroin with another drug	5	2.8 (-1.1, 6.7)	0	--	13	4.7 (2.3, 7)	18	2.7 (0.9, 7.4)
Opium/Morphine	1	1.4 (-0.5, 3.2)	12	3.8 (1.5, 6.1)	1	0.2 (0, 0.3)	14	1.6 (0.3, 7.2)
<b>Injected more than one drug at the same time</b>								
	47	18.6 (13.4, 23.8)	57	18.2 (13.9, 22.6)	87	29.4 (24.4, 34.3)	191	19.0 (14.4, 24.6)
<b>Drugs injected at the same time ^</b>								
Heroin (Putaw)	36	74.1 (33.5, 114.5)	20	38.5 (25.6, 52.4)	84	96.3 (93, 100)	140	72.3 (57.9, 83.3)
Diazepam/Valium	1	1.3 (0.7, 1.9)	0	--	0	--	1	1.1 (0.2, 7.7)
Amphetamine	21	40.2 (22.9, 57.4)	13	23.5 (0, 55.7)	74	83.2 (74.1, 91.6)	108	40.8 (27.6, 55.6)
Methadone	6	17.5 (7.1, 28.1)	40	71.2 (56.6, 86)	3	3.3 (-0.9, 7)	49	21.1 (10.5, 37.8)
Methamphetamine/Ecstasy	25	44 (29.7, 57.9)	1	0.9 (0.5, 1.1)	15	15.5 (7.6, 21.9)	41	39.4 (26.2, 54.3)
Benzodiazepine/ alprazolam	8	23.2 (13.9, 32.9)	36	60 (28.2, 90.3)	0	--	44	24.9 (14.1, 40.1)
Gorilla **	0	--	1	0.9 (0.5, 1)	1	2.1 (0.7, 7.7)	2	0.2 ( 0.0, 0.7)
Fentanyl^	0	--	0	--	1	0.6 (0.2, 0.8)	1	0.0 ( 0.0, 1.5)
Opium/Morphine	0	--	2	3.2 (0, 7.9)	0	--	3	0.3 (0.0, 1.0)
<b>Frequency of injecting drugs in past six months</b>								
> one time/day	71	25.8 (19.4, 32.1)	50	14.5 (10.7, 18.3)	72	25 (20.1, 29.8)	193	24.9 (19.2, 31.5)
Once/day	45	17.1 (13.6, 20.6)	24	7.9 (4.2, 11.6)	68	26.3 (22, 30.8)	137	16.6 (12.6, 21.7)
Once/2-3 days	51	19.1 (13.9, 24.2)	60	19.5 (15.7, 23.4)	76	28.4 (23.5, 33.3)	187	19.3 (14.8, 24.9)
Once/4-5 days-week	40	15.4 (10.8, 19.9)	39	14.7 (10.6, 18.8)	35	13.8 (10.2, 17.5)	114	15.3 (11.2, 20.6)
Once/2-3 weeks	15	6.8 (1.3, 12.3)	43	14.9 (11.3, 18.5)	7	1.7 (1.4, 2.1)	65	7.3 (4.5, 11.8)
Once/month or less	38	15.9 (10.7, 21.1)	83	28.5 (23.2, 33.8)	16	4.7 (2.7, 6.6)	137	16.6 (12.5, 21.6)

\* Also known as Hash, Ganja, cimeng, gele, gelok; \*\*Also known as Synthetic marijuana/ Cannabinoids; ^No responses for Amitriptyline, mix heroin with another drug; ^ synthetic heroin.

### Injection drug use behaviors-Ever and past month

Most PWID injected in the past month, among which few shared a needle or syringe during their last injection (Table 7). Among PWID who ever injected with the same needle or syringe as others, a significantly higher percentage in Chiang Mai (34%) than Bangkok (18%) and Songkhla (7%) injected with the same needle or syringe as others. Of those, the median number of months that PWID reported doing so the last time was 12 in Bangkok and Chiang Mai and 2.5 in Songkhla.

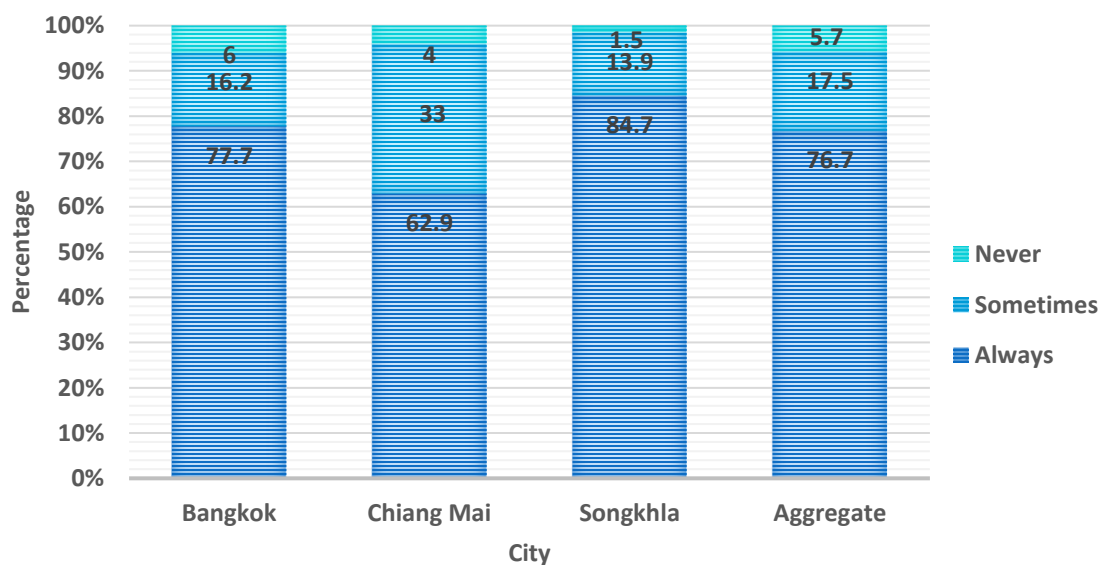
**Table 7. Ever and past month injection behaviors among PWID**

	Bangkok n=261		Chiang Mai n=300		Songkhla n=282		Aggregated n=843	
	n	95% CI	n	95% CI	n	95% CI	n	95% CI
<b>Injected in last month</b>								
	185	70.3 (62, 78.6)	174	54.5 (48.4, 60.7)	230	81.3 (77, 85.7)	589	69.3 (63.0, 75.0)
<b>Shared needle/syringe during last injecting in last month (among those who injected in last month)</b>								
	7	2.8 (0.7, 4.9)	25	16.9 (10.9, 23.3)	5	2.4 (0.15, 4.7)	37	3.7 (2.0, 6.5)
<b>Ever injected with the same needle/syringe as others</b>								
	44	18.4 (13, 23.8)	101	34.3 (29.6, 39.1)	20	8 (5.2, 10.8)	165	19.8 (15.0, 25.7)
<b>Mean, median (range) number of months injecting with same needle/syringe with others</b>								
	44	19.9, 12 (1-97)	92	21.8, 12 (1-96)	12	5.7, 2.5 (0- 36)	147	19.0, 12 (0-96)

### Injection drug use behaviors-Past six months

Most PWID used sterile, not previously used needles and syringes in the past six months (Figure 5, Table 8).

**Figure 5. Frequency of using sterile, not previously used needle/syringe in past six months**





A significantly higher percentage (24%) of PWID in Chiang Mai, compared to PWID in Bangkok (10%) and Songkhla (4%), injected with a needle or syringe previously used by someone else. Of those, the majority did so once a month or less. PWID in Bangkok and Chiang Mai reported a median of three and in Songkhla a median of one other person(s) injecting with needle or syringe before they did. Twenty percent in Bangkok, 27% in Chiang Mai and 10% in Songkhla reported that someone injected with a needle or syringe after they used it in the past six months and over 80% of in Bangkok and Chiang Mai reported that someone had used a spoon and/or cooker after someone else used it. Most PWID reported never dividing drugs with a syringe that someone else had already used.

**Table 8. Injection drug user behaviors in past six months among PWID**

	Bangkok n=261		Chiang Mai n=300		Songkhla n=282		Aggregated n=843	
	n	95% CI	n	95% CI	n	95% CI	n	95% CI
<b>Used sterile injecting equipment the at last injection</b>								
	175	95.8 (89, 100)	146	83.1 (76.3, 89.4)	222	97.2 (96.4, 97.9)	543	95.0 (91.3, 97.2)
<b>Injected with needle/syringe previously used by someone else</b>								
	24	10.2 (5.2, 15.2)	71	24.1 (19.0, 29.2)	11	4.3 (1.9, 6.7)	106	11.4 (7.6, 16.7)
<b>Frequency of Injecting with needle/syringe previously used by someone else</b>								
Once/month or less	19	74.1 (52.2, 95)	44	66.3 (58.1, 74.9)	6	74.2 (47.1, 100)	69	72.4 (47.2, 88.5)
2-4 times/month	4	25.9 (5, 47.8)	13	15.1 (8.2, 21.5)	1	20.3 (--)	18	24.4 (9.0, 51.2)
2-7 times/week, once/day	0	--	5	6.3 (2.3, 10.2)	0	--	5	1.1 (0.4, 3.1)
2-3 times/day	0	--	9	12.3 (6.5, 18.1)	0	--	9	2.1 (1.0, 4.7)
5 + times/day	0	--	0	--	1	5.6 (1.3, 1.3)	1	5.3 (0, 0.2)
<b>Mean, median (range) number of different people injecting with needle/syringe before participant</b>								
	24	2.8, 3 (1-25)	68	3.0, 3 (1-8)	4	1.4, 1 (1-3)	96	2.8, 3 (1-25)
<b>Someone injected with needle/syringe after participant used it</b>								
	50	19.7 (13.5, 26)	74	26.8 (22.0, 31.6)	29	10.1 (7, 13.2)	153	21.9 (16.5, 28.4)
<b>Mean, median (range) number of times using same new, unused needle/syringe (not shared) before discarding</b>								
	251	1.5, 1 (1-10)	289	2.1, 1 (1-60)	236	1.5, 1 (1-10)	776	1.6, 1 (1-60)
<b>Frequency of using injecting equipment* after someone else used it</b>								
Always	17	4.5 (2.2, 6.7)	30	10.2 (6.9, 13.6)	10	3.4 (1.5, 5.2)	57	4.9 (3.2, 7.5)
Sometimes	32	14.3 (7.1, 21.6)	68	22.7 (18.4, 27.1)	35	11.2 (10.1, 12.1)	135	14.9 (10.7, 20.3)
Never	208	81.2 (74, 88.3)	200	67.0 (61.7, 72.4)	225	85.5 (83.5, 87.6)	633	80.2 (74.6, 84.8)
<b>Used injecting equipment* after someone else used it the last time injecting</b>								
	26	47.6 (31.3, 63.4)	69	75.3 (66.9, 84.0)	16	41.4 (27.5, 58.6)	111	51.6 (37.2, 65.7)
<b>Equipment used after anyone else</b>								
Spoon/cooker	21	80.2 (5.6, 155)	58	84.6 (65.6, 100)	10	56 (24.8, 80.3)	89	80.8 (62.2, 91.5)
Filter/cottons	4	8.2 (6.1, 9.7)	24	33.9 (22.6, 45.0)	5	33.2 (5.5, 64.3)	33	13.5 (7.4, 23.3)
Water	9	39.3 (--)	37	55.5 (44.9, 66.1)	8	58.7 (39.9, 85.5)	54	42.7 (26.5, 60.8)
Drug solution/mix	5	10.9 (8.3, 12.9)	39	54.7 (43.6, 65.4)	5	26.8 (2.7, 45.7)	49	19.5 (11.4, 31.3)
<b>Frequency of dividing drugs with a syringe that someone else had already used</b>								
Always	8	3.3 (0.4, 6.3)	14	4.8 (2.7, 6.8)	6	3 (1, 5.1)	28	3.4 (1.8, 6.6)
Sometimes	54	20.6 (13.9, 27.3)	65	21.3 (16.8, 25.8)	0	--	161	20.4 (15.7, 26.2)
Never	195	76 (69.8, 82.3)	217	74.0 (69.1, 78.8)	224	82.9 (80.4, 85.4)	636	76.1 (70.2, 81.2)

\* spoons, cotton, cups, and water.

## Overdose

Between 20% in Songkhla and 31% in Chiang Mai reported ever overdosing (Table 9), of which PWID in Bangkok did so a medium of four, in Chiang Mai a median of 12 and in Songkhla a median of 12.5 months ago.

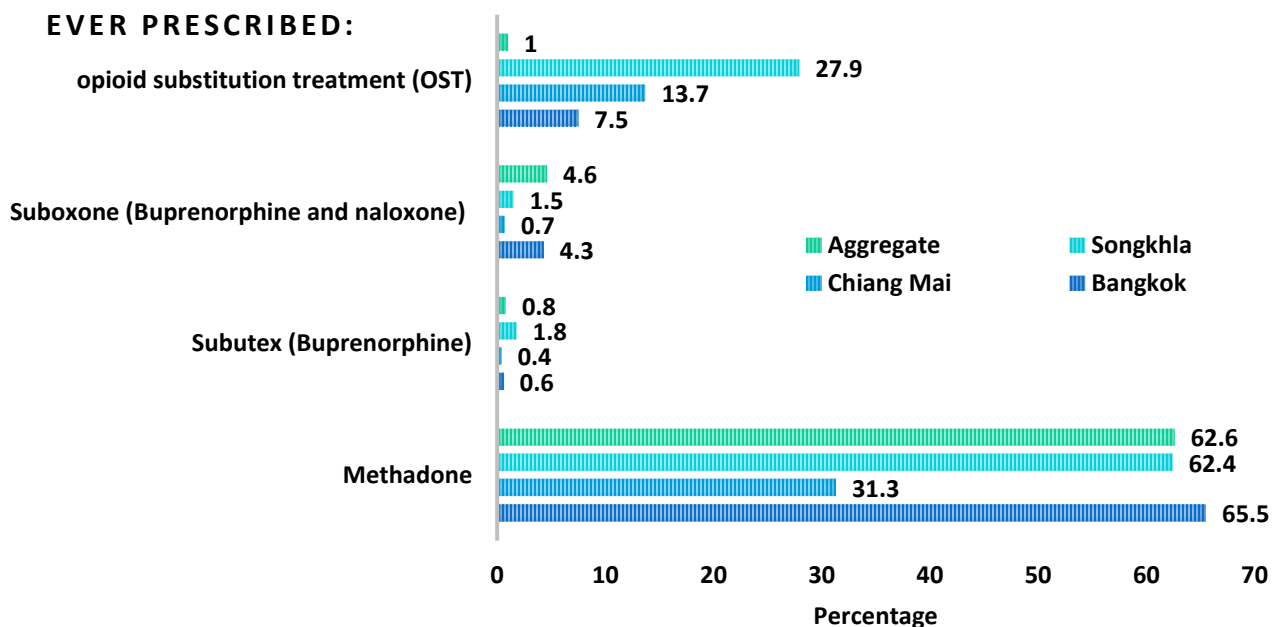
**Table 8. Overdosing among PWID**

	Bangkok n=261		Chiang Mai n=300		Songkhla n=282		Aggregated n=843	
	n	95% CI	n	95% CI	n	95% CI	n	95% CI
<b>Ever overdosed</b>	80	30.5 (24.4, 36.7)	95	31.2 (26.6, 35.9)	59	20.5 (15.9, 25.1)	234	30.4 (24.7, 36.7)
<b>Mean, median (range) number of months since overdosing</b>	80	15.4, 4 (1–132)	90	19.3, 12 (1 – 96)	46	12.5, 10 (1– 96)	216	15.6, 9 (1 -132)

## Treatments for PWID

Only 31% of PWID in Chiang Mai and over 60% in Bangkok and Songkhla were ever prescribed methadone (Figure 6). Few were ever prescribed Subutex or Suboxone and 28% in Songkhla were ever prescribed opioid substitution treatment (OST).

**Figure 6. Ever prescribed/received the following treatments, PWID**



A significantly higher percentage of PWID in Chiang Mai (74%) never contacted a methadone program in the past six months compared to Bangkok (49%) and Songkhla (6%) (Table 9). Of those who ever

received OST, the reason most cited for why they first used OST was by their own will or because of suggestions by friends. The median number of months since PWID last received OST was five in Bangkok, 12 in Chiang Mai and two in Songkhla. Most PWID never contacted an in-patient OST program in the past six months. A significantly higher percentage of PWID in Songkhla (26%) compared to Bangkok (3%) and Chiang Mai (7%) ever received OST six months continuously, of which most are currently on OST. However, among all PWID, few are currently on OST. Of those currently receiving OST, between 31% in Songkhla and 56% in Bangkok ever received OST for injection drug use as an in-patient and between 6% in Chiang Mai and 20% in Songkhla were referred by a drop-in center, outreach workers or peer educators to any drug treatment services in past 12 months; of those, PWID in Bangkok were referred a median of three times, in Chiang Mai as median of two times and in Songkhla a median of one time.

