



Validating Estimates of the Size of Key Populations

A Study in Region 4 of Guyana

Zahra Reynolds
Nastassia Rambarran
Joel Simpson

July 2017

TR-17-184



Validating Estimates of the Size of Key Populations

A Study in Region 4 of Guyana

Zahra Reynolds
Nastassia Rambarran
Joel Simpson

July 2017

MEASURE Evaluation
University of North Carolina at Chapel Hill
400 Meadowmont Village Circle, 3rd Floor
Chapel Hill, North Carolina 27517
Phone: +1 919-445-9350 | Fax: +1 919-445-9353
measure@unc.edu
www.measureevaluation.org

This publication was produced with the support of the United States Agency for International Development (USAID) under the terms of MEASURE Evaluation cooperative agreement AID-OAA-L-14-00004. MEASURE Evaluation is implemented by the Carolina Population Center, University of North Carolina at Chapel Hill in partnership with ICF International; John Snow, Inc.; Management Sciences for Health; Palladium; and Tulane University. Views expressed are not necessarily those of USAID or the United States government. TR-17-184

ISBN: 78-1-9433-6466-4



ACKNOWLEDGMENTS

Funding for this assessment was provided by the United States Agency for International Development (USAID)/Guyana and the President's Emergency Plan for AIDS Relief (PEPFAR). We appreciate the technical support that our USAID colleagues provided.

This assessment would not have been possible without the generous contributions of local organizations that work with key populations in Guyana and partner with USAID. We thank our colleagues from Advancing Partners & Communities, Artistes in Direct Support, Guyana Sex Work Coalition, and Guyana Trans United, which provided crucial input into the process and the results. Support and input were received from our government counterpart at the National AIDS Programme Secretariat. The Society Against Sexual Orientation Discrimination (SASOD) was the primary implementer of this assessment and provided expertise and commendable management of the work. We also thank the interviewers and the respondents who took the time to contribute to knowledge in Guyana.

Cover photo: Courtesy of SASOD

CONTENTS

ACKNOWLEDGMENTS.....	3
ABBREVIATIONS	6
INTRODUCTION.....	7
METHODS OF THE SIZE ESTIMATION VALIDATION	9
Data Collection.....	9
Community Informant Interviews	9
Individual Interviews at Previously Identified Spots.....	10
Power and Sample Size	11
Sampling.....	11
Ethical Considerations	12
Data Collection/Data Entry	12
Data Analysis	13
Size Estimation Analysis	13
RESULTS OF THE SIZE ESTIMATION VALIDATION.....	14
Community Informant Interviews	14
Individual Interviews.....	16
Size Estimates.....	21
METHODS OF THE CLIENT CODE ASSESSMENT	25
Key Informant Interviews	25
Focus Groups with Key Populations	25
Data Collection.....	25
Data Analysis	25
RESULTS OF THE CLIENT CODE ASSESSMENT.....	27
Identification of Key Populations	27
Client Code Knowledge.....	27
Client Trust and Preference for Code Verification	28
Functionality within the HIV Care Continuum and Suggestions for Improvement	28
DISCUSSION.....	30
CONCLUSION.....	32
REFERENCES.....	33
APPENDIX A. GUYANA FOCUS GROUP DISCUSSION GUIDE.....	34
APPENDIX B. KEY INFORMANT INTERVIEW GUIDE	36
APPENDIX C. QUESTIONNAIRE FOR SIZE ESTIMATION VALIDATION	38

FIGURES

Figure 1. Site verification sampling.....	12
Figure 2. Identified sites compared with BBSS sites.....	15
Figure 3. Spot types for all spots identified by community informants.....	15
Figure 4. Percentage of respondents who had exchanged cash or gold for sex in the previous 12 months.....	18
Figure 5. Percentage of respondents tested for HIV in the previous 12 months.....	19

TABLES

Table 1. Definitions of key populations.....	9
Table 2. Region 4's subregions.....	10
Table 3. Summary of community informant interviews.....	14
Table 4. Summary of fieldwork for interviews with individuals at sites.....	16
Table 5. Self-reported spot-visiting behavior.....	17
Table 6. Sexual behavior.....	18
Table 7. HIV outreach and testing.....	20
Table 8. Key population size estimates for Region 4.....	21

ABBREVIATIONS

APC	Advancing Partners & Communities
BBSS	Bio-Behavioral Surveillance Survey
CBO	community-based organization
FSW	female sex worker
KP	key population
MOPH	Ministry of Public Health
MSM	men who have sex with men
NAPS	National AIDS Programme Secretariat
NGO	nongovernmental organization
PEPFAR	United States President's Emergency Plan for AIDS Relief
PLACE	Priorities for Local AIDS Control Efforts
SASOD	Society Against Sexual Orientation Discrimination
TG	transgender
USAID	United States Agency for International Development

INTRODUCTION

With a generalized epidemic and an estimated adult HIV prevalence rate of 1.4 percent (Guyana Ministry of Health, 2015), HIV is a major cause of death in Guyana. Cases are concentrated in the coastal regions, and certain subpopulations face much higher rates of HIV. Notably, the 2013–2014 Guyana Bio-Behavioral Surveillance Survey (BBSS) revealed rates as high as 16 percent among female sex workers (FSWs) who find clients at street sites (BBSS, 2014). Transgender (TG) people (7.8%) and men who have sex with men (MSM) (4.6%) also have elevated prevalence rates in comparison with the general population.

These key populations (KPs) are due special attention and are given such under the *Most-At-Risk Populations (MARPs) Guidelines and Standards for Non-Governmental Organizations* (Guyana Ministry of Public Health, 2012). With a goal of ensuring the “provision of high-quality prevention services” for key populations, the guidelines outline a comprehensive package of services, standard outreach activities, and guidance to reduce vulnerability and stigmatization. Essential to any of these KP-targeted activities is understanding where key populations are and how many of their members can be reached with outreach activities.

In 2014, MEASURE Evaluation (funded by USAID and the United States President’s Emergency Plan for AIDS Relief [PEPFAR]), provided technical assistance to Guyana’s National AIDS Programme Secretariat (NAPS) for a BBSS based on the Priorities for Local AIDS Control Efforts (PLACE) method. Developed by MEASURE Evaluation, PLACE lays out a step-by-step method for monitoring AIDS prevention and risk behavior among key populations. The focus of this study was populations of special interest: miners, loggers, FSWs, and MSM. Findings from the 2014 BBSS/PLACE survey included, for the first time, data on TG women in Guyana, thus presenting an opportunity to address the needs of that community. Specifically, the initial analysis of the 2014 BBSS/PLACE provided information on HIV- and AIDS-related knowledge, attitudes, and behaviors of the TG population in Guyana—namely, condom use, access to HIV information, knowledge of common HIV myths and misconceptions, and knowledge and use of HIV testing.

In 2015, again with MEASURE Evaluation’s support, the BBSS/PLACE data were further analyzed to better characterize the HIV epidemics among key populations and to develop regional size estimates. MEASURE Evaluation synthesized this information in a report on prevention and treatment cascades and presented an analysis of subgroup risk factors and locations to NAPS and MOPH. These estimates were used to set targets for outreach and testing among key populations. Because the PLACE study was not designed to produce subnational size estimates, it was agreed that a validation study to update the estimates would be beneficial. The study focused on Region 4, an area with high KP density and a need for outreach activities.

