Resource Guide:
Time Location Sampling (TLS)

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A: Introduction

This manual is geared to helping public health professionals gain a working understanding of **time location sampling** (**TLS**) as it is applied to surveys among most-at-risk populations (MARPS) in their area.

Anyone who is responsible for collecting behavioral and serological data from hard to reach populations such as men who have sex with men (MSM), commercial sex workers (CSW), intravenous drug users (IDU) and at-risk youth will benefit from this guide.

The manual is organized by the basic steps of TLS that are:

1. Planning / Getting Started
2. Resource Requirements
3. Formative Assessment
4. Sampling Frame Construction
5. Random selection / Sampling Calendar
6. Sampling
7. Survey
8. Specimen Collection
9. Safety Considerations
10. Results Return
11. Data Management
12. Analysis
13. Dissemination and Use of Findings

In addition the manual offers a systematic guide to conducting surveys using this **sampling** methodology. Interspersed throughout are real examples taken from other countries where TLS is used for HIV/AIDS surveillance. Exercises and discussion boxes help clarify key points of TLS. We recommend that readers first review all the material in this guide before setting out to conduct a survey using TLS. Afterwards users can refer back to this manual to guide them as they progress through their own fieldwork.

Attached in the appendices are forms and other tools that can be used to help organize and facilitate TLS. Also in the appendices are a variety of reports on the results of TLS studies and surveillance activities. The terms in **bold** are defined in the glossary.

B: Types of Sampling Used among MARPS

Because populations at high-risk of HIV are rare, using general population surveys, such as household surveys or national censuses, typically do not obtain a large enough sample of populations of interest when conducting regular surveillance activities. Additionally, stigma associated with high-risk populations inhibits individuals from disclosing risk behaviors. Alternative sampling methods designed to access these populations have been developed to enable researchers and public health officials to collect useful data that approximate representative samples. A number of sampling methods have been implemented for behavioral surveillance and research among hard to reach populations and MARPs:

- **Snowball Sampling**
- **Institution Based Sampling**
- **Respondent Driven Sampling**
- **Time Location Sampling**
- **Targeted Sampling**

Key to any sampling method is the method's ability to potentially reach all members of the priority population. Also key is following a standardized protocol to help ensure reproducibility over time and comparability across locations.

C: Choosing A Sampling Method

Choosing the best sampling method for a particular priority population and the local context and conditions is key to a successful **HIV behavioral surveillance** activity. **Time-location-sampling (TLS**) may not always be the right choice for a MARP and local context. Sampling methods should be matched to the MARP and local conditions. Some important considerations are:

- Existence of venues where a MARP may congregate
- Social networks
- Stigma and discrimination
- MARP culture
- MARP buy in
- Current understanding of the population

Mangani, Sabin, Saidel, & Heckathorn (2005) summarize a number of options for sampling of MARPs. In addition, the US Centers for Disease Control present an alternate method for selecting sampling methods at:
`http://www.theagencyfordesign.com/clients/cdc/index.htm`

D: Time Location Sampling Overview

1: History

Sampling hard to reach populations has had a long and rich history, particularly in the AIDS era. Utilizing venues where MARPs are known to congregate was seen as increasing the efficiency of obtaining a complete sample while retaining assurance that the target population was included. Early efforts to efficiently identify and recruit MARPs using **venues** was implemented by Watters & Biernaki (1989) using what is described as **targeted sampling**. Their research among IDU was designed to overcome limitations found in **convenience sampling** such as ensuring inclusion of diverse sub-populations. Target sampling entails initial mapping of areas frequented by a MARP, ethnographic mapping, developing target enrollment plans (quotas) for each area, and finally sampling in those areas based on the quotas established to approximate the make-up of the population (Watters & Biernacki, 1989). Soon after, Carlson, Wang, Siegal, Falck, & Guo (1994), enhanced targeted sampling with the addition of estimation of density of drug users in the target areas and the introduction of proportional sampling quotas. Ethnographic research has also played a role in sampling MARPs (Bluthenthal & Watters, 1995).

TLS draws on this history in the use of venues and ethnographic understanding of the priority population but also adds **venue-day-time (VDT)** based random selection. VDT sampling takes advantage of the fact that MARPs attend a universe of venues at identifiable and specific days and times. Time-location-sampling combines the concept of VDTs and a thorough **formative research** phase that ensures that a high proportion of venues attended by a priority population are included in the **sampling frame**.

