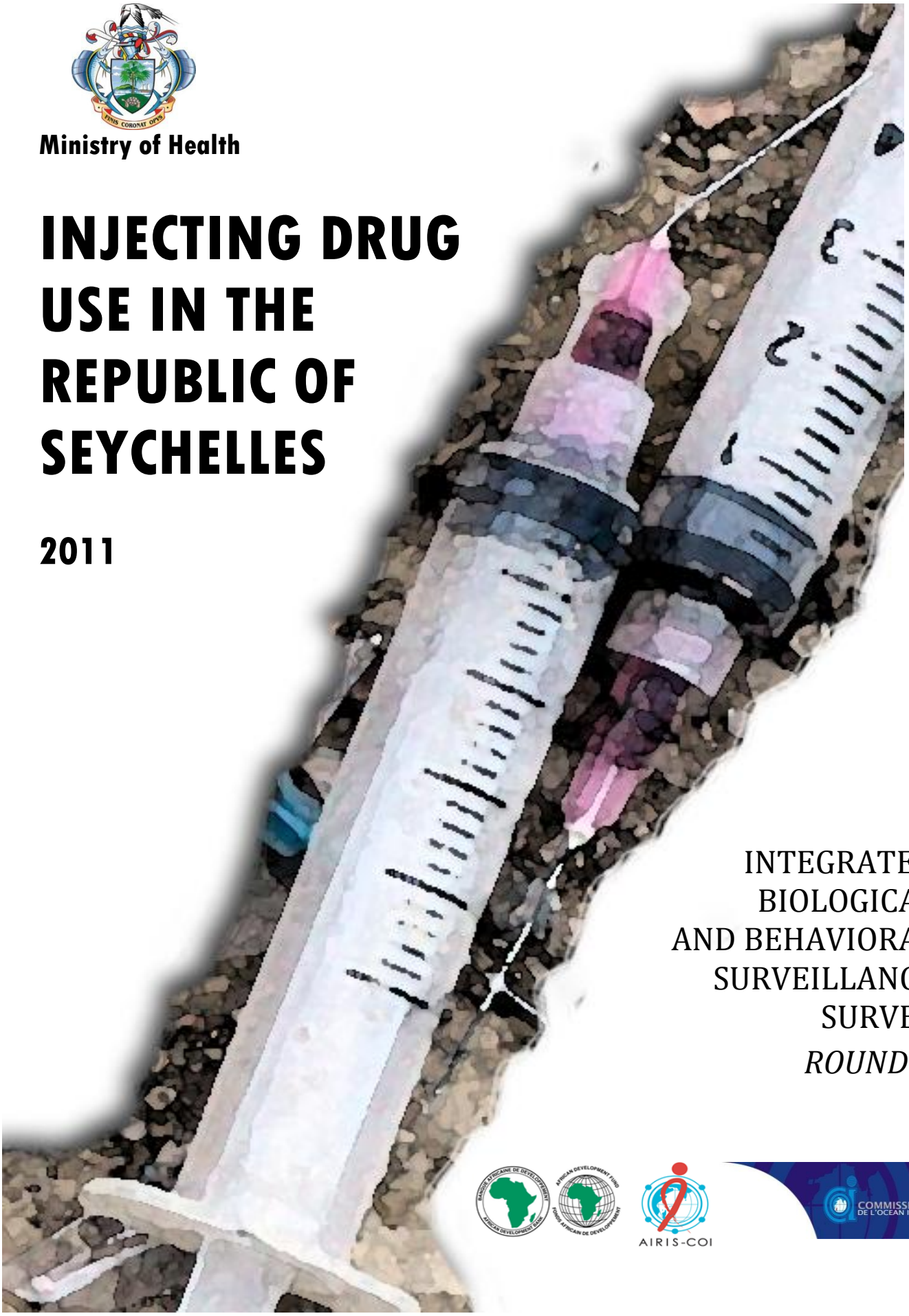
Ministry of Health

INJECTING DRUG USE IN THE REPUBLIC OF SEYCHELLES

2011



INTEGRATED BIOLOGICAL AND BEHAVIORAL SURVEILLANCE SURVEY

ROUND 1

AIRIS-COI

COMMISSION DE L'OCEAN INDIEN

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Biological testing and processing

All biological tests were performed at the Ministry of Health, Clinical Laboratory, Victoria, Seychelles.

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ABBREVIATIONS/ACRONYMS

ART	Antiretroviral Therapy
CDCU	Communicable Disease Control Unit
DEFF	Design Effect
HbsAg	Hepatitis B
HCV	Hepatitis C
HIV	Human Immunodeficiency Virus
IBBS	Integrated behavioral and biological surveillance
IDU	Injecting Drug User
MARP	Most at risk population
MOH	Ministry of Health
NGO	Non-Governmental Organization
PLWHIV	People living with HIV
AIRIS-COI	Projet d´Appui à l´Initiative Régionale de prévention du IST/VIH/SIDA dans les Etats membres de la Commission de l'Océan Indien
RDS	Respondent Driven Sampling
RDSA	Respondent Driven Sampling Analyst
RDSAT	Respondent Driven Sampling Analysis Tool
STI	Sexually Transmitted Infection
UNGASS	United Nations General Assembly Special Session
VCT	Voluntary Counselling and Testing
WHO	World Health Organization

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EXECUTIVE SUMMARY

This report presents findings of the first round of an integrated behavioral and biological surveillance (IBBS) survey conducted from June to August 2011, among Injecting drug users (IDU) in the Republic of Seychelles. The primary objective of this survey was to provide information on the prevalence of HIV infection and associated risk factors among IDU to inform programmatic and policy responses and to provide a baseline from which to monitor epidemic trends. While the prevalence of HIV infection in the Seychelles remains below 1% in the general population, prevalence is expected to be much higher among high-risk groups such as female sex workers, men who have sex with men and IDU[1].

The SeychellesIDU HIV IBBS surveys were carried out by the Ministry of Health, Victoria, Seychelles, in collaboration with the Projet d´Appui à l´Initiative Régionale de prévention du IST/VIH/SIDA dans les Etats membres de la Commission de l'Océan Indien (AIRIS-COI project), National AIDS Trust Fund, and World Health Organization (WHO). Funding for technical support was provided by AIRIS-COI, United National Office of Drugs and Crime (UNODC) and WHO. This surveillance survey used respondent-driven sampling (RDS) to obtain a final sample of 346 IDU in Seychelles. Eligible participants were males and females who reported injecting illicit drugs in the last six months, aged 18 years and older, residing in Seychelles and speaking Creole or English.

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 to be tested for HIV, syphilis and Hepatitis B (HbsAg) and C (HCV). Data were entered into a database in SPSS. Population frequencies and corresponding 95% confidence bounds were adjusted using the successive sampling estimator in RDS Analyst (www.hpmrg.com). Graphics of recruitment chains were created using Netdraw in UCINET 6.0.Key variables (HIV, age groups, and marital status) were checked for equilibrium using RDSAT 6.0.1 (www.respondentdrivensampling.org) before analysis in RDS Analyst.

The findings from this survey will provide a baseline for monitoring and evaluation, and to identify gaps in existing programs to help in the development of effective and sustainable intervention and prevention strategies responsive to the needs of IDU in Seychelles.

[1]Republic of Seychelles: Progress Report on Declaration of Commitment on HIV and AIDS 2010. UNGASS Report. Accessed at: www.unaids.org/.../seychelles_2010_country_progress_report_en.pdf.

KEY FINDINGS

Below is a presentation of the key findings from the IBBS survey conducted among IDU in Seychelles. Additional findings are presented in the remainder of the report.

Socio demographic results: The majority of IDU have employment, have a secondary education, are single or unmarried, are living with a partner, and are Catholic. Twenty percent of IDU are female.

Biological test results: HIV prevalence among IDU in Seychelles was 5.8%. Only 0.7% of IDU were found to be infected with Syphilis and 0.1% infected with Hepatitis B (HbsAg). However, 53.5% of IDU were infected with Hepatitis C (HCV). Among female IDU, 4.6% were HIV seropositive. Sixteen percent (95% CI. 2.8, 59.4) of HIV seropositive IDU were also infected with HCV.

High-risk sexual behaviours: The median age of sexual debut for IDU was at 15 years. IDU have multiple types of sexual partners, including occasional and commercial partners. The median number of sexual partners of the opposite sex was two and condoms use was inconsistent.

Alcohol and drug use: Among the 30% of IDU who reported consuming alcohol, 46% did so weekly or more often. Almost all IDU reported using illegal non-injection drugs. Smoking cannabis or heroin were the most frequently used drugs in the six months prior to the survey.

High-risk injection drug use practices: IDU in Seychelles inject heroin, specifically *tanmaren* and *white* heroin. There was almost an even split between IDU who reported injecting once a week or less (54%) and more than once a week (but not daily) (46%). High percentages of IDU share needles and syringes previously used by someone else as well as give, lend or sell needles or syringes to someone else after already using them. In addition, high percentages of IDU share cookers, vials and containers, cotton and filters, and/or rinse waterand draw up drug solutions from common containers shared by others.

Low HIV transmission knowledge: Few IDU had correct knowledge (as determined using an aggregated scale of knowledge questions) of HIV transmission. However, IDU had good knowledge of some individual sexual risks and injection risks. Sixty three percent of IDU reported ever having had an HIV test. Among that Sixty three percent, 48% had a test in the past twelve months, and among those so tested, 89% received their test results.

Low treatment access and utilization: Although 41% of IDU reported ever receiving treatment or "help" for injecting drug use, very few received detoxification or maintenance with methadone.

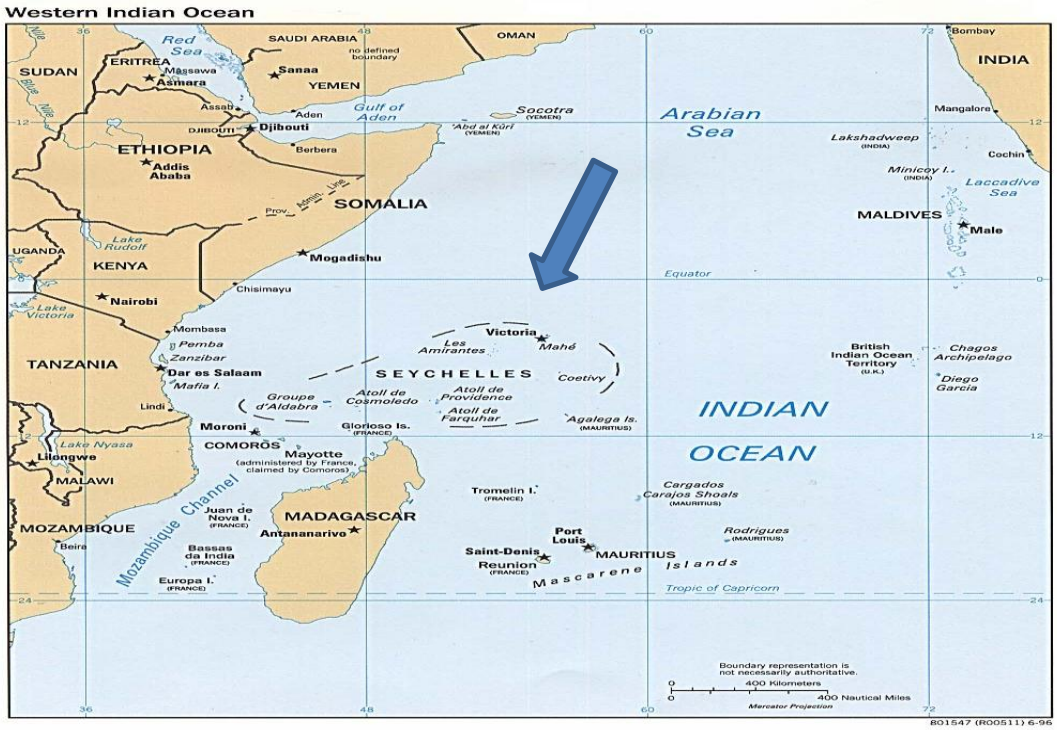
High stigma and discrimination: IDU in Seychelles suffer from high levels of stigma and discrimination. Sixty eight percent of IDU reported being refused a service in the past 12 months because of their injection drug use. Just over 50% of IDU had been arrested in the past twelve months.

The Seychelles have many people who inject illicit drugs: Approximately 2.3% (or 1, 283) of the adult population in Seychelles inject drugs. Females comprise 257 of the adult IDU population in Seychelles.

BACKGROUND

The Republic of Seychelles

The Republic of Seychelles (population 89,000) is an island country spanning an archipelago of 115 islands in the Indian Ocean, some 1,500 kilometres (932 mi) east of mainland Africa, northeast of the island of Madagascar (Figure 1)[2]. Other nearby island countries and territories include Zanzibar to the west, Mauritius and Réunion to the south, Comoros and Mayotte to the southwest.



As the islands of Seychelles had no indigenous population during the first millennium AD, the current Seychellois are composed of people who immigrated to the island in the second millennium. The largest ethnic groups are those of African, French, Indian, and Chinese descent. French and English are official languages along with Seychellois Creole, which is primarily based upon French.