In reviewing the BBSS-based size estimates, figures were compared with program data that had been collected by community-based-organization outreach programs. The size estimates varied significantly in some areas, raising questions about how the data were being collected, the quality of the data, and the differences between program data and survey indicators in definitions being used. To address these issues, an assessment of the “client code” was suggested both by donor partners and MOPH staff members.

The assessment, completed in the spring of 2017, was managed by the Society Against Sexual Orientation Discrimination (SASOD) with technical oversight from MEASURE Evaluation. Input was also received from national partners such as the National AIDS Programme Secretariat.

The knowledge generated by this assessment will inform HIV outreach and prevention activities with key populations primarily in Region 4. It will help outreach organizations better target their activities and determine whether they are reaching those who need services most.

Locating key populations so they can receive testing, care, and treatment for HIV is essential to USAID's goal of an AIDS-free generation (USAID, 2017) and the achievement of the 90-90-90 targets that PEPFAR has adopted (PEPFAR, 2014).¹

¹ These targets are that by 2020, 90 percent of those who are HIV-positive will have been tested, 90 percent of those who have been tested will receive antiretroviral treatment, and 90 percent of those in treatment will be virally suppressed.

METHODS OF THE SIZE ESTIMATION VALIDATION

This study was designed to validate existing KP size estimates in Guyana’s Region 4 that had been developed using national-level BBSS size estimates. The BBSS estimates were based on individual-level interview data along with spot verification data collected according to the standard Priorities for Local AIDS Control Efforts (PLACE) method. (The general PLACE protocol can be found in English at <https://www.measureevaluation.org/resources/tools/hiv-aids/place>.) It was decided that the validation efforts would focus on Region 4, because that region has a high concentration of key populations and USAID support for KP activities.

The study calculated and validated size estimates for FSWs, MSM, and TG women through site visits and individual interviews. The focus was on these three groups because they are the populations studied in the BBSS and they have programmatic importance in the fight against the HIV epidemic in Guyana. Definitions for them are given below.

Table 1. Definitions of key populations

Key population	Definition
Female sex workers (FSW)	Women who received money or gold in exchange for sex in the 12 months prior to the study
Men who have sex with men (MSM)	Men who had sex with another man in the twelve months prior to the study
Transgender (TG) people	People who currently identify as a gender different from their sex at birth (Note: Transgender women and men may be differentiated at points in the report.)

Data Collection

Community Informant Interviews

Interviewers were trained to conduct brief interviews with 400 community informants to learn the names of places where people meet new sexual partners. Region 4 was divided into seven subregions based on natural landmarks and divisions for ease of ensuring coverage. The subregions were as follows:

Table 2. Region 4's subregions

Subregion number	Subregion name	Boundaries
1	Central Georgetown	Seawall Demerara River Vlissengen Road Front Road
2	Greater Georgetown	Seawall East of Vlissengen Road Atlanticville-Turkeyen-Cummings Lodge Cane View Avenue
3	East Bank 1	East Bank Public Road right after Banks DIH going south Mocha Road–Shell Ramsburg Service Station
4	East Bank 2	Immediately after Mocha Road Linden-Soesdyke Highway
5	East Coast 1	Industry to Mon Repos
6	East Coast 2	De Endragt to Enmore
7	East Coast 3	Haslington to Helena No. 1

Community informant targets were set according to the size of the population and the types of spots available in each subregion.

Community informant interviews involved a very short questionnaire that asked where the general population as well as FSWs, MSM, and TG people go to socialize. Community informants were characterized as people who are knowledgeable about the community, such as taxi drivers, security guards, shop owners, and KP members. The results of those interviews were used to develop a list of spots where individual interviews would be conducted.

Individual Interviews at Previously Identified Spots

Trained interviewers administered a simple questionnaire at spots that had been identified from the community informant interviews or had been visited while implementing the PLACE method for the 2013/2014 BBSS. These spots were bars, restaurants, clubs, and other public spaces. Sites where key populations are found (FSWs, MSM, and TG people) were visited during a busy time to conduct individual interviews. At each site, all patrons and workers were interviewed unless there were too many to be interviewed in a single night, in which case a random sample of 10 patrons and workers was selected. A total of 60 spots were visited, resulting in 600 individual interviews.

Respondents gave their informed consent and were asked to respond to a short questionnaire that focused on whether they had been engaged by outreach workers or programs associated with community-based organization (CBO) KP outreach activities. They were also asked for their “client code” or the elements that make up their client code: initials (first and last name), date of birth (day, month, year) and gender. KP members receive a client code when they are engaged in HIV outreach activities by CBOs in Region 4.

Key Population Gatherings

Key population members were invited by SASOD and outreach workers from CBOs to two gatherings at the Tower Suites Hotel in Georgetown, Guyana. These people in turn invited friends who fell within the national definitions of the various key populations. One gathering focused on FSWs and was held in conjunction with a sex worker coalition meeting. The other encouraged MSM and TG people to attend and invite their friends. At the events, attendees were surveyed using a questionnaire like the one used at the previously identified spots and asked for client codes and about their interaction with outreach activities. A total of 110 interviews were conducted at these events.

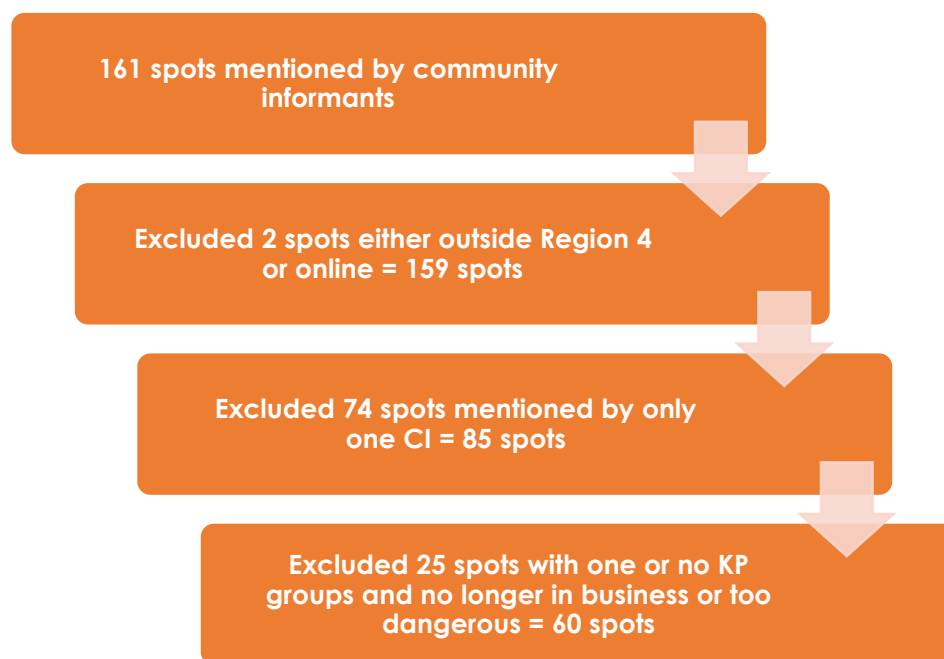
Power and Sample Size

This study attempted to capture a sample similar in size to that of the BBSS in 2013–2014, in which approximately 600 individuals were interviewed at spots in Region 4, thus allowing for comparability between the studies and between the population samples.