Random selection of VDTs adds substantial rigor to the method by reducing selection bias (i.e. the investigators choosing just easily accessible venues – AKA Convenience sampling). Consecutive sampling VDT further reduces selection bias by not picking and choosing venues. TLS was first used for behavioral surveillance among MSM in the United States in the early 1990's (Lemp., et. al., 1994; MacKellar et al., 1996). Since that time, TLS has been implemented in countries throughout the world, among a wide variety of MARPS, in very diverse settings. (See Section F). Currently TLS is the standard method for ongoing HIV behavioral surveillance among MSM in the United States (MacKellar et al., 2007).

Box 1. TLS is also sometimes referred to as:

Venue Day Time (VDT) Sampling
Temporal Spatial Sampling (TSS)
Time Venue Sampling (TVS)

2: Statistical Foundations

TLS approximates **probability sampling** method. TLS randomly selects venues as proxies for randomly selecting population members. Although a true probability sample of the **target population** is generally impossible to obtain because no censuses generally

exist for MARPS nor are there complete rosters of these populations, TLS allows inferences to be made about the population. These strengths are enhanced by the robustness of randomizing VDTs, systematic sampling at the venue itself, and by the length of time spent in the field conducting **sampling events**.

TLS is held to approximate random cluster sampling where everyone attending the cluster (venue) has an equal chance of inclusion but are sampled as a group. Members of the target population have approximately equal or somewhat known chances of being sampled by randomly selecting venues, days and times where they can be found. The equal chance of being in a study is achieved by randomly sampling enough places and times.

To accomplish this, a "map" of all the possible places the MARP can be found is created. This map is called the "universe of venues" and also contains the days and times when the MARP can be found. The universe of venues serves as the foundation for the sampling frame.

Table 1. Strengths and Limitations of TLS

Strengths	Limitations
• Assumed representativeness by approximating random cluster sampling • Efficient for rare or hard to reach populations • No need for a complete roster of individuals in a MARP	• Need complete "map" of venue-day-times • Somewhat hard to validate • Bias towards those who attend venues, leaves out those who never or rarely attend

3: Uses of TLS

The following are the practical uses of TLS:

- Reaching rare and hidden sub-populations
- Tracking the leading edge of the epidemic
- Opportunities for prevention
- Including other members of the population not just those in care
- Monitoring and evaluation of HIV prevention efforts
- Estimating the size of "MARPS" through multiplier methods
- Prevention planning
- Targeting HIV prevention
- Development of novel HIV prevention programs
- Guiding HIV prevention research

E: Implementation of TLS

We have organized this guide to follow the steps used in the implementation of TLS. Although these areas illustrate implementation of TLS in a generally linear fashion, at points activities will require that the process cycle back through some of the steps.

Step 1: Getting Started

A few tasks related to conducting TLS among a priority population need to be addressed up front. The research team needs to have a clear understanding of the goals and desired outcome the effort is to produce, what data will be necessary to collect and what ethical considerations must be addressed related to conducting TLS in the community. The team will also begin formalizing an **operations manual** to document the effort.

Understanding the Context

The first step in planning a TLS among any population is to determine the following:

- What is the geographic area of interest?
  - Is it the immediate city limits?
  - City and suburbs around it?
  - A larger jurisdiction?

- What are the epidemiological issues?
  - Rising, level, falling or unknown HIV prevalence?
  - Rising, level, falling or unknown STD Prevalence?
  - Increasing risk behavior?
  - New emerging risk factors?
  - Program coverage?

- The need for trend data (implies 3 or more reproducible waves of TLS)

- What level of commitment does surveillance among the priority population have among the stakeholders?

- What is already known about the priority population.
  - Size of the population?
  - Where do they congregate?
  - How frequently do the congregate?

*Setting **Goals** and **Objectives***

Objectives can be thought of as your main research question or questions. It is important to think these through before starting your study. Different objectives may require accommodating different logistical requirements (e.g., biological testing would require staff training in specimen collection methods and referrals to HIV and or STD care and treatment). Overall objectives may include, biological testing for HIV and STD,

surveillance of key risk indicators, evaluation of existing HIV prevention programs and population size estimation. Additionally, having specific objectives helps to frame your study and keep it focused.