[2] Downloaded on October 18, 2011 from http://www.google.com/imgres?imgurl=http://www.lib.utexas.edu/maps/islands_oceans_poles/indian_ocean_w_96.jpg&imgrefurl=http://www.lib.utexas.edu/maps/indian_ocean.html&h=1286&w=1066&sz=193&tbnid=6uoZvfB15DzmHM:&tbnh=90&tbnw=75&prev=/search%3Fq%3DMap%2Bof%2BIndian%2BOcean%26tbm%3Disch%26tbo%3Du&zoom=1&q=Map+of+Indian+Ocean&docid=d8HtSjmVM9CRzM&hl=en&sa=X&ei=HGadTrqvF9DpOc6axZAJ&ved=0CCoQ9QEwAQ&dur=44.

HIV in Seychelles

The first case of HIV/AIDS was detected in Seychelles in 1987.As of December 2010, 460 cases of HIV/AIDS had been detected, of which males represented 58% (265 cases) and females represented 42% (195 cases). Productive workforce portions of the population (15 to 49 year olds) comprise more than half of the population of Seychelles. This group is disproportionately sexually active and represents 84% of those testing positive for HIV in Seychelles. Increased morbidity and mortality caused by the continued spread of HIV/AIDS present major challenges for the future socio-economic development of Seychelles.

Although these statistics are based on laboratory surveillance data conducted at sentinel points of the Communicable Disease Control Unit (CDCU), District Health Centres, private health centres, antenatal clinics, the Occupational Health Unit and the blood bank in the Ministry of Health, they are currently the only available evidence of the extent of the HIV/AIDS epidemic in the country. These statistics are not valid because there is no random collection of data and therefore consist of biases that cannot be measured. Until now, there have been no representative data collected using probability based sampling techniques on any populations in Seychelles that could provide an accurate picture of HIV prevalence and sexual and drug use behaviours.

According to the CDCU, in the past years Seychelles has seen an increase in the use of intravenous and other illicit drugs and the numbers of sexually transmitted infection (STI) cases, as well as an increase in the early onset of first sexual intercourse.

Injecting drug users and the HIV Epidemic in Seychelles

The HIV/AIDS epidemic in Seychelles is classified as 'low level' as HIV prevalence is estimated to be about0.1% among the general population. For low HIV prevalence countries, public health professionals recommend focusing resources on estimating HIV prevalence and associated risk factors among "high-risk" or "Most at Risk" Populations,[3] which comprise Injecting Drug Users (IDU), Female Sex Workers (FSWs), and Men who have Sex with Men (MSM). The following section provides background on the HIV epidemic in Seychelles with a focus on IDU.

Sharing needles, syringes and other injecting drug equipment is an extremely efficient mode of HIV and Hepatitis C (HCV) transmission and remains a critical factor for exacerbating the spread of these viruses among IDU worldwide. Both HIV and HCV are chronic diseases. Infected people can live for years before having symptoms, resulting in

[3]UNAIDS. *A framework for monitoring and evaluating HIV prevention programmes for most-at-risk populations.* Geneva, Switzerland, UNAIDS, 2008. Accessed on 25 December 2009 at: http://data.unaids.org/pub/Manual/2007/JC1519_me_Framework_en.pdf.

numerous opportunities for further spread of the viruses. As in many countries, IDU remain 'hidden'. They are difficult-to-reach for research purposes due to their practice of illegal behaviours, the level of criminalization associated with these behaviours, community social stigma, and discrimination. These factors increase the motivation for IDU to remain hidden, resulting in increased vulnerability to HIV infection and transmission. Many countries in the region are just starting to recognize the benefits of including IDU in their HIV surveillance systems. Conducting HIV surveillance in this population is critical for monitoring emerging HIV and other infection trends and setting national prevention priorities for this population.

Prior to this study, little was known about the IDU population in Seychelles and there are no specific HIV or HCV interventions targeting them. In 2002, there were two HCV cases. No new cases were detected between 2003 and 2007. In 2008, there eight new HCV cases were detected, 32 cases in 2009 and 52 cases in 2010. There are eight known cases of HIV and HCV co-infection. All the new HCV cases detected from 2008 are among IDU.

HIV and other infections prevalence among IDU has been reported in several parts of East Africa and the Indian Ocean countries. For instance, in a recent IBBS of 511IDU using RDS conducted in Mauritius in 2009[4], HIV sero-prevalence was 47.4%, Hepatitis B (HbsAg) was 9.0%, HCV was 97.3% and syphilis was 2.7%. In regression analysis, IDU who were female, ≥45 years, had ≥ 2 sexual partners in the past year (among those who reported having sex in the past one year), and tested positive for HCV and/or syphilis, had statistically significant higher odds of being HIV seropositive.[5]In another IBBS conducted in Zanzibar in 2007, also using RDS, IDU were found to have an HIV prevalence of 16%, a syphilis prevalence of 0.3%, HbsAg prevalence of 6.5% and a HCV prevalence of 26.9%.[6] In addition, 45.1% of IDU infected with HIV also tested positive for HCV infection. IDU in both studies were found to engage in numerous high risk sexual behaviours, including multiple sexual partners, commercial sex work, and unprotected intercourse.

[4]Republic of Mauritius. (2010). Country progress report: Declaration of commitment of the United Nations General Assembly Special Session (UNGASS) on HIV/AIDS. Accessed August 21 at: http://www.unaidsrstesa.org/files/u1/mauritius_2010_country_progress_report_en.pdf; Johnston, LG. Integrated Behavioral and Biological Surveillance Survey among Injecting Drug Users in Mauritius, 2009. Mauritius Ministry of Health, Port Louis. www.gov.mu/portal/sites/sida/idu.pdf.

[5]Johnston LG, Saumtally A, Corceal S, Mahadoo I, Oodally F. High HIV and hepatitis C prevalence amongst injecting drug users in Mauritius: Findings from a population size estimation and respondent driven sampling survey. *International Journal of Drug Policy*. 2011. 22(4):252-8. Epub 2011 Jun 22.

[6] Dahoma M, Holman A, Kim E, Miller L, Johnston L.Integrated Behavioral and Biological Surveillance Survey among Most at Risk Populations in Zanzibar, 2007. Zanzibar AIDS Control Programme, Ministry of Health and Social Welfare. 2007.

Current programs addressing HIV among IDU

HIV intervention, prevention and harm reduction efforts to address the needs of IDU do not yet exist in Seychelles. There is one government program (Mont Royale on Mahe Island) and a couple of private programs (Dr. Chetty Health Centre and Dr. Jivan Drug counselling and rehabilitation services, both on Mahe Island) which offer detoxification from drugs. There currently are no opiate substitution therapy programs in the Seychelles.

STUDY METHODS TO SAMPLE IDU IN SEYCHELLES

Sampling IDU to gather data on HIV prevalence and risk behaviours

This is the first attempt by Seychelles to study HIV prevalence and associated risk factors among IDU in the context of an IBBS study using RDS. RDS is a chain-referral sampling method specifically designed to obtain probability-based samples of 'hidden' populations.

Data collection began with seven eligible respondents who initiated the recruitment process. After providing informed consent, eligible respondents completed an interview about their socio-demographic backgrounds; sexual risk behaviours with male and female partners; access to and use of HIV services; alcohol and drug use;HIV transmission; STI signs, symptoms, and knowledge; stigma and discrimination, and a measurement of their social network size (the number of people they know who meet eligibility criteria). The interview also included questions about IDU's visits to service providers and whether they received a unique object (which was handed out as part of the study before the survey began) which was used to estimate the size of the IDU population using the multiplier technique.

Once the interview was completed, respondents received HIV pre-test counselling and provided a blood specimen to be tested for HIV, syphilis, HbsAg and HCV. Respondents were provided their test results with post-test counselling approximately two weeks after their enrolment. Those who had positive test results were referred for treatment and/or for further management at the CDCU.

A diverse group of 345 IDU were recruited and tested for HIV, syphilis, HbsAg and HCV over the course of two months from June to August, 2011. Eligible persons were males or females, who reported having injected illicit drugs in the last six months, being 18 years and older, and living in Seychelles. This report provides survey findings and offers some recommendations on how to use these data to respond to the HIV prevention and intervention needs of IDU in Seychelles.

Eligibility Criteria

Eligibility criteria for IDU were:

- 18 years and older
- having injected illicit drugs in the past six months
- residing in Seychelles
- having a valid coupon (except for the seeds)

Persons who meet the eligibility criteria may be excluded from enrolment in the study on the following grounds:

- Unable to understand or provide informed consent: this includes recruits who are thought to be under the influence of alcohol or drugs.
- Already enrolled in the survey.
- No coupon or received coupon from a stranger (does not know recruiter).
- Unable to speak English or Creole.

RATIONALE AND OBJECTIVES

Specific Objectives

Specific objectives of the survey were to determine the prevalence of HIV and syphilis and associated risk behaviours (using the United Nations General Assembly Special Session [UNGASS] indicators)among IDU in Seychelles, and to provide a baseline for monitoring trends in HIV epidemic prevalence.

In addition, the study objectives included:

- Measuring key socio-demographic characteristics.
- Quantifying alcohol and drug use.
- Assessing the knowledge of and attitudes towards HIV/AIDS.
- Evaluating attitudes of stigma and discrimination towards people living with HIV (PLWHIV).
- Assessing personal stigma associated with injecting drugs.
- Measuring STI occurrence and treatment seeking behaviours.
- EvaluatingHIV and STI knowledge.
- Estimating the size of the IDU population.
- Strengthening the research capacities of national teams.
- Developing recommendations to guide programs and expand services.

METHODOLOGY

Respondent Driven Sampling (RDS)

This survey used respondent-driven sampling (RDS) to recruit IDU in Seychelles. RDS is a variant of a chain referral sampling method which, when implemented and analyzed properly, yields data representative of the populations from which the samples were gathered[7,8]. Several theoretical and mathematical techniques borrowed from various disciplines (e.g., social network theory, physics, statistics, etc.) are used to develop a sampling frame and to mitigate several well-known biases generally associated with chain referral methods. RDS is specifically designed to sample hard-to-reach and hidden populations such as IDU and has also been successfully used among other HIV high-risk populations, including men who have sex with men and female sex workers.[9]

Recruitment with RDS is initiated with a number of 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 IDU) into the survey. These recruited peers who also enrol in and complete the survey steps are considered the first wave of respondents. Each respondent in the first wave who enrols 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 directly tied to the 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 which is 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 analyzed with mathematical modelling of the recruitment process (social network ties of recruits-recruiters) to generate relative inclusion probabilities and to measure the level of recruitment effort and homophily (the non-random recruitment of persons with characteristics similar to the recruit).

[7]Heckathorn DD. (1997) Respondent-driven sampling: A new approach to the study of hidden populations. *Sociological Problems*. 44 (2), 174-199.
[8]Heckathorn, DD. (2002). Respondent driven sampling II: deriving valid population estimates from Chain-Referral samples of hidden populations. *Sociological Problems*,49(1), 11-34.
[9]Malekinejad M, Johnston LG, Kendall C, Kerr L, Rifkin M, Rutherford G. (2008) Using respondent-driven sampling methodology for HIV biological and behavioral surveillance in international settings: a systematic review. *AIDS and Behavior,* 12(suppl. 1), 105-130.

The recruitment process of who recruited whom is monitored through the unique numbers on each participant's recruitment coupon. The unique coupon numbers also permit respondents' anonymity by linking each respondent to their questionnaire and biological test results, thereby avoiding the 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 behaviours of the sampled population.

Sample Size Calculation

The sample size needed to conduct behavioural and biological surveys can be based on the number of participants needed in each round (or year) to detect a change in the proportion of an indicator from one round to the next.
The sample size calculation for this study was based on calculations for countries which do not have accurate information. Prior to this survey (or study), there were no accurate estimates for HIV prevalence for IDU in Seychelles. Based on the lack of any accurate data on HIV estimates, the estimates for calculating the sample sizes for IDU were calculated based on HIV estimated prevalence automatically set at 50%[10] and change over time at 65% (to detect a 15% difference over time). Power was set at 80%, significance at 95%, and the design effect at 2.

The general formula for the determined sample size (N) is:

$$N = D \frac{[Z1\text{-}\alpha \sqrt{(2P(1\text{-}P))} + Z1\text{-}\beta \sqrt{(P1(1\text{-}P1) + P2(1\text{-}P1)]}\ 2)}{(P2 - P1)\ 2}$$

Where:

N	=	Sample size required per survey round (year).
D	=	Design effect = 2
Z1-α	=	The z score for the desired confidence level, usually 1.96 for 95%
Z1-β	=	The z score for the desired power, usually 0.83 for 80%
P1	=	The proportion of the sample reporting indicator in year 1 = 0.5
P2	=	The proportion of the sample reporting indicator in year 2 = 0.65
P	=	(P1 + P2)/2
α	=	1.65
β	=	0.84

Using the formula above, a sample size of 266 was determined to be appropriate. The final sample size was calculated as 300 IDU(see table 1).