Sampling

For this study, sampling was done both of spots where interviews were conducted and of respondents at the selected spots. The sample frame for the selection of spots was all spots mentioned by one or more community informants. The figure below shows how the sampling frame was narrowed down to the final spots where individual interviews were conducted, and the characteristics of those spots that were selected.

Figure 1. Site verification sampling



Sixty spots were selected where individual interviews could be conducted. Five of them turned out to be ineligible owing to closure or safety risks and were replaced by spots with fewer community informant mentions and fewer key populations who socialize there.

A target of 10 interviews per spot was set. If a spot had 10 or fewer patrons and workers, everyone was eligible to be interviewed. Otherwise, 10 respondents were randomly selected from the patrons and workers at the spot.

Ethical Considerations

This study received ethical review in Guyana as well as at the University of North Carolina at Chapel Hill. In view of the sensitive nature of the data collected and the stigma associated with the populations of interest, the study team took great measures to ensure confidentiality, both during data collection and afterward. To increase trust in the respondents, members of their peer group interviewed those who felt more comfortable speaking to a peer. All respondents gave their informed consent and received information on the risks and benefits of participation. The data have the potential to expose both stigmatized and illegal behaviors, and they will be used only for public health purposes. They will not be shared with any authorities outside the Ministry of Public Health.

Data Collection/Data Entry

Data from the community informant interviews was collected on paper and then entered on a tailored spreadsheet. The data from the individual interviews at previously identified spots was collected using tablets pre-programmed with the survey questionnaire by MEASURE Evaluation; this data was regularly downloaded to a central server.

Data Analysis

Survey data was analyzed using Stata 14 to provide descriptive statistics for the variables of interest: engagement with HIV prevention outreach workers, receipt of a client code, the elements of the client code, site-visiting behavior, and HIV testing behavior and experience. Descriptive analysis delineated the sociodemographic characteristics of the target populations. Additionally, Stata was used to calculate population size estimates for the key populations in Region 4.

Size Estimation Analysis

Size estimates for key populations were calculated using a multiplier method. Respondents were assigned to KP groups according to their behaviors in the previous 12 months, as determined by the individual surveys. The proportion of KP members found within the sampled group was applied to the total number of patrons and workers observed by supervisors at all spots during busy times.

This total was adjusted upward based on monthly visiting behaviors: If persons visited a spot 12 or fewer times per month, it was assumed that they would not be found there on all busy nights. People who visited the spot more frequently were given less weight than those who visited the spot less frequently.

The size estimates calculated using the multiplier method were also compared with program data from the USAID implementing partner in Region 4, who collects a unique identifier for each KP member reached through outreach services. Respondents were asked whether they had engaged with an HIV outreach worker in the previous six months. This provided an opportunity to calculate a capture/recapture size estimate.

Size estimates were validated through a review-and-revise process that brought together stakeholders familiar with the KP data and with the assumptions both of survey and program data. Stakeholder expertise was engaged to build consensus around the size estimates for key populations.

RESULTS OF THE SIZE ESTIMATION VALIDATION

Community Informant Interviews

Table 3. Summary of community informant interviews

Number of interviews conducted		400
Types of community informants		
	n=	%
Taxi driver	54	13.5
Bar owner or worker	41	10.3
Individual socializing at spot	95	23.8
Security guard/car guard	26	6.5
Hairdresser	18	4.5
Youth in school	19	4.8
Youth out of school	16	4.0
Military/police	10	2.5
Trader/businessperson	35	8.8
Hawker/street vendor	35	8.8
Unemployed/individual loitering	39	9.8
Other	12	3.0
Number of spots mentioned		161
Spots reported to have:		
Female sex workers	136	84.5
Women who exchange sex for goods	90	55.9
Transgender women	83	51.6
Men who have sex with men	101	62.7
Sex on site	68	42.2

Four hundred interviews were conducted with community informants, most of whom were individuals socializing at a spot (23.8%), taxi drivers (13.5%), or bar owners and workers (10.3%). A total of 161 spots were mentioned by these community informants, spread throughout the seven subregions.

Female sex workers were reported to be at 136 of these spots, while men who have sex with men were the second most commonly reported key population—present at 101 spots.

Of the 162 spots mentioned by community informants as places where people meet new sexual partners and where key populations socialize, 43 were also named in the 2013/2014 BBSS. An additional 119 spots that had not been previously identified were mentioned by at least one community informant.

Figure 2. Identified sites compared with BBSS sites

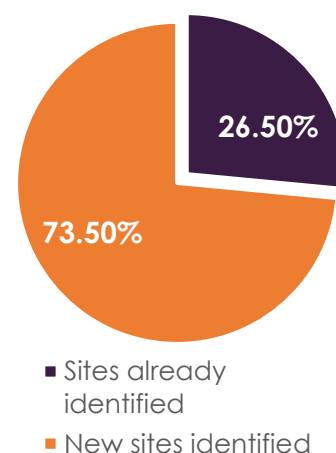
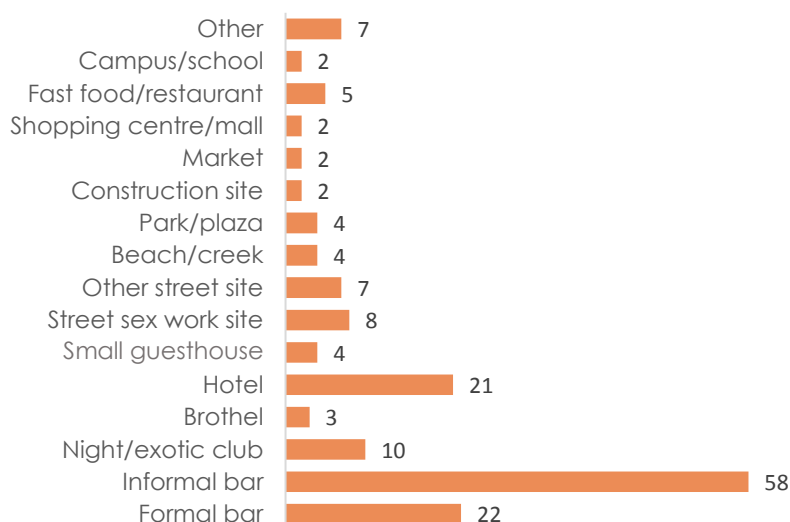


Figure 3. Spot types for all spots identified by community informants



Individual Interviews

Table 2. Summary of fieldwork for interviews with individuals at sites

Number of spots where interviews conducted		60
Number of interviews	n=	%
Recruited at study-sponsored parties	111	15.5
Recruited at spots where socializing or working	603	84.5
Total	714	
Result of interview		
Refused or already interviewed	2	0.3
Completed	712	99.7
Sex of respondents	n=	%
Male	325	52.6
Female	276	40.0
Trans Male	12	1.7
Trans Female	88	5.8
Age		
15-19	52	5.2
20-24	197	25.6
25-29	169	22.5
30-34	100	14.2
35-39	92	14.8
40-44	48	7.8
45+	54	9.9
Mean		30.8
Median		27.0
Region of residence		
Region 1	3	0.3
Region 3	36	6.5
Region 4	612	85.3
Region 5	20	3.4
Region 6	13	1.8
Region 9	4	0.1
Region 10	18	2.6

Six hundred and three interviews were conducted at spots identified by community informants where persons were socializing or working. An additional 111 interviews were done at the study-sponsored gatherings. Of these, two interviewees refused or had already been interviewed, resulting in a total of 712 completed interviews. Respondents were largely cisgender men (52.6%) and cisgender women (40%), with a minority of transgender women (5.8%) and transgender men (1.7%). (“Cisgender” signifies those whose gender corresponds to their birth sex.) Participants averaged 30 years of age, with the largest age

group being 20 to 24 years (25.6%), and most often lived in Region 4 (85.3%). People who lived in other regions—except 2, 7, and 8—also took part in the survey.