Box 2 Examples of Specific Objectives

- To measure HIV prevalence among female sex workers (FSW) in Zagreb, Croatia
- To measure the frequency of unprotected vaginal sex by truck drivers with casual sex partners along the Pernambuco highway in Brazil
- To assess exposure to one on one interventions provided by STOP AIDS Project among MSM in San Francisco, USA
- To estimate the number of MSM living in Shenzhen, Peoples Republic of China by using a multiplier method built into a TLS survey

In practice, sample size requirements are influenced by statistical considerations and by resources. Balancing these two factors is important in having a successful study. Consult a statistician to assist with sample size calculations if you have a central hypothesis or single most important primary outcome or measure. However, in surveillance typically a number of outcomes and indicators are being tracked over time thus a wide range of sample sizes are possible. Attempting to achieve a sample of 500 each year for a number of years typically has enough power to detect changes. Some issues to bear in mind during the consultation:

- True sample size and power estimation is complex for TLS
- Practically speaking a minimum of 500 should be achieved
- If there is clustering of characteristics around venues a design effect may be factored in the sample size calculation. (typically a design effect of 2)
- 500 is usually enough to estimate prevalence of HIV and main risk behaviors in a MARP
- 500 is also usually enough in behavioral surveillance to detect a 15% change between waves
- When focusing on trends over time (i.e. seroprevalence), 1500 is usually more than enough over 3 survey waves
- Take into account the amount of time that can be spent in the field (e.g., 9 months, 14 events per month, and minimum 4 persons per event = 504 persons)

Goals also known as performance criteria should be established at the beginning of the study and will serve to monitor the progress of fieldwork. The goals of the criteria are to enable study staff to maximize recruitment and to minimize participation bias. Each fieldworker should be aware of the goals and work individually and together to achieve them. The goals are set by taking into consideration:

  - Statistician: Power and sample size as determined during consultations
  - Community: Need reliable data in a timely manner
  - Project staff: Feasibility of sampling schedule, morale
  - Funding: How much money is available translates into resources needed to complete the study.

Typical performance criteria to achieve a rigorous sample:

- Data collection for no less than six months and no more than 12 months
- Completing 14 sampling events per month
- A minimum of 4 completed interviews per event
- Completing 100% of sampling events
- Complete ≥90% of the intercepts
- Enroll ≥75% of the eligible men
- Collect specimens with 80% of enrolled men
- 500 subjects total (or calculated sample size)

Performance criteria should be adapted for the study and monitored for each event and feedback given to the field team. Table 2 illustrates actual performance data achieved in a TLS survey of MSM in SF.

Table 2. TLS performance, MSM, San Francisco, 2003-2004

Example	Description
169 Sampling events	Projected by considering total number needed to reach N minimum recruitment, staff work load, weather, and months for field work
44,477 Total enumerates	Event by event enumeration count to be used for weighting if necessary
3,568 Intercepts attempted	Systematic sampling / approaches
2,898 Intercepts completed	Allow for refusals
>80% intercepts completed	Minimize participation bias and selection bias
2,488 Eligible	Allow for refusals
>70% Eligible enrolled	Minimize participation and maximize validity and reproducibility
1,772 Completed Interviews	Over-sampled the projected sample size to account for missing data, non-members of the target population and increasing power.

Logistics and other considerations

1) *Biological testing* will require special resources and logistical considerations for fieldwork. Some things to consider are:

- Methods of collecting specimens will influence how many participants can be seen during a sampling event
- Methods of collection such as venipuncture will require special spaces to be performed.
  (e.g., mobile testing vans at venues, referrals to clinics, spaces reserved inside venues)
- Local regulations may determine where testing can occur.

2) *Survey instruments* can be based on standard instruments such as those developed by Family Health International and available on the internet. Care should be taken so that

local variations are included accordingly. Additionally, questions of particular local interest should be added (e.g., asking about specific HIV intervention services available in the target area). We discuss survey instruments in more detail in Step 7.

3) *Ethical considerations.* Often, MARPs are highly stigmatized and frequently engage in behaviors that are illegal in the local setting. This situation makes it of paramount importance to protect study subjects from risks associated with participation. In addition to adhering to established ethical principles, ethical conduct also reduces barriers to participation and increases the willingness of MARPs to participate in future activities. Below we outline the main points of ethical considerations. Local standards should also be followed.

a. *Confidentiality / Anonymity:* Great potential harm to subjects can result through inadvertent disclosure of personal information and/or a HIV positive status which can lead to stigmatization and discrimination (including potential loss of job and insurance). Therefore conducting both the survey and HIV testing anonymously protects participants. This means that survey data and HIV test results do not appear together with any information that may potentially identify a subject.

b. *Informed Consent / Verbal Consent:* Verbal consent is preferred because having a signed consent would undermine anonymous participation. Participants should receive a copy of the verbal consent form complete with contact information of the PI and the IRB

c. *Potential Risks and measures to minimize them:* Subjects face other risks in participating in the study. Finding out they are HIV-positive is extremely stressful and may cause depression. Disclosure of male-male sexual behavior, illicit drug use and sex work exposes subjects to potential legal problems and stigmatization. The study therefore entails loss of privacy, discomfort and embarrassment. Risk of bruising, bleeding, pain, infection and passing out can occur with phlebotomy.