[10]Family Health International. Guidelines for repeated behavioral surveys in populations at risk of HIV. 2003. Family Health International. **Arlington, VA. Accessed at: http://www.fhi.org/en/topics/bss.htm.**

Table 1. Definitions for the sample size calculation formula to survey IDU in Seychelles

Formula term	Calculation
D (design effect)-The design effect helps to mitigate biases associated with the sampling technique and to account for common random biases such as respondents enrolling in a study more than one time and interviewer and response biases.	2
p1 (baseline)-Proportion at baseline	0.5
p2 (final evaluation)-Proportion expected in the next round	0.65
Zα (95%)-standard error associated with a level of confidence of 95%)	1.64
Zß (80%)-level of power in for the analysis	0.84
n (sample size)	266

Given that IDU had not been previously sampled in Seychelles using RDS, or any other sampling method, it was uncertain whether this sample size would be reached.

Formative research

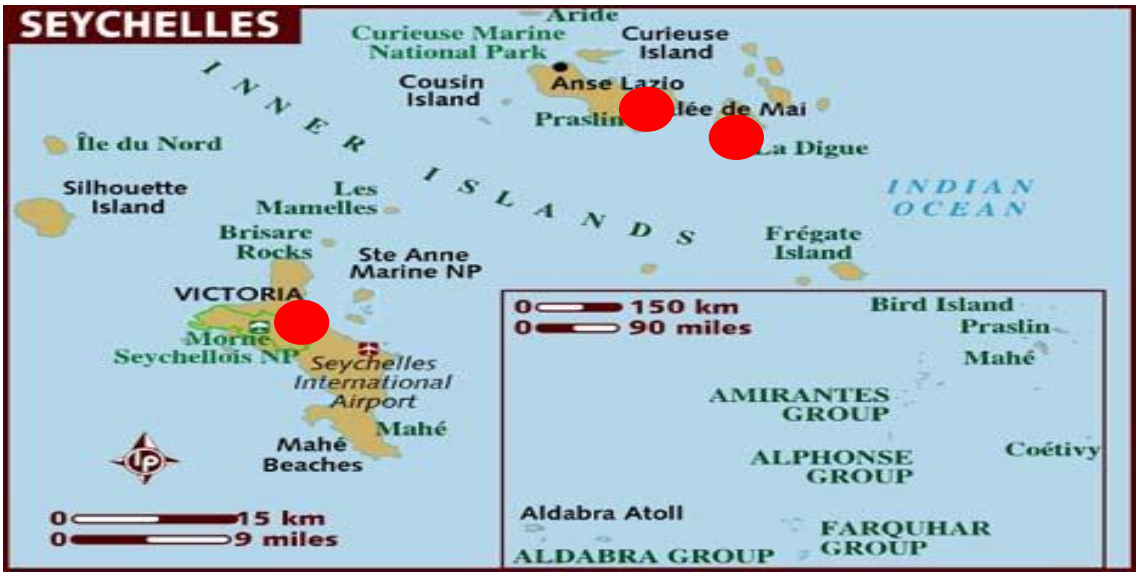
Formative research was conducted in February 2011 on the islands of Mahe, Praslin and La Digue in order to identify potential sampling issues related to RDS (e.g., social network sizes, network properties, acceptability of RDS, etc.), to resolve study logistics (e.g., amount for incentives, preferred interview site location, hours of operation, openness to HIV testing and results, etc.) and to identify seeds to initiate the study. Information was also gathered to help develop the final behavioral questionnaire.
Formative research questions used in the qualitative data collection were adapted from the manual, *Introduction to Respondent Driven Sampling.*[11] Data were collected through focus group discussions, key informant interviews and observational site visits to identify interview facilities. Findings from the formative research activities were incorporated into the design of the survey and the development of the questionnaire.

Data collection locations

In Seychelles, IDU were sampled from three islands: Mahe, which is the largest island and includes the capital city, Victoria, (population: ~80,000); Praslin, the second largest island (population: ~6,500); and, La Digue (population: ~2,000)[12]. The red dots on the map (Figure 2, below) show the locations of each of the interview sites.

[11]Johnston LG. (2008) Behavioural Surveillance: Introduction to Respondent Driven Sampling (Respondent Manual). Centers for Disease Control and Prevention-Global AIDS Program (CDC-GAP), Atlanta, GA. http://globalhealthsciences.ucsf.edu/PPHG/assets/docs/respondent-driven-sampling-2008.pdf
[12]Downloaded on October 28, 2011 from http://www.google.com/imgres?imgurl=http://www.lonelyplanet.com/maps/africa/seychelles/map_of_seychelles

Figure 2. Map of The Seychelles, identifying Mahe, La Digue and Praslin



Interviews with key informants and members of the IDU population noted that IDU social networks extended across these three locations.

Recruitment Process

Four seeds (initial recruits) in Mahe and two in Praslin were identified through outreach and health workers.

Seeds identified for the study population were each given three uniquely coded coupons which were used in recruiting their peers into the survey. Respondents who presented a valid recruitment coupon to any of the survey sites were screened for eligibility and provided informed consent for a face-to-face interview. Those eligible received HIV pre-test counselling and gave a blood extraction for HIV, syphilis, HbsAg, and HCV testing. Interviews were conducted in Creole or English by trained interviewers and took approximately 45 minutes to complete. The questionnaire collected data on socio-demographic characteristics; sexual, alcohol and drug risk behaviours; HIV transmission; HIV and STI signs and symptoms; HIV knowledge, perceptions, stigma and discrimination; information on respondents' social network sizes; and access to and utilization of HIV related services. Following the interview, each respondent was provided a set number of coupons (maximum of three) to use in recruiting eligible peers.

.jpg&imgrefurl=http://www.lonelyplanet.com/maps/africa/seychelles/&h=350&w=466&sz=51&tbnid=XZOEb07_TBnaGM:&tbnh=83&tbnw=111&prev=/search%3Fq%3DMap%2Bof%2BSeychelles%26tbm%3Disch%26tbo%3Du&zoom=1&q=Map+of+Seychelles&docid=ptyT8T8zH5cUiM&sa=X&ei=vWSdTq3zAo2WOt7nnYUJ&ved=0CEQQ9QEwBQ&dur=3554

Respondents received a primary compensation of 200 Seychelles Rupees (approximately 16$USD) for competing the survey and 100 Seychelles Rupees for each (a maximum of three) recruit who was eligible and consented to participate in and completed the survey. Survey completion consisted of completing the behavioural questionnaire and the biological testing. As explained to them during the consent process, respondents could neither receive their compensation nor recruitment coupons if they decided not to provide a biological specimen.

No personal identifying information was collected. To permit confidentiality, respondents' questionnaires and biological tests were identified using a unique study identification number provided on the recruitment coupons.

Tools development

The IDU IBBS protocol and final questionnaire were developed by a team from the Seychelles Ministry of Health using information from the formative research and other questionnaire templates. The protocol and questionnaire were submitted for ethical review and approval to the Seychelles medical research ethical committee in May, 2011.

Staffing

Staff members for the survey were recruited through the Seychelles Ministry of Health and comprised Ministry of Health staff, non-governmental organizations (NGOs) staff, peer outreach workers and members of the target population. All staff members were trained for one week in June of 2011about staff roles and responsibilities, seed selection and respondent recruitment, the ethical consent process, coupon and respondent tracking, the compensation process, administration of the behavioural questionnaire, collection of biological specimens, biological sample processing and transport and provision of biological test results and referrals.

Staff members comprised two separate teams: one for Mahe and the other for Praslin.The site in La Digue had staffing of only one or two nurses who performed all rolls and who also worked in Praslin on some days. The Mahe and Praslin teams had the following staff:

- Screener (one in each site): responsible for checking validity of the coupons being redeemed, screening for eligibility and membership in the population of interest, obtaining consent, managing coupon tracking and completing management forms as needed.
- Interviewer (three in each site, except for La Digue): responsible for conducting face-to-face interviews in English or Creole and completing the questionnaire.
- VCT counselor (one in each site): responsible for HIV pre-test counselling, obtaining blood specimens from respondents, and labelling and storing blood

samples. The counselors were also responsible for conducting HIV post-test counselling; providing HIV, syphilis, HbsAg and HCV test results; and making referrals for care, treatment and management when necessary.

- Nurse: responsible for collecting blood specimens from respondents using standard guidelines and procedures. After the specimen collection, the nurse labelled the specimen container with a lab number and recorded in a 'log book' for anonymous linking to the respondent's coupon identification number.
- Coupon manager (one in each site): responsible for explaining the RDS recruitment procedure and compensation system, filling in the coupon number and expiration dates onto coupons and coupon management forms, providing respondents with the appropriately numbered coupons, paying out primary and secondary incentives, completing a follow-up form for IDU recruiters who return to the interview site to receive a secondary incentive, and for distributing informational materials and condoms.
- Study coordinator (one in each site): responsible for overseeing the general flow of the study, updating the steering committee on recruitment progress and seeking technical advice when needed.

LABORATORY PROCEDURES

Biological specimen collection, storage, transport and processing

Seven millilitres (7 mL) of whole blood were drawn from each respondent at the interview location by venipuncture into vacutainer tubes. Tubes were left upright on a test tube rack until the blood has clotted. All specimens were stored in a cool box maintained at 4-8 C and transported daily to the Clinical Laboratory, Ministry of Health at the Seychelles hospital in Victoria. Blood specimens collected in Praslin or La Dique, were airlifted daily to the Clinical Laboratory, Ministry of Health at the Seychelles hospital in Victoria.

At the Clinical Laboratory blood specimens were centrifuged for 10 minutes at 2500 rpm. Three 0.5-ml serum tubes were aliquoted for each sample by laboratory technicians into cryotubes from the vacutainer tube. The aliquoted sera were stored at -20C. At the time of testing only one aliquot per test was retrieved from the stored sera and documented. The remaining serum was stored at the Clinical Laboratory at - 20 C for a maximum period of two years in case of possible future testing.

Specimens were tested using the national testing algorithms for HIV, syphilis and hepatitis. Technicians at the laboratory completed a testing worksheet which included the respondents' coupon number identification, date of specimen collection, assigned lab

number, initials of personnel receiving specimen, and the results from the specimen processed. All testing conformed to manufacturer's instructions of individual test kits.

All test results were counterchecked and signed off by a senior technologist before dispatch. All test results were dispatched within 7 to 14 days (1 to 2 calendar weeks) of sample receipt in the laboratory.

HIV testing used a national serial algorithm for confirmatory testing. HIV antibodies were detected using Rapid Determine HIV 1 and 2 as a first line testing. Non-reactive results were recorded as Negative while reactive results were tested out in duplicates using Determine HIV 1 and 2. Confirmatory testingwas conducted using Inno-lia line assay (ELISA) and these results were recorded as final.

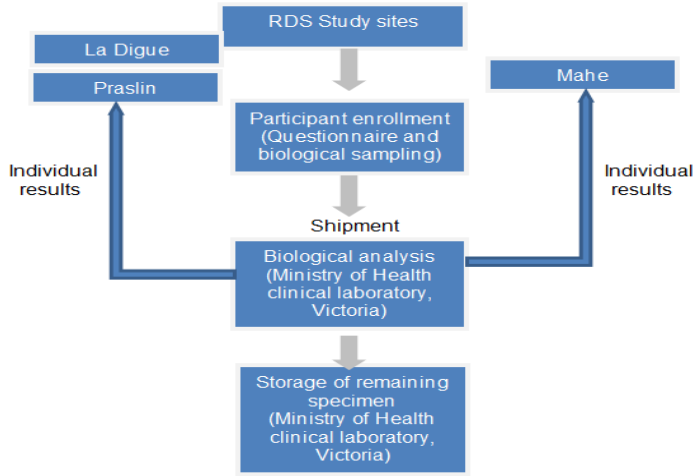
Syphilis serological testing was performed using rapid plasma reagin (RPR) assays for screening and *Treponema pallidum haemagglutination assays* (TPHA) for confirmation. Hepatitis B antigen was detected using the Monalisa Hepatitis B ELISA test kit (Bio-Rad), a qualitative enzyme linked Immunosorbent assay for detection of HBsAg in serum or plasma.

Hepatitis C virus antibodies were detected using Monalisa anti–HCV PLUS (Bio-Rad) which detects antibody to HCV in serum or plasma.

Testing and results procedures

Test result procedures were adapted for the IBBS to include the RDS respondent's coupon number identification, date of specimen collection, assigned lab number, initials of personnel receiving specimen and the results from the specimen processed.

Figure 3: Diagram of testing and results procedures for the IBBS



DATA MANAGEMENT AND ANALYSIS

The database was developed and data were double entered after the study was completed. Final datasets underwent consistency checks. Frequencies and cross-tabulations were performed to check validity and logic of most variables in the datasets. Hard copies of completed questionnaires were stored in Victoria and referred to in order to correct any discrepancies. Questionnaires completed in Praslin or La Dique were airlifted daily to the Ministry of Health in Victoria.