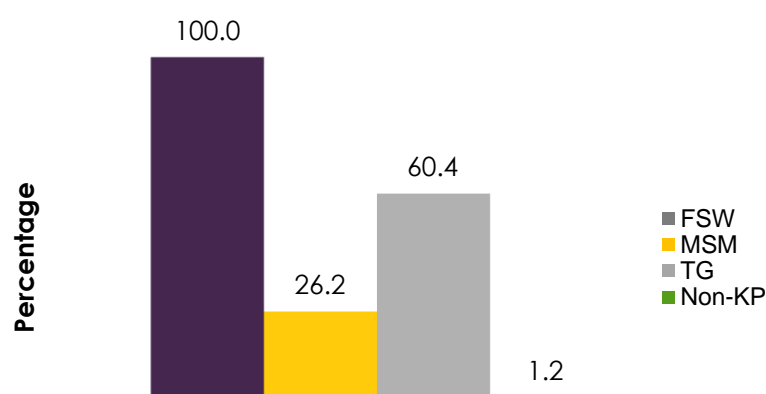
Table 3. Self-reported spot visiting behavior

Interviews with eligible and willing respondents at spots and parties					
	FSW (n=112)	MSM (n=131)	TG (n=99)	Non-KP (n=356)	Total (n=699)
Frequency of attendance at spot					
Lives at spot	1.1	0.0	0.0	1.9	1.4
Every day	21.6	7.9	38.8	10.7	13.4
4 to 6 times each week	5.2	3.5	5.8	2.2	2.9
2 to 3 times each week	5.5	6.4	9.6	2.7	3.9
Every week	37.6	17.7	23.8	17.0	19.5
2 to 3 times each month	8.7	9.8	0.7	10.4	9.5
Every month	9.4	15.4	4.9	21.1	18.1
Less than once a month	7.9	28.2	12.0	24.6	22.6
This is my first time here	2.5	6.9	3.5	7.2	6.5
Refused	0.6	4.2	0.9	2.1	2.1
Number of other spots respondent already visited that night					
No other spot	30.0	48.1	39.3	55.9	51.0
1	39.1	30.0	26.0	27.8	29.1
2 to 3	17.5	13.3	26.3	13.6	14.9
4+	13.5	8.6	8.4	2.7	5.0
Number of other spots respondent plans to visit that night					
No other spot	40.0	47.1	50.7	75.2	65.8
1	23.4	30.7	22.0	20.8	22.6
2 to 3	27.0	13.6	20.7	3.9	8.8
4+	9.6	8.6	6.7	0.1	2.8

Most MSM reported visiting the spot where they were interviewed less than once a month (28.2%), while most FSWs visited every week (37.6%) and most TG people every day (38.8%). Overall, and among KP members (except FSWs), most respondents had visited only that spot that night. Many KP members intended to visit no other spot that night (40% to 50.7%), but some did plan to visit either one other spot (20% to 30%) or two or more (6.7% to 27%).

Table 4. Sexual behavior

Interviews with eligible and willing respondents at spots and parties					
	FSW (n=112)	MSM (n=131)	TG (n=99)	Non-KP (n=356)	Total (n=699)
Ever had sex					
Yes	100.0	100.0	99.5	94.2	96.0
No	0.0	0.0	0.0	4.5	3.1
Missing	0.0	0.0	0.5	1.3	0.1
Exchanged cash or gold for sex in the past 12 months					
Yes	100.0	26.2	60.4	1.2	19.5
No	0.0	70.7	32.9	91.6	74.7
Missing	0.0	3.1	6.7	7.2	5.8
Average age at first sex work					
	17.1	16.5	16.0	20.1	16.9

Figure 4. Percentage of respondents who had exchanged cash or gold for sex in the previous 12 months

Regarding sexual behavior, most respondents had ever had sex, with only 3.1 percent of respondents (all non-KP members) yet to make their sexual debut. For a woman to be categorized as FSW, she had to have exchanged cash or gold for sex in the previous 12 months. As many as 60.4 percent of transgender persons, 26.2 percent of MSM, and 1.2 percent of non-KP members (i.e., men who exchanged cash or gold for sex with women) had also exchanged cash or gold for sex in the previous year. The average age of first sex work was similar for the three KP groups, at 16 to 17 years, but skewed older, at 20 years, for non-KP members.

Approximately one-third of all respondents had engaged with an HIV outreach worker within the previous six months, engagement being highest among TG people (60.2%), followed by MSM and FSW. Of those engaged by outreach workers, roughly half reported receiving a client code.