Study procedures should attempt try to minimize these risks. Results disclosure will be done by certified counselors with several years' experience. A referral network for prevention, care, and mental health needs including services for sexual abuse should be available. Procedures to maintain anonymity discussed above minimize the risk of inadvertent disclosure or test results and risk behavior information. Recruiter/counselors should be trained to conduct interviews in a neutral manner to minimize embarrassment and collect accurate data. Recruiter/counselors should also be certified and experienced in phlebotomy. Subjects should be informed that they may withdraw from the study at any point without consequence.

d. *Potential Benefits:* Participants in the survey may benefit from knowing their HIV serostatus and being referred to care; early treatment of STDs; hepatitis screening, vaccination, and referral to care; referrals to other resources; and counseling on reducing their future risk for HIV and STDs. Generally, the potential risks should be outweighed by the potential individual benefits, by the impact of the study data on health policy decisions, and by the benefit to society in enhancing the ability to control the spread of HIV and other infections.

4) *Institutional Review Board Approval:* All research involving human subjects should be reviewed by local institutional review boards initially and periodically during the course of the research.

5) *Reimbursement for time and effort / Incentives:* In many settings, participants of behavioral surveillance are remunerated for their time and effort. Projects should apply local standards to whether incentives are used. An important consideration in terms of incentives is the potential for coercion. If incentives are used, the amount should be enough to adequately reimburse participants a token amount for their time and or transportation but not so much that the amount represents an undue enticement to participate.

6) ***Operations Manual.*** A manual that documents all the processes and procedures necessary to conduct a TLS study should be created and should include all aspects of the planned study. Sections detailing formative assessment, creation of the sampling frame, random selection methods, recruitment events, etc should be included.

Step 2: Resource Requirements

Operational resources need to be assessed before committing to a sample size, length of data collection, and overall objectives. The following are the typical minimum resource requirements for a TLS survey.

- Project Coordinator
- 3-4 Field Staff
    - Team leader
    - Recruiter / Interviewer / Counselor / Phlebotomist
- Data collection method
- Publicity materials
- Space to conduct interviews
- Participant referral materials
- Data entry
- Data management
- Analysis and dissemination
- **Incentives** (e.g., $25 per survey is typical in the U.S.) See *Ethical Considerations* in Step 1 for a discussion on amounts and related issues)

Step 3: Formative Assessment / Community Buy In

Formative assessment (FA) is the process by which researchers or public health practitioners define the community of interest, ways of accessing the community and the attributes of the community relevant to the specific public health issue. These procedures are presented in sequential steps because they often build upon preceding steps. Generally, formative research is a rigorous methodology that produces detailed information on a topic or population. Some of the tools of formative research are adapted here.

Secondary Data Review

The purpose of the secondary data review is to:

- Begin to compile demographic and other general information on the local MARP
- Develop a list of venues to be used during **formative assessment** interviews
- Begin a list of people (e.g., gatekeepers and stakeholders) to be contacted for formative research interviews
- Begin to determine potential collaborators in both the health department and the community

The initial data collection about the MARP will include reviewing existing data sources. This data will describe the characteristics of the MARP. It will also provide the background information on the MARP and HIV prevention activities as well as local venues frequented by the MARP.

A review of the local HIV epidemiological profiles may reveal the names of the non-governmental organizations (NGOs) and other people who should be included in the **key informant** interviews. Identify and collect available data about where the MARP can be found in the geographic area by reviewing online and print media. Local publications are likely to have the locations/listings of possible study venues. For example, many cities in the United States have a "Gay Yellow Pages" that should be helpful in identifying venues and community groups that are frequented by MSM. Internet resources may also be available. For example, searching "gay" and "Uganda" produces websites that can serve as a starting point to assess the MSM population in that country. Other MARPS may not have such readily available resources.

Once the information is gathered, an electronic database or spreadsheet to maintain a list of venues should be created. The database will serve as a universe of venues. Other variables such as hours of operation and VDTs should be considered for inclusion into the universe.