Data were formatted and coded in SPSS before being transferred into an excel file and then a text file for analysis in RDS Analyst (www.hpmrg.org). Key variables (HIV, age groups, and marital status) were checked for equilibrium using RDSAT 6.0.1 (www.respondentdrivensampling.org) before analysis in RDS Analyst. Population frequencies and 95% confidence intervals were derived with RDS Analyst using the Successive Sampling (SS) estimator.[13] This applies a more rigorous adherence to RDS assumptions of Markov processes, (specifically, a probability proportional to size without replacement model), than do previously used estimators. Recruitment graphics for each sample were created using RDSAT version 6.0 (www.respondentdrivensampling.org) and transformed into a debug log file (DL) using NETDRAW in UCINET version 6 for Windows (http://www.analytictech.com/ucinet/download.htm).

ETHICAL CONSIDERATIONS

In order to minimize social risks, consultations were held prior to the start of the survey and during data collection with key representatives from ad-hoc IDU groups, the Seychelles Ministry of Health, and members of the target communities. The background, purpose, and procedures of the survey, the measures taken by the investigators to permit confidentiality and privacy of the respondents, and applicability of study findings were discussed and agreed upon at these meetings. The outcomes of these discussions were used to adjust and to guide the implementation of the survey.

Study participation was voluntary and respondents were informed that they were free to withdraw from the study at any time during the survey process. Following careful explanation of the survey, study staff gave eligible respondents the consent form to read or, if necessary, the consent form was read to the respondents by a staff member. All respondents either signed or verbally stated that they understood and agreed to all of the

[13] Gile KJ, Handcock MS: Respondent-Driven Sampling: An Assessment of Current Methodology. Sociological Methods, 2010. 40, (1): 285-327.

items contained in the consent form before being enrolled in the survey. In order to enrol in the survey, potential participants had to agree to complete the behavioural interview and to give a blood sample.

To minimize discomfort due to the sensitive nature of the questions asked, the questionnaire was administered in a private and confidential setting. Respondents could refuse to answer any specific question. All respondents were provided the name and telephone number of the local survey coordinator in case they had questions about the survey or if they believed they had been injured or mistreated as the result of their involvement in the survey.

All study data, including biological and behavioural information, were kept in a confidential manner. The survey team did not record names, addresses or other personal identifiers on the survey questionnaires or on any of the laboratory specimens and results. In this survey, coupon identification numbers were assigned to each respondent and used to link questionnaire responses to management forms and laboratory test results. After data collection, questionnaires, forms and test results were kept in a secure location at the Seychelles Ministry of Health, Public Health Department, Department of Statistics and Epidemiology, in Victoria.

SIZE ESTIMATION

The size of the IDU population in Seychelles was estimated using the multiplier method, where overlapping independent population counts are used to extrapolate the overall population size. 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 encompass the group in the multiplier
- Second data source (multiplier) need not be random but should be specific to the group being estimated
- No individual accounted for more than once in the multiplier
- Two data sources must be independent of each other (inclusion in one not related to inclusion in the other)
- Limited in- and out-migration

Service Data

This study used service data provided by the psychiatric ward (used to treat IDU) and CDCU (HIV counselling and testing) to estimate the size of the IDU population in the Seychelles. This approach involved gathering the 'first multiplier' component by asking each service the number of IDU (counted only one time) who visited their facility in the year previous to the RDS survey (specifically, from June 1, 2010 to May 31, 2011). The second multiplier was enumerated during the RDS survey by asking each respondent whether they had exposure to each of the services at least one time in the year previous to the RDS survey (specifically, from June 1, 2010 to May 31, 2011).

Multiplier Calculation

The number of IDU who attended one of the services in the previous year (data provided by service independently) was used as a numerator (M) and the proportion who reported attending the respective service in the year previous to the survey was used as the denominator (P). The mathematical formula to calculate the total size of the population was:

$$N = M/P$$

Where:
N=Estimated Size
P=Proportion of IDU in survey corresponding to the list provided by each service the proposed one year period.
M=Number of IDU who had exposure to the service during the proposed one year period.

Confidence bounds around the population size estimates

To calculate the confidence bounds around the population size estimates two sources of variance were used: the RDSAT standard errors[14] provided for the adjusted estimates of study participants who reported that they had received services from one of the listed service providers and/or a unique object. The RDSAT standard errors are calculated based on the bootstrap procedure using the percentiles 2.5 and 97.5 of the replicate estimates for the lower and upper limit of a 95% confidence interval. In addition, the uncertainty around the number of individuals who received services from the listed service providers was calculated with a normal distribution as a good approximation of the Poisson distribution with equal mean and variance to M, where:

M = Number of individuals who received services from the listed service providers and/or a unique object and its variance

[14]Salganik MJ, Heckathorn DD. (2004). Sampling and estimation in hidden populations using respondent-driven sampling. Sociological Methodology, 34, 193-239.

α= Type I Error. Set at a maximum 0.05

Z1-α/2 = the normal standard transformation. When the Type I Error is 0.05, Z1-α/2 is equal to 1.96

The variances for M and P were combined by using the following formula (delta method):

N= M / P

$Var(N)=Var(M)/[E(P)]^2 + [E(M)]^2/[E(P)]^4 * Var(P)$

95% for N=N ±1.96×√(Var(N))

The assumptions for calculating the confidence bounds are:

- N and P are two independent variables (Covariance = 0)
- P has an approximate a normal distribution with the Standard Error equal to SE. The RDSAT output for the SE for P comes from the bootstrap percentile method and it might be asymmetric.
- P has a small Coefficient of Variation.

LIMITATIONS

This survey was subject to several limitations. Because behavioural data were self-reported in face-to-face interviews, social desirability bias may have resulted in the underreporting of risky sexual practices and drug use behaviours. Compensation for respondents is a crucial element of recruitment in RDS but it can be challenging to determine the appropriate amount for a population in a given country. If the compensation offered is too high, there is a risk that some recruits will fake eligibility requirements. If the amount is too low, recruitment may not be successful. For this survey, compensation amounts were set based on meetings with key experts and population members during the planning phases and during pre-survey formative research with IDU. However, during the recruitment process a few men who showed up with valid coupons were found to be ineligible, had their coupon taken away, and were asked to leave the premises.

Although the estimates presented here may be considered representative of the network of the population from which respondents were recruited, the small number of values for certain variables may limit our ability to derive accurate estimates. In some cases, confidence intervals are too wide for meaningful interpretation.

OVERVIEW
OF STUDY FINDINGS

This section presents the behavioural findings and biological results from the HIV IBBS survey among IDU in The Seychelles.

Unless otherwise noted, the text and figures provide the weighted proportion estimates as percentages. The tables additionally show the number of respondents and the 95% confidence intervals around each weighted proportion estimate.

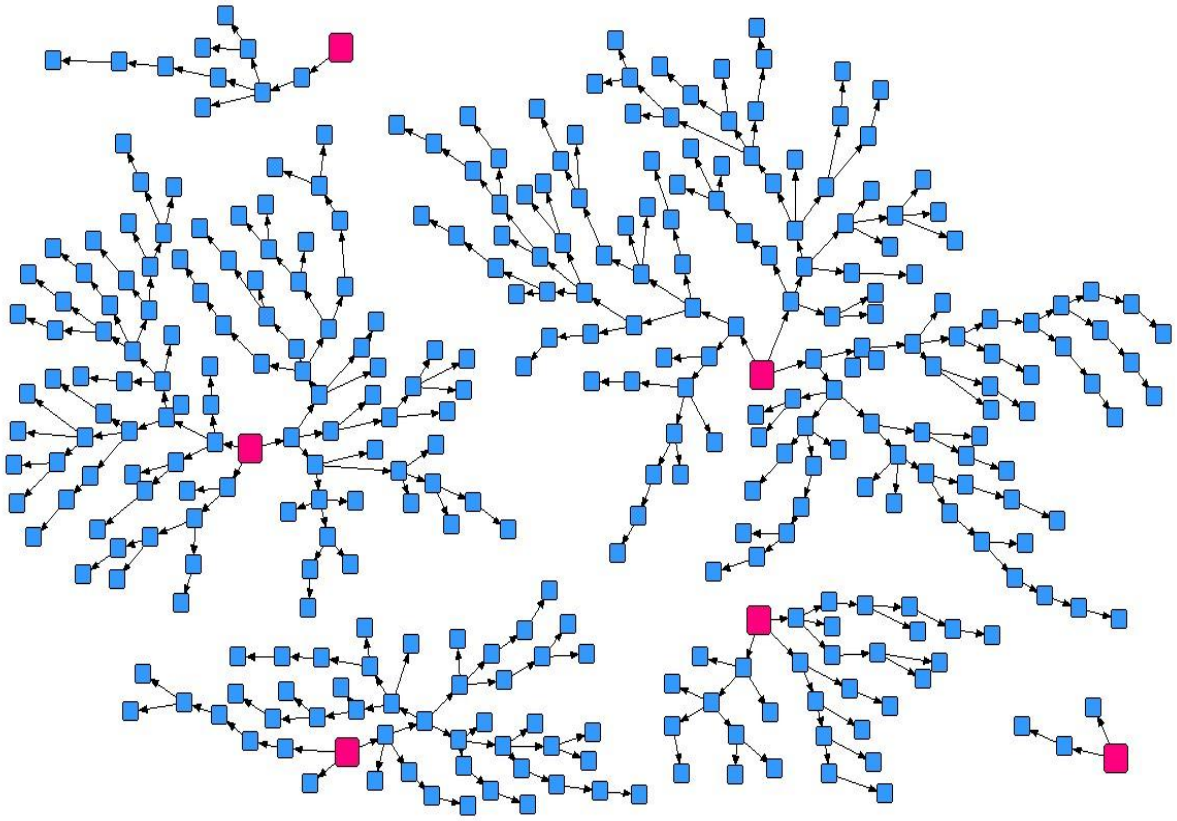
OVERVIEW OF STUDY FINDINGS

Overview: Injecting drug users (IDU) in Seychelles

Over the course of two months, beginning in June and ending in August 2011, 345 IDU(288 in Mahe, 55 in Praslin, and 2 in La Digue) enrolled in the HIV IBBS survey.

IDU recruited across recruitment locations qualitatively indicated that IDU formed one complete social network component, an important requirement in RDS. The longest recruitment chain reached 12 waves and the shortest recruitment chain reached two waves (see recruitment graph, figure 4). Seeds are identified in the recruitment graph as larger squares and only have arrows leading away from them rather than towards them.

Figure 4. Recruitment graph of the IDU sample (n=345), with six recruitment chains*, Seychelles, 2011.



**The single large pink square in each recruitment chain indicates a seed.*

Seed Characteristics

The tables below display some basic characteristics of each IDU seed (Table 2)as well as each seed's recruitment effort. Recruitment began with six seeds (four in Mahe and two in Praslin; there were no seeds recruited from La Digue). Social network sizes for IDU seeds ranged from six to 95. Age for IDU seeds ranged from 23 to 50 years and the average age of seeds was 33.5 years. All seeds were HIV sero-negative and only two of the six seeds were HCV negative.

Seed one from Mahe produced the longest recruitment chain (n=11 waves) and was the most effective recruiter (145 recruits; 42% of the sample) of the seeds. The shortest recruitment chain was from seed two which composed just two waves and made up only 1.2% of the sample.

Table 2. Characteristics of seeds (n=9) in The Seychelles, 2011

	Social network size	Interview location*	Age	HIV status	HCV status	Maximum number of recruits♦	Maximum number of waves♦	Percent of sample
Seed 1	6	MA	34	Neg.	Neg.	145	12	42.0%
Seed 2	15	MA	31	Neg.	Pos.	3	2	1.2%
Seed 3	95	MA	37	Neg.	Neg.	31	6	9.3%
Seed 4	25	PR	23	Neg.	Pos.	49	8	14.5%
Seed 5	7	PR	50	Neg.	Pos.	10	6	3.2%
Seed 6	20	MA	26	Neg.	Pos.	102	9	29.9%

**MA=Mahe, PR=Praslin.*

♦*Excluding seeds*

SOCIO-DEMOGRAPHIC CHARACTERISTICS

The majority of IDU were males (80%). Median age was 28 years old with the oldest participant being 58 years old. Most IDU reported completing their secondary education (55%), and a sizable proportion reported attending technical or professional school or a university (41%). The highest percentage of IDU reported working as unskilled labour (44%), and 21% reported working as skilled labour. Nine percent reported being unemployed and 7% reported illegal employment such as selling drugs or sex.

The majority of IDU were single (56%) or not married but living with a partner (40%). Only 9.5% of IDU reported ever being married. Most IDU reported being Catholic (82%).