Figure 5. Percentage of respondents tested for HIV in the previous 12 months

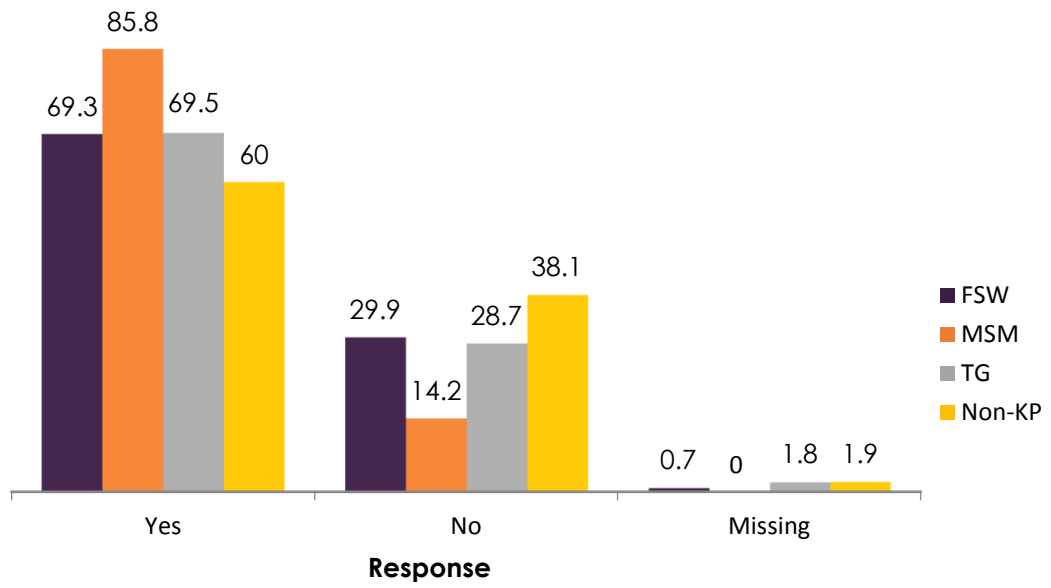


Table 7. HIV outreach and testing

Interviews with eligible and willing respondents at spots and parties					
	FSW (n=112)	MSM (n=131)	TG (n=99)	Non-KP (n=356)	Total (n=698)
Engaged with outreach worker in previous 6 months					
Yes	46.2	52.8	60.2	23.6	32.8
No	53.4	46.6	39.9	75.9	66.8
Missing	0.4	0.5	0.0	0.5	0.5
Received a client code if engaged by outreach worker					
Yes	40.5	55.1	52.1	44.0	47.2
No	51.9	39.9	48	52.4	48.8
Don't know	7.6	5.0	0.0	3.6	4
Knows where to get an HIV test					
Yes	88.7	91.3	99	93.4	93
No	11.3	8.7	0.5	6.5	6.9
Missing	0	0	0.5	0.1	0.1
Ever tested if not tested in the previous 12 months					
Yes	75.6	77.1	70	61.7	64.4
No	24.4	22.9	28.3	38.1	35.3
Missing	0	0	1.7	0.3	0.3
Received test results if tested					
Yes	100	98.6	100	95.5	96.8
No	0	1.4	0	4.4	3.1
Missing	0	0	0	0.1	0.1
Received counseling if tested					
Yes	96.8	91	94.5	84.1	87.5
No	3.2	9	5.5	15.6	12.4
Missing	0	0	0	0.3	0.2

Almost all the respondents knew where to get an HIV test, with this knowledge being most prevalent among TG people (99%), followed by MSM (91.3%) and FSW (88.7%). However, only 65 percent had been tested within the previous 12 months. Among KP respondents, more MSM (85.8%) than TG people (69.5%) or FSW (69.3%) had been tested within the previous year. Overall, 35.3 percent of respondents had never been tested for HIV, with non-KP members having the highest rate of nontesting

(38.1%), followed by TG people (28.3%). Almost all respondents in each KP group reported receiving their results after testing (98.6% to 100%), but slightly fewer reported receiving counseling upon testing (94.5% to 96.8%).

Client codes generated from the survey data were compared with program data from Advancing Partners & Communities (APC). Client code components are initials (first and last name), date of birth (day, month, year) and gender. Only seven respondents were completely duplicated in the APC data; all of them reported having been reached by an outreach worker. Two respondents matched on date of birth but not on gender assignment. Another 68 records varied by one digit, but it cannot be determined whether they are duplicates with data-entry errors or just similar records. (Data not shown.)

Size Estimates

Size estimates based on the survey data adjusted for site visiting behavior are representative of the number of KP members who can be reached at one busy point in time at spots where they work or socialize. According to this method, 1,655 FSW can be reached at any one point in time in Region 4, as can 2,797 MSM and 629 TG women.

The estimates from the service multiplier method are a better representation of how many KP members can be reached over the course of one year in Region 4. These size estimates were based on USAID program data that engaged with 2,904 FSW, 2,259 MSM, and 214 TG people over the course of one year, from April 2015 to April 2016.

These size estimates were shared with a group of stakeholders who work with key populations or support key population programs. The assumptions and qualities of each method of estimation were discussed at length, as follows:

- Survey-based size estimates reflect key populations identified through behavior (e.g., exchanging sex for cash), while program data reflect those who self-identify. It is very possible that people engage in sex work, but do not self-identify as sex workers. These people would be more difficult to find for outreach services.
- Key populations are very mobile, and many socialize in Region 4 even if they do not live in Region 4. This assumption could inflate both annual targets (e.g., the annual estimate may be much larger than any point-in-time estimate), and a single point-in-time estimate (e.g., populations from outside Region 4 can be found socializing in Region 4 as well as other regions at other points in time).
- Gender identity and sexual behaviors are fluid. Inclusion in a key population group is not consistent over time according to the operationalized definitions.
- Social norms are changing around perceptions of key populations, particularly transgender people. People may be more comfortable identifying as transgender, potentially increasing size estimates for transgender compared to previous surveys.
- The environment around sex work in Guyana is changing. Finding transactional partners is easier with the advent of Internet-based sites, mobile apps, and social media. Women may engage in this type of sex work without considering themselves sex workers. These individuals would be

included in the survey-based size estimates, but are less likely to be included in size estimates based on service delivery.

Based on this feedback, an additional size estimate was developed that focuses on the “reachable” key populations. This estimate was calculated by including only people who reported visiting the spot where the interview was conducted at least once a week. The assumption is that frequent site visiting makes these people easier to reach with outreach services. See the table below for updated size estimates.

Table 8. Key population size estimates for Region 4

Key Population	BBSS 2013/14 final estimate	USAID program data (April 2016-April 2017)	Weighted cross-sectional data	Weighted data with site visiting adjustment	Reachable core group with site visiting adjustment	Service multiplier method
Female sex workers	1,821	2,259	607	2,037	1,332	4,891
Men who have sex with men	1,837	2,904	543	1,850	1,564	5,488
Transwomen		214	225	209	171	292
Method of calculation	Estimates based on the Review and Revise tool which accounted for program data, expert opinion, and large confidence intervals in the survey-based size estimates.	De-duplicated data reported by the USAID implementing partner conducting HIV prevention outreach with KPs. This is the number reached during a one-year time period.	Weighted data on the number of KPs interviewed across spots in Region 4 weighted for sample design. This is a point-in-time estimate.	Weighted data adjusted for frequency of attendance at the venue across the month. This is a point-in-time estimate.	Weighted data adjusted for frequency of attendance at the venue, but limited to those who visit the site at least weekly (suggesting they are easily reached at the venue). For FSW, those who visited at least monthly were also included due to the high risk of this particular group.	Calculated by applying the proportion of survey respondents who said they had been reached by an outreach worker in the previous six months to the USAID program data. This is an annual estimate.

The different size estimates can be utilized for different purposes. Population size estimates based on weighted data with a site-visiting adjustment provide a point-in-time estimate of all the key populations that can be reached at spots where they socialize, whether key population members self-identify or not. The size estimates based on a reachable core group with a site-visiting adjustment are particularly useful for key population programs that conduct outreach at the types of places where the survey was conducted. These figures represent the key population members that regularly visit these spots and can be more easily reached than those who only visit spots infrequently. Lastly, the size estimates based on the service multiplier method are best suited for long-term agendas that include both the easily reached populations as well as the very hard to reach populations. Users of size estimates should consider the implications of using the different size estimates for their programs, targets and planning.

METHODS OF THE CLIENT CODE ASSESSMENT

The second component of the study was an assessment of the unique identifier code system currently implemented by KP outreach programs. As with the size estimation validation, the need for a client code assessment arose after a review of program data in relation to survey-based size estimates. This assessment involved both key informant interviews and focus groups.

Sample sizes for the focus groups were chosen to balance the need for multiple perspectives with the logistics of conducting focus groups. The sample size for the key informant interviews was sufficient to include representation from all the CBOs working with key populations in Region 4.

Key Informant Interviews

Key informant interviews with individuals identified in collaboration with NAPS were conducted over the course of a week. Interviewees were purposively selected and represented outreach workers, monitoring and evaluation staff members, and managers of outreach programs in Region 4. The interviews focused on barriers to and facilitators of collecting good-quality data related to unique identifiers; definitions of key populations and how they are applied in outreach activities; willingness of KP members to provide information; and their experience in implementing the system. The goal was to understand the experience of those using the client code and what they perceived as its successes and potential problems. Nine key informant interviews were conducted with a standardized key informant interview guide designed specifically for the role of the person being interviewed.