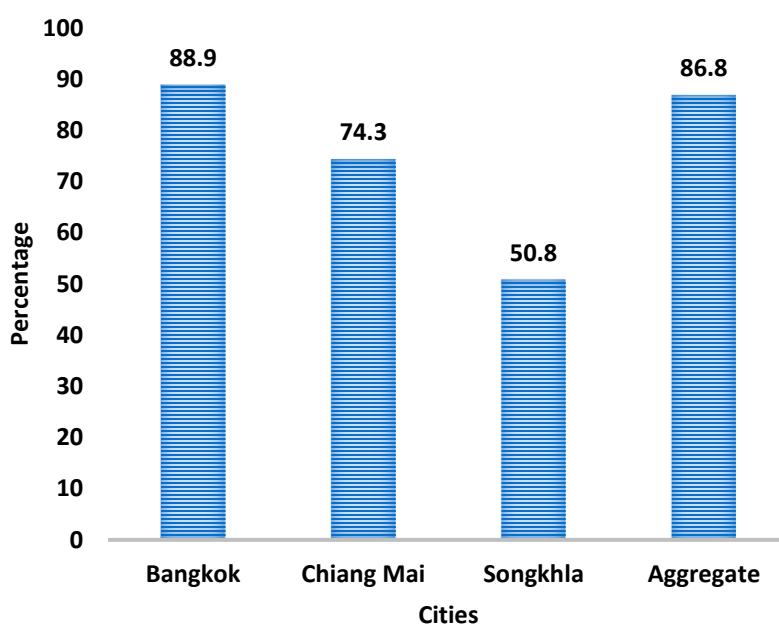
**Table 9. Treatment for PWID**

	Bangkok n=261		Chiang Mai n=300		Songkhla n=282		Aggregated n=843	
	n	95% CI	n	95% CI	n	95% CI	n	95% CI
<b>Contact with methadone program in past 6 months with intention of enrolling</b>								
Yes, and got in	110	41.6 (32.8, 50.5)	52	16.2 (12.4, 20.1)	94	32 (27, 36.8)	256	39.3 (33.1, 45.8)
Yes, but did not get in	14	5.2 (1.8, 8.7)	8	2.1 (0.8, 3.5)	32	11.3 (7.8, 14.7)	54	5.1 (2.8, 9.3)
Never contacted in patient program	124	49.3 (40.8, 57.8)	215	74.4 (69.2, 79.6)	120	45.6 (40.1, 51.2)	459	51.2 (44.8, 57.7)
Already on treatment > 6 months	13	3.9 (1.5, 6.3)	25	7.2 (4.5, 9.9)	31	11.2 (7.8, 14.6)	69	4.3 (2.6, 7.2)
<b>Reason for using OST first time*</b>								
Referred by health care provider	0	--	1	1.8 (0, 3.9)	7	8.8 (4, 13.1)	8	1.0 (0.4, 2.5)
Referred by peer educator	0	--	5	11.2 (4.0, 18.3)	6	9.2 (1.9, 21.6)	11	2.3 (1.1, 4.9)
By your own will/ suggested by friends	18	98.6 (97.4, 100)	31	69.0 (57.9, 80.2)	56	74.6 (63.5, 87.1)	105	92.7 (87.3, 95.9)
Compulsory treatment after being arrested	1	1.4 (0.1, 2.6)	4	10.7 (1.7, 20.4)	1	1.3 (0.8, 2)	6	2.6 (0.9, 7.2)
Required /suggested by parents/guardians	0	--	4	7.36 (0, 14.4)	7	6.1 (1.2, 8.6)	11	1.4 (0.6, 3.3)
<b>Last time received OST for drug use in months (Mean, median, range)</b>	19	15.0, 5 (1-96)	44	13.5, 12 (0 -72)	72	13.8, 2 (0-96)	135	14.7, 5 (0-96)
<b>Contacted an OST program with intention of enrolling in past six months</b>								
Yes, and got in	10	3.6 (1.5, 5.8)	25	7.9 (5.2, 10.5)	34	13.6 (9.1, 18.1)	69	4.5 (2.7, 7.3)
Yes, but did not get in	1	0.3 (0.1, 0.7)	4	1.0 (0.2, 1.9)	11	3.9 (1.8, 6)	16	0.5 (0.1, 1.5)
Never contacted in patient program	240	90.3 (85.8, 94.9)	263	89.4 (86.5, 92.4)	191	78.6 (73.5, 83.8)	694	94.9 (92.0, 96.7)
Already on treatment for >6 months	10	5.8 (1.4, 10.1)	7	1.7 (0.6, 2.8)	8	3.9 (1.5, 6.3)	15	0.2 (0.1, 0.4)
<b>Ever received 6 months continuously OST</b>								
	7	2.8 (0.8, 4.8)	26	7.5 (4.9, 10.1)	74	26.4 (21.7, 31)	107	4.0 (2.4, 6.5)

<b>Currently receiving OST (among those who ever received OST)</b>								
	5	66.3 (28.1, 100)	21	76.4 (61.7, 89.4)	62	85.7 (81.4, 90.3)	88	71.5 (42.2, 89.7)
<b>Currently receiving OST (among all PWID)</b>								
	5	1.8 (0.2, 3.4)	21	5.6 (3.5, 7.7)	62	21.8 (17.3, 26.3)	88	5.2 (2.6, 7.9)
<b>Ever received OST for injection drug use as in-patient</b>								
	4	56 (17.2, 94.7)	9	36.4 (20.9, 52.8)	25	31.2 (15.2, 44.7)	38	47.9 (24.6, 72.2)
<b>Contacted in-patient drug treatment program with intention of enrolling in past six months</b>								
	34	14.2 (8.8, 19.6)	29	8.8 (5.7, 11.8)	23	7.3 (4.7, 9.9)	86	13.5 (9.7, 18.5)
<b>Referred by drop-in center/outreach workers/peer educators to any drug treatment services in past 12 months</b>								
	22	8.2 (4.5, 11.9)	17	5.9 (3.5, 8.2)	50	20.5 (15.3, 25.7)	89	8.5 (5.7, 12.5)
<b>Mean, median (range) times referred by drop-in center/outreach worker/peer educator to any drug treatment service, past 12 months</b>								
	22	51.3, 3 (1.0 – 365)	17	2.0, 2 (1 - 5)	50	1.5, 1 (1 – 5)	89	1, 45 (1 - 365)

\*No responses for Required by employers

**Figure 7. Tried to give up drugs in past six months among PWID**



As much as 89% of PWID in Bangkok, 74% in Chiang Mai and 51% in Songkhla have tried to give up drugs in the past six months (Figure 7).

## Sexual Risk

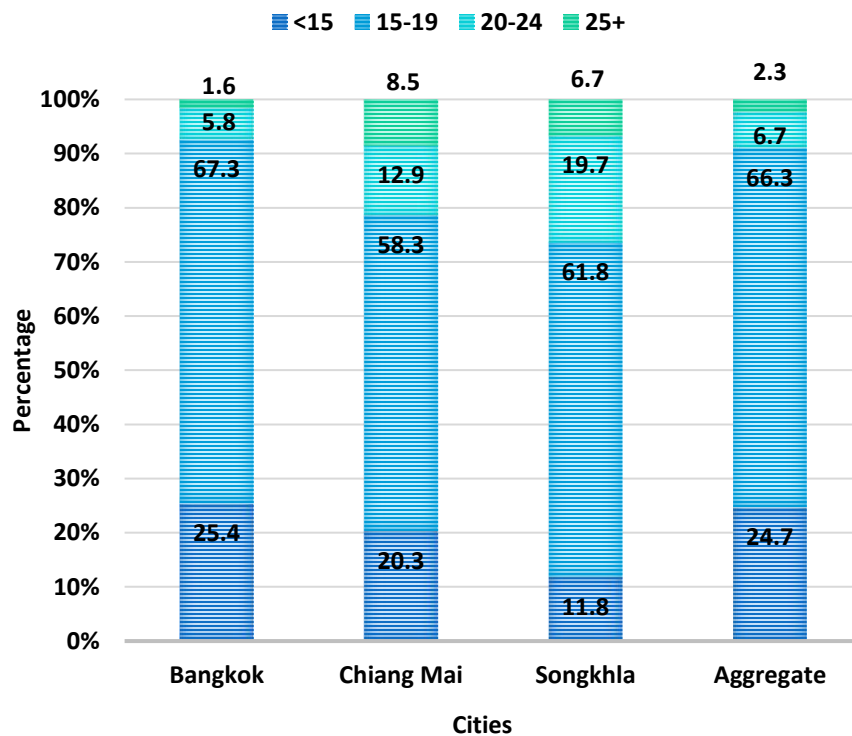
### *Sexual intercourse*

Over 95% of PWID reported ever having sexual intercourse, just over three quarters in Bangkok and Chiang Mai and 60% in Songkhla reported having sexual intercourse in the previous 12 months and between 61% in Songkhla and 75% in Chiang Mai reported having sexual intercourse in the previous one month (Table 10).

**Table 10. Sexual intercourse ever, past 12 months, past month among PWID, Chiang Mai**

	Bangkok n=261		Chiang Mai n=300		Songkhla n=282		Aggregated n=843	
	n	95% CI	n	95% CI	n	95% CI	n	95% CI
<b>Ever had sexual intercourse</b>								
	253	97.2 (95.2, 99.2)	293	97.7 (96.3, 99.2)	261	95.2 (93, 97.4)	807	97.2 (94.5, 98.6)
<b>Sexual intercourse in past 12 months</b>								
	189	78 (71.8, 84.3)	234	78.7 (74.0, 83.5)	149	59.8 (54.4, 65.4)	572	77.6 (71.9, 82.4)
<b>Sexual intercourse in past one month</b>								
	124	65.2 (57.7, 72.7)	172	75.3 (69.8, 81.1)	88	61 (51.1, 70.1)	384	66.0 (58.3, 72.8)

**Figure 8. Age at first sexual intercourse**

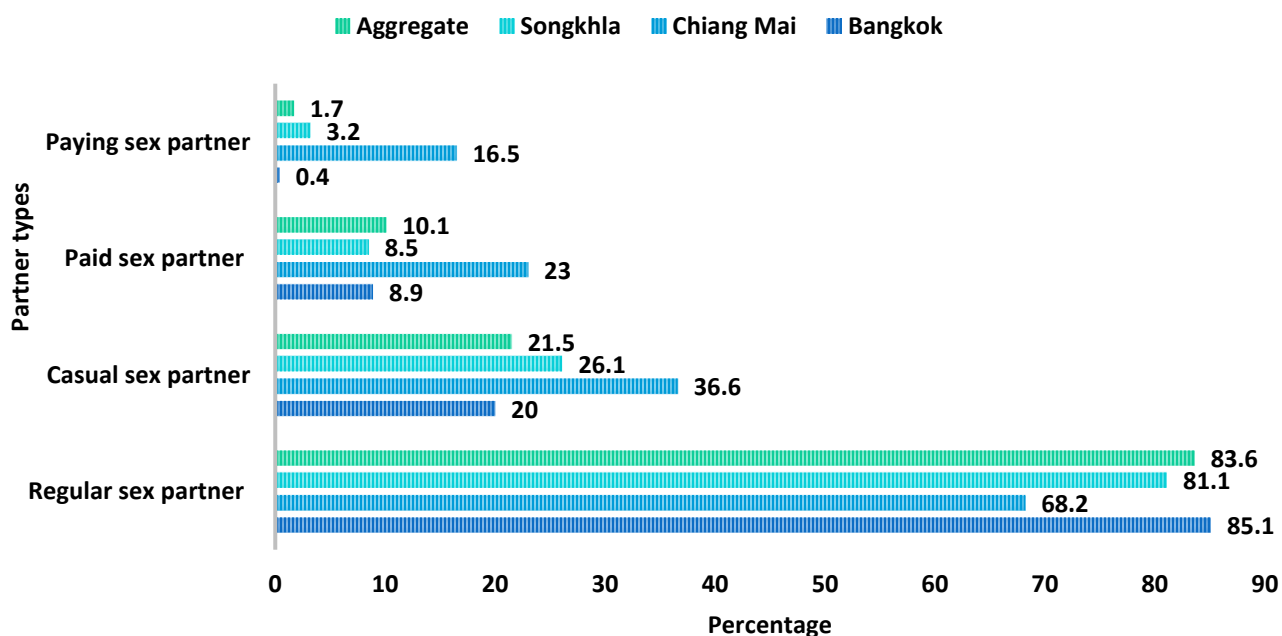


Most PWID in all cities first had sexual intercourse when they were between the ages of 15 and 19 years (Figure 8). PWID in Songkhla, compared to Bangkok and Chiang Mai, had the lowest percentage of being younger than 15 years the first time they had sexual intercourse. The median age of first sexual was 16 in Bangkok (range 11 to 28), 17 in Chiang Mai (range: 10 – 49) and 18 in Songkhla (range: 11 to 40).

### *Sexual partner types in the past 12 months*

Compared to in Bangkok and Songkhla, PWID in Chiang Mai had a lower percentage of having a regular sex partner, but a higher percentage of having a casual sex partner, paid (someone that the participant paid for sex) sex partner and paying (someone from whom the participant received money for sex) sex partner (Figure 9). The majority of PWID overall reported having regular sex partners.

Figure 9. Types of sexual partners in the past 12 months among PWID



### Sexual partner types in the past month

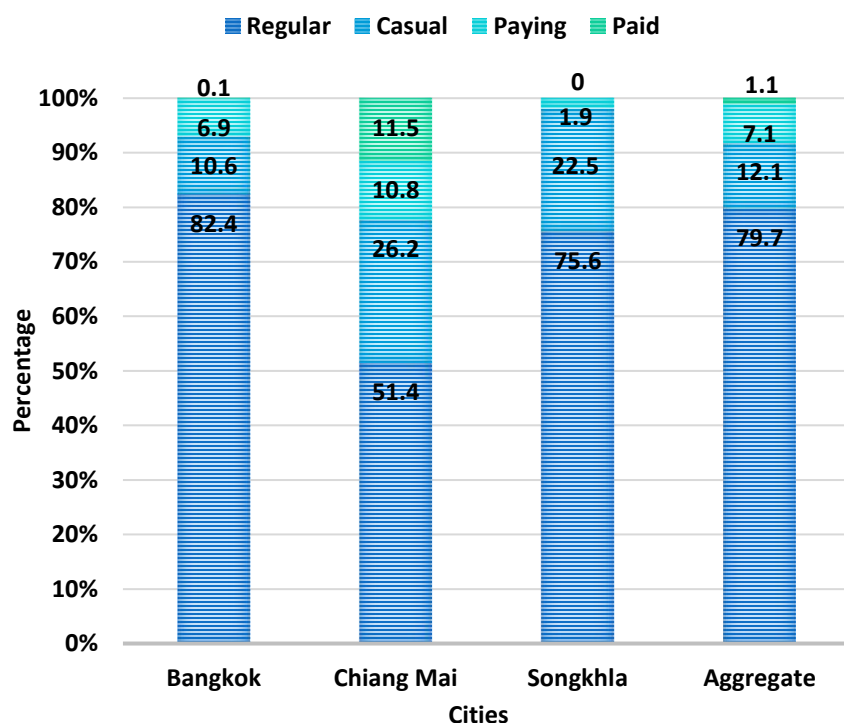
The patterns of percentages of types of sex partners in the past one month were similar to those for the past one year with Chiang Mai having lower percentages of regular partners but higher percentages of casual and paid sex partners (Table 11). Only PWID in Chiang Mai reported having paying sex partners.

Table 11. Types of sexual partners in the past month among PWID

	Bangkok n=261		Chiang Mai n=300		Songkhla n=282		Aggregated n=843	
	n	95% CI	n	95% CI	n	95% CI	n	95% CI
<b>Regular sex partner</b>								
	110	87.5 (72.1, 102.9)	115	64.8 (56.9, 72.5)	73	83.6 (75.3, 92)	298	85.3 (78.2, 90.4)
<b>Casual sex partner</b>								
	15	10.9 (4.1, 17.6)	42	26.5 (19.0, 34.0)	16	17.3 (9.1, 25.3)	73	12.4 (7.9, 19.0)
<b>Paid sex partner</b>								
	5	4.8 (1.6, 8.1)	26	13.8 (8.4, 18.9)	2	1.6 (1.1, 1.7)	33	5.6 (2.7, 11.2)
<b>Paying sex partner</b>								
	0	--	27	16.3 (10.6, 22.2)	0	--	-	--

### Last partner type in last 12 months

Figure 10. Last partner type in last 12 months



The majority of all PWID reported that their last sexual partner was a regular partner (Figure 10). In Chiang Mai, a significantly lower percentage of PWID reported that their last partner was regular.

### Number of sexual partners by type

Of those with a regular sex partner in the past 12 months and past one month, PWID in each city reported having a median number of 1 (Table 12). Of those with a casual sex partner in the past 12 months, the median number ranged from one in Songkhla to 2.5 in Chiang Mai; Of those who had a paid sex partner in the past 12 months, the median number ranged from two in Songkhla and four in Chiang Mai; of those with a paying sex partner in the past 12 months the median number ranged from two in Bangkok to three in Chiang Mai and Songkhla. Of those with a casual sex partner in the past one month, the median number ranged from one in Bangkok and Songkhla to two in Chiang Mai and of those with a paid sex partner in the past month the median number ranged from two in Chiang Mai to three in Songkhla and Bangkok. Only PWID in Chiang Mai reported having paying sex partners in the past month, the median number of which was four.