Table 4. Socio-demographic characteristics of IDU, Seychelles, 2011

	Seychelles (N=346)		
	N	%	95% CI
Sex			
Male	332	79.8	71.8, 87.9
Female	13	20.1	12.1, 28.2
Age			
≤24	97	32.6	22.8, 42.3
25-29	107	21.4	14.9, 27.8
30-34	75	24.1	15.9, 32.3
35-39	47	13.6	7.2, 20.2
≥ 40	20	8.4	2.7, 14.5
Median age (min., max.)		28 (18-53)	
Education			
Primary	6	3.9	0.5, 8.5
Secondary	206	54.9	44.4, 65.4
Technical/professional school/ University	133	41.1	30.4, 51.9
Employment			
Unemployed	19	8.8	1.8, 15.7
Tourism	40	9.5	3.2, 15.9
Skilled labour	75	21.1	14.2, 28.1
Professional	20	9.4	1.7, 17.1
Unskilled labour	155	44.4	34.8, 53.3
Sell drugs/sex	15	7.1	0.2, 14.0
Current civil status			
Single	202	55.7	44.6, 66.8
Married, living with spouse	10	1.1	0.8, 1.5
Not married, Living with a partner	121	40.0	28.9, 51.1
Divorced, widowed, separated	10	2.4	0.27, 4.5
Ever been married			
Yes	35	9.5	3.9, 15.2
No	311	90.4	84.8, 96.1
Religion			
Muslim	31	10.1	4.0, 16.6
Anglican	21	4.7	2.3, 7.1
Christian	8	2.9	0.02, 5.8
Catholic	268	82.2	75.5, 88.9

ALCOHOL, INJECTION AND NON-INJECTION DRUG USE

Alcohol use among IDU

Eighty one percent of IDU reported ever consuming alcohol and, among those 30.2% reported doing so in the past six months. Among those who reported consuming alcohol in the past six months (N=78), the majority reported doing so weekly or more often (46%) and having six or more drinks on one occasion less than monthly (45%).

Table 5. Alcohol use among IDU, Seychelles, 2011

	Seychelles (N=346)		
	N	%	95% CI
Ever consumed alcohol			
Yes	283	80.8	72.5, 89.2
No	63	19.2	19.2, 10.9
Consumed alcohol in the past six months			
Yes	78	30.2	20.3, 40.0
No	203	69.7	59.9, 79.6
Frequency of alcohol use in the past six months (among those reporting consuming in the past six months)			
Less than monthly	58	25.3	13.4, 37.3
Monthly	59	28.6	15.7, 41.3
Weekly or more often	87	46.0	32.0, 60.1
Frequency of having six or more drinks on one occasion			
Less than monthly	72	44.8	33.5, 56.1
Monthly	46	24.8	13.4, 36.2
Weekly or most often	46	30.4	18.9, 41.8

Non-injection drug use among IDU

Most IDU reported ever using non-injection drugs (98%) and the largest proportion reported the age of initiating non-injection drug use as between 20 and 25 years old (Table 6). More than half of IDU reported smoking cannabis (53%) and just under half reported smoking heroin (46%) in the past six months

Table 6. Non-injection drug use among IDU, Seychelles, 2011

	Seychelles (N=346)		
	N	%	95% CI
Ever used illegal non-injection drugs			
Yes	344	97.8	94.5, 101.0
No	2	2.2	1.1, 5.5
Age for first using illegal non-injection drugs			
≤19	105	26.4	19.0, 33.8
20-25	205	59.3	49.8, 68.9
≥30	33	14.2	6.3, 22.2
Illegal non-injection drug used most often in the past six months			
Cannabis	182	52.8	43.5, 62.1
Smoking heroin	107	46.2	36.7, 55.7
Cocaine	2	1.0	0.5, 2.5

Injection drug use among IDU

More than half (51%) of IDU reported being 20 years or older the first time they injected drugs and 54% reported injecting for two years or less. Eighty one percent of IDU reported being with a friend or other person the first time they injected and 14% reported injecting the first time when they were by themselves.

Almost all IDU reported injecting some type of heroin in the past six months, with the majority reporting injecting so called *tanmaren* heroin (86%) and *white* heroin (70%).

There was almost an even split between IDU who reported injecting once a week or less (54%) and more than once a week (but not daily) (46%). Forty eight percent of IDU reported injecting the same day as participating in the survey.

Table 7. Injection drug use among IDU, Seychelles, 2011

	Seychelles (N=346)		
	N	%	95% CI
Age for first injection drugs			
≤14	60	20.9	12.9, 28.9
15-19	124	28.4	22.2, 34.7
≥20	162	50.7	41.6, 59.7
Length of time injecting illegal drugs			
≤2 years	151	54.4	46.5, 62.3
3 years	150	34.9	26.5, 43.4
≥4 years	37	10.7	4.3, 1.7
Injection setting during first injection			
On own	38	13.9	7.1, 20.9
With friend or other person	290	80.8	73.8, 87.9
In a group	18	5.1	1.4, 8.9
Injected heroin in the past six months			
Yes	335	97.8	94.8, 100.7
No	2	2.2	0.1, 5.2
Types of drugs injected in the past six months			
Heroin (Brown)	151	43.9	33.9, 53.9
Buprenorphine (Subutex)	7	0.3	0.0, 6.5
Heroin(Brown et Subutex)	24	8.7	1.7, 15.8
Heroin (White)	258	70.2	62.4, 78.0
Heroin(tanmaren)	306	86.1	80.5, 91.6
Heroin(pof pof)	105	36.5	26.1, 46.8
Cocaine	7	5.2	0.96, 11.4
Frequency of injecting drugs in the past six months			
Once a week or less	203	53.6	43.5, 63.6
More than once a week (but not daily)	143	46.4	36.4, 56.5
Last time participant injected drugs			
Today	176	48.0	38.04, 58.6
Yesterday	115	36.0	26.9, 45.6
A few days ago	54	15.0	9.4, 21.4

Needle and syringe practices among IDU

The majority of IDU reported ever using a needle or syringe previously used by someone else (65.9%) and, among those, 29% reported doing so at their last injection and 59% did so in the past one month (Table 8). Most IDU reported *sometimes* (67.2%) and 23.8% reported *always* using a needle or syringe that had previously been used by someone else. Among those who reported sharing needles and syringes in the past six months (N=175), the majority reported doing so with only one other injector (53%); 25% reported sharing with 2 to 3 other persons and 22% reported sharing with four or more persons.

Sixty one percent of IDU reported *sometimes* and 25% reported *never* cleaning needles and syringes that had previously been used by someone else before injecting in the past six months. The preferred method for cleaning needles and syringes that had previously been used by someone else was to wash them with hot water (52%) or with boiling water (38%). No respondent reported ever using bleach, the only effective way to clean a used needle. Fifty five percent of IDU reported *sometimes* and 44% reported *always* giving, lending or selling a needle or syringe to someone else, after already having used it in the past six months.

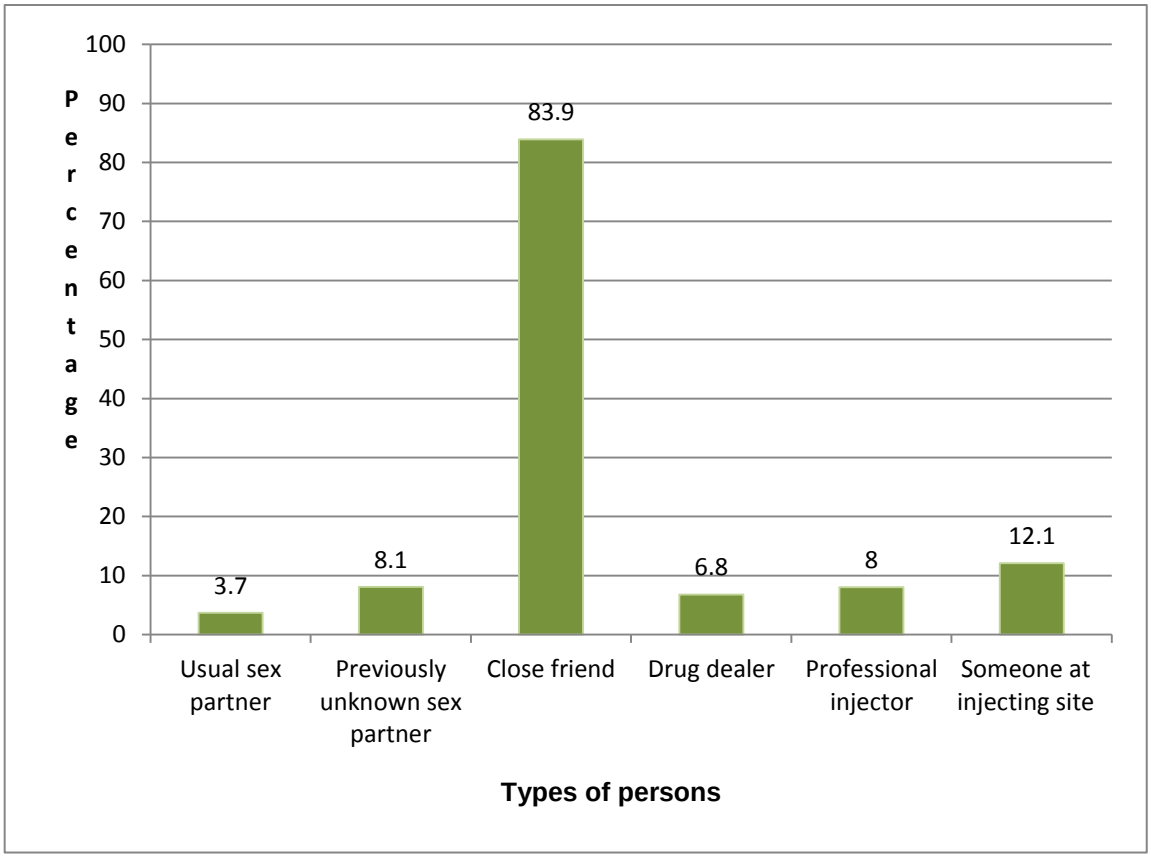
Table 8. Needle and syringe practices, Seychelles, 2011

	Seychelles (N=346)		
	N	%	95% CI
Ever used a needle/syringe previously used by someone else			
Yes	228	65.9	56.2, 75.5
No	117	34.1	24.4, 43.8
Used a needle or syringe at last injection that had previously been used by someone else			
Yes	50	28.9	16.9, 41.08
No	180	71.0	58.9, 83.09
Used a needle or syringe that had previously been used by someone else at in past one month			
Yes	107	58.9	44.2, 73.7
No	40	26.2	13.4, 39.1
Frequency of ever using a needle or syringe that had previously been used by someone else			
Never	14	8.9	0.4, 17.5
Sometimes	117	67.2	54.5, 80.0
Always	44	23.8	12.2, 35.2

Number of different injecting partners shared needles or syringes within the past six months			
1	98	53.1	38.1, 68.1
2-3	46	25.0	14.1, 36.0
4+	31	21.7	7.9, 35.4
Frequency of cleaning needles and syringes that had previously been used by someone else before injecting in the past six months			
Never	50	25.0	11.0, 38.9
Sometimes	102	60.9	48.8, 72.9
Always	32	14.1	5.1, 23.1
Method of cleaning needles and syringes that had previously been used by someone else before injecting in the past six months			
Cold water	18	10.4	3.4, 17.4
Hot water	71	51.5	37.4, 65.8
Boiled water	78	37.9	24.6, 51.2
Frequency of giving, lending or selling a needle or syringe to someone else, after you already using it in the past six months			
Never	5	0.5	0.31, 0.74
Sometimes	117	55.2	40.0, 70.2
Always	92	44.1	29.3, 59.1

Among IDU who reported sharing needles and syringes in the past six months, the majority reported doing so with a close friend (84%) (Figure 5). Only 4% reported doing so with their usual sex partner and 8.1% reported doing so with a sex partner they did not previously know.

Figure 5. Persons with whom IDU reported injecting in the past six months, Seychelles, 2011.



Obtaining clean needles/syringes and treatment

Eighty six percent of IDU reported that they obtain new, unused needles and syringes when needed and 93% reported knowing of any person or place from which new, unused needles and syringes can be obtained (Table 9, below).

Ten percent of IDU reported ever injecting with a pre-filled syringe (syringe that was filled without participant witnessing it). Most IDU reported *sometimes* (51%) sharing a cooker, vial or container, or cotton or filter, or rinse water in the past six months and 39% *sometimes* drawing up a drug solution from a common container shared by others In the past six months.

Forty one percent of IDU reported ever receiving help or treatment because of drug use and among those, 10% reported that they were currently receiving help or treatment because of drug use. Among those who reported ever receiving help or treatment because of drug use, the majority reported receiving detoxification with drugs other than methadone (67%), followed by outpatient counseling (27%) and residential rehabilitation (26%).