Focus Groups with Key Populations

Three focus groups were conducted, with one each for the three target key populations: FSW, MSM, and TG people. The goal of the focus groups was to understand KP perceptions of the client code—comfort providing the information, understanding of its use, and experience with its implementation so far. Participants in the focus groups were purposively selected to represent a range of experiences with the client code, and the groups were conducted using a standardized focus group guide.

Data Collection

Interviews with 10 key informants and three focus groups comprising five to eight participants each were conducted over the course of 10 weeks, with interviews lasting an average of 30 minutes and focus groups averaging 45 minutes. Interviews were conducted primarily at organizational offices, and the focus groups were held either in SASOD's offices or in the offices of other CBOs working with key populations.

Data Analysis

Audiotaped interviews were transcribed verbatim into Microsoft Word. Data both from interviews and focus groups were then analyzed using thematic analysis. This type of analysis takes an “inductive”

approach, analyzing transcripts and notes with a view to identifying key themes or “codes,” arising either directly from the data or in line with previously identified themes. The coding scheme was developed in a spreadsheet (OpenOffice Calc), and data exploration and analysis involved manually color-coding the themes and cutting and pasting them together to create a classification system and for ease of cross-referencing.

RESULTS OF THE CLIENT CODE ASSESSMENT

The focus groups with key populations involved participants ranging in age from 17 to 48, with an average age of 32. Most participants had been tested for HIV within the previous year and were involved with such nongovernmental organizations (NGOs) as SASOD, Guyana Trans United (GTU), Guyana Sex Worker Coalition (GSWC), Linden Care Foundation, and Artistes in Direct Support (AIDS). They obtained a variety of services—including legal, medical, testing, and training—from these NGOs. Outreach practices, confidentiality, efficiency, friendliness of staff members, and, sometimes, the provision of refreshments played a role in their decision to access these services. Interactions with the NGOs were both formal and informal and for the most part took place on social media and the telephone, interspersed with face-to-face encounters.

Analysis of both the focus groups and the key informant interviews revealed several themes, discussed below.

Identification of Key Populations

Key informants used various forms of written guidance when assessing whether a person belonged to one of the three key populations of interest—MSM, FSW, and TG people—including from PEPFAR, USAID, and APC. They asserted that “frontline” staff members are educated on these guidelines, with the emphasis being on behavior rather than orientation, and with regular refresher training sessions. Regarding MSM, many participants stated that they “never assume” and allow the client to self-identify, as illustrated by two participants:

“Some people don’t see themselves as MSM even if they have sex with men, and we try to explain why we categorize them as such. We don’t ask about a specific time frame. If you do that, it could be losing a lot of people. If we ask about the past six months, it may cut people out.”

“If I see a man who looks gay, I still ask them questions that help them define themselves.” Respondents used phrases such as “feel them out” and “never assume” when describing the process of clients’ self-identification as a KP member.

Female sex workers can self-identify, as well, with the definition including whether these women have sex for “cash, gold, or favors” such as payment of electricity bills or school fees. Transgender people “don’t have a strict definition of TG,” according to one participant. “People self-identify, so it’s different in different settings and defined differently depending on the education level.”

Some intake forms for outreach do have specific questions related to behavior that could help the NGO identify a client as a KP member. Nevertheless, those screening questions are not used regularly to enroll clients in outreach activities; rather, outreach workers rely on KP self-identification.

Client Code Knowledge

All the key informants were aware of the client code and knew how to correctly generate one. Focus group participants had all heard of the client code but were generally less able to correctly identify its components, with the letter denoting sex left out of the definition. Two TG participants reported that

their code included transgender at the end instead of male or female, and another participant thought that the last three digits of a client's phone number formed the end of the code. Key informants reported that they could identify no written or documented guidance on the client code; rather, they were trained in its use by national programs, such as NAPS and APC. Completing their outreach field report forms reinforced the components of the client code. The key informants agreed that clients did not generally know their client codes "offhand" but could supply the elements to generate the code. As one key informant noted, "We try not to say, 'What is your client code?' because of the nature of the work. Ninety percent of the clients are under-educated. You just ask them for the same information each time. They may say that you asked them that three months ago or so, but we will tell them it's the client code if they wonder about it."

Client Trust and Preference for Code Verification

None of the key informants reported that their clients had expressed concerns about the code, and few of the focus group participants had any concerns either. However, some focus group participants did note that when they were doing outreach (and not when personally using the code), clients would sometimes ask them the purpose of the code. One participant explicitly mentioned a dislike of using the code out of fear that a relative who shared the initials might be given the file by accident.

About half the key informants have had clients who purposely changed or inadvertently altered their code information. One key informant said, "I'm not sure how honest the codes are. I think clients may be changing their name, even their gender identity. They may tell you what you want to hear." Most of the focus group participants reported that they always gave the correct information required for the code when accessing services, but three reported that they have given incorrect information in the past, although they declined to say why. The focus group participants thought that, in general, reasons for supplying incorrect information might be a client's lack of understanding of the code, fear of testing HIV-positive, or a deliberate effort to deceive the client's partner about HIV status. To decrease the amount of "cheating" on the code, they suggested, the information for the code could be verified by presenting picture identification, though it was noted that this verification could be circumvented by using a similar-looking person's identification.

Functionality within the HIV Care Continuum and Suggestions for Improvement

Most of both types of respondents viewed the client code favorably, remarking that it was an improvement over using names. Some mentioned that the use of initials seems to place clients at ease: "It creates a space where clients can kind of feel like, okay, they have some information, but they don't have my direct information. In the event I have a positive result and you have my client code, you can't find me." None of the focus group participants thought that using the code prevented their access to services.

It was noted that the client code is "not currently being used across the healthcare system." Codes for prevention are different from those for testing. "There was some work being done at the Ministry on making a consistent code, but it hasn't been realized." This results in limited utility for the code, because a gap remains in tracking people who have been tested if or when they enter treatment and care. "Hearing from my social worker, we can't do tracer on defaulters and getting them back into care," said one key

informant. “Even though a social worker may get some support from a ministry staff, they may not be able to get info from them.” This led to the suggestion by at least one key informant that the code be used throughout the HIV continuum—a feeling echoed by many focus group participants, who felt it would also improve confidentiality.

Key informants and focus group participants had suggestions for improving the code. These included adding “transgender” as an option for gender at the end of the code, adding distinguishing marks, adding a middle initial, and using thumbprints or other biometric data as alternatives. The latter two suggestions were countered by other participants, who argued that not everyone would have a middle initial, that requiring thumbprints might dissuade testing, and that thumbprints could be altered. One key informant went so far as to suggest that maybe anonymity should be discontinued altogether: “Testing is still anonymous in Guyana. Maybe we should make it name-based. Our recommendation would be to make it name-based and not anonymous.”

DISCUSSION

Surveys were conducted with 400 community informants to identify 161 spots in Region 4 where KP members meet new sexual partners and socialize. These data show the variety of spots where key populations congregate and can thus be reached with programs to curb the concentrated HIV epidemic. Most spots identified are bars, whether formal or informal (a vague distinction in the Guyanese context). Community informants reported that as many as 85 percent of these spots have FSW who either work or socialize there. More than half have TG women, and close to two-thirds have MSM. Two out of five have sex on-site. This study could identify venues in which high-risk activity takes place, and nearly three-quarters of these sites were different from the sites identified in the previous BBSS. This highlights the ever-changing landscape of key population spots and the need for recurrent mapping to best target outreach efforts.