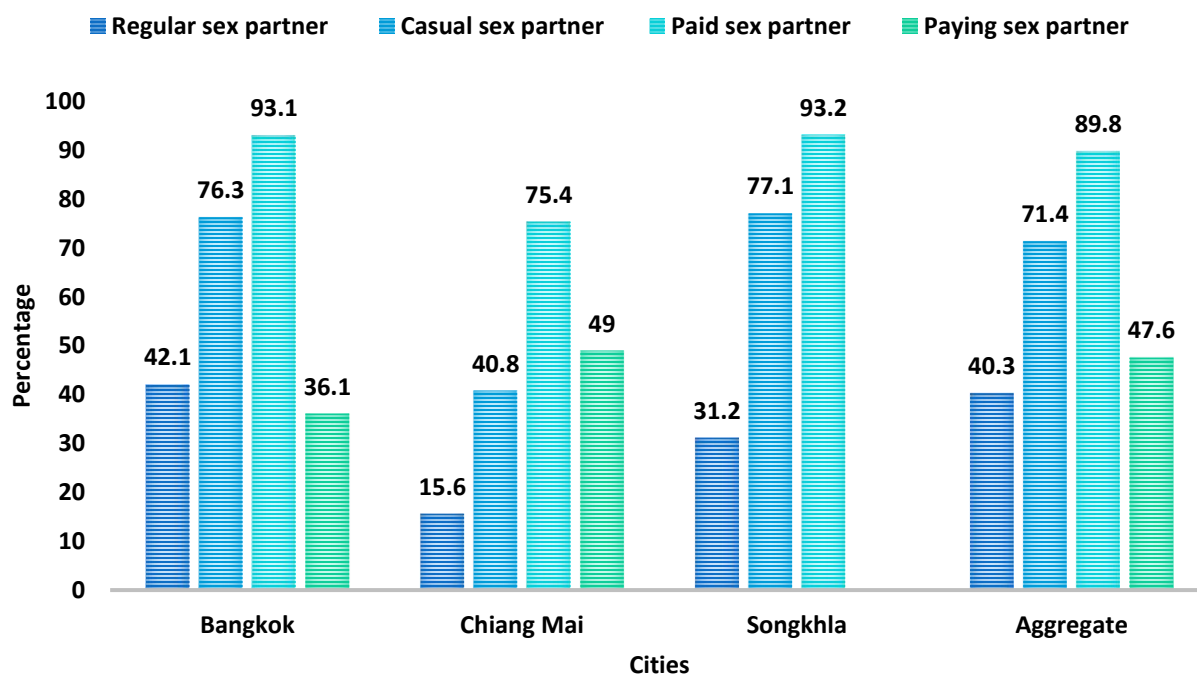
**Table 12 Number (mean, median, range) of sexual partners by type in the past 12 months and one month**

	Bangkok n=261		Chiang Mai n=300		Songkhla n=282		Aggregated n=843	
	n	mean, median, range	n	mean, median, range	n	mean, median, range	n	mean, median, range
<b>Number In past 12 months:</b>								
Regular sex partners	161	1.2, 1 (1 - 6)	163	1.9, 1 (1-91)	114	1.0, 1 (1.0 – 2.0)	438	1.3, 1, (1 – 91)
Casual sex partners	42	5.1, 2 (1 – 55)	84	4.6, 2 (1 - 48)	31	2.1, 1, (1 - 10)	153	5.0, 2 (1 – 55)
Paid sex partners	15	5.6, 3 (1 – 24)	54	12.7, 4 (1-300)	7	4.6, 2 ( 1- 14)	76	7.0, 3 ( 1-300)
Paying sex partners	1	2.0, 2. (2- 2)	27	8.5, 3 (1-75)	2	2.6, 3 (1–3)	16	5.6, 3 (1–70)
<b>Number In past 1 month:</b>								
Regular sex partners	110	1.3, 1, (1.0-15.0)	115	1.0, 1 (1 - 2)	70	1.0, 1 (1.0 – 1.0)	295	1.3, 1 (1 – 15)
Casual sex partners	15	2.1, 1 (1 – 20)	42	2.8, 2 (1 - 19)	14	1.8, 1 (1.0 – 4.0)	71	2.2, 1 ( 1- 20)
Paid sex partners	5	2.7, 3 (1 - 6)	26	3.1, 2 (1-20)	5	2.9, 3.0 (1– 6)	36	2.8, 2 ( 1-20)
Paying sex partners		--	13	7.4, 4 (1 – 70)		--	-	--

### Condom use in the past one months

The lowest percentages of PWID in all cities used condoms with a regular partner in the past month and the highest percentages used condoms with paid sex partners (Figure 11).

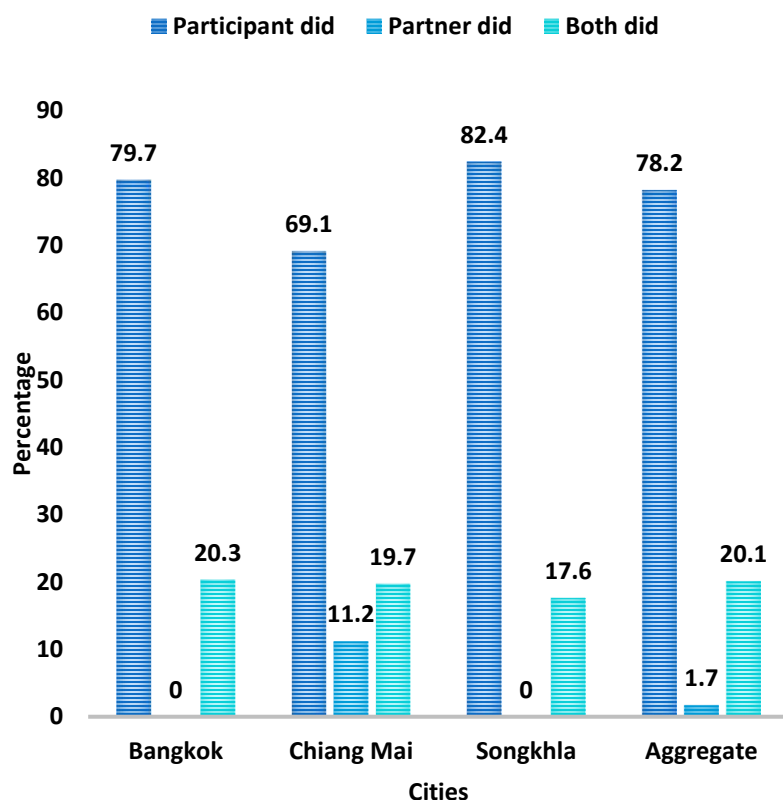
**Figure 11. Condom use by partner type at last sex in the past one month among PWID**





## Drug use and sex

Figure 12. Participant or partner took drugs to get high during sex in the past one month



Half (CI: 41.9, 59.1) of PWID in Bangkok, 42% (CI: 35.9, 48.1) and 42% (CI: 35.9, 48.1) never used drugs to get high before having sex in past month. Among those that did, most participants reported that they were the one who was high during sex in the past month (Figure 12).

## Frequency of condom use in the past month by partner type

Past month condom use varied by survey location. Almost three quarters of PWID in Chiang Mai and Songkhla and 51% in Bangkok never used a condom with their regular partners (Table 13). Most PWID in Bangkok and Songkhla always used condoms with their casual partners, whereas only 26% in Chiang Mai did so. Most PWID in Bangkok and Chiang Mai used condoms with their paying partners, however none did so in Songkhla.<sup>12</sup> Of the few PWID in Chiang Mai who had a paid partner, only 34% always used a condom. Roughly a third of PWID in all cities used a condom at last sex in the past month; However, the percentage of those who used a condom in the past one month (among those who injected and had sexual intercourse in the past month) was significantly lower in Chiang Mai compared to Bangkok and Songkhla.

<sup>12</sup> Note small sample sizes.

**Table 13. Frequency of condom use in the past month by partner type among PWID**

	Bangkok n=261		Chiang Mai n=300		Songkhla n=282		Aggregated n=843	
	n	95% CI	n	95% CI	n	95% CI	n	95% CI
<b>Regular partner</b>								
Never	62	51.4 (38.2, 64.4)	90	79.8 (64.6, 95.1)	51	72.4 (59.9, 83.7)	203	53.6 (42.9, 64.0)
Sometimes	31	33.3 (21.1, 45.8)	17	14.5 (0, 29.4)	11	19.3 (9.3, 31.6)	59	31.9 (22.3, 43.2)
Always	17	15.3 (8.3, 22.3)	7	5.7 (1.8, 9.6)	7	8.3 (2.1, 13.4)	31	14.5 (8.3, 24.2)
<b>Casual partner</b>								
Never	3	15.3 (7.3, 37.5)	17	46.8 (35.3, 58.6)	4	28.2 (4, 52.3)	24	22.0 (10.0, 41.6)
Sometimes	2	6.1 (1.3, 13.1)	13	27.2 (16.3, 37.8)	3	13.9 (2.3, 19.6)	18	11.0 (4.7, 22.0)
Always	10	78.6 (54.2, 100)	12	26.0 (14.1, 37.7)	7	57.9 (37, 84.8)	29	67.6 (47.2, 82.9)
<b>Paying partner</b>								
Never	0	--	4	14.6 (2.5, 31.4)	1	46.1 (--)	5	3.6 (1.0, 12.1)
Sometimes	1	14.8 (0, 40.6)	8	28.9 (13.3, 43.5)	1	53.9 (--)	10	18.4 (4.4, 52.6)
Always	4	85.2 (59.4, 100)	14	56.5 (42.4, 71.9)	0	--	18	78.0 (45.3, 93.9)
<b>Paid partner</b>								
Never	0	--	9	35.8 (18.4, 57.9)	0	--	9	35.8 (18.4, 57.9)
Sometimes	0	--	7	29.8 (14.0, 52.6)	0	--	7	29.8 (14.0, 52.6)
Always	0	--	11	34.4 (18.1, 55.5)	0	--	11	34.4 (18.1, 55.5)
<b>Used a condom at last sex in the past one month (among all injectors)</b>								
	43	38 (27.4, 48.4)	53	30.2 (21.9, 38.3)	25	35.9 (25, 48.1)	121	37.3 (28.3, 47.3)
<b>Used a condom at last sex in the past one month (among all those who injected in past month)*</b>								
	27	40.2 (26.4, 54.3)	33	32.4 (23.7, 40.7)	22	38.6 (28.1, 51.8)	82	39.8 (28.2, 52.5)

\*Global AIDS Monitoring indicator

### *Males who have sex with males*

A significantly higher percentage of male PWID in Chiang Mai, compared to Bangkok and Songkhla, ever had anal sex with a male, among which 77% reported doing so in the past 12 months (Table 14). No PWID in Songkhla and 17% in Bangkok had sex with a male in the past 12 months. Among those who reported having sex with a male in the past 12 months, the majority in Chiang Mai and all in Bangkok usually have the receptive position during anal sex with a man and only 47% in Chiang Mai and all in Bangkok used a condom at last anal sex with a man.

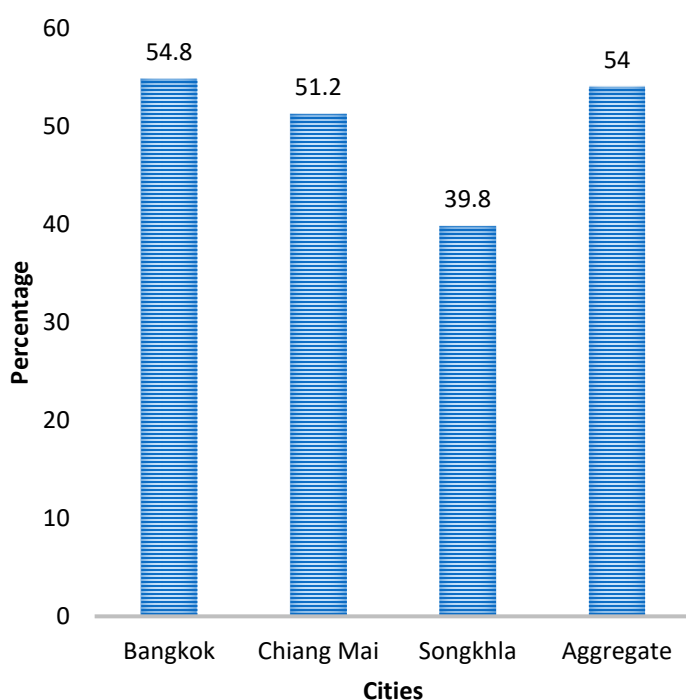
**Table 14. Males who have sex with males among PWID**

	Bangkok n=261		Chiang Mai n=300		Songkhla n=282		Aggregated n=843	
	n	95% CI	n	95% CI	n	95% CI	n	95% CI
<b>Ever had anal sexual intercourse with a</b>								
	27	9.9 (5.9, 13.8)	61	26.0 (20.1, 31.9)	13	3.9 (2.2, 5.3)	101	11.0 (7.7, 15.4)
<b>Had sex with a male in past 12 months</b>								
	5	17 (16.9, 16.9)	46	76.6 (68.1, 85.1)	0	--	51	28.2 (16.6, 43.8)
<b>Position during last anal sex with a male</b>								
Insertive	0	--	9	18.8 (7.0, 30.2)	0	--	9	9.8 (4.1, 21.4)
Receptive	5	100	35	76.9 (62.0, 92.2)	0	--	40	88.1 (75.6, 94.6)
Both	0	--	2	4.1 (0.1, 11.5)	0	--	2	2.2 (0.5, 9.3)
<b>Used condom during last anal sex</b>								
	5	100	24	47.2 (27.5, 65.3)	0	--	29	72.4 (53.8, 85.5)

## Prison and detention in the past 12 months

Between 17% of PWID in Songkhla and 32% in Bangkok were arrested for drug use in the past 12 months (Table 15) and Between 40% in Songkhla and 55% in Bangkok had were ever detained in a prison or detention center (Figure 13).

**Figure 13. Ever detained in a prison or detention center.**



Of those detained in the previous 12 months (just over one quarter of PWID in all cities), between 2% in Chiang Mai and 16% in Bangkok injected drugs during imprisonment or detainment and two to none used a needle or syringe used previously by another person. Of those detained in the previous 12 months, a significantly lower percentage of PWID in Bangkok (6%) received services or treatment for drug use compared to Chiang Mai (21%) or Songkhla (18%).

**Table 15. Prison and detention in the past 12 months among PWID**

	Bangkok n=261		Chiang Mai n=300		Songkhla n=282		Aggregated n=843	
	n	95% CI	n	95% CI	n	95% CI	n	95% CI
<b>Arrested for drug use in past 12 months</b>								
	84	32 (24.7, 39.3)	84	27.3 (22.8, 31.9)	45	17.3 (13.2, 21.4)	213	31.2 (25.4, 37.6)
<b>Detained in prison or detention center in past 12 months</b>								
	33	24.6 (15.2, 34)	36	23.4(16.3, 30.6)	28	26.9 (18.3, 37)	97	24.6 (17.7, 33.1)
<b>Injected drugs for non-medical purposes while in prison or detained in past 12 months</b>								
	4	16.5 (10.4, 22.5)	1	1.8 (1.6, 1.6)	1	5.8 (6.7, 6.7)	6	15.2 (4.1, 42.8)
<b>Used needle/syringe used previously by another person while in prison/detained in past 12 months</b>								
	2	36.2 (--)	1	100	0	--	3	35.7 (1.4, 95.5)
<b>Receive any services/treatment for drug use while in prison/detained in past 12 months</b>								
	2	5.6 (3.7, 7.4)	8	20.6 (10.1, 30.2)	4	18.1 (6.1, 32.4)	14	7.0 (2.3, 19.2)
<b>Types of services/treatment received while in prison or detained in past 12 months</b>								
OST	0	--	0	--	2	54 (1.5, 100)	2	3.2 (0.4, 21.0)
Methadone	1	38.2 (--)	2	19.2 (0, 39.8)	0	--	3	31.6 (3.7, 84.8)
In-patient drug treatment	0	--	1	9.1 (0, 23.0)	2	46 (0, 97.4)	3	4.5 (0.7, 23.8)

## Sexually transmitted infections

Among all cities aggregated, 14% of PWID experienced intense pain and/or burning sensations during urination and 11% had pain in the lower abdomen in the past 12 months (Table 16). Between 12% in Chiang Mai and 36% in Bangkok were tested or screened in the past 12 months; of which between 26% in Chiang Mai to 42% in Songkhla were referred by a health care worker or NGO. The last test or screening was conducted between two to five months prior to the survey. The highest percentage of PWID in Bangkok had their test or screening at a primary health center and in Chiang Mai and Songkhla had their test or screening at a public hospital. Of those, between 12% in Chiang Mai and 27% in Bangkok were diagnosed with an STI, among which the majority received treatment.