Formative assessment interviews are conducted to gather information, learn about venues, gathering referrals of individuals, and to learn the prevention services provided by local health agencies. It usually begins within the health department and progresses out to the rest of the community. The people interviewed will have varying levels of knowledge of the MARP. The combination of all the information gathered will provide a comprehensive picture of the MARP studied.

Formative assessment is an important part of getting ready to conduct a TLS survey. Such assessments can range from simple collection of key informant, **gate-keeper**, and or community member input to detailed ethnographic study of the priority population. Determining which level of FA needed is determined by the following:

- Assessing the level of knowledge the research team has of the priority population
- The extent to which knowledge of the population exists in the literature
- The extent to which the population has been involved in past survey activities

An additional benefit of FA occurs through the process of conducting the assessment. The priority population becomes sensitized to the fact that survey activities will be taking place in their community. Community awareness helps immeasurably in allowing researchers to access a population successfully and can increase willingness to participate in survey activities.

Start with the immediate research team then expand to other professionals in public health agencies, and government agencies that provide services or interact with the population (can include police), academic institutions and community based organizations serving the priority population. Gather the following types of information:

- What kind of _____(e.g., MSM, CSW, IDU) are in our geographic area of interest?
- What different socio-economic strata are represented by the population?
- What ages, race / ethnicities, genders are represented in the priority population?
- Is the population hidden? To what extent?
- Is the population found in geographically separate areas or all in one area?
- How is the population thought of by the greater community?
- Is there stigma? What level of stigma?
- What is the legal situation of the MARP?
- Is the priority population organized around health issues? Does the population have an awareness of the impact HIV/AIDS has upon it?
- Where do _____ live / work/ socialize?
- How often can _____ be found at identifiable venues?

See the Appendix for a sample interview guide.

NOTE: The formative research interview should flow like a conversation. If necessary, it is appropriate to tailor an interview to a specific person/agency. Some questions may not be relevant to the interviewee. For example, if you are to interview a local expert on street kids who inject only heroin, you may tailor that interview to ask specifically about this population.

The next step in the process is to interview population members. They will serve as key informants for the study. The members of the population will be asked questions similar to those asked of the public health professionals. Insightful and possibly unknown information about the MARP community can be revealed through these interviews.

Keep in mind that not everyone makes a good key informant. People should be selected because they are knowledgeable about some aspects of the target population that is relevant to the study. These individuals offer insight into the context of HIV risk behavior among the MARP as well as types of venues where they can be easily recruited. A good key informant doesn't need to know everything there is to know about the priority population. However, this person should be able to offer some understanding into how best approach potential participants and identify problems staff may have in the field. Selecting a diverse group of individuals may lead to a more accurate representation of the priority population's characteristics.

Focus Groups

Focus groups are interviews conducted with several individuals at a time and directed by a moderator. These groups can provide quick information on topics of interest. Gathered information can be used to validate formative assessment information or explore issues expressed during other formative assessment activities. On average, focus groups last 1 – 2 hours. Ideally, focus groups consist of 6-10 people with a moderator promoting group interaction. The focus group should be documented by recording the session or taking detailed notes.

As the interviews progress, the information gathered may begin to sound similar. Redundant information will let you know if you have completed enough interviews or if you have not directed your efforts ("cast your net") wide enough. It may indicate that you have talked to similar people in the same neighborhood or geographic location. In that case, one would look into different geographic locations, different organizations and other members of the MARP.

The desired outcomes of focus groups are:

- amenability of the MARP to research
- level of trust in the health agencies/government or other institutions that may be involved in conducting TLS
- population demographics
- size of population
- location of population
- best way to reach/access the MARP
- best way to create study awareness
- gaining community buy-in
- insight to underserved populations
- measure exposure to local health agencies
- venue elicitation by type, location and name of venue

Box 3. Steps of Formative Assessment / Literature Review

STEP 1. Review of secondary data within geographic area of interest

- Describe what is known about HIV-related risk behaviors among the MARPS
- Identify HIV prevention services for the at-risk population (e.g., MSM, SW, IDU)
- Document gaps in formation identified through secondary data and plans to address these gaps during subsequent stages of formative assessment.

STEP 2. Garnering community support

- Identify community stakeholders
- Attend community meetings/events to inform the residents about the project

STEP 3. Key informant interviews with local "MARP experts"

- Key informants may include:
  * Staff in prevention outreach programs
  * Local community leaders knowledgeable about HIV prevention activities targeting specific populations
  * Local researchers familiar with HIV issues among the studied population

STEP 4. Focus groups with members of the priority population.