Interviews conducted at these spots found populations that visit them frequently. Close to two out of five TG people visit the spot of the interview every day. Site visits are less frequent by those who are not KP members. These data show that key populations routinely visit certain spots for social or work purposes, but they also visit multiple spots in one night and over the course of a week. The data reveal where key populations can be reached easily.

Respondents were asked sexual-behavior questions both to identify them as KP members and to identify high-risk behaviors that affect their chances of HIV transmission. Ninety-six percent of respondents had experienced sex, which may reflect their mean age of 30.8, indicating the types of people who socialize and work at these spots—that is, older and sexually active. FSW make up 23 percent of the female population at these spots, according to survey responses. Additionally, more than one-quarter of MSM and three out of five TG people have exchanged cash or gold for sex in the past year, highlighting the need for education and outreach to help these populations protect themselves during transactional sex. The average age for first transactional sex is lowest in the transgender population, highlighting the need to reach this population at a young age.

Although many KP members engage in potentially risky behavior, large numbers know where to receive HIV testing and other services. Even so, about one-quarter of KP respondents had not been tested for HIV in the past year, although nearly all had been tested at some point. This shows the need to focus on repeat testing for HIV-negative clients. Sixty percent of transgender persons reported engaging with an outreach worker, but fewer than half of FSWs had had such contact in the past year. This could be because not all these women self-identify as FSWs, but they do engage in transactional sex. The same is true of MSM.

The calculated size estimates are in line both with the program data and previous size estimates. Because assumptions for each estimate vary, they need to be kept in mind when comparing size estimates. The BBSS reached estimates for FSWs and MSM of 1,821 and 1,837 respectively after a review-and-revise process with stakeholders. The MSM definition in that process included TG women, but we have calculated a separate estimate for that population in our analysis. Additionally, it is important to recognize that the size estimate based on the multiplier method is for one point in time and does not consider the high mobility of these populations, which is better represented in the capture/recapture method. That method looks at the size of a population over a one-year period.

Comparing survey data with APC data highlights the need to better understand the use of and utility of the client code, which is a unique identifier acceptable to both clients and outreach workers but has some failings that are difficult to address. The qualitative data collection component of this assessment suggests that a better way of tracking outreach activities with key populations is needed.

One issue is the ease with which clients can change their information, making them difficult to track over time. Another is the lack of specificity in the assignment of KP status. Without standardized screening questions to appropriately classify clients, the client code—and thus outreach—is limited to those who self-identify. In addition, the client code does not allow for tracking of individuals across the HIV prevention-to-care continuum.

These data do have some limitations. The first is that all survey results are representative of people who socialize at the types of spots where interviews were conducted. They do not represent members of key populations who don't visit bars, hotels, restaurants, and street sites. Similarly, the qualitative results are representative of KP members who have engaged with NGOs that conduct HIV outreach, but not of the views and feelings of those beyond the NGOs' reach.

CONCLUSION

Good-quality data are essential for understanding the concentrated HIV epidemic in Guyana, particularly in Region 4, which bears the largest burden of HIV among key populations. These data demonstrate the continuing need to address gaps in HIV outreach and testing among populations engaged in high-risk behavior. They highlight the need to expand definitions of key populations, because not all KP members may self-identify as FSWs or MSM, and the need for repeat mapping and size estimation in this dynamic area and among these mobile populations. They also shine a light on an imperfect client code, which fails to adequately track key populations in outreach and along the HIV prevention-and-care continuum but is highly accepted among the key populations with whom NGOs work. Many of these issues have no easy solution, but stakeholder engagement in the search for answers is critical to designing programs that best serve the key populations in Region 4.

REFERENCES

Guyana Ministry of Health. (2012). *Most-at-risk populations (MARPs) guidelines and standards for non-governmental organizations*. [Online]. Retrieved from <https://www.msh.org/resources/most-at-risk-populations-marps-guidelines-and-standards-for-non-governmental-organizations>

Guyana Ministry of Health. (2015). Global AIDS progress report Guyana. [Online]. Retrieved from http://www.unaids.org/sites/default/files/country/documents/GUY_narrative_report_2015.pdf

National AIDS Programme Secretariat (NAPS). (2014). Guyana bio-behavioral surveillance survey. Georgetown, Guyana: NAPS.

United States President's Emergency Plan for AIDS Relief (PEPFAR). (2014). PEPFAR 3.0. Controlling the epidemic: Delivering on the promise of an AIDS-free generation. Washington, DC, USA: PEPFAR. Retrieved from <https://www.pepfar.gov/documents/organization/234744.pdf>

United States Agency for International Development (USAID). (2017). Key populations: Targeted approaches toward an AIDS-free generation. [Online]. Retrieved from <https://www.usaid.gov/what-we-do/global-health/hiv-and-aids/technical-areas/key-populations>

APPENDIX A. GUYANA FOCUS GROUP DISCUSSION GUIDE

Guyana Key Population Size Estimation Validation Study and Assessment of Unique Identifier System

Key Informant Interview Guide

Interview Identification Information		
Date:	Start Time:	End Time:
Name of Interviewer:		
Respondent Demographics		
<i>After informed consent, ask each participant to fill this form, either through written or verbal answers.</i>		
Name of respondent? [Enter]_____	What is your place of employment?	
What is your professional title?	What is your sex? <input type="radio"/> Male <input type="radio"/> Female <input type="radio"/> Transgender	

Introductions

Welcome. Thank you for being willing to speak with me today. My name is _____ and I work with _____. As we explained during the informed consent process, we are trying to understand your attitudes, perceptions, and experiences when working with the client code during HIV outreach services. We are especially interested in your experience and perceptions of the efficacy and utility of the code to monitor your activities. The information you provide will be used to provide recommendations to improve key population programs. We will not use your names or otherwise identify you personally in the analysis and reporting of the results of our discussion today.

Interview Questions

1. Tell me what you know about unique identifier codes.
2. When working with clients, can you describe how you generate the client code?

READ ALOUD: Specifically, we are referring to the client code that is used to enroll participants in HIV outreach programs. It is created through a series of individual prompts that include the first letter of their first and last names, date of birth, and sex.

3. Can you explain how these codes influence your ability to do your job?
4. How are you trained on using the client code?
5. Do you feel comfortable asking people for the components of the client code?
6. Is there any written guidance on using the client code?
7. Do you have any concerns about the current client code?
8. If yes, what are your specific concerns about the current client code?

9. If yes, can you tell me a bit about anything you have done personally to make the unique identifier code easier to use?
10. Can you describe any conversations you have with the HIV outreach participants about using the prompts that create the client code?
11. Have participants raised any concerns about the unique identifier codes?
12. If yes, what are participants' specific concerns?
13. If yes, can you tell me a bit about anything you have done personally to alleviate participants' concerns?
14. If yes, what else do you think can be done to alleviate these concerns?
15. How often do clients know their client code when you ask for it after the initial enrollment?
16. In your experience, do clients correctly remember their own client codes or the components that go into the client code?
17. What is the definition of key populations?
18. Is there any written guidance on defining key populations? If so, where?
19. Do you feel comfortable with the definitions of key populations that you are using?
20. Can you describe the requirements for someone to be classified as a sex worker?
21. Can you describe the requirements for someone to be classified as an MSM?
22. Can you describe the requirements for someone to be classified as transgender?
23. Do you do any screening to ensure that your clients fit the definitions of the particular key population they fall into? For example, how do you know if someone is a sex worker, or MSM, or transgender?
24. Are you comfortable with the quality of the data that you submit in your reports on outreach?
25. How do you know if one of your outreach clients goes for testing?
26. How is the client code related to the indicators that your organization reports on?
27. Anything else you would like to say?