**Table 16. Sexually transmitted infection among PWID in past 12 months, Chiang Mai**

	Bangkok n=261		Chiang Mai n=300		Songkhla n=282		Aggregated n= 843	
	n	95% CI	n	95% CI	n	95% CI	n	95% CI
<b>Experienced any of the following symptoms</b>								
Intense pain, burning sensation during urination	39	12.8 (8.2, 17.4)	87	28.4 (23.2, 33.5)	15	6.5 (3.6, 9.3)	141	13.8 (10.4, 18.3)
Warts in anal area	3	0.8 (0.2, 1.8)	27	8.9 (6.2, 11.6)	2	0.4 (0.2, 0.6)	32	1.4 (0.7, 2.8)
Sores or ulcers in the genital area	12	4.3 (1.9, 6.6)	48	16.3 (11.9, 20.7)	1	0.2 (0, 0.4)	61	5.1 (3.2, 8.1)
Abnormal discharge from the penis	15	5.8 (2.4, 9.1)	27	8.87 (5.9, 11.8)	3	1.1 (0.1, 2.2)	45	5.9 (3.6, 9.5)
Abnormal anal discharge	1	0.1 (0, 0.4)	6	1.73 (0.4, 3.0)	1	0.2 (0.1, 0.4)	8	0.3 (0, 0.8)
Bumps/swelling in anal area	4	1.3 (0, 2.6)	16	4.9 (2.8, 7.1)	3	0.7 (0.2, 1.3)	23	1.6 (0.7, 3.3)
Vaginal discharge	10	5 (1.6, 8.3)	2	0.5 (0.05, 0.9)	1	0.2 (0.1, 0.3)	13	4.5 (2.1, 9.2)
Pain-lower abdomen	21	9.7 (4.6, 14.7)	75	26.3 (21.5, 31.1)	2	0.4 (0.2, 0.6)	98	10.8 (7.1, 15.9)
<b>Tested/screened for STI, not including HIV/AIDS</b>								
	87	36.2 (28.9, 43.5)	39	12.2 (8.7, 15.6)	65	23.2 (18.7, 27.8)	191	34.0 (27.8, 40.8)
<b>Number of times tested/screened for STI, not including HIV/AIDS (Mean, median, range)</b>								
	86	2.3, 1.5 (1 – 16)	39	1.5, 1 (1-4)	54	1.3, 1 (1.0 – 4.0)	179	2.3, 1 (1 – 16)
<b>Last STI test/screening (in months)</b>	85	4.9, 5 (0.1 – 15.0)	29	5.3, 5 (0.7- 12)	32	3.7, 2 (0-12.0)	146	4.9, 4 (0 – 15)
<b>Referred by a health care worker/NGO for last STI test/screening</b>								
	28	37.8 (23.7, 52.4)	11	25.9 (14.9, 35.4)	29	41.7 (13.9, 66.8)	68	39.2 (27.5, 52.3)
<b>Where last STI test/screening was conducted</b>								
Primary Health Center	37	41.4 (26.4, 56.1)	1	3.6 (2.6, 4.8)	1	3.1 (2.6, 4.6)	39	39.4 (28.2, 52.0)
Public Hospital	14	16.5 (5.6, 27.4)	19	46.8 (23.4, 69.5)	50	85 (75.7, 91.3)	83	18.6 (10.3, 31.3)
Private Clinic/hospital	6	5.3 (-0.3, 10.8)	12	28.7 (5.5, 51.4)	2	2.5 (1.6, 2.6)	20	5.9 (2.6, 12.7)
NGO	16	22 (4, 40.3)	1	3.6 (6.5, 12.1)	2	6.3 (0.2, 14.6)	19	21.4 (12.2, 34.7)
Mobile STI	1	2 (1.3, 2.6)	4	11.7 (8.6, 15.7)	0	--	5	2.2 (0.4, 10.9)
Drug treatment Clinic	11	12.9 (2.5, 23.2)	0	--	1	3.1 (2, 5.2)	12	12.3 (6.4, 22.2)
<b>Diagnosed with STI</b>								
	22	27.5 (17.1, 38)	5	11.9 (0, 38.7)	11	16.9 (6.8, 27.1)	38	27.1 (17.2, 40.0)
<b>Received treatment the last time diagnosed with STI</b>								
	12	58.7 (37.4, 80.2)	4	77 (48.2, 104.3)	5	71 (62.5, 93.9)	21	62.2 (36.2, 82.7)

Where treatment was received last time diagnosed with STI*								
Primary Health Center	2	16 (0, 37.9)	0	--	0	--	2	15.4 (3.0, 51.5)
Public Hospital	5	38 (3.1, 72.9)	2	55.9 (--)	4	100	11	39.0 (10.8, 77.1)
Private Clinic/hospital	4	38.1 (2.4, 73.9)	2	44.1 (--)	0	--	2	0.7 (0.1, 3.9)
NGO	1	8 (0, 22.8)	0	--	0	--	4	37.3 (9.7, 76.6)
Mobile STI	0	--	0	--	0	--	1	7.7 (0.8, 45.6)
Drug treatment Clinic	1	8 (0.9, 22.8)	0	--	0	--	1	7.7 (0.8, 45.6)

\*No one responded mobile STI, STI clinic.

## HIV testing and treatment

Roughly 50% of PWID and higher have ever had an HIV test, the majority of which in Bangkok had tests at a primary health center and in Chiang Mai and Songkhla at a public hospital (Table 17). Of all the reasons to have an HIV test, the highest percentages reported that they had their last test because they felt at risk from having unprotected sex. Under 36% of PWID in all cities had and HIV test in the last 12 months and received their results; 38% of all PWID aggregated had an HIV test in the last 12 months or know their status to be positive. The highest percentage of PWID in Bangkok had their last HIV test at a primary health center and the highest percentage in Chiang Mai and Songkhla had their last HIV test at a public hospital. Of all PWID who ever received an HIV test, almost all received their test results; 4% of which were positive in Bangkok and Chiang Mai and 25% of which were positive in Songkhla. Of those living with HIV, most initiated Antiretroviral therapy (ART). Although the majority of PWID in Bangkok and Songkhla living with HIV reported currently taking ART, no one from Chiang Mai reported currently taking ART. ART treatment for PWID in Bangkok and Songkhla was covered by the National Health Scheme and treatment for PWID in Chiang Mai was covered by the National Health Scheme, Social Security Fund or by their own funds. The highest aggregate percentage for why PWID never had an HIV test was because they were not feeling at risk.

**Table 17. HIV testing and treatment among PWID**

	Bangkok n=261		Chiang Mai n=300		Songkhla n=282		Aggregated n=843	
	n	95% CI	n	95% CI	n	95% CI	n	95% CI
<b>Ever been tested for HIV</b>								
	156	60.9 (53.6, 68.3)	145	47.6 (42.2, 53.1)	157	55.8 (50.1, 61.4)	467	60.1 (53.6, 66.3)
<b>Places where HIV tests were taken</b>								
Primary Health Center	80	53.3 (44.1, 62.4)	5	3.9 (0.8, 7.1)	2	0.9 (0.1, 1.6)	87	48.4 (39.9, 57.0)
Public Hospital	45	30.2 (19.5, 40.7)	90	57.9 (49.9, 65.7)	146	93 (88.8, 97.3)	281	33.8 (26.2, 42.5)
Private Clinic/hospital	12	6.4 (2.7, 10.2)	31	20.9 (13.3, 28.8)	9	5.2 (0.1, 9.9)	52	7.4 (4.5, 12.0)
NGO Drop-in center	34	23.6 (12.4, 34.9)	17	9.9 (5.5, 14, 0)	12	8.6 (3, 14.6)	63	22.3 (15.6, 30.8)
Mobile HIV testing	3	2.7 (-0.9, 6.3)	16	10.8 (6.0, 15.8)	3	1.9 (-0.5, 4.2)	22	3.2 (1.3, 7.8)
Drug treatment Clinic	12	8.7 (3.1, 14.3)	0	--	10	7.4 (3.4, 11.9)	22	8.1 (4.5, 14.1)
STI Clinic	3	1 (0.3, 2.2)	0	--	6	3.4 (0.6, 5.9)	9	1.0 (0.3, 3.2)

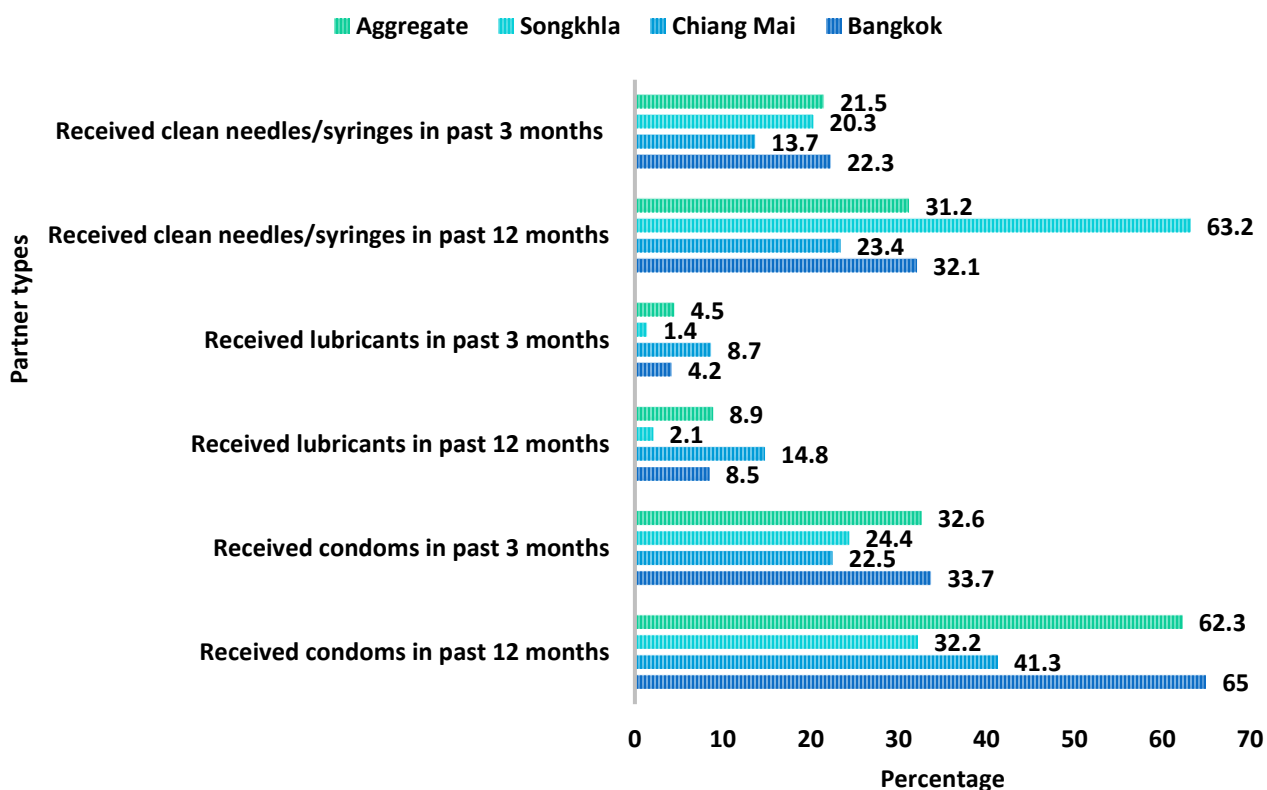
<b>Main reason for having HIV test the last time*</b>								
Had unprotected sex	30	34.3 (16.7, 52)	46	28.6 (21.3, 35.6)	63	41.5 (31.6, 50.8)	139	34.0 (24.9, 44.5)
shared needle /injection equipment	19	16.9 (4.4, 29.4)	16	10.7 (5.1, 16.3)	37	27.7 (20.6, 36.2)	72	16.6 (10.6, 25.1)
For marriage	1	0.8 (0.5, 1)	0	--	6	3.2 (0.1, 5.7)	7	0.8 (0.2, 4.2)
New sexual partner	1	0.2 (0.2, 0.3)	2	1.1 (0, 2.5)	3	2.3 (0.1, 4.9)	6	0.4 (0.1, 1.2)
Preparing for pregnancy	3	4.6 (0.4, 15.4)	2	1.6 (0, 4.6)	1	0.4 (0.1, 0.8)	6	4.1 (1.4, 11.5)
As antenatal care	5	6.3 (-5.6, 18.2)	12	7.5 (2.1, 12.8)	2	0.8 (0.1, 1.2)	19	6.3 (2.1, 17.1)
Job application	12	12.2 (3.7, 20.8)	7	3.9 (1.1, 6, 6)	12	7.3 (2.6, 11.6)	31	11.1 (5.5, 21.3)
Health insurance	3	2.9 (0.4, 6.1)	0	--	3	3.8 (0.1, 8)	8	2.6 (0.7, 9.2)
Army recruitment	2	3.3 (0.4, 9.8)	44	28.3 (18.6, 38.5)	0	--	46	6.0 (3.0, 11.4)
Blood donation	0	--	0	--	1	0.7 (0, 2.0)	1	--
Getting ordained	2	1.5 (1.2, 1.7)	0	--	0	--	2	1.2 (0.3, 4.9)
As part of surgery	1	1.3 (0.9, 1.7)	0	--	2	0.7 (0.1, 0.8)	3	1.1 (0.2, 7.4)
Feeling sick	4	4.3 (0.4, 31.9)	7	7.3 (0.4, 23.8)	3	1.4 (0.1, 2.4)	14	4.6 (1.8, 10.9)
Participating in research	11	11.4 (1.5, 21.4)	17	10.6 (5.6, 15.4)	14	10.4 (5.1, 16.4)	42	11.3 (6.7, 18.5)
<b>HIV test in the last 12 months and know result</b>								
	94	39.3 (31.9, 46.5)	62	21 (16.1, 25.9)	87	31.2 (25.4, 36.9)	243	36.6 (30.3, 43.3)
<b>HIV test in the last 12 months or have received a positive HIV test result</b>								
	94	39.3 (31.4, 47.1)	65	21.7 (17.1, 26.3)	96	34.5 (28.6, 40.4)	255	38.1 (32.2, 45.6)
<b>Place of last HIV test</b>								
Primary Health Center	61	40.1 (28.9, 51.3)	4	3.1 (0, 6.5)	1	0.4 (-0.1, 0.7)	66	36.5 (28.5, 45.3)
Public Hospital	35	22.5 (12.3, 32.7)	84	54.7 (47.1, 62.3)	135	89 (83.7, 94.2)	254	26.7 (19.8, 34.9)
Private Clinic/hospital	10	4.7 (1.7, 7.5)	26	17.8 (10.7, 24.9)	5	2.8 (0.2, 5.1)	41	5.6 (3.1, 9.7)
NGO Drop-in center	30	21.2 (10.2, 32.1)	14	7.8 (3.6, 11.8)	8	6.2 (2.1, 10.7)	50	20.0 (13.4, 28.5)
Mobile HIV testing	2	2.4 (0.6, 5.3)	14	9.7 (5.0, 14.5)	0	--	16	2.8 (1.0, 7.8)
Drug treatment Clinic	10	8.1 (1.3, 15.1)	0	--	2	1.7 (0.6, 4.2)	10	--
STI Clinic	1	0.6 (0.4, 1.6)	0	--	0	--	1	--
Do not know	1	0.5 (0.4, 1.4)	0	--	0	--	1	--
<b>Received last test result</b>								
	148	94.5 (90.7, 98.3)	143	91.9 (87.0, 96.5)	141	90.5 (85, 95.6)	432	94.2 (89.2, 97.0)
<b>Result of last test</b>								
<b>Positive</b>	7	4.0 (1.2, 9.2)	6	4.0 (1.3, 6.8)	33	25.2 (15.2, 36)	46	4.6 (2.4, 8.7)
<b>Negative</b>	138	93.8 (88.1, 99.6)	133	95.6(92.8, 98.5)	105	74.8 (70.8, 84.3)	376	95.4 (91.3, 97.6)
<b>Indeterminate</b>	3	2.2 (0.8, 5.1)	1	0.4 (0, 0.8)	0	--	4	2.0 (0.0, 3.2)
<b>Initiated ARV</b>								
	6	84.8 (69.8, 99.7)	4	72.6 (44.4, 100)	31	94.9 (91.1, 96.9)	41	97.7 (91.4, 99.4)
<b>Currently on ARV treatment^</b>								
	4	66.6	0	--	28	90.3	32	--
<b>How ARV treatment is covered **</b>								
National Health Scheme	4	49.4 (6.8, 91.7)	1	31.0 (0, 83.1)	28	91.5 (77.6, 100)	33	53.8 (22.0, 82.8)
Social Security Fund	0	--	2	38.0 (0, 74.8)	0	--	2	--
Out of pocket	0	--	1	31.0 (0, 84.0)	0	--	1	--
<b>Reasons for never having HIV test</b>								
Not feeling at risk	70	66.9 (56.1, 77.8)	67	44.7 (36.5, 52.6)		79.4 (73.4, 86.9)	233	65.2 (55.6, 73.8)
Do not want to pay	5	4.7 (0.3, 9)	15	9.6 (5.1, 14.0)		4.4 (0.3, 13.3)	25	5.1 (2.4, 10.7)
The cost is too high	7	6.1 (1.3, 10.8)	6	3.6 (0.7, 6.3)		1.8 (-0.2, 4)	15	5.7 (2.8, 11.3)
Not confidential	3	2.9 (0.6, 6.4)	11	7.3 (3.2, 11.3)		3 (0.2, 5.7)	18	3.3 (1.2, 8.8)
Unknown where to get	10	11.5 (5, 18.2)	64	46.0 (37.1, 55.4)		1.3 (0, 2.4)	76	14.5 (9.2, 22.1)
Afraid to know result	15	13.4 (4.4, 22.3)	8	5.79 (2.0, 9.6)		5.5 (2.1, 8.2)	31	12.4 (7.3, 20.1)
Afraid of discrimination	1	1.2 (0.6, 4)	1	0.7 (0, 1.6)		3.3 (0.8, 5.9)	6	1.2 (0.2, 6.3)
Already know status	2	1.4 (1.4, 1.4)	2	1.1 (0, 2.3)		4.7 (0.8, 8.9)	9	1.5 (0.4, 5.9)

\*No responses for applying for education, my partner has HIV; \*\*No responses for Government Health Coverage, Health Insurance for Migrant Workers, Private Health Insurance; ^Unadjusted-too few values.

## HIV prevention

PWID in Bangkok had the highest percentages and Chiang Mai reported the lowest percentages receiving clean needles and syringes from an NGO or drop-in center in the past three and 12 months. Few PWID receive lubricants in the past three or 12 months. PWID in Bangkok had the highest percentages receiving condoms in the past three and 12 months (Figure 14).

Figure 14. Services received from and NGO or drop-in center in the past 3 and 12 months



Lower percentages of PWID in Chiang Mai reported receiving all types of education through an outreach service, drop-in centre or sexual health clinic in the past 3 months compared to PWID in Bangkok and Songkhla (Table 18). Roughly, only between 23% and 37% of PWID in all three areas aggregated received all types of education through an outreach service, drop-in centre or sexual health clinic in the past 12 months compared Chiang Mai and Songkhla. Most PWID in Bangkok (51%) received HIV prevention materials and information from mass media in past 12 months, whereas most in Chiang Mai and Songkhla received materials and information from governmental service providers

(19% and 46%, respectively). Most PWID in Bangkok and Chiang Mai received clean needles/syringes in the past three and 12 months from outreach workers or peer educators; Most in Songkhla received them from a drop-in center. The mean number of needles received in the past month was highest in Bangkok (median of 30) and lowest in Chiang Mai (median of 2.5). In aggregate, only 32% of PWID received two or more prevention services in the past three months.