Once the formative assessment materials have been gathered and reviewed, the process of writing a formative research report can begin. Formative assessment will lay the foundation from which data about the specific MARP will be collected. The report will also describe the local context in which the survey will be conducted. The goal when writing this report is to get a broad scope of information about the local area, MARP population, and HIV prevention activities. Lastly, the report enhances reproducibility over time and is updated each year.

Box 4. Suggested Outline for formative assessment report

PART I: DESCRIPTION OF GEOGRAPHIC AREA (1 PAGE)

1.Name of the geographic area:

2. Local health agencies / health researchers/ interested key contacts/ ministries of health:
List the name of the local health departments.

3. Distinguishing features of the geographic area:
Briefly describe the distinguishing features of the city/area. Include general information about the area and its population, such as the size and racial and/or ethnic groups. Also, include a statement about which groups are impacted by the local HIV epidemic.
Discuss any features of the area that may influence the conduct of the study throughout the year. For example, very cold or rainy weather during certain months may prohibit behavioral surveillance teams from recruiting men outdoors.

PART II: DESCRIPTION OF STUDY POPULATION (1½ PAGES)

1. What are the demographic characteristics of MARP in the geographic area?
If possible, estimate the size of the population of the MARP relative to the broader population. Provide the race or ethnic makeup of the local MARP as well as the age, socio-economic factors, if significant.

Note some of the general health issues facing the MARP in the city. Include any recent STD outbreaks as well as the public health response (e.g., prevention programs or surveillance to monitor cases) to the outbreak.

2. What languages are spoken by this group?
Provide the languages by MARP in the local area.

3. Summarize the challenges to accessing members of the study group. For example, police activity surrounding the MARP or the migration pattern of the community.

PART III: VENUES FREQUENTED BY MARPS IN THE GEOGRAPHIC AREA

For each venue include:

1. The name or venue ID
2. The type of the venue
3. The VDTs at the venue
4. If the venue was not observed, the reason for not observing it
5. Any operational barriers noted in the observation
6. Whether the venue was excluded from the venue frame

7. If excluded, the reason for exclusion.

(See Step 4 of this guide for details in construction of venue universe)

PART V: LOCAL HIV PREVENTION ACTIVITIES (OPTIONAL IF EVALUATION OF PREVENTION PROGRAMS IS BEING ATTEMPTED)

1. List the prevention programs selected for the surveillance.

Create a list of local prevention programs that includes:

1. The name of the organization

2. The HIV prevention programs and/or services the organization provides

3. The demographics of the targeted population

2. Describe the local prevention programs for the MARP in the local area.

Discuss which programs are believed to have the greatest exposure among MARP and why.

3. Describe the current methods used to assess exposure to, use and impact of local HIV prevention services.

Step 4: Venue Universe / Sampling Frame Construction

Overview

A complete venue universe is the fundamental key to the methodological rigor of TLS and the basis for TLS to be considered a quasi-probability sampling method. The venue universe is both a tool to organize your understanding of the geography and diversity of the priority population and serves as the sampling frame for TLS.

Once the initial list of venues is identified through formative research, two sampling frames are constructed. The first sampling frame is a list of venues that meet the MARP attendance requirements. The second sampling frame is a list of venue-specific sampling periods of 4 hours each.

Venue Identification (ID) Code

A venue ID code is a unique six-digit code that identifies specific venues. Venue ID codes are fixed; that is, new venues may not be given identification codes of venues that have been deleted from sampling frames. The code incorporates codes for the venue category, and the specific venue.

Venue category: The third value of the code identifies the venue category. For example, MSM venues may include:

A = Bars
B = Cafes and restaurants
C = Dance clubs
D = Brothels
E = Social organizations
F = Beaches
G = Parks
H = Street locations
I = Markets
J = Private homes
K = Other

Other MARPS may some similar venues or entirely different venues. Formative assessment should produce enough information to determine what types of venues the MARP attends.

Specific venue: The remaining three numeric digits of the code identify the specific venue.

Example: The venue ID code E001 represents social organization 1, H003 would be the third park in the universe of venues, I021 would be the 21st street location and so on.

Notes: You may want to create definitions for each venue category because some may have multiple characteristics. One thing to keep in mind when classifying venues is the main purpose or primary activity of the venue.

Some venues may feature events that vary by day of the week. For example, a bar may be open 7 days a week serving the general MSM community, but has a S&M/Leather theme on Thursday nights. Because the Thursday event is expected to draw a unique and specific crowd, a second venue ID representing an additional unique venue should be created for this location.