Thank you for taking the time to speak with me today.

APPENDIX B. KEY INFORMANT INTERVIEW GUIDE

Guyana Key Population Size Estimation Validation Study and Assessment of Unique Identifier System

Key Informant Interview Guide

Interview Identification Information		
Date:	Start Time:	End Time:
Name of Interviewer:		
Respondent Demographics		
<i>After informed consent, ask each participant to fill this form, either through written or verbal answers.</i>		
Name of respondent? [Enter]_____	What is your place of employment?	
What is your professional title?	What is your sex? <input type="radio"/> Male <input type="radio"/> Female <input type="radio"/> Transgender	

Introductions

Welcome. Thank you for being willing to speak with me today. My name is _____ and I work with _____. As we explained during the informed consent process, we are trying to understand your attitudes, perceptions, and experiences when working with the client code during HIV outreach services. We are especially interested in your experience and perceptions of the efficacy and utility of the code to monitor your activities. The information you provide will be used to provide recommendations to improve key population programs. We will not use your names or otherwise identify you personally in the analysis and reporting of the results of our discussion today.

Interview Questions

28. Tell me what you know about unique identifier codes.
29. When working with clients, can you describe how you generate the client code?

READ ALOUD: Specifically, we are referring to the client code that is used to enroll participants in HIV outreach programs. It is created through a series of individual prompts that include the first letter of their first and last names, date of birth, and sex.

30. Can you explain how these codes influence your ability to do your job?
31. How are you trained on using the client code?
32. Do you feel comfortable asking people for the components of the client code?
33. Is there any written guidance on using the client code?
34. Do you have any concerns about the current client code?
35. If yes, what are your specific concerns about the current client code?

36. If yes, can you tell me a bit about anything you have done personally to make the unique identifier code easier to use?
37. Can you describe any conversations you have with the HIV outreach participants about using the prompts that create the client code?
38. Have participants raised any concerns about the unique identifier codes?
39. If yes, what are participants' specific concerns?
40. If yes, can you tell me a bit about anything you have done personally to alleviate participants' concerns?
41. If yes, what else do you think can be done to alleviate these concerns?
42. How often do clients know their client code when you ask for it after the initial enrollment?
43. In your experience, do clients correctly remember their own client codes or the components that go into the client code?
44. What is the definition of key populations?
45. Is there any written guidance on defining key populations? If so, where?
46. Do you feel comfortable with the definitions of key populations that you are using?
47. Can you describe the requirements for someone to be classified as a sex worker?
48. Can you describe the requirements for someone to be classified as an MSM?
49. Can you describe the requirements for someone to be classified as transgender?
50. Do you do any screening to ensure that your clients fit the definitions of the particular key population they fall into? For example, how do you know if someone is a sex worker, or MSM, or transgender?
51. Are you comfortable with the quality of the data that you submit in your reports on outreach?
52. How do you know if one of your outreach clients goes for testing?
53. How is the client code related to the indicators that your organization reports on?
54. Anything else you would like to say?

Thank you for taking the time to speak with me today.

APPENDIX C. QUESTIONNAIRE FOR SIZE ESTIMATION VALIDATION

Guyana Key Population Size Estimation Validation Study and Assessment of Unique Identifier System

Key Informant Interview Guide

Interview Identification Information		
Date:	Start Time:	End Time:
Name of Interviewer:		
Respondent Demographics		
<i>After informed consent, ask each participant to fill this form, either through written or verbal answers.</i>		
Name of respondent? [Enter]_____	What is your place of employment?	
What is your professional title?	What is your sex? <input type="radio"/> Male <input type="radio"/> Female <input type="radio"/> Transgender	

Introductions

Welcome. Thank you for being willing to speak with me today. My name is _____ and I work with _____. As we explained during the informed consent process, we are trying to understand your attitudes, perceptions, and experiences when working with the client code during HIV outreach services. We are especially interested in your experience and perceptions of the efficacy and utility of the code to monitor your activities. The information you provide will be used to provide recommendations to improve key population programs. We will not use your names or otherwise identify you personally in the analysis and reporting of the results of our discussion today.

Interview Questions

55. Tell me what you know about unique identifier codes.
56. When working with clients, can you describe how you generate the client code?

READ ALOUD: Specifically, we are referring to the client code that is used to enroll participants in HIV outreach programs. It is created through a series of individual prompts that include the first letter of their first and last names, date of birth, and sex.

57. Can you explain how these codes influence your ability to do your job?
58. How are you trained on using the client code?
59. Do you feel comfortable asking people for the components of the client code?
60. Is there any written guidance on using the client code?

61. Do you have any concerns about the current client code?
62. If yes, what are your specific concerns about the current client code?
63. If yes, can you tell me a bit about anything you have done personally to make the unique identifier code easier to use?
64. Can you describe any conversations you have with the HIV outreach participants about using the prompts that create the client code?
65. Have participants raised any concerns about the unique identifier codes?
66. If yes, what are participants' specific concerns?
67. If yes, can you tell me a bit about anything you have done personally to alleviate participants' concerns?
68. If yes, what else do you think can be done to alleviate these concerns?
69. How often do clients know their client code when you ask for it after the initial enrollment?
70. In your experience, do clients correctly remember their own client codes or the components that go into the client code?
71. What is the definition of key populations?
72. Is there any written guidance on defining key populations? If so, where?
73. Do you feel comfortable with the definitions of key populations that you are using?
74. Can you describe the requirements for someone to be classified as a sex worker?
75. Can you describe the requirements for someone to be classified as an MSM?
76. Can you describe the requirements for someone to be classified as transgender?
77. Do you do any screening to ensure that your clients fit the definitions of the particular key population they fall into? For example, how do you know if someone is a sex worker, or MSM, or transgender?
78. Are you comfortable with the quality of the data that you submit in your reports on outreach?
79. How do you know if one of your outreach clients goes for testing?
80. How is the client code related to the indicators that your organization reports on?
81. Anything else you would like to say?

Thank you for taking the time to speak with me today.

MEASURE Evaluation

University of North Carolina at Chapel Hill
400 Meadowmont Village Circle, 3rd Floor
Chapel Hill, North Carolina 27517
Phone: +1 919-445-9350 | Fax: +1 919-445-9353
measure@unc.edu
www.measureevaluation.org

This publication was produced with the support of the United States Agency for International Development (USAID) under the terms of MEASURE Evaluation cooperative agreement AID-OAA-L-14-00004. MEASURE Evaluation is implemented by the Carolina Population Center, University of North Carolina at Chapel Hill in partnership with ICF International; John Snow, Inc.; Management Sciences for Health; Palladium; and Tulane University. Views expressed are not necessarily those of USAID or the United States government. TR-17-184

ISBN: 78-1-9433-6466-4