**Table 18. HIV prevention among PWID**

	Bangkok n=261		Chiang Mai n=300		Songkhla n=282		Aggregated n=843	
	n	95% CI	n	95% CI	n	95% CI	n	95% CI
<b>Received education (e.g., through outreach service, drop-in centre, sexual health clinic) in past 3 months for ...</b>								
Condom use, safe sex	171	66.3 (59.7, 72.9)	144	48.1 (43.0, 53.2)	183	67.1 (61.2, 73)	498	64.9 (58.5, 70.7)
STI	167	65.2 (58.5, 71.9)	137	45.7 (39.7, 51.8)	173	63.1 (56.9, 69.3)	477	63.6 (57.1, 69.5)
TB	130	51.3 (43.9, 58.7)	82	28.1 (22.6, 33.6)	164	60.1 (54, 66.2)	376	49.7 (43.2, 56.2)
Hepatitis	109	43.5 (35.8, 51.3)	73	25.3 (20.8, 29.7)	166	58.7 (52, 65.2)	348	42.5 (36.1, 49.2)
HIV	173	67.2 (60.1, 74.3)	130	43.5 (38.0, 49.0)	180	65.4 (59.5, 71.1)	483	65.3 (58.9, 71.1)
Cleaning needles/safe injection	116	45.1 (37.4, 52.7)	106	34.3 (29.3, 39.3)	179	65.6 (59.5, 71.7)	401	44.7 (38.3, 51.3)
Overdose prevention	98	37.9 (30.2, 45.5)	77	25.0 (20.9, 29.1)	175	63.4 (57.5, 69.3)	350	37.5 (31.4, 44.1)
OST/MMT/other treatment	118	46 (38.4, 53.7)	95	30.1 (25.5, 34.7)	149	55.3 (49.2, 61.3)	362	44.9 (38.5, 51.5)
<b>Received education (e.g., through outreach service, drop-in centre, sexual health clinic) in past 12 months for.....</b>								
Condom use, safe sex	86	32.4 (25.2, 39.6)	112	36.9 (31.9, 41.9)	143	51.1 (45.7, 56.5)	341	33.3 (27.4, 39.8)
Sexually transmitted diseases	93	36.3 (29.2, 43.5)	103	34.1 (28.5, 39.7)	138	48.6 (43.4, 53.9)	334	36.5 (30.4, 43.1)
TB	71	29.5 (23.0, 36.0)	60	20.5 (15.6, 25.4)	135	47.4 (41.8, 53.1)	266	29.4 (23.5, 36.0)
Hepatitis	63	25.4 (18.0, 32.7)	54	19.9 (15.6, 24.2)	136	46.6(41.1, 52.1)	253	25.6 (20.1, 32.0)
HIV	89	36.3 (29.1, 43.5)	103	34.9 (29.2, 40.5)	149	52.1 (46.6, 57.5)	341	36.7 (30.5, 43.3)
Cleaning needles/safe injection	61	27.3 (20.2, 34.3)	85	27.5 (22.4, 32.4)	149	52.5 (46.8, 58.2)	295	28.1 (22.3, 34.7)
Overdose prevention	53	22.5 (15.7, 29.4)	61	19.8 (15.1, 24.4)	146	50.7 (45.1, 56.3)	260	23.1 (17.9, 29.4)
OST/MMT/other treatment	72	28.6 (21.3, 35.9)	82	26.3 (21.3, 31.2)	121	42.2 (36.7, 47.9)	275	28.7 (23.1, 35.1)
<b>Places/people from where/who received HIV prevention materials/information in past 12 months</b>								
Governmental service providers	111	43.2 (36.8, 49.8)	59	19.5 (15.2, 23.9)	125	46.1 (41, 51.2)	295	41.5 (35.1, 48.2)
Private hospital service providers	10	4.2 (1.5, 6.9)	12	4.3 (2.0, 6.5)	9	3 (1.3, 4.7)	31	4.1 (2.2, 7.5)
Drop-in centers	51	18.8 (11.5, 26.2)	18	5.5 (3.0, 7.9)	98	34.3 (27.8, 40.8)	167	18.2 (13.7, 23.9)
Friend/sex partner†	36	13.5 (8.7, 18.2)	44	14.9 (10.5, 19.4)	17	4.4 (2.9, 5.9)	97	13.3 (9.4, 18.4)
Mass media (TV/radio/internet)	137	50.7 (43.5, 58)	47	15.2 (11.4, 19.0)	100	35.9 (30.6, 41.3)	284	47.5 (41.0, 54.0)
Targeted media (brochure, leaflets)	70	27.1 (20.7, 33.4)	28	8.9 (6.0, 11.9)	37	12.7 (9.2, 16.2)	135	25.2 (19.8, 31.4)
Campaign	22	8.6 (4.5, 12.6)	10	3.4 (1.5, 5.2)	21	6 (4, 8)	53	8.0 (5.2, 12.3)
Do not know	11	4.8 (0.2, 9.8)	0	--	56	20.2 (15.7, 24.7)	75	5.1 (2.7, 9.3)
<b>Places/people from where/who received clean needles/syringes in past 12 months *</b>								
NGO Drop-in Center	31	37.9 (24.2, 51.4)	21	26.0 (12.1, 38.8)	114	69.2 (59.5, 79.3)	166	38.9 (28.6, 50.2)
Outreach worker/peer educator	44	49.5 (36.1, 63)	34	49.9 (39.7, 61.3)	38	26.1 (19.2, 35)	116	48.4 (37.7, 59.3)
Convenient /drug store	15	18.9 (9.5, 28.2)	0	--	3	1.1 (0.3, 1.3)	18	16.9 (9.9, 27.3)



Friend/sex partner/other PWID†	16	17.7 (8.9, 26.5)	14	17.3 (9.3, 24.9)	8	5.1 (0, 10.5)	38	17.0 (10.4, 26.5)
Government drug treatment/hospital	16	18.6 (10.7, 26.5)	11	14.2 (5.0, 23.1)	21	10.9 (5.5, 15.4)	48	17.9 (10.8, 28.0)
Private hospital/clinic	0	--	1	1.82 (1.9, 1.9)	0	--	1	--
<b>Places/people from where/whom received clean needles/syringes in past 3 months **</b>								
NGO Drop-in Center	25	44.4 (29.6, 59.3)	17	36.7(-10.6, 83.5)	106	69.5 (58, 80.5)	148	45.7 (33.1, 58.9)
Outreach worker/peer educator	36	59.2 (43.5, 75)	17	36.9(22.1, 51.3)	33	24.9 (18.4, 32.8)	86	55.8 (42.6, 68.3)
Convenient /drug store	10	16.6 (5.6, 27.7)	0	--	3	2 (0.4, 4.5)	13	14.8 (7.7, 26.5)
Friend/sex partner/other PWID†	10	13.5 (4.5, 22.4)	10	21.0 (10.6, 30.7)	5	2.5 (0.2, 4.2)	25	13.1 (7.1, 23.0)
Government drug treatment/hospital	9	13.1 (4.7, 21.5)	5	11.1 (3.3, 19.1)	17	10.3 (5.8, 14.2)	31	12.8 (6.5, 23.7)
<b>Number of needles/syringes received in past month</b>								
	61	52.9, 30 (0-300)	42	16.5, 3.5 (0-100)	134	15.7, 10 (0-100)	236	48.6, 10 (0-300)
<b>Places/people from where/who received condoms/lubricants in past 3 months ^</b>								
NGO Drop-in Center	5	58.1 (32.6, 84.1)	12	40.7 (0, 89.3)	3	51.4 (29.3, 75.3)	20	55.2 (27.0, 80.4)
Outreach worker/peer educator	4	22.6 (2.0, 42.5)	5	19.5 (5.8, 33.6)	2	38.9 (--)	11	22.5 (7.9, 49.5)
Convenient /drug store	1	16.5 (16.0, 16.7)	0	--	0	--	1	--
Friend/sex partner/other PWID†	0	--	1	2.7 (1.7, 3.5)	1	19.4 (0, 51.3)	2	0.6 (0.1, 3.1)
Government drug treatment/hospital	4	60.7 (61.1, 61.1)	3	12.5 (7.7, 17.9)	2	34.5 (--)	9	52.6 (25.3, 78.4)
Private hospital/clinic	0	--	2	5.7 (3.8, 7.1)	2	34.5 (--)	4	1.2 (0.3, 4.4)
<b>Receiving two or more prevention services in the past three months^^</b>								
	89	34.8 (26.8, 42.9)	65	21.8 (17.2, 26.3)	90	30.4 (25.5, 35.3)	244	31.7 (22.4, 42.1)

\*No responses for where drugs are bought; \*\*No responses for where drugs are bought Private hospital/clinic; ^ No responses for where drugs are bought.^^Global AIDS monitoring indicator. †Not peer outreach worker.

## Hepatitis testing and treatment

Under 40% of PWID in all cities ever had an HCV test, of which 48% in Bangkok, 32% in Chiang Mai and 63% in Songkhla had a positive test result (Table 19). Of those, most in Bangkok and Songkhla and only 43% in Chiang Mai had a liver fibro scan for HCV and, of those, between 45% in Chiang Mai and 70% in Songkhla received treatment.

**Table 19. Hepatitis testing and treatment among PWID**

	Bangkok n=261		Chiang Mai n=300		Songkhla n=282		Aggregated n=843	
	n	95% CI	n	95% CI	n	95% CI	n	95% CI
<b>Ever tested for HCV</b>	86	32.3 (24.3, 40.2)	50	16.5 (12.7, 20.3)	112	37.5 (31.7, 43.2)	248	31.3 (25.7, 37.6)
<b>Ever positive for HCV</b>	40	47.8 (26.9, 68.6)	18	32.5 (18.4, 44.6)	72	62.9 (51.9, 72.4)	130	49.2 (37.9, 60.7)
<b>Ever received liver fibro-scan for HCV</b>	30	80.3 (70.3, 90.5)	9	42.8 (0, 88.5)	48	64.6 (50.5, 76.9)	87	78.5 (63.5, 88.5)
<b>Ever received treatment for HCV</b>	26	58.4 (19.9, 96.5)	7	44.8 (27.8, 62.6)	48	69.6 (56.8, 83.9)	81	61.3 (43.4, 76.5)

## PREP and PEP

Under 20% of PWID who ever heard of PREP, of which none in Bangkok and Chiang Mai and 25% in Songkhla took PREP in the past three months (Table 19). Under 15% of PWID had heard of PEP, of which none in Bangkok and Chiang Mai and 18% in Songkhla took PEP in the past three months.

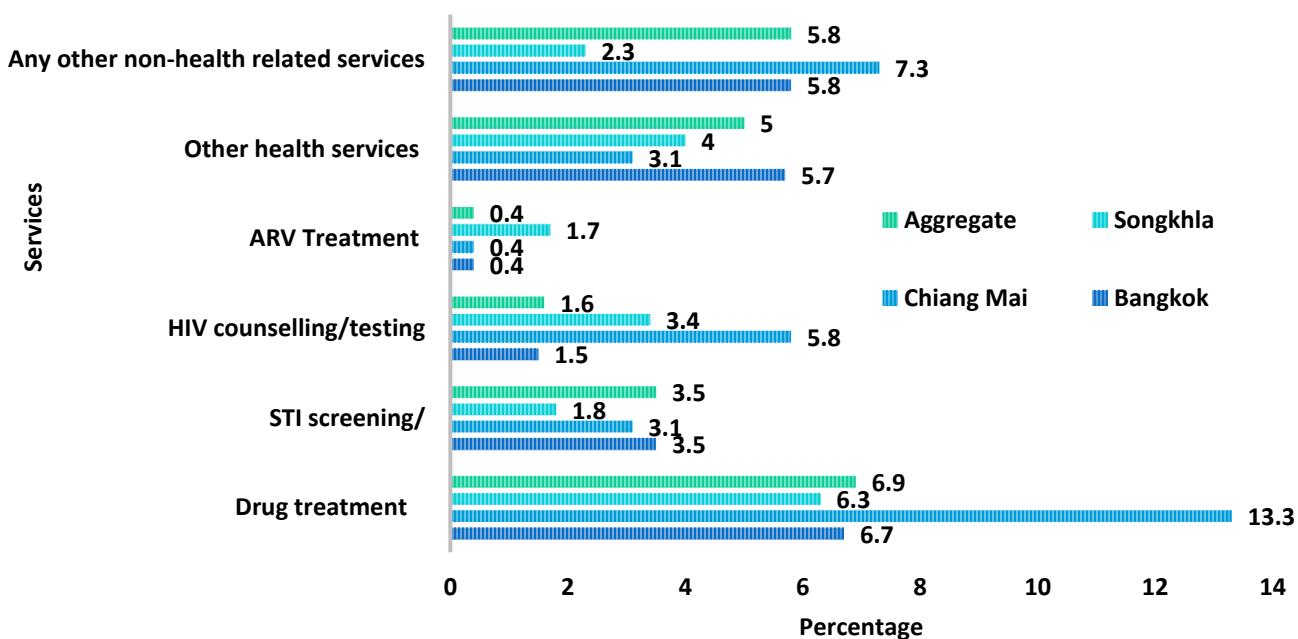
**Table 19. PREP and PEP among PWID, Chiang Mai**

	Bangkok n=261		Chiang Mai n=300		Songkhla n=282		Aggregated n=843	
	n	95% CI	n	95% CI	n	95% CI	n	95% CI
<b>Has heard of PREP</b>								
	24	8.9 (4.5, 13.3)	48	16.8 (12.5, 21.0)	27	9.7 (6.5, 12.9)	99	9.6 (6.4, 14.1)
<b>Took PREP in past 3 months</b>								
	0	--	0	--	5	25.5 (16.4, 38.4)	5	--
<b>Has heard of PEP</b>								
	28	11.1 (6.1, 16.1)	36	12.2 (8.6, 15.8)	16	5.1 (3, 7.2)	80	11.1 (7.5, 16.0)
<b>Took PEP in past 3 months</b>								
	0	--	0	--	2	18.4 (0.1, 51.6)	2	--

## Stigma and discrimination

Low percentages of PWID reported that they had been discriminated or treated unequally when accessing different types of services because of injecting drugs (Figure 15).

**Figure 15. Services by which PWID felt discriminated or treated unequally when accessing services because of injecting drugs \***



Few PWID avoided HIV testing, prevention, or treatment services because of fear someone will know of their injection drug use (Table 20). Of those, the highest percentages avoided HIV testing, prevention, or treatment services because fear of or concern about stigma by health care staff. Few PWID were ever denied employment or expelled from school because of injecting drugs. Significantly lower percentages of PWID in Songkhla (9%) had any family member express aversion (e.g., not wishing to speak with, speaking sarcastically about, blaming, scolding, gossiping about) because participant injects drugs, compared to PWID in Bangkok (52%) and Chiang Mai (43%). Significantly lower percentages of PWID in Songkhla (16%) became so sick in the past 12 months they had to go to the hospital, compared to PWID in Bangkok (36%) and Chiang Mai (45%); of those, a higher percentage of PWID in Songkhla received poorer care or services from a clinic or hospital doctor, nurse or other staff member compared to other patients and had clinic or hospital attending doctor, nurse or other staff member refuse treatment because they inject drugs. Under 10% of PWID in all cities avoided or delayed HIV testing in the past 12 months. Few PWID reported being forced to have sexual intercourse in the previous 12 months.