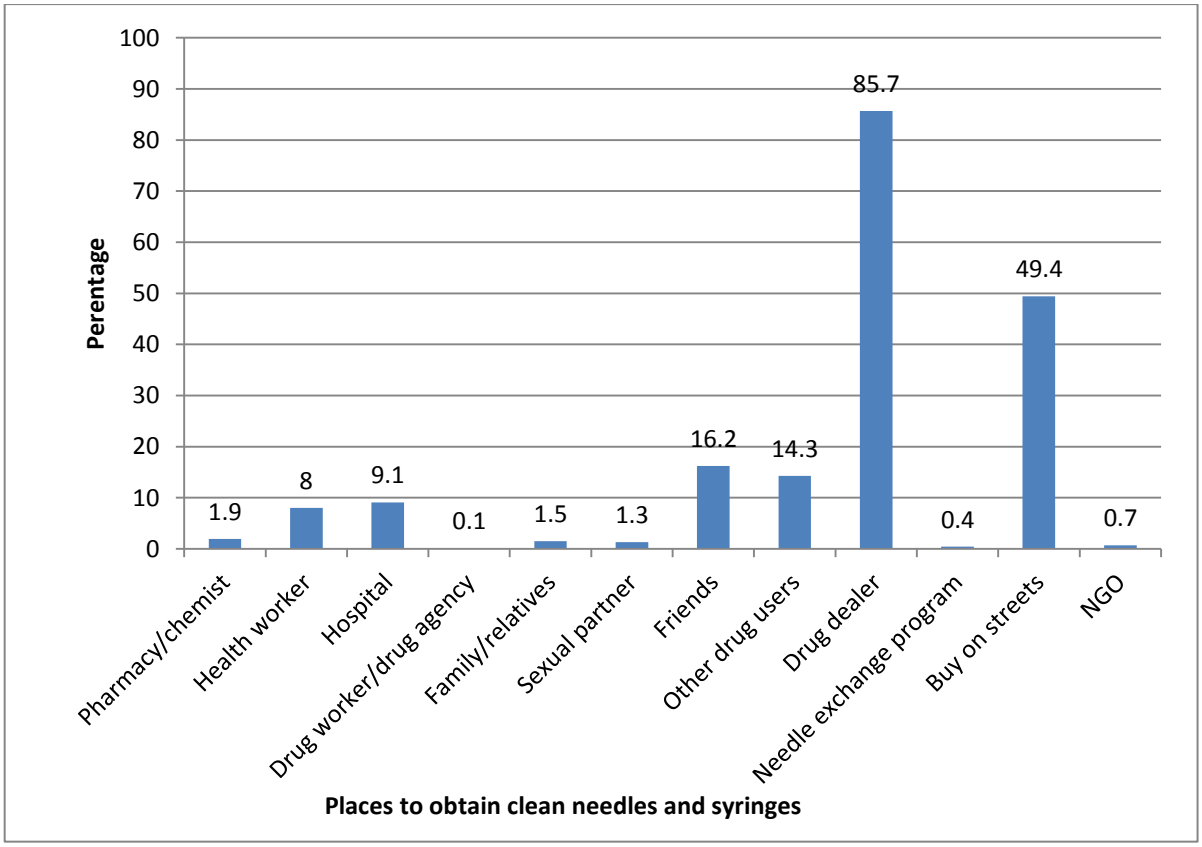
Table 9. Obtaining clean needles/syringes and treatment, Seychelles, 2011

	Seychelles (N=346)		
	N	%	95% CI
Can obtain new, unused needles and syringes when needed			
Yes	295	85.9	79.6, 92.2
No	48	14.0	7.76, 20.3
Knows of any person or place from which new, unused needles and syringes can be obtained			
Yes	323	93.3	88.4, 98.2
No	22	6.7	1.7, 11.6
In the past six months, ever injected with a pre-filled syringe (syringe that was filled without participant witnessing it)			
Yes	19	10.3	37.3, 16.9
No	324	89.7	83.1, 96.2
Frequency of sharing a cooker/vial/container, cotton/filter, or rinse water In the past six months			
Never	129	39.5	27.9, 51.1
Sometimes	193	51.3	40.9, 61.7
Always	22	9.1	3.3, 15.0
Frequency of drawing up a drug solution from a common container shared by others In the past six months			
Never	186	54.7	42.6, 66.8
Sometimes	139	39.1	27.4, 50.7
Always	15	6.2	1.0, 11.4
Ever received treatment (or help) because of drug use			
Yes	157	40.9	30.4, 51.4
No	188	59.0	48.6, 69.6
Currently under treatment (or receiving help) because of drug use			
Yes	12	10.2	2.8, 17.6
No	144	89.8	82.4, 97.2

Type of treatment or help received			
Outpatient counseling	51	26.7	13, 40.3
Self-help groups	11	13.9	1.2, 26.5
Detoxification w/methadone	22	12.5	2.3, 22.5
Maintenance w/methadone	6	3.4	0.8, 5.9
Detoxification w/other drugs	100	67.4	52.3, 82.3
Detoxification with no drug	10	5.6	1.3, 9.9
Residential rehabilitation	45	26.0	12.2, 39.8
Somebody helped you to quit cold turkey	4	6.6	0.2, 12.9

Few IDU reported getting their new, unused needles and syringes from the pharmacy (1.9%) or health facility (8.0% from a health worker; 9.1% from the hospital) and almost no IDU reported getting them from a needle exchange program or NGO (Figure 6, following page). The majority of IDU reported getting their new, unused needles and syringes from a drug dealer (86%) or by buying it on the street (49%). Other common sources reported were from friends (16%) and other drug users (14%).

Figure 6. Where new, unused needles and syringes are obtained by IDU, Seychelles, 2011.



SEXUAL RISK BEHAVIOURS

General sexual risk behaviours

Table 10 presents findings on general sexual history and behaviours. Almost all (99%) IDU reported ever having vaginal or anal sexual intercourse with the opposite sex and 81% reported doing so in the past six months. Most IDU reported having their first sexual experience with someone of the opposite sex between the ages of 15 and 19 years (65.3%; median of 15 years); however 32% reported doing so before they reached 15 years of age. More than half of IDU reported having 2 or more sexual partners of the opposite sex in the past six months and 48% reported having just one in the past six months (median=2) .

Table 10. General sexual behaviours with male partners among IDU, Seychelles, 2011

	Seychelles (N=346)		
	N	%	95% CI
Ever had vaginal or anal sexual intercourse with the opposite sex			
Yes	343	99.0	97.9, 100.1
No	3	0.9	-0.1, 2.0
Had sexual intercourse in the last 6 months with someone of the opposite sex			
Yes	292	81.4	72.1, 90.7
No	51	18.6	9.3, 27.9
Age at first sexual intercourse with someone of the opposite sex			
≤14	110	31.7	21.9, 41.5
15-19	216	65.3	55.4, 75.3
≥20	17	2.9	1.9, 3.9
Median (min., max) age at first sexual intercourse with someone of the opposite sex		15 (1, 28)	
Number of partners of the opposite sex in the last 6 months			
1	143	48.0	37.8, 58.2
2-3	88	30.8	21.7, 39.8
4+	60	21.2	12.0, 30.4
Median (min., max) Number of partners of the opposite sex in the last 6 months		2 (1, 25)	

Regular sex partners

Twenty three percent of IDU reported having sex with a spouse, live-in or other regular sexual partner (non-paid partner) in the last 6 months. The median number of partners reported by IDU was one. Among those who ever had sex with a regular partner (N=198), 27% reported using a condom at last sex with this partner. Among those who reported not using a condom at last sex with a regular sex partner, the main reason cited for not doing so was that they *trust partner* (72%), followed by it not being pleasurable for the respondent (11%). Most IDU reported *never* using a condom in the last six months with a regular partner (68.5%).

Table 11. Sexual risk behaviours with regular (permanent) sex partners among IDU, Seychelles, 2011

	Seychelles (N=346)		
	N	%	95% CI
Spousal, live-in or other regular sexual partner (non-paid partner) in the last 6 months			
Yes	97	23.1	16.5, 29.8
No	194	76.9	70.2, 83.4
Median (min., max) number of male regular sex partners in the past six months		1 (1, 5)	
Used condom at last sex with regular sex partner			
Yes	41	27.3	15.3, 39.3
No	157	72.7	60.7, 84.7
Primary reason why respondent did not use condom at last sex with a regular sex partner (among those who reported not using a condom at last sex with regular sex partner)			
No condom available	9	9.8	0.4, 19.9
Not pleasurable for respondent	11	11.0	0.17, 21.9
Trust partner	112	72.0	57.2, 86.8
Frequency of condom use in the past 6 months with aregular sex partner			
Never	141	68.5	53.6, 83.3
Sometimes	19	8.5	1.7, 15.9
Always	31	22.9	9.1, 36.9

Commercial sex partners

Table 12, below, provides data about sexual risk with commercial sex partners. Twenty seven percent of IDU reported having a commercial sex partner in the past six months. The median number of commercial sex partners in the past six months was two.

Among those who reported being paid for sex in the past six months (N=45), 95% reported having two or more paying partners and among those who reported paying for sex in the past six months (N=46), 67% reported paying two or more partners for sex. The majority of IDU who reported having commercial sex partners also reported using a condom at last sex with this partner type (87.4%).

Table 12. Sexual risk behaviours with commercial sex partners among IDU, Seychelles, 2011

	Seychelles (N=346)		
	N	%	95% CI
Commercial sex partner in the past six months			
Yes	80	26.7	18.5, 34.9
No	210	73.3	65.1, 81.5
Median (min., max) number of commercial sex partners in the past six months		2 (1, 100)	
Frequency of commercial partners to whom participant sold sex in the past six months (paying partners)			
1	8	5.3	1.6, 8.9
2-3	21	52.6	10.3, 94.9
4+	16	42.1	0.10, 84.1
Frequency of male clients in the past six months (among those who reported buying sex)			
1	18	32.9	12.7, 53.1
2-3	17	49.7	25.6, 73.7
4+	11	17.5	8.4, 26.5
Used condom at last sex with a commercial sex partner			
Yes	63	87.4	80.1, 93.9
No	13	12.6	6.0, 19.2

Occasional sex partners

Table 8 (below) provides data about sexual risks with occasional male sex partners. Just over half of IDU reported having sex with an occasional sex partner in the past six months. Forty four percent of IDU reported having 2 or more occasional sex partners in the past six months (median of 2 partners).

Most IDU reported using a condom at last sex with an occasional partner (81%) and 72.1% reported *always* using a condom with an occasional partner in the past six months.

Table 13. Sexual risk behaviours with occasional (casual) male sex partners among IDU, Seychelles, 2011

	Seychelles (N=346)		
	N	%	95% CI
Occasional sex partner in the past six months			
Yes	164	57.1	48.0, 66.2
No	127	42.9	33.8, 51.9
Frequency of occasional (casual) sex partners in the past six months			
1	61	55.8	40.5, 70.9
2-3	45	26.3	12.4, 40.3
4+	21	17.8	6.1, 29.8
Median (min., max) number of male occasional (casual) sex partners in the past six months		2 (1, 25)	
Used condom at last sex with occasional sex partner			
Yes	87	81.4	72.4, 90.5
No	39	18.1	9.1, 27.1
Frequency of condom use in the past 6 months with occasional sex partner			
Never	3	2.2	1.5, 3.0
Sometimes	28	25.6	7.8, 43.7
Always	67	72.1	54.1, 90.0

Male to male sex partners

Table 14 displays findings from male IDU about sexual encounters with other males. Twelve percent of IDU reported that they had ever had sex with another male and, among those, 52% had done so in the past six months. The median number of male anal sex partners in the past six months was two.

Table 14. General sexual risk behaviours with male sex partners among IDU, Seychelles, 2011

	Seychelles (N=346)		
	N	%	95% CI
Ever had any male sexual partners			
Yes	40	12.4	3.2, 21.5
No	267	87.6	78.4, 96.7
Sexual intercourse with a man in the last six months			
Yes	29	52.1	20.8, 83.4
No	11	47.9	16.6, 79.1
Median (min., max.) number of different male anal sex partners in the last 6 months		2 (1-9)	

CONDOMS AND LUBRICANTS

Condom usage and accessibility

Table 15 provides data about reported condom usage and accessibility. Whereas 98% of IDU can obtain a male condom every time they need one and 92% know where to obtain male condoms, only 10% were carrying a condom with them when they were enrolled in the survey. Forty eight percent of IDU reported being given condoms through an outreach service, drop-in centre or health facility in the previous year.