Venue Eligibility

Any public or private locations attended by the priority population can be included as venues in the universe. One exception is any venues that specifically serve HIV positive members of the priority population. Including these types of venues would artificially increase representation of HIV positive individuals in the final sample. Excluded venues are, for example, clinics for HIV positives, residential treatment centers.

Typical MSM venues eligible for consideration include but are not limited to; bars, dance clubs, retail businesses, cafes and restaurants, health clubs, social and religious organizations, sports organizations, adult book/video stores and bathhouses/sex clubs, street locations, parks, beaches, and special events such as festivals, and street parties. Venues for IDU may include areas where drugs are sold or shooting galleries. Venues for FSW may be truck stops or street corners.

Exercise 1.

Brainstorm the kinds of venues the MARP attends in your area with your colleagues, or others familiar with your MARP of interest.

Although all venues attended by the priority population will be included in the universe of venues, not all venues will be included in monthly sampling frames because of low levels of attendance of the priority population, lack of safety, or disapproval by owners or managers. Monthly sampling frames change over the course of data collection. For example, some venues may close temporarily for a few months and then reopen. During the closed periods, the venue would not be included in the monthly sampling frame but would be included again when it reopened. Monitoring the status of venues is an ongoing task that occurs on a regular monthly basis especially with repeated waves.

Venue Identification

Methods. To identify the complete universe of eligible venues, staff should collaborate with local professionals and lay persons who are familiar with the priority population. A thorough review of the literature is a good place to start in gaining expertise about the priority population. Published articles, reports, etc. can also provide leads on other experts to contact. Interviews may be conducted with staff of health department prevention programs, local research entities and community-based organizations, and with HIV/AIDS providers, community leaders, **venue owners**, managers, workers and patrons. Make sure to include a diverse group of community members in key informant interviews so that venues catering to smaller sub-groups within the MARP are included.

Venues and venue-day-time periods (VDTs). Starting with a list of venues already known to the research team is helpful when asking key informants about additional venues. Interviewees are asked to review the list and add other venues and their associated VDTs that are well attended by the priority population. Venues can have as few as one VDT per month, for example a special monthly party that happens regularly. Venues can have multiple VDTs during a day as well, for example, a high traffic street location may be busy from 8am until 6pm during the workweek. The entire daytime period can be broken into smaller 4 hour VDTs for that venue.

As the list is updated, it can be shown to subsequent key informants to elicit their input. This process is repeated until no new additional venues and associated VDTs are mentioned. In addition to the initial creation of the universe, the study team should

always be aware that new venues may open during the survey period. These new venues should be investigated just as the initial ones were. Additionally, venue elicitation can be built into the survey itself. Asking survey participants about venues on an ongoing basis can help ensure that the venue universe is complete. These new venues must be considered for inclusion in sampling frames in accordance with the criteria described below. Adding new venues during the course of the survey is theoretically acceptable and highly recommended.

Elicitation of Socio-demographic Characteristics & Operational Barriers

In addition to venues and venue-specific-day-time periods, pre-surveillance interviews conducted during the FA should also elicit, by venue, the socio-demographic characteristics of patrons and potential barriers to recruiting and interviewing men. Assessing socio-demographic characteristics of venue patrons will enable staff to monitor these distributions and help ensure the elicitation of venues that are attended by important subpopulations. For example, if no venues are attended by older MSM it would be important to redouble efforts to identify places where this segment of the MARP could be found and thus included in the sampling frame. Identifying potential recruitment and interview barriers will help staff to further assess, clarify, and prevent or minimize sampling barriers. Potential barriers that should be assessed include structural, management, safety, parking (if interview vans are used), and competing outreach activities

Collaboration with Venue Owners/Managers & Organizations

Staff will need to obtain the approval, if appropriate, of venue owners or managers for many entertainment and commercial venues that are included in sampling frames. Approval is necessary to conduct sampling events just outside of or within these establishments. In meeting with venue owners or managers, staff should emphasize individual and community benefits of the study to the community, and that sampling activities will be conducted in ways to minimize burden on venue management and patrons. Staff will also need to collaborate with organizations that may also conduct outreach prevention or research activities at venues attended by the MARP. Staff should talk with community informants about the organizations that are known to conduct these activities and where and when they are conducted. Staff should then inform managers of these organizations about the study and the need to collaborate. As part of collaborative agreements, monthly outreach calendars can be shared, including the place, date and time activities will be occurring so that both the organization and study activities do not interfere with each other.