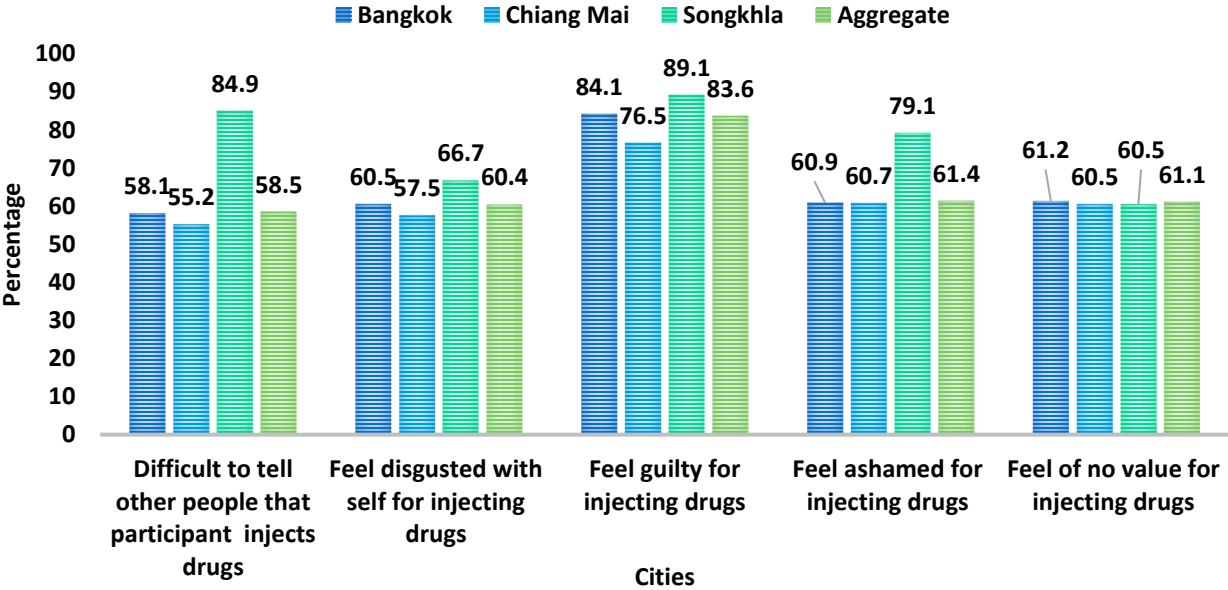
**Table 20. Stigma, discrimination, and violence among PWID in past 12 months, Chiang Mai**

	Bangkok n=261		Chiang Mai n=300		Songkhla n=282		Aggregated n=843	
	n	95% CI	n	95% CI	n	95% CI	n	95% CI
<b>Avoided HIV testing/prevention/treatment services because of fear someone will know of injection drug use</b>	23	10.1 (6.1, 14.2)	23	7.1 (4.4, 9.7)	13	5.7 (3, 8.4)	59	9.8 (6.3, 14.9)
<b>Avoided HIV testing/ prevention/treatment services for fear of or concern about:</b>								
Stigma by health care staff	12	34.4 (17, 51)	12	50.0 (26.9, 71.5)	6	51.4 (23.7, 83.6)	30	35.5 (18.2, 57.7)
Stigma by community	2	4.8 (0.9, 10.3)	4	15.6 (1.2, 28.9)	5	42.3 (11.6, 75.5)	11	6.1 (1.8, 18.7)
Or experienced violence	0	--	0	--	2	22.3 (6.3, 55.3)	2	0.4 (0.0,1.7)
Or experienced police harassment or arrest	5	31.7 (6.4, 57.1)	4	14.5 (13.9, 13.9)	3	17.5 (0, 32.6)	12	30.4 (12.0, 58.4)
<b>Denied employment/expelled from school because of injecting drugs</b>	6	2 (0.1, 3.8)	11	4.0 (1.8, 6.2)	5	2 (0.3, 3.7)	22	2.1 (1.0, 4.6)
<b>Denied employment/expelled from workplace because of injecting drugs</b>	24	9.4 (5, 13.8)	39	12.8 (9.2, 16.3)	12	4.2 (2, 6.4)	75	9.5 (6.2, 14.4)
<b>Any family members express aversion (e.g., not wishing to speak with/ speaking sarcastically about/blaming/scolding/gossiping about) because participant injects drugs</b>	133	51.8 (44.2, 59.3)	131	43.5 (37.9, 49.2)	28	9.4 (6.5, 12.3)	292	49.9 (43.4, 56.4)
<b>Had to go to hospital/clinic because of being so sick</b>	98	35.8 (27, 44.6)	134	45.5 (40.1, 51.0)	47	15.9 (12, 19.7)	279	36.0 (30.0, 42.5)
<b>Received poorer care/services from clinic or hospital doctor/nurse/staff compared to other patients because participant inject drugs</b>	7	6.5 (1.7, 11.3)	11	9.3 (3.3, 15.5)	13	28.5 (15.3, 42.1)	31	7.1 (3.6, 13.6)
<b>Clinic/hospital attending physician/nurse/staff refused participant treatment because of injecting drugs</b>	4	3.8 (0.1, 7.4)	4	3.2 (0, 6.7)	9	18 (5.4, 28.9)	17	3.9 (1.4, 10.2)
<b>Avoided/delayed medical services when needed</b>	9	6.1 (2, 10)	32	22.2 (15.2, 28.9)	10	24.9 (20.2, 32.9)	51	8.0 (4.7, 13.1)

Reasons for avoiding/delaying medical services when needed								
Afraid health care providers might stigmatize/treat poorly/be unwilling to provide services/discriminate	3	39.3 (3.6, 75.1)	3	8.7 (0, 21.5)	3	27.6 (0, 57.4)	9	30.2 (11.1, 60.0)
Afraid people might know participant injects drugs	3	29.1 (0.2, 60)	8	21.4 (0.9, 40.9)		16 (0.9, 55.9)	12	26.4 (10.1, 53.2)
Afraid of (or had) violent experiences	1	16.2 (0.1, 48.9)	2	6.6 (--)	0	--	3	13.0 (2.3, 48.1)
Afraid of being (or was) caught by police	0	--	4	14.5 (--)	1	9.3 (0, 26.6)	5	4.5 (1.5, 12.5)
Avoided/delayed HIV testing when needed								
	19	8.5 (4.4, 12.7)	26	8.0 (5.2, 10.9)	13	5.7 (2.9, 8.5)	58	8.4 (5.1, 13.7)
Reasons for avoiding/delaying HIV testing services when needed								
Afraid health care providers might stigmatize/treat poorly/be unwilling to provide services/discriminate	5	14.4 (3.5, 24.8)	3	10.3 (0, 23.1)	4	24.8 (--)	12	14.2 (5.2, 33.4)
Afraid people might know participant injects drugs	4	9.2 (3, 14.6)	3	10.6 (2.5, 18.7)	4	28.0 (28.2, 28.2)	11	9.5 (3.4, 23.7)
Afraid of (or had) violent experiences	0	--	0	--	2	9.2 (--)	2	0.2 (0.0, 0.9)
Afraid of being (or was) caught by police	2	18.6 (0.1, 48.6)	5	17.0 (0, 44.3)	1	6.2 (0.7, 29.5)	8	18.4 (3.8, 56.1)
Forced sexual intercourse in past 12 months								
	12	6.2 (2.6, 9.8)	14	5.7 (3.1, 8.2)	6	3.6 (0.7, 6.4)	32	6.1 (3.4, 10.7)

PWID in Songkhla had higher percentages of feeling internalized stigma because they inject drugs (Figure 16). More than half of PWID overall, felt internalized stigma because they inject drugs.

Figure 16. Stigma related to injection drug use



## HIV prevalence

PWID in Songkhla had a significantly higher percentage of HIV compared to Bangkok and Chiang Mai (Table 21). Among those who tested positive for HIV, 30% had never had an HIV test in Bangkok and Chiang Mai and 16% had never had an HIV test in Songkhla. Among those who had an HIV positive test result, only 43% had an HIV test in the previous 12 months.

**Table 21. HIV**

	Bangkok n=261		Chiang Mai n=300		Songkhla n=282		Aggregated n=843	
	n	95% CI	n	95% CI	n	95% CI	n	95% CI
<b>HIV*</b>	21	7.4 (3.3, 11.5)	26	8.1 (5.4, 10.9)	53	18.5 (14, 23)	100	7.8 (5.2, 11.5)
<b>Ever tested for HIV among those with HIV</b>								
Yes	15	69.5 (49.3, 89.8)	18	70.4 (53.7, 87)	43	83.9 (71.4, 96.4)	76	72.2 (53.9, 87.7)
No	6	30.5 (10.2, 50.7)	8	29.6 (13, 46.3)	9	16.1 (3.6, 28.6)	23	27.8 (1.1, 7.8)

## Syphilis, HBsAg and ANTI HCV testing Prevalence

Syphilis prevalence ranged from 6% in Songkhla to 9% in Bangkok and Chiang Mai. PWID in Bangkok and Songkhla had a significantly higher percentage of PWID with HCV compared to Chiang Mai. HBV prevalence was highest in Chiang Mai (9%) compared to Bangkok and Songkhla (3%).

**Table 22. Syphilis, HBV and HCV**

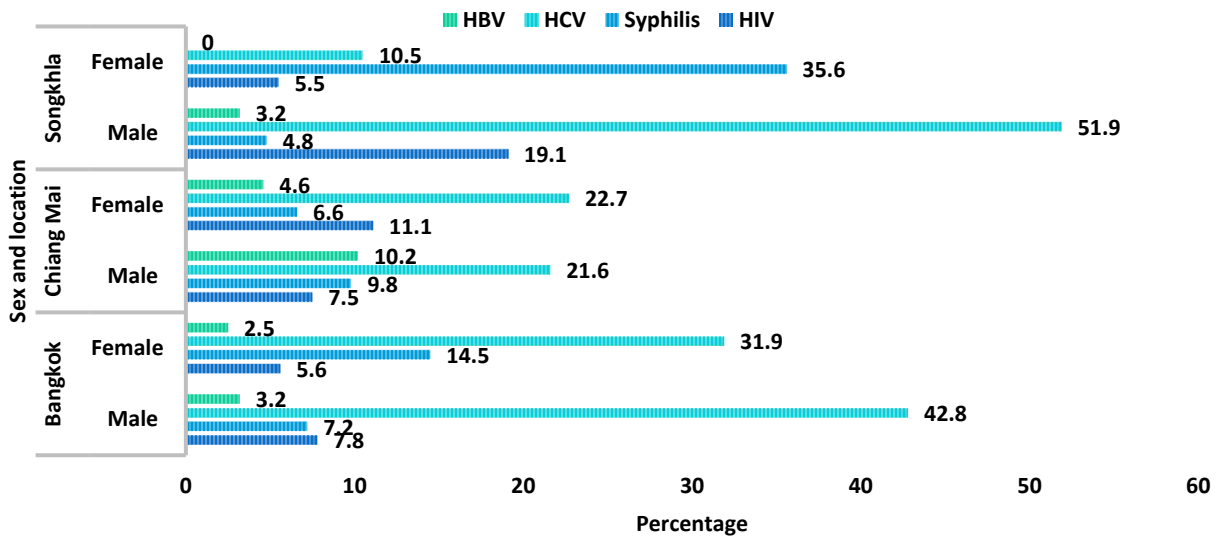
	Bangkok n=261		Chiang Mai n=300		Songkhla n=282		Aggregated n=843	
	n	95% CI	n	95% CI	n	95% CI	n	95% CI
<b>Syphilis</b>	18	8.7 (3.9, 13.3)	24	9.1 (6.0, 12.4)	17	6.3 (3.5, 9.1)	59	8.7 (5.1, 14.4)
<b>Anti HCV*</b>	107	40.7 (32.6, 48.8)	68	21.8 (16.4, 27.2)	45	49.9 (43.5, 56.3)	183	42.2 (33.9, 47.7)
<b>HBsAg</b>	8	3.1 (0.8, 5.3)	27	9.3 (6.0, 12.5)	7	3.1 (1.2, 5.6)	180	3.2 (1.1, 7.8)

\*Global AIDS Monitoring indicator

## HIV, Syphilis, HCV and HBV Prevalence by sex

In Songkhla, males had higher prevalence of HIV, HCV and HBV than females; However, females in Songkhla had substantially higher prevalence Syphilis (Figure 17). In Chiang Mai, females had higher prevalence of HIV, while males had higher prevalence of HBV and syphilis. Males and females in Chiang Mai had similar percentages of HCV. In Bangkok, males had higher prevalence of syphilis, but males had higher HIV, HBV and HCV.

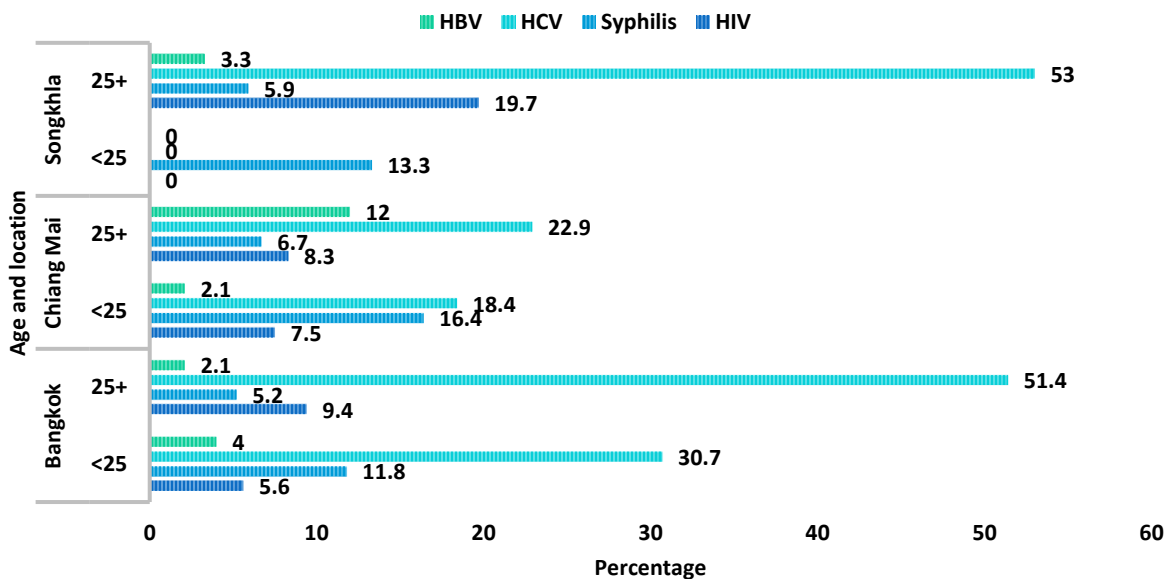
Figure 17. HIV, Syphilis, HCV and HBV by sex among PWID



*HIV, Syphilis, HBV and HCV Prevalence by age group*

Few survey participants were under the age of 25 in Songkhla, accounting for all HIV, HBV and HCV infection being among those in the older age groups (Figure 18). Interestingly, a higher percentage of syphilis cases were found in those under the age of 25, compared to older PWID, in Songkhla, as well as in Chiang Mai and Bangkok. Among those under the age of 25 years, 8% of PWID in Chiang Mai and 6% in Bangkok are living with HIV and 18% in Chiang Mai and 31% in Bangkok are living with HCV.

Figure 18. HIV, Syphilis, HCV and HBV by age groups (<25, 25+), PWID



## POPULATION SIZE ESTIMATIONS

Population sizes for PWID were generated for Bangkok, Chiang Mai and Songkhla with mixed success (Table 22). In addition to size estimations from service multiplier data, size estimations were generated using network data to produce SS-PSEs. For Bangkok, size estimations were generated using data from the methadone program at the BMA, HIV tests at Raks Foundation, needle/syringe program at the Raks Foundation, and the needle/syringe program at Ozone. The mean population size estimation is 5,205 in Bangkok using a general population size of males and females ages 15 to 29 years of 3,684,753. The mean population size estimation indicates that PWID make up 0.141% of the adult population in Bangkok.

For Chiang Mai, size estimations were generated using data from the methadone program at Thanyarak Hospital and the condoms/lubricants program at TDN. The mean population size estimation is 3,410 in Chiang Mai using a general population size of males and females ages 15 to 29 years of 1,141,873. The mean population size estimation indicates that PWID make up 0.30% of the adult population in Chiang Mai. For Songkhla, size estimations were generated using data from the methadone program at Thanyarak Hospital and the needle/syringe exchange program at Ozone. The mean population size estimation is 945 in Songkhla using a general population size of males and females ages 15 to 29 years of 175,000. The mean population size estimation indicates that PWID make up 0.54% of the adult population in Songkhla.

**Table 22. Population size estimates, PWID**

SURVEY SITE AND METHODS	ESTIMATES FROM SURVEY	DATA FROM PROGRAMS	FINAL SIZE ESTIMATION (COUNT)	POPULATION (15 TO 29 YEARS)	PWID AS % OF ADULT POPULATION
<b>BANGKOK</b>					
Methadone BMA	0.4	800	2000	3,684,753	0.054%
HIV test Raks Foundation	0.03	109	3633	3,684,753	0.099%
Needle/syringe Raks Foundation	0.05	806	16120	3,684,753	0.437%
Needle/syringe Ozone	0.18	151	839	3,684,753	0.023%
SS-PSE (mean)			3435	3,684,753	0.093%
Mean			5205	3,684,753	0.141%
<b>CHIANG MAI</b>					
Methadone Thanyarak Hospital	0.221	146	661	1,141,873	0.06%

Condoms/lubricants TDN	0.06	518	8633	1,141,873	0.76%
SS-PSE (mean)			935	1,141,873	0.08%
Mean			3410	1,141,873	0.30%
<b>SONGKHLA</b>					
Methadone Thanyarak Hospital	0.17	190	1118	175,000	0.64%
Needle/Syringe Ozone	0.45	584	1298	175,000	0.74%
SS-PSE (mean)			420	175,000	0.24%
Mean			945	175,000	0.54%

Songkhla has a unique situation whereby there are fewer females who inject drugs compared to Bangkok. Given that females did not access services and females were not included in the counts of program data for the methadone program at Thanyarak Hospital, it makes sense to calculate size estimations using male population data. Although the size estimation counts remain the same, the final mean percentage of the male population is much higher: 1.12% (Table 23).

**Table 23. Population size estimates only among male PWID in Songkhla**

SURVEY SITE AND METHODS	ESTIMATES FROM SURVEY	DATA FROM PROGRAMS	FINAL SIZE ESTIMATION (COUNT)	POPULATION (15 TO 59 YEARS)	PWID AS % OF ADULT POPULATION
<b>SONGKHLA</b>					
Methadone Thanyarak Hospital	0.17	190	1118	84500	1.32%
Needle/Syringe Ozone	0.45	584	1298	84500	1.54%
SS-PSE (mean)			420	84500	0.50%
Mean			945	84500	1.12%

**Limitations to size estimations**

These size estimations are subject to several limitations. There was some difficulty in collecting accurate program data which may indicate that these data are not systematically collected. Some of the size estimations appear to be over or underestimations (e.g., overestimations in the needle/syringe program at the Raks Foundation in Bangkok and in the condoms/lubricants program at TDN in Chiang Mai) which are likely due to biases in the survey data or program data. Biases may be a result of the effects of restrictions caused by COVID 19, especially in Bangkok, whereby the sample size was not attained, and in Songkhla, which had to move sites during data collection. However, given that it is impossible to know the direction of these biases using these methods, there is no way to



definitively know which results make the most sense without additional estimations and qualitative input from experts and stakeholders. The SS-PSE results seem reasonable, except for Songkhla which may be an underestimation. This may be due to limitations in network data collected or a bottleneck caused by having to move interview locations during sampling.