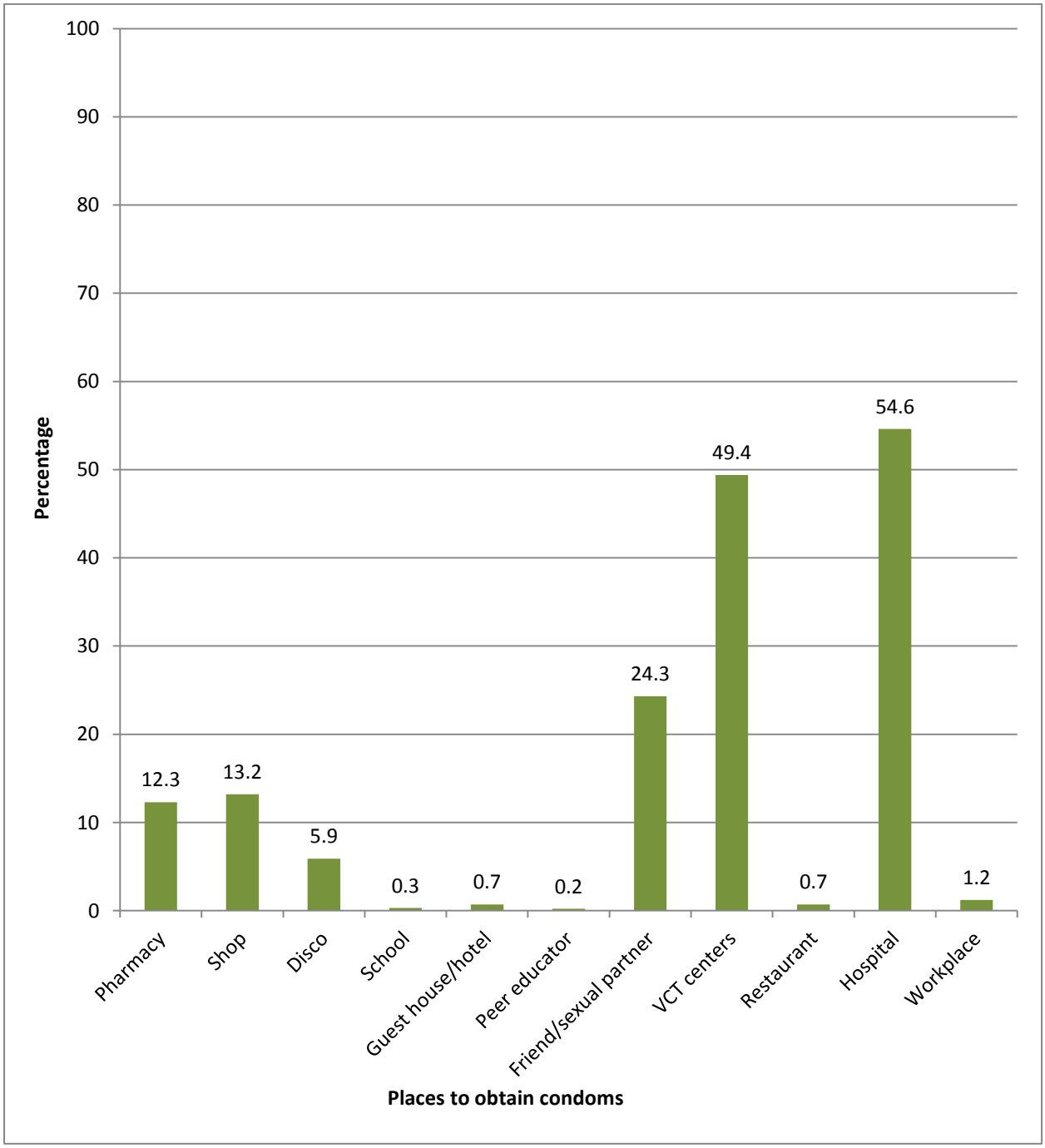
Only 4.5% of IDU reported having a condom break while using it during vaginal or anal sex.

Table 15. Condom usage and access among IDU, Seychelles, 2010-2011

	Seychelles (N=346)		
	N	%	95% CI
Can obtain a condom every time it is needed			
Yes	325	97.8	96.2, 99.3
No	10	2.1	0.6, 3.8
Knows where to obtain male condoms			
Yes	321	92.4	85.8, 98.6
No	8	7.6	1.0, 14.2
Respondent currently has condoms with them			
Yes	38	10.0	4.9, 15.2
No	294	89.9	84.8, 95.1
In the past twelve months, has been given condoms through an outreach service, drop-in centre or health facility			
Yes	173	48.0	39.6, 56.4
No	153	52,0	43.6, 60.5
In the last month, has used a condom that broke while using it during vaginal or anal sex			
Yes	19	4.5	1.9, 7.0
No	300	95.6	92.9, 98.1

The majority of IDU reported obtaining male condoms from the hospital (55%), HIV voluntary counselling and testing centers (49%) or from friends or sexual partners (24%) (Figure 7).

Figure 7. Where IDU know to obtain male condoms, Seychelles, 2011.



PERSONAL STIGMA, DISCRIMINATION, VIOLENCE AND ARREST

Sixty eight percent of IDU reported that they had received verbal insults and 2.0% reported being hit, kicked or beaten in the past 12 months because someone believed respondent injected drugs (Table 16). Twelve percent of IDU reported being forced to have sexual intercourse when they did not want to at some point in their lives and, among those, 83.4% reported having been forced to have sexual intercourse in the past 12 months. Fifty-four percent of IDU reported being arrested in the past 12 months.

Table 16. Personal stigma, discrimination, violence and arrest experienced by IDU, Seychelles, 2011

	Seychelles (N=346)		
	N	%	95% CI
Verbal insults in the past 12 months because of someone believed respondent injects drugs			
Yes	198	67.6	60.5, 74.7
No	144	32.4	25.3, 39.5
Hit, kicked or beaten in the past 12 months because of someone believed respondent injects drugs			
Yes	9	2.0	0.4, 3.6
No	334	97.8	96.4, 99.5
Ever forced to have sexual intercourse when responded did not want to			
Yes	33	11.6	5.3, 61.9
No	312	88.4	82.1, 94.7
Forced to have sexual intercourse when respondent did not want to in the past 12 months			
Yes	21	83.4	67.2, 99.5
No	10	16.7	0.5, 32.8
Arrested in the past 12 months			
Yes	213	54.1	46.3, 61.9
No	133	45.9	38.1, 53.7

SEXUALLY TRANSMITTED INFECTIONS (STI)

STI knowledge, signs and symptoms

Most IDU reported that they have heard of diseases (other than HIV) that can be transmitted through sexual intercourse (98%) and 96% said that they knew where to receive treatment if infected with a STI (Table 17, below).

Low percentages of IDU reported having signs or symptoms of an STI (genital ulcer, ulceration/lesions in the anal area, anal discharge) in the past 12 months (7.1%).

Table 17. Sexually transmitted infections (STI) knowledge, signs and symptoms among IDU, Seychelles, 2011

	Seychelles (N=346)		
	N	%	95% CI
Has heard of diseases that can be transmitted through sexual intercourse (STIs)			
Yes	336	97.9	96.4, 99.4
No	9	1.6	0.6, 2.6
Know where to receive treatment if infected with a Sexually Transmitted Infection			
Yes	318	96.2	94.3, 98.1
No	18	3.8	1.9, 5.7
Has signs or symptoms of an STI (genital ulcer, ulceration/lesions in the anal area, anal discharge) in the past 12 months			
Yes	19	7.1	2.2, 11.9
No	326	92.9	88.1, 97.8

HIV CHARACTERISTICS

HIV knowledge and attitudes

All IDU have heard of HIV/AIDS (Table 18, following page). However, only 8.5% reported that HIV sexual transmission can be prevented through abstinence and 33% reported that HIV sexual transmission can be prevented by being faithful to just one person. Almost all IDU knew that HIV can be prevented through condom use. Only 43% of IDU had accurate knowledge about HIV transmission based on a composite of several knowledge questions[15].

A low percentage of IDU believed that someone can get HIV by shaking hands (15.6%) and by sharing a meal (20.9%) with someone who is infected with HIV. Few IDU reported believing that there is no risk in using the same condom more than one time (<5%).Many IDU reported believing that someone who appears to be healthy can still be HIV positive (62.8%) and that a pregnant woman infected with HIV can transmit the virus to her unborn child (79.3%).

Few IDU believe that someone can get HIV by shaking hands with someone who is infected (6.5%) and almost all IDU believe that someone can get HIV by injecting with a needle that was already used by someone else (98%). Eighty nine percent of IDU believe that having sex with only one faithful, uninfected partner can reduce the risk of HIV transmission, 95% believe that using condoms reduces the risk of HIV transmission and 98% believe that a healthy-looking person can have HIV. Forty four percent of IDU believe that a person can get HIV from mosquito bites and 11% believe that a person can get HIV by sharing a meal (eating from the same plate) with someone who is infected.
Twenty six percent of IDU believe they have no risk for being infected with HIV, whereas 46% believe they are at medium to high risk for being infected with HIV.

[15]Correct HIV transmission knowledge was measured by answering all of the following questions correctly: Can having sex with only one faithful, uninfected partner reduce the risk of HIV transmission? (yes); Can a person get HIV by shaking hands with someone who is infected? (no); Can a person get HIV from mosquito bites? (no); Can using condoms reduce the risk of HIV transmission? (yes); Can someone who appears to be healthy still be HIV positive ? (yes).

Table 18. HIV knowledge and attitudes among IDU, Seychelles, 2011

	Seychelles (N=346)		
	N	%	95% CI
Has heard of HIV/AIDS			
Yes	346	100	--
No	0	0	--
Ways in which one can prevent the sexual transmission of HIV			
Abstinence	24	8.5	2.9, 13.9
Being faithful	110	32.7	22.5, 42.8
Condom use	335	96.3	57.2, 77.5
Has correct knowledge of HIV			
Yes	154	43.4	36.2, 50.7
No	190	56.6	49.3, 63.8
Believes someone can get HIV by:			
shaking hands with someone who is infected	17	6.5	1.0, 12.0
getting injections with a needle that was already used by someone else	338	98.3	96.9, 99.7
Believes that:			
having sex with only one faithful, uninfected partner can reduce the risk of HIV transmission	313	89.3	82.5, 96.2
using condoms reduces the risk of HIV transmission	328	95.2	90.9, 99.3
a healthy-looking person can have HIV	325	98.1	96.9, 99.3
a person can get HIV from mosquito bites	131	43.5	34.5, 52.5
a person can get HIV by sharing a meal (eating from the same plate) with someone who is infected	45	10.7	7.1, 14.2
Self assessment of risk of getting HIV			
High	57	20.8	12.2, 29.4
Medium	100	25.9	17.6, 34.3
Low	74	27.3	16.9, 37.7
None	91	25.9	16.8, 35.1

HIV testing

A high percentage of IDU (96%) know where to get an HIV test (Table 19, below) and 62.5% have ever been tested for HIV. Among those ever tested for HIV, 50% were tested in the last year. Among those ever tested for HIV, 89% reported receiving their test results the last time they were tested.

Among those IDU who never had an HIV test prior to this study, the majority reported the main reasons for not doing so was that they *did not perceive themselves at risk* (24%), *afraid someone will find out test they took the test*(8.6%) and that it *requires too much time* (6.4%).

When asked about the benefits of having an HIV test and counselling and testing, the majority of IDU responded in order *to avoid infection* (40.3%), *to get treatment if needed* (25%) and *plan future and get general knowledge of status* (21%). Only 0.5% responded that there was no benefit to having an HIV test and counselling and testing.

Table 19. HIV testing among IDU, Seychelles, 2011

	Seychelles (N=346)		
	N	%	95% CI
Knows where to go to have an HIV test			
Yes	333	96.0	92.2, 99.8
No	12	3.9	0.2, 7.8
Has ever been tested for HIV			
Yes	198	62.5	53.8, 71.2
No	147	37.5	28.8, 46.2
Was tested for HIV in the last 12 months			
Yes	96	49.7	35.5, 63.8
No	95	50.3	36.2, 64.5
Received HIV test result at last testing in the past 12 months			
Yes	79	88.9	82.4, 95.6
No	20	11.0	4.4, 17.6
Reasons why respondent never had an HIV test			
Testing center too far away	0	--	--
I do not have HIV (not being risky)	35	24.0	13.6, 30.1
Do not want to change behavior if positive/afraid of results	0	--	--
Do not trust HIV testing staff	4	2.2	2.7, 4.9
I think I am positive	3	1.3	0.2, 3.2

Costs too much	0	--	--
Requires too much time	12	6.4	2.5, 10.3
Do not know where to go	1	1.1	--
Afraid someone will find out test they took the test	9	8.6	0.6, 20.8
Benefits of having counselling and testing of HIV			
Plan future/general knowledge of status	75	21.3	13.8, 28.6
Avoid infection	156	40.3	30.4, 48.9
Protect unborn child	1	0.2	0.1, 0.3
Get treatment if infected	78	25.0	15.9, 34.8
Learn to live with HIV if infected	13	8.3	1.9, 16.3
Receive social support	2	0.3	0.1, 0.5
Receive material support	1	0.1	0.0, 0.2
Receive HIV care	18	7.3	0.1, 14.0
No benefit	3	0.5	0.2, 0.9

HIV Stigma and discrimination towards people living with HIV

Overall, IDU show tolerant attitudes towards hypothetical situations which would put them into contact with people living with HIV/AIDS. Eighty percent or more IDUs in the Seychelles were tolerant of most situations (sharing a meal with someone with HIV; willing to care for a male or female relative if he or she became ill with HIV; and allowing a student to continue attending school if he or she has HIV, but is not sick), but less so when it came to buying food from a shopkeeper who was infected with HIV (12%).

Most IDU would want it to remain secret if one of their family members became ill with HIV (83%).