### **All population size estimations**

During a meeting of key experts, these data were reviewed and some data were excluded for obvious underestimations (i.e., the condom program at Raks Foundation and the condom program at Ozone in Bangkok). Final agreement on the size estimations, and especially the proportion of 15 to 59-year olds in each survey site that PWID comprise, is needed. Ideally, among experts and stakeholders is needed before extrapolation to other cities in Thailand.

## **DISCUSSION AND RECOMMENDATIONS**

### **Concentrated HIV epidemic among PWID**

PWID have high HIV prevalence, among which high percentages are among females and, with the exception of Songkhla, are among young PWID. HIV prevalence is especially alarming among PWID in Songkhla, however this may be partially due to the population being older. These findings indicate an urgent need to scale up HIV prevention and intervention among PWID, with added focus on females and young PWID. Given that 11% of PWID in all cities combined reported sharing needles and syringes and 52% reported sharing injection equipment in the past six months and that among those who injected in the past one month, 96% reported sharing a needle or syringe during their last injection, further transmission of HIV is likely. Expansion of existing programs is needed to ensure that PWID have access to harm reduction and treatment.

### **HIV status and ART**

Using data from all three sites, 46 PWID reported knowing they were living with HIV. Of those, 41 (89%) had initiated ART, but only 32 (78%) of those who had initiated ART were currently taking ART. More information is needed about the initiation of and retention on ART among PWID living with HIV.

## High prevalence of Hepatitis C infection.

HCV positivity was high in all locations, especially in Songkhla where half of PWID have HCV. Of those with HCV, sizable proportions were among females and young people in Bangkok and Chiang Mai. Overall, only 31% of PWID have ever had a test for HIV among which almost half were positive and only 61% ever received treatment. Continued sharing of needles and syringes and injecting equipment requires on going monitoring and an expansion of programs to prevent and treat HCV based on the WHO Guidelines for the screening, care and treatment of persons with HCV infection<sup>13</sup>. Ongoing sharing of needles, syringes and equipment indicate further spread of HCV.

## Low screening for STI; Syphilis infection

Syphilis infection was under 10% among PWID in all cities. However, female PWID in Songkhla and Bangkok had higher syphilis prevalence than males and younger PWID in all cities had higher syphilis prevalence than older PWID. In Songkhla, only younger PWID were positive for syphilis infection. Although 27% of all PWID combined had a diagnosis for an STI (not only syphilis) in the previous year, only 62% received any treatment which is an indication of possible ongoing sexual transmission of STI by those not treated. Having an STI that produces ulcers in the genital area increase the risk of HIV transmission during unprotected sexual intercourse. PWID friendly programs, especially for young PWID, should provide on site screening and treatment of STI, as well as education about when to seek testing and screening and how to avoid STI.

## Injection behaviors vary by city

### *Types of drugs*

A statistically significantly higher percentage of PWID in Chiang Mai and Songkhla use Amphetamine (Shabu), compared to PWID in Bangkok. Similarities include that the majority of PWID in all cities inject heroin, however, notable drug injection patterns included a significantly higher percentage of PWID in Chiang Mai and Songkhla injecting Heroin with another drug compared to Bangkok and a significantly higher percentage in Chiang Mai injecting Methadone, opium, morphine, and other similar drugs compared to Bangkok and Songkhla.

---

<sup>13</sup> WHO Guidelines for the screening, care and treatment of persons with hepatitis C infection (updated version). 2016. Geneva, Switzerland. [http://apps.who.int/iris/bitstream/10665/205035/1/9789241549615\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/205035/1/9789241549615_eng.pdf).

## Sharing

A significantly statistically higher percentage of PWID in Chiang Mai than Bangkok injected with the same needle or syringe as others and used injection equipment already used by someone else in the past six months. Both HIV and HCV can survive for long periods of time on injecting materials allowing for ample opportunities for transmission among those who use materials previously used by others<sup>14,15</sup>. Easy access to clean needles and syringes and other injecting equipment through many venues, including pharmacies, clinics, hospitals and harm reduction programs, is essential for reducing HIV and HCV transmission among PWID<sup>16</sup>.

## *Songkhla has some notable patterns*

PWID in Songkhla are older, initiated injection drug use at an older age, have been injecting for more than twice as long a longer time and have higher percentages that inject drugs daily compared to Bangkok and Chiang Mai. These differences in drug use behaviors are essential in developing effective targeted programs. Long term use and frequency of injecting drugs increases the risk of HIV and/or HCV transmission, as well as increased morbidity and mortality from complications of drug use. WHO recommends a comprehensive package of harm reduction which includes the expansion of needle and syringe programmes, drug dependence treatment with specific focus on opioid substitution therapy (OST), HIV testing and counselling (HTC), HIV treatment and care Information, education and risk reduction counseling, condom distribution and STI management and management of TB and viral hepatitis<sup>17</sup>.

## Treatment patterns vary by city

A significantly higher percentage of PWID in Songkhla were ever prescribed OST and Only 31% of PWID in Chiang Mai and over 60% in Bangkok and Songkhla were ever prescribed methadone. Most PWID in all cities are injecting opioids and most have tried to give up drug use in the previous six months. OST, a harm reduction initiative that offers people who are dependent on opioids (such as heroin) an alternative, prescribed medicine – most typically methadone or buprenorphine, which is

---

<sup>14</sup>Accessed on June 15, 2012 at: [http://www.aidsinfonet.org/fact\\_sheets/view/154](http://www.aidsinfonet.org/fact_sheets/view/154).

<sup>15</sup>Thibault V et al. Hepatitis C transmission in injecting drug users: could swabs be the main culprit? J Infect Dis, online edition, doi: 10.1093/infdis/jir650

<sup>16</sup>European Monitoring Center for Drugs and Addiction. Harm reduction interventions for opioid injectors. Accessed at: <http://www.emcdda.europa.eu/best-practice/harm-reduction/opioid-injectors>.

<sup>17</sup>WHO. See: <http://www.who.int/hiv/topics/idu/about/en/>.

swallowed rather than injected, is effective in helping PWID to cease or reduce their injection drug use and is recommended as part of a comprehensive package for the prevention, treatment and care of HIV among PWID.<sup>18</sup> However, the treatment of injection drug use is a complex and multifaceted health problem which requires the development of comprehensive treatment programs which include engaging psychiatric, psychological and mental health care, social services (for housing and job skills/employment and, other specialist health care (such as services for HIV, HCV and other infections)<sup>19</sup>.

## **Females at high risk of HIV**

Females comprise 19% of those injecting drugs in Bangkok, 16% in Chiang Mai and only 5% in Songkhla. Female injectors tend to be more stigmatized, vulnerable, and isolated than male injectors and may rely on male partners to buy drugs and injecting equipment for them. Compared to males, higher percentages of females are living with HIV in Songkhla and Chiang Mai and higher percentages of females are living with HCV in Bangkok and Chiang Mai. Worldwide, female injectors generally have a higher HIV prevalence than male injectors<sup>20</sup>. Harm reduction and treatment services for women who inject drugs should also address issues of violence, sexual abuse, depression, family planning, STI screening, sex work and care for family and children<sup>21</sup>. In addition, services should provide spaces and time accessible only to females, separate from males who inject drugs.

## **High risk sexual practices**

Most PWID are having sexual intercourse with multiple partner types, including paid and paying partners. PWID report inconsistent condom use; overall condom use was only 37% at last sexual intercourse. Sexual intercourse is an important route for HIV and other STI transmission. Sexual risk behaviors should be closely monitored among PWID. Inconsistent condom use is demonstrated by the prevalence of syphilis which is especially high among young PWID.

---

<sup>18</sup> UNAIDS. Do No Harm: Health, Human Rights and People who use Drugs. Geneva, Switzerland; 2018 [Available from: [https://www.unaids.org/sites/default/files/media\\_asset/donoharm\\_en.pdf](https://www.unaids.org/sites/default/files/media_asset/donoharm_en.pdf)

<sup>19</sup> 1. UNODC. International Standards for the Treatment of Drug Use Disorders. Vienna, Austria; 2017. Available from: [https://www.unodc.org/documents/UNODC\\_WHO\\_International\\_Standards\\_Treatment\\_Drug\\_Use\\_Disorders\\_December17.pdf](https://www.unodc.org/documents/UNODC_WHO_International_Standards_Treatment_Drug_Use_Disorders_December17.pdf)

<sup>20</sup> Des Jarlais DC, Feelemyera JP, Modia SN, Arasteha K, Haganb H. Are females who inject drugs at higher risk for HIV infection than males who inject drugs: An international systematic review of high seroprevalence areas. *Drug and Alcohol Dependence*. 124 (2012) 95–107.

<sup>21</sup> UNODC. Global epidemiology of women and injecting drug use. Vienna, Austria; 2018. Available from: [http://regist2.virology-education.com/2018/8Women/21\\_Ciupagea.pdf](http://regist2.virology-education.com/2018/8Women/21_Ciupagea.pdf)

## **HIV testing among PWID is low.**

Only half of PWID have ever had an HIV test, of which under roughly half did so in the past 12 months. Of all PWID who ever received an HIV test, almost all received their test results; 4% of which were positive in Bangkok and Chiang Mai and 25% of which were positive in Songkhla. Of importance, this survey was able to identify previously untested PWID living with HIV. Increasing the percentage of PWID who seek HTC could be addressed by increasing awareness about the importance of being tested and the availability of HIV testing locations, promoting existing services, with additional training for counselors on how to receive and provide quality HTC services for PWID, having more 'PWID friendly' HTC settings.

## **PREP and PEP**

HIV PrEP and PEP are evidence-based interventions that reduce HIV incidence among PWID. However, uptake in PWID has lagged due to limited PrEP and PEP knowledge, discrepancies between perceived and actual HIV risk, stigma, and structural barriers to adherence including homelessness and incarceration<sup>22</sup>. Low percentages of PWID in all cities have heard of PrEP or PEP and only PWID in Songkhla have taken either in the previous three months. Provision of PrEP and PEP to PWID should be explored.

## **Access to HIV preventions differ by city**

PWID in Bangkok had the highest percentages and Chiang Mai reported the lowest percentages receiving clean needles and syringes from an NGO or drop-in center in the past three months. PWID in Songkhla had the highest percentages and Chiang Mai reported the lowest percentages receiving lubricants and condoms in the past three months. Of all cities combined, only 31% received clean needles or syringes and 50% received lubricants and/or condoms in the previous three months. Provision of clean needles and syringes, condoms and lubricants and education on HIV prevention are an essential components of harm reduction. Expansion of outreach and NGO drop-in services are needed to ensure PWID have access to a full range of harm reduction services.

---

<sup>22</sup>Taylor JL, Walley AY, Bazzi AR. Stuck in the window with you: HIV exposure prophylaxis in the highest risk people who inject drugs. *Subst Abus.* 2019;441-3.

## PWID population sizes of PWID

There were some limitations to the population size estimation calculations which may limit representativeness. The final mean counts were roughly 5000 PWID in Bangkok, 3400 in Chiang Mai and 950 in Songkhla. The final count for Songkhla may only represent males, whereas the final counts in Bangkok and Chiang Mai likely represent males and females. Population size estimates are useful for deciding how and where resources should be allocated for better program planning and management.

## SUMMARY OF KEY RECOMMENDATIONS

### Strategic Information and population size estimation

- Continue to collect strategic information to monitor HIV transmission and related behaviors, including among young and female PWID.

### Access to services

- Scale-up OST, harm reduction and effective treatment programs and increase the number of NSP and OST programs.
- Improve existing treatment programs: The currently available evidence strongly supports OST, combined with psychosocial assistance for keeping PWID in treatment.
- Continue to scale up harm reduction, including provision of clean needles and syringes and HIV prevention education.
- Increase HIV testing, especially for females who inject drugs, by scaling up HTC services that treat PWID with dignity and respect.
- Make use of the knowledge that PWID constitute a large social network (as confirmed by the effective recruitment of PWID in this study) to deliver prevention through peer driven intervention modalities.
- Investigate and implement the best practices for PWID targeted programs to provide HIV and harm reduction education, effective drug treatment and maintenance modalities, condom distribution and easy access to needles to reduce the spread of HIV.
- Continue to enhance formal guidelines and interventions for hepatitis prevention and management of both hepatitis and hepatitis-HIV co-infection among PWID.

- Develop strategies to scale up programs to provide HCV and harm reduction education to PWID.
- Integrate prevention and screening of HIV and HCV among PWID at public health centers.
- Educate health staff to improve prevention services targeting high risk populations, especially PWID.
- Educate pharmacists to the needs of PWID and allow PWID to access clean syringes at pharmacies.
- Educate condom providers (shops, stores, etc.) about the needs of PWID, to encourage PWID to use and purchase condoms.
- Evaluate the scale up of PrEP and PEP for PWID.
- Enhance youth programs to include healthy lifestyle choices and support for young people who may be vulnerable to drug use and injecting.
- Increase outreach efforts/policy changes, including reducing stigma and discrimination related to PWID.
- Increase education about drug use and HIV and HCV risk to youth and allow harm reduction and outreach to young people, which is currently stymied because of parental consent requirements.
- Use the population size estimations of PWID to better plan and allocate resources for prevention and intervention programs.

## APPENDIX A

**Table A. Number of needles and syringes used, purchased/not purchased in past month, among PWID who injected drugs in past one month (Mean, median, range)**

	Bangkok n=261		Chiang Mai n=300		Songkhla n=282		Aggregated n=843	
	n	95% CI	n	95% CI	n	95% CI	n	95% CI
<b>Number of needles used</b>	261	19.9, 7 (0-150)	292	10.2, 3 (0, 420)	227	17.0, 12 (0–90)	777	18.3, 7 (0-420)
<b>Number of needles purchased</b>	261	15.6, 4 (0-150)	290	7.2, 1 (0, 120)	236	12.8, 10 (0–90)	784	14.0, 4 (0-150)
<b>Number of needles not purchased</b>	257	4.9, 0 (0–95)	288	3.0, 0 (0-405)	215	4.7, 0 (0–90)	760	4.8, 0 (0–405)
<b>Number of syringes used</b>	261	17.6, 5 (0-120)	290	9.1, 2 (0-420)	245	16.4, 10 (0–90)	794	16.4, 5 (0–420)
<b>Number of syringes purchased</b>	261	14.7, 3 (0-120)	289	6.6, 1 (0-90)	228	12.9, 10 (0–90)	775	13.1, 4 (0-120)
<b>Number of syringes not purchased</b>	260	3.4, 0 (0–90)	286	2.6, 0 (0-405)	222	3.8, 0 (0-90)	768	3.4, 0 (0-405)



## APPENDIX B

**Table B1. Contact with local services in Bangkok**

	Bangkok n=261	
	n	95% CI
<b>Had contact with any of the following</b>		
Ozone BKK Drop-in center	48	19.5 (11.4, 27.5)
Ozone BKK Outreach workers	39	13.9 (7.1, 20.8)
Raks Thai BKK Drop-in center	14	4.4 (0.5, 9.2)
Raks Thai BKK Outreach workers	13	4.4 (0, 8.8)
<b>Times having contact with in past 3 months (Mean, median range)</b>		
Ozone BKK Drop-in center	48	9.2, 1.0 (0- 150)
Ozone BKK Outreach workers	39	8.4, 1.0 (0- 90)
Raks Thai BKK Drop-in center	14	0.8, 0.0 (0 - 3)
Raks Thai BKK Outreach workers	13	5.4, 3.0 (0- 12)
<b>Times having contact with in the past 12 months (Mean, median range)</b>		
Ozone BKK Drop-in center	48	40.6, 3.5 (0 - 360)
Ozone BKK Outreach workers	39	86.6, 5.0 (0 - 1800)
Raks Thai BKK Drop-in center	14	3.8, 1.0 (0 - 12)
Raks Thai BKK Outreach workers	13	32.1, 11.0 (0 - 144)

**Table B2. Contact with local services in Chiang Mai**

	Chiang Mai n=300	
	n	95% CI
<b>Had contact with any of the following</b>		
Ozone Chiang Mai Drop-in center	8	2.8 (0.9, 4.5)
Ozone Chiang Mai Outreach workers	5	1.7 (0.3, 3.0)
TDN Chiang Mai Drop-in center	24	7.3 (0.3, 3.0)
TDN Chiang Mai Outreach workers	24	7.4 (4.9, 9.9)
Herbal Life Chiang Mai Drop-in center	11	3.6 (1.8, 5.4)
Herbal Life Chiang Mai Outreach workers	7	2.0 (0.7, 3.5)
<b>Times having contact with in past 3 months (Mean, median range)</b>		
Ozone Chiang Mai Drop-in center	8	1.6, 1.0 (1.0, 3.0)
Ozone Chiang Mai Outreach workers	5	1.2, 1.0 (1.0, 2.0)
TDN Chiang Mai Drop-in center	23	1.7, 1.0 (1.0, 5.0)
TDN Chiang Mai Outreach workers	22	1.5.1, 0 (1.0, 5.0)
Herbal Life Chiang Mai Drop-in center	11	2.5.2.0 (1.0, 6.0)
Herbal Life Chiang Mai Outreach workers	6	1.7, 1.5 (1.0, 3.0)
<b>Times having contact with in the past 12 months (Mean, median range)</b>		
Ozone Chiang Mai Drop-in center	8	2.3, 1.5 (1.0, 5.0)
Ozone Chiang Mai Outreach workers	5	1.2, 1.0 (1.0, 2.0)
TDN Chiang Mai Drop-in center	23	3.3, 2.0 (1.0, 9.0)
TDN Chiang Mai Outreach workers	21	2.3, 2.0 (1.0, 6.0)
Herbal Life Chiang Mai Drop-in center	11	4.6, 4.0 (1.0, 9.0)
Herbal Life Chiang Mai Outreach workers	6	2.3, 2.0 (1.0, 4.0)