Table 20. Stigma and discrimination towards people living with HIV among IDU, Seychelles, 2011

	Seychelles (N=176)		
	N	%	95% CI
Would share a meal with a person you knew had HIV			
Yes	287	79.3	69.3, 89.4
No	57	20.7	10.6, 30.7
Would be willing to care for a male relative in his household if he became ill with HIV			
Yes	334	96.9	93.3, 100.4
No	9	3.2	-0.4, 6.8
Would be willing to care for female relative in his household if she became ill with HIV			
Yes	335	96.3	92.9, 99.7
No	9	3.7	0.3, 7.1
Would you buy food from a shopkeeper or food seller if he knew they had HIV			
Yes	33	11.6	5.4, 17.8
No	312	88.4	82.2, 94.6
Would you want it to remain secret if a member of your family became ill with HIV			
Yes	241	83.3	66.7, 99.8
No	100	16.7	0.2, 33.3
If a student has HIV but is not sick, he or she should be allowed to continue attending school			
Yes	330	96.4	93.9, 98.8
No	13	3.6	1.2, 6.1

HIV, SYPHILIS AND HEPATITIS PREVALENCE

HIV prevalence among IDU in the Seychelles was 5.8%. Only 0.7% of IDU were found to be infected with Syphilis and 0.1% infected with Hepatitis B. However, 53.5% of IDU were infected with Hepatitis C.

Among female IDU, 4.6% were HIV seropositive. There was little overlap of HIV and HCV as only 15.9% (95% CI. 2.8, 59.4) of HIV seropositive IDU were also infected with HCV.

Table 21. Prevalence of HIV and Syphilis among IDU, Seychelles, 2011

	Seychelles (N=346)		
	N	%	95% CI
HIV			
Negative	332	94.2	89.9, 98.6
Positive	13	5.8	1.4, 10.1
Syphilis			
Negative	344	99.3	98.1, 100
Positive	1	0.7	0.1, 0.2
Hepatitis B			
Negative	343	99.9	99.8, 99.9
Positive	1	0.1	0.02, 0.2
Hepatitis C			
Negative	145	46.5	35.9, 57.0
Positive	200	53.5	42.9, 64.1

POPULATION SIZE ESTIMATIONS

The population size of IDU was assessed using service data provided by the psychiatric unit of the Seychelles hospital, located at Victoria and the CDCU, also located at the Seychelles hospital, located at Victoria. During the RDS survey, IDU were asked whether they had received services from one of the listed service providers in the previous six months. This was used to derive an adjusted estimate of the percentage of IDU who had received the services in the previous six months. The actual number of visits to service providers by IDU in the Seychelles in the previous six months was provided by each of the services through their service data file. Population size estimations for the Seychelles using service data are provided in Table 22.

Table 22. Population size estimates of IDU in the Seychelles, 2011

	Psychiatric unit	CDCU
Number of one time visits	212	49
Percent[16] who reported visiting	**13.6%**	**7.0%**
Calculation	**212/.136 = 1559**	**49/.079=621**
Standard Error	**0.029**	**0.029**
Percent of the population[17]	**2.8%**	**1.1%**
95% Confidence bounds	**875, 2244**	**143, 1100**

Three hundred and forty six (346) unique objects were distributed to IDUs one week prior to the initiation of the survey and 20.7% IDUs reported receiving one. With this information the population size estimation of IDU was calculated to be 1,671 (95% CI. 673, 1706) or 3.0% of the adult population of Seychelles. The mean of all multipliers (unique object and two service multipliers) is 1,283 or 2.3% of the population. Females comprise approximately 257 of the adult IDU population in Seychelles.

[16]Percentages are weighted using RDS Analyst
[17]Assuming that adult (15 to 64 years) population size is 55,000.

DISCUSSION AND RECOMMENDATIONS

Concentrated HIV epidemic among IDU:

Six percent of the IDU population tested positive for HIV, indicating that Seychelles has a concentrated epidemic. Immediate harm reduction measures, including access to clean needles, education about safe injecting practices and targeted outreach for IDU, is urgently needed to counter the high prevalence of HIV and the high percentages of IDU who dirty needles. In addition, existing HIV voluntary counseling programs should be scaled up to provide information on harm reduction, HIV prevention, and condom promotion.

High prevalence HCV:

Prevalence HCV was high (53.5%). Fortunately, HIV and HCV co-infection was relatively low. As HCV is prevalent and easily transmissible, and, as many IDU share needles, Seychelles will likely see a major increase in HCV in the next few years among IDU if no interventions are initiated soon.

Formal guidelines and interventions for hepatitis prevention and management of both hepatitis and hepatitis-HIV co-infection are needed urgently. Guidelines and interventions should be comprehensive, these should include hepatitis education and prevention; HIV-hepatitis counseling; screening for HCV and referral for services where appropriate and available; promotion of safe sex and safe injection practices; and overall integration of hepatitis prevention into HIV prevention programs. The usefulness of piloting HCV-HIV co-infection management and treatment programs should be explored.

High-risk injection drug use practices:

High percentages of IDU reported using needles or syringes previously used by someone else. Low percentages of IDU reported cleaning needles and syringes, and those who did report cleaning them, did so only with water, previously used by someone else. In addition, high percentages of IDU reported sharing a cooker/vial/container, cotton/filter, or rinse water and drawing up drug solutions from a common container shared by others before injecting.

Sharing needles and syringes and other injecting equipment provide many opportunities for HIV and HCV transmission. The Seychelles currently has no program to provide clean needles to IDUs. Few IDUs can access new needles from pharmacies but rather rely mostly on drug dealers to obtain them. It is strongly recommended that the Seychelles develop harm reduction programs to reduce needle sharing; to increase access to clean needles and syringes through needle and syringe exchange programs; and to promote safer injecting practices, including the proper cleaning of needles, syringes and other injection equipment.

Need for effective treatment for IDU:
The population size estimation exercise identified a large population of IDU in the Seychelles. Although 41% of IDU reported receiving some kind of treatment or "help" because of their drug use, recidivism appears to be very high. Treatment opportunities, especially proven regimens (such as substitution treatment with methadone and other substitutes for injection drug use), are urgently needed for those who want to stop injecting. Seychelles offers no proven and effective method for injection drug use treatment.

High levels of risky sexual behaviours:
Almost all IDU reported ever having sexual intercourse and 81% reported having sexual intercourse in the past six months. Almost all IDU reported having sex with a person of the opposite sex when they were in their teens and 32% of IDU reported having sex at 14 years or younger. IDU reported having different partner types with the majority having occasional partners (57%) and commercial partners (27%). IDU also had multiple sex partners in the past six months (median of 2, range 1-100). Reported condom use with occasional and commercial partners at last sex was fairly high (81.4 and 87.4%, respectively). Condom use with permanent partners was low (27.5%).
Behavior change interventions and communications aimed at sex partner reduction as well as promotion of condom use among IDU are urgently needed.

Male to male sex:
Among the 12% of IDU who reported male to male sex, just over half of them have done so in the last six months with a median of 2 partners. Although male to male sex with a condom is not a big risk, the questionnaire used in this survey did not ask IDU about their condom use during male to male sexual encounters. This question will be useful in follow up surveys given the large percentage of IDU who also engaged in male to male sex in the past six months. Given that a survey of 176 MSM conducted in 2011 found inconsistent condom use during male to male sex, it might be assumed that IDU MSM also practise inconsistent condom use. Educational programs about condom use during all sexual encounters should be aggressively targeted towards IDU.

Overlap of high risk drug use and sexual risk behaviours:
As IDU are a sexually active population, and as drug use and sexual risk behaviours overlap, associations between HIV prevalence and specific risk behaviours are difficult to assess in the IDU population. This overlap suggests a potential bridge for HIV transmission beyond the drug-using population. Substance abuse services and harm reduction interventions should integrate HIV testing and sexual prevention activities.

Low knowledge of HIV:
Despite relatively low syphilis prevalence, no data are currently available about prevalence of other STIs among IDU. Systematic screening for STIs should be integrated into programs providing services to IDU. Health facility-based service providers should consider including systematic physical examinations for STIs in people known or suspected to be injecting drugs since signs or symptoms may neither be self-recognized nor reported.

IDU have extremely low levels of aggregated knowledge about HIV transmission but had high levels of knowledge for some individual sexual risks associated with HIV transmission. Given that most IDU reported ever having sexual intercourse and 81% reported doing so in the past six months, there is an urgent need for widespread education about reducing sexual risks associated with HIV and other STI infections. An introduction to some HIV education should be initiated during primary and secondary school to capture potential IDU, the majority of which completed secondary school.

IDUs are getting tested for HIV:
Almost all IDU know where to go to have an HIV test and 62.5% have ever had an HIV test. Among those who did have an HIV test 50% did so in the past 12 months and among those 89% received their test results. Among those who have not yet had an HIV test, the main reason why IDU reported not doing so was because they thought they did not have HIV (that they did not practice behaviours that put them at risk for HIV) (24%).Some additional reasons are that they are afraid people will find out they took the test (8.6%) and it requires too much time to get tested (6.4%). Some of these barriers to getting tested can be addressed through more extensive outreach and advertisement.

HIV VCT for IDU may need to be addressed in two ways: (a) Promotion of use of existing services, with additional training for counselors on how to receive and provide quality VCT services for this population, and (b) Bringing VCT services to the IDU population through mobile services that can reach non-traditional locations for those IDUs who may have concerns about accessing public or private health facilities.

High stigma and discrimination towards people living with HIV:
IDU in Seychelles are fairly tolerant of people living with HIV but most would not want anyone to know if a family member became ill with HIV. This is an indication that although stigma and discrimination towards people living with HIV may be low, there are sectors of society where stigma and discrimination remain high. High percentages of IDU reported that they would not buy food from shopkeepers or food sellers if they knew they had HIV, indicating the need for improved knowledge about HIV transmission.

Sixty eight percent of IDU reported that they had received verbal insults and 2.0% reported being hit, kicked or beaten in the past 12 months because someone believed respondent had injected illicit drugs (Table 16). Twelve percent of IDU reported being forced to have sexual intercourse when they did not want to at some point in their lives and, among those, 83.4% reported having been forced to have sexual intercourse in the past 12 months. Fifty-four percent of IDU reported being arrested in the past 12 months.

IDU face stigma and discrimination:

Sixty eight percent of IDU reported being refused a service in the past 12 months because of their injection drug use. High risk groups are less likely to seek health and other services and more likely to remain hidden when stigma and discrimination is high. Stigma and discrimination among high risk groups increase risk for everyone.

Just over 50% of IDU had been arrested in the past twelve months. Given that most IDU are arrested, and perhaps imprisoned at some point in their lives, effective education, including harm reduction, should be provided in the prison system. The police force should be sensitized to the vulnerabilities of IDU and included in developing effective responses to the health needs of IDU. The police force should also be educated about their risk for HIV and HCV and take precautions to avoid risk to themselves while interacting with any population.

Female IDU:

Females make up 20% of the IDU population. Female IDU are often more hidden and vulnerable than male IDU. Female IDU are more likely than non-injecting females to be in abusive relationships and often turn to prostitution to purchase drugs for themselves and/or for their partners.

Interventions for female sex workers who inject drugs should be designed to account for the overlap of high-risk sexual and injection drug using networks and should include programs targeted to the special needs of women. Programs should include condom and lubricant distribution; STI testing and treatment; HIV counselling, testing, care and treatment; and integrate linkages to injecting drug use services, including evidence-based risk reduction programs such as syringe exchange and opiate substitution therapy. In addition, development of female only programs to address the special economic, social and health needs of women is urgently recommended.

IDU population size is approximately 2.3% of the adult population:

Based on two service multipliers and a multiplier using a unique object, the population size of IDU is estimated to be 1,283. Females comprise approximately 257 of the adult IDU population in Seychelles. Population size estimation is not an exact science and the final estimates are just that, estimates.

CONCLUSION

Study findings clearly identify and confirm the need for the establishment of programs targeting IDU in Seychelles. Currently there are no services targeting IDU. This study supports the need to develop enhanced packages for prevention, care, and treatment of HIV infection, provided in settings that are easily accessed by and comfortable to IDU. As described in this report, this package should build on existing services and integrate important messages on how to reduce sexual and drug use risk, particularly among individuals that engage in multiple risk behaviours.

Given that such a large portion of the population in the Seychelles injects illicit drugs, it is essential that harm reduction programs be developed immediately. Needle and syringe exchange programs, effective treatment programs, and regimens such as substitution treatment with methadone and other substitutes, which are proven to be effective, are desperately needed. Mauritius has excellent harm reduction and treatment programs in the region and should be sought out for assistance.

Any scale-up of programs and services will need to be appropriately defined and adapted according to the unique context and risks identified for the population in their respective geographic location, endorsed by appropriate stakeholders in The Seychelles, and once implemented, monitored appropriately.

This was the first use of RDS among IDU in Seychelles. This survey successfully captured a diverse sample of IDU serving as a foundation for the establishment of a HIV surveillance system. This baseline survey has provided important epidemiological data to better understand the current context of the HIV epidemic in Seychelles and should be used by policy makers and funders to prioritize their resources for HIV prevention. IBBS should be incorporated into an on-going surveillance strategy whereby surveys of HIV and other infections prevalence and associated risk behaviours are implemented every two to three years using the same sampling methodology (RDS) to monitor trends, identify and respond to failures, and measure successes.

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