**Table B3. Contact with local services in Songkhla**

	Songkhla n=282	
	n	95% CI
<b>Had contact with any of the following</b>		
Ozone Songkhla Drop-in center	115	40.4 (34, 46.9)
Ozone Songkhla Outreach workers	129	42.5 (35.8, 49.2)
Ozone Pattani Drop-in center	2	0.6 (0, 1.1)
Ozone Pattani Outreach workers	1	0.2 (0, 0.5)
<b>Times having contact with in past 3 months (Mean, median range)</b>		
Ozone Songkhla Drop-in center	107	2.4, 1.0, (0 – 50)
Ozone Songkhla Outreach workers	118	2.2, 1.0 (0 – 90)
<b>Times having contact with in the past 12 months (Mean, median range)</b>		
Ozone Songkhla Drop-in center	117	7.8, 2.0 (0.0 – 366)
Ozone Songkhla Outreach workers	109	7.6, 2.0 (0.0 – 180)

## APPENDIX C

**Table C1. Global AIDS Monitoring indicators by city and aggregated (weighted)**

	Bangkok n=261		Chiang Mai n=300		Songkhla n=282		Aggregated n=843	
	n	95% CI	n	95% CI	n	95% CI	n	95% CI
<b>GAM 3.4 PWID who tested for HIV in past 12 months or who know their current HIV status</b>	94	39.3 (31.4, 47.1)	65	21.7 (17.1, 26.3)	96	34.5 (28.6, 40.4)	255	38.1 (32.2, 45.6)
<b>GAM 3.5 PWID living with HIV receiving ART in past 12 months</b>	7	100	4	73.0 (42.9, 104.7)	32	94.9 (92.2, 95.9)	43	97.7 (91.4, 99.4)
<b>GAM 3.6 Used a condom during last sexual intercourse in past month among PWID who injected in past month</b>	27	40.1 (26, 54.5)	33	32.4 (23.7, 40.7)	22	38.6 (27.6, 52.3)	82	39.6 (28.0, 52.5)
<b>GAM 3.7 PWID reporting having received a combined set of HIV prevention interventions</b>	89	34.8 (26.8, 42.9)	65	21.8 (17.2, 26.3)	90	30.4 (25.5, 35.3)	244	31.7 (22.4, 42.1)
<b>GAM 3.8 PWID reporting using sterile injecting equipment last time they injected</b>	175	95.8 (89, 102.5)	146	83.1 (76.3, 89.4)	222	97.2 (96.4, 97.9)	543	95.0 (91.3, 97.2)
<b>GAM 3.10 PWID receiving OST</b>	5	1.8 (0.2, 3.4)	21	5.6 (3.5, 7.7)	62	21.8 (17.3, 26.3)	88	5.2 (2.6, 7.9)
<b>GAM 4.2 Avoidance of health care among PWID because of stigma and discrimination</b>	14	5.2 (1.8, 8.6)	15	4.4 (2.2, 6.7)	11	4.3 (2, 6.5)	40	5.1 (2.7, 9.5)

**Table C2. Global AIDS Monitoring indicators by age groups (weighted)**

		Aggregate N= 843		Aggregate N= 843	
		n	%	n	%
<b>HIV prevalence among PWID</b>					
<b>&lt; 25 years</b>				<b>Male</b>	
	Yes	12	5.48	Yes	90
	No	207	94.52	No	646
<b>&gt; 25 years</b>				<b>Female</b>	
	Yes	88	14.10	Yes	10
	No	536	85.90	No	97
<b>HCV prevalence among PWID</b>					
<b>&lt; 25 years</b>				<b>Male</b>	
	Yes	55	25.11	Yes	291
	No	164	74.89	No	445
<b>&gt; 25 years</b>				<b>Female</b>	
	Yes	265	42.47	Yes	29
	No	359	57.53	No	78
<b>GAM 3.6 Used condom during last sexual intercourse in past month among PWID who injected in past month</b>					
<b>&lt; 25 years</b>				<b>Male</b>	
	Yes	24	40.00	Yes	75
	No	36	60.00	No	136
<b>&gt; 25 years</b>				<b>Female</b>	
	Yes	58	33.53	Yes	7
	No	115	66.47	No	15
<b>GAM 3.7 PWID reporting having received a combined set of HIV prevention interventions</b>					
<b>&lt; 25 years</b>				<b>Male</b>	
	Yes	50	22.83	Yes	218
	No	169	77.17	No	518
<b>&gt; 25 years</b>				<b>Female</b>	
	Yes	194	31.09	Yes	26
	No	430	68.91	No	81
<b>GAM 3.8 % PWID reporting using sterile injecting equipment the last time they injected in last month</b>					
<b>&lt; 25 years</b>				<b>Male</b>	
	Yes	126	93.33	Yes	491
	No	9	6.67	No	37
<b>&gt; 25 years</b>				<b>Female</b>	
	Yes	417	93.08	Yes	52
	No	31	6.92	No	3
<b>GAM 3.10 PWID receiving OST</b>					
<b>&lt; 25 years</b>				<b>Male</b>	
	Yes	8	3.65	Yes	84
	No	211	96.35	No	652
<b>&gt; 25 years</b>				<b>Female</b>	
	Yes	80	12.82	Yes	4
	No	544	87.18	No	103
<b>GAM 4.2 Avoidance of health care among PWID because of stigma and discrimination</b>					
<b>&lt; 25 years</b>				<b>Male</b>	
	Yes	13	5.94	Yes	38

	No	206	94.06		No	698	94.84
	<b>&gt; 25 years</b>				<b>Female</b>		
	Yes	27	4.33		Yes	2	1.87
	No	597	95.67		No	105	98.13
<b>GAM 3.4 PWID who tested for HIV in past 12 months or who know their current HIV status</b>							
	<b>&lt; 25 years</b>				<b>Male</b>		
	Yes	67	30.59		Yes	228	30.98
	No	152	69.41		No	508	69.02
	<b>&gt; 25 years</b>				<b>Female</b>		
	Yes	188	30.13		Yes	27	25.23
	No	436	69.87		No	80	74.77
<b>GAM 3.5 PWID living with HIV receiving ART in the past 12 months</b>							
	<b>&lt; 25 years</b>				<b>Male</b>		
	Yes	2	100		Yes	40	97.56
	No	0	0		No	1	2.44
	<b>&gt; 25 years</b>				<b>Female</b>		
	Yes	41	93.18		Yes	3	60.00
	No	3	6.82		No	2	40.00

## APPENDIX D

**Table D1. Data for graphics**

	Bangkok n=261		Chiang Mai n=300		Songkhla n=282		Aggregated n=843	
	n	95% CI	n	95% CI	n	95% CI	n	95% CI
<b>Age groups</b>								
<19	38	16.2 (8.4, 24)	32	10.6 (3.1, 17.9)	2	0.8 (0.2, 1.8)	72	15.4 (10.8, 21.4)
20-24	87	35.7 (23.1, 48.4)	49	16.1 (10.8, 21.4)	11	5.1 (2.2, 7.9)	147	33.3 (27.2, 40.0)
25-34	53	18.6 (11.9, 25.3)	70	24.2 (18.8, 29.6)	41	15.3 (11.3, 19.4)	164	19.0 (14.6, 24.3)
35-44	34	11.6 (4.9, 18.3)	88	29.8 (23.8, 35.8)	111	37.6 (32.7, 42.5)	233	13.8 (10.4, 18.2)
45-54	36	12.7 (3.8, 21.6)	40	12.6 (8.5, 16.8)	96	32.7 (27.7, 37.7)	172	13.2 (9.7, 17.8)
55+	13	5.1 (0.2, 10)	21	6.8 (3.4, 10.2)	21	8.5 (5.4, 11.6)	55	5.4 (3.2, 8.9)
<b>Age at first drug use (years)</b>								
<15	76	30.6 (23.9, 37.3)	164	53.9 (47.8, 60.1)	21	7.1 (4.6, 9.6)	139	28.5 (22.7, 35.2)
15-19	148	55.4 (48.1, 62.7)	62	20.5 (16.3, 24.7)	112	41.8 (36, 47.5)	393	54.3 (47.7, 60.7)
20+	37	14 (9.3, 18.7)	74	25.6 (19.8, 31.3)	142	51.1 (45.5, 56.8)	301	17.2 (13.3, 21.9)
<b>Age at first injection drug use</b>								
<15	17	8.5 (3.7, 13.2)	4	1.2 (0.3, 2.1)	5	1.6 (0.4, 2.8)	26	7.8 (4.3, 13.7)
15-19	127	48.7 (41.3, 56.3)	104	35.1 (28.5, 41.7)	56	21.5 (17.1, 25.9)	287	46.8 (40.3, 53.3)
20+	117	42.8 (35.4, 50.2)	190	63.7 (56.9, 70.5)	215	76.9 (72.5, 81.4)	522	45.5 (39.1, 51.9)
<b>By whom injected first time</b>								
Self	59	25.9 (19, 32.8)	68	22 (17.6, 26.3)	81	31 (26.2, 36)	208	25.9 (20.1, 32.5)
Sex partner	3	0.6 (0, 1.2)	8	2.7 (1, 4.5)	0	--	11	0.8 (0.3, 1.8)
Relative/friend	149	55 (47.5, 62.4)	69	23.8 (19.1, 28.5)	70	23.3 (18.9, 27.6)	288	51.5 (45.0, 58.0)
Dealer/injector	50	18.5 (12.3, 24.7)	154	51.5 (46.2, 56.8)	131	45.7 (40.5, 50.9)	336	21.9 (17.2, 27.4)
<b>Frequency of using a sterile, not previously used needle/syringe in past six months</b>								
Always	198	77.7 (72.6, 82.8)	184	62.9 (57.6, 68.3)	230	84.7 (81.3, 88)	612	76.7 (70.5, 82.0)
Sometimes	42	16.2 (11.6, 21)	95	33.0 (27.8, 38.2)	39	13.9 (10.9, 16.9)	176	17.5 (13.0, 23.2)
Never	16	6 (3, 9)	12	4.0 (2.0, 6.0)	3	1.5 (-0.2, 3.2)	31	5.7 (3.1, 10.3)
<b>Ever prescribed methadone</b>								
	173	65.5 (57.6, 73.3)	100	31.3 (25.1, 37.5)	182	62.4 (56.7, 68)	455	62.6 (56.1, 68.7)
<b>Ever prescribed Subutex (Buprenorphine)</b>								
	2	0.6 (0, 1.3)	1	0.4 (0, 1.1)	5	1.8 (0.5, 3.2)	8	0.8 (0.2, 2.6)
<b>Ever prescribed Suboxone (Buprenorphine and naloxone)</b>								
	9	4.3 (0.9, 7.8)	2	0.7 (0, 1.5)	4	1.5 (0.2, 2.8)	15	4.6 (2.0, 9.9)
<b>Ever received opioid substitution treatment (OST)/therapy for injection drug use</b>								
	19	7.5 (4.1, 10.8)	45	13.7 (10.2, 17.3)	79	27.9 (23.2, 32.5)	143	1.0 (6.9, 14.4)
<b>Tried to give up drugs in past six months</b>								
	224	88.9 (85.3, 92.4)	220	74.3 (70.0, 78.7)	142	50.8 (44.9, 56.6)	586	86.8 (82.9, 90.0)
<b>Age at first sexual intercourse</b>								
<15	62	25.4 (18.8, 32)	61	20.3 (16.0, 24.5)	29	11.8 (8, 15.6)	152	24.7 (19.1, 31.3)
15-19	173	67.3 (60, 74.5)	169	58.3 (53.3, 63.2)	155	61.8 (55.5, 68)	497	66.3 (59.5, 72.5)
20-24	13	5.8 (1.4, 10.1)	38	12.9 (9.3, 16.5)	50	19.7 (15.1, 24.3)	101	6.7 (4.1, 11.0)
25+	3	1.6 (0.1, 3.2)	23	8.5 (5.3, 11.6)	16	6.7 (3.7, 9.8)	42	2.3 (1.1, 4.7)
<b>Regular sex partner in past 12 months</b>								
	165	85.1 (76.6, 93.5)	163	68.2 (62.0, 74.0)	120	81.1 (74.9, 87.5)	448	83.6 (77.1, 88.5)
<b>Casual sex partner in past 12 months</b>								
	38	20 (13.7, 26.3)	84	36.6 (30.3, 42.8)		26.1 (18.6, 33.6)	161	21.5 (16.0, 28.2)
<b>Paid sex partner in past 12 months</b>								
	15	8.9 (4.7, 13.2)	54	23 (16.5, 29.5)	11	8.5 (3.8, 13.8)	80	10.1 (6.6, 15.1)

<b>Paying sex partner in past 12 months</b>								
	2	0.4 (0.1, 0.8)	38	16.5 (11.6, 21.4)	2	3.2 (0.1, 6.5)	44	1.7 (1.2, 2.6)
<b>Last type of sex partner in last 12 months</b>								
Regular	160	82.4 (74.9, 89.8)	127	51.4 (44.8, 57.6)	91	75.6 (67.7, 83.8)	378	79.7 (73.0, 85.1)
Casual	18	10.6 (4.4, 16.8)	57	26.2 (20.7, 31.9)	29	22.5 (14.3, 30.1)	104	12.1 (7.9, 18.4)
Paying	10	6.9 (2.9, 10.9)	25	10.8 (6.8, 14.9)	2	1.9 (0.4, 4.4)	37	7.1 (4.1, 12.1)
Paid	1	0.1 (0.1, 0.3)	25	11.5 (7.4, 15.7)	0	--	26	1.1 (0.7, 1.7)
<b>Used condom at last sex with regular partners in past 12 months</b>								
	63	42.1 (31.9, 52.5)	28	15.6 (9.8, 20.8)	36	31.2 (21.4, 40.4)	127	40.3 (32.1, 49.1)
<b>Used condom at last sex with casual partners in past 12 months</b>								
	27	76.3 (66.4, 86.5)	37	40.8 (25.7, 54.8)	28	77.1 (42.1, 99.1)	92	71.4 (57.0, 82.5)
<b>Used condom at last sex with paid partners in past 12 months</b>								
	14	93.1 (93.1, 93.1)	41	75.4 (64.5, 86.0)	8	93.2 (85.7, 100)	63	89.8 (72.3, 96.7)
<b>Used condom at last sex with paying partners in past 12 months</b>								
	1	36.1 (0, 96)	19	49 (31.6, 65.0)	0	--	23	47.6 (28.7, 67.2)
<b>Participant or partner took drugs to get high before having sex in past one month</b>								
Participant did	22	79.7 (68.8, 90.8)	49	27.4 (21.3, 33.4)	27	82.4 (23.5, 100)	98	78.2 (61.6, 88.9)
Partner did	7	20.3 (9.2, 31.2)	7	4.39 (1.4, 7.4)	0	--	7	1.7 (0.7, 4.0)
Both did	0	--	15	7.89 (3.7, 11.8)	5	17.6 (-39.1, 76.5)	27	20.1 (9.8, 36.9)
<b>Ever detained in prison/detention center</b>								
	146	54.8 (46.5, 63)	156	51.2 (45.5, 56.8)	113	39.8 (34.9, 44.8)	415	54.0 (47.4, 60.4)
<b>Received clean needles/syringes in past 12 months</b>								
	86	32.1 (22.1, 41.9)	73	23.4 (18.7, 28.3)	167	63.2 (57.4, 68.8)	326	67.9 (61.7, 73.5)
<b>Received clean needles/syringes in past 3 months</b>								
	61	22.3 (8.6, 35.9)	45	13.7 (9.8, 17.6)	61	20.3 (16.2, 24.3)	167	21.5 (16.7, 27.2)
<b>Received condoms in past 12 months</b>								
	163	65 (58.1, 72)	120	41.3 (35.7, 47)		32.2 (26.9, 37.5)	373	62.3 (55.9, 68.2)
<b>Received condoms in past 3 months</b>								
	84	33.7 (26.8, 40.7)	64	22.5 (17.7, 27.3)	73	24.4 (19.7, 29.0)	221	32.6 (26.7, 39.1)
<b>Received lubricants in past 12 months</b>								
	23	8.5 (4.6, 12.6)	42	14.8 (10.9, 18.7)		2.1 (0.7, 3.5)	72	8.9 (6.1, 12.8)
<b>Received lubricants in past 3 months</b>								
	10	4.2 (0.8, 7.6)	27	8.7 (5.7, 11.8)	6	1.4 (0.7, 2.1)	43	4.5 (2.5, 7.8)
<b>Difficult to tell other people that participant injects drugs</b>								
	153	58.1 (51, 65.2)	167	55.2 (49.8, 60.7)		2 (0.3, 3.7)	546	58.5 (51.9, 64.8)
<b>Feel disgusted with self for injecting drugs</b>								
	147	60.5 (53.6, 67.3)	170	57.5 (52.0, 63.2)		4.2 (2.1, 6.4)	495	60.4 (54.0, 66.5)
<b>Feel guilty for injecting drugs</b>								
	222	84.1 (78.9, 89.3)	229	76.5 (72.1, 80.9)		9.4 (6.5, 12.3)	692	83.6 (78.0, 88.0)
<b>Feel ashamed for injecting drugs</b>								
	155	60.9 (54.2, 67.7)	176	60.7 (50.1, 65.5)		15.9 (12.4, 19.4)	547	61.4 (54.9, 67.5)
<b>Feel of no value for injecting drugs</b>								
	162	61.2 ( 54.4, 68.0)	173	60.5(55.0, 65.9)		28.5 (15.1, 42.1)	503	61.1 (54.5, 67.3)