Type I and Type II Enumeration

Two enumeration methods are designed to collect quantitative data that will support the inclusion of a venue and its associated VDTs in the universe of venues. In order to discern venue specific sampling periods, standardized enumerations are conducted of the MARP attending venues during possible high attendance day-time periods.

Type I Enumeration is performed at all venues and is designed to capture a) that the venue is attended by the MARP, b) days and times of high attendance (VDTs) and c) estimates of how many MARP attend during these times. The purpose of a Type I enumeration is to determine whether the venues gathered from formative research are actual venues that the MARP attends. Type I enumerations do not usually require any

interaction with members of the MARP. Staff members go to the venue to observe the activity there and conduct counts of patron attendance. Staff can attend the venues for as little as 30 minutes. Counts of patrons (also known as "clicker counts") are conducted for the 30 minutes and then multiplied by 8 to arrive at an estimate of the total number of patrons that might attend during a four-hour sampling event. Duplicate visits by an individual are not counted. Those venue day time periods that produce sufficient MARP will be more thoroughly evaluated with Type II enumerations.

Illustration 1. Counting is typically facilitated by using a mechanical tally counter as shown below

Figure 1 below shows an example Type I enumeration form used for MSM surveillance

Figure 1. Type I Enumeration Form

Behavioral Surveillance
Type I Enumeration Form

Staff ID # _____ Date: _____

E Event #: _____ Venue Type (1)* _____ Clicker Count _____

Venue ID #: _____

Venue Name:_____

Begin Time: ____:____ a.m. p.m. End Time: ____:____ a.m. p.m.

Day of the Week: Sun M T W Th F Sat

*Venue Type Codes: 1=Bar 2=Dance Club 3=Bus Estab. 4=Health Club 5=Sex Estab.
6=Social Org. 7=Street Location 8=Park 9=Other: _____

Comments (Weather, safety, etc.):
_____
_____
_____
_____

Draw area of intercept line/area below:

Type II Enumeration is conducted at venues or specific VDTs where it is unclear if all or enough of the patrons are members of the priority MARP. The purpose of a Type II enumeration is to determine the number of eligible persons who attend a venue at a particular day and time period. The keys elements of a Type II enumeration are a) venue identifiers, b) enumeration counts (clicker count), c) intercepts eliciting key information from patrons that establish membership in the priority MARP (e.g., gender, sexual behavior, IDU behavior), d) whether intercepted persons are potentially eligible for the study and e) general sense of where and what kind of enumeration area is best for the venue. Type II enumerations do require interaction with MARPS. Just as in the Type III enumerations conducted during actual sampling events, people are systematically approached as they enter the enumeration area or line (see below for details of enumeration areas and lines). The criteria for including venues in the universe is based on the effective yield, defined as the number of eligible MARP expected to attend a given venue during a four hour period. Based on Type II enumerations, only VDTs that yield more than 75% of the target population should be included in the sampling frame.

Enumeration areas or lines are usually standardized for each venue. These are the areas or lines that will determine who gets counted during Type II and Type III enumerations. Enumeration areas and lines are fully described beginning on page 32.

A sample Type II Enumeration Form can be found in Appendix B.

Both Type I and Type II enumerations are the basis for building the overall Universe of Venues. Information on the location, name, VDTs are all entered in the universe database. Figure 2 is an example of a fictitious universe of venues for a MARP. We will use this universe of venues to simulate random selection and sampling calendar creation in the next step.

Figure 2. Sample Universe of Venues

Venue Info			VDT Information: January 2006							
ID	Type	Venue	M	T	W	R	F	Sa	Su	Current
P001	Park	Independence Park			2000-0000		2000-0000	2000-0000	1800-2200	Y
S001	Street	Wall and Gower					2000-0000	2000-0000	1800-2200	Y
B001	Bar	Echo Bar	1600-2000		2000-0000			2000-0000	1800-2200	Y
B002	Bar	Moe's	1700-2100	1700-2100	1700-2100	1700-2100	1700-2100	1700-2100	1700-2100	N
D001	Dance	T-Cozy					2000-0000	2000-0000	2000-0000	Y
P015	Park	Noe Valley Playground					2200-0200			Y

Another example of a venue universe is presented in Appendix C.

Attendance Levels

Attendance levels are used to ensure a given venue can meet the minimum effective yield during a given sampling event. Effective yield is designed to maximize productivity of the project. Generally, the minimum effective yield is set at 8 MSM but can be lower if formative assessment indicates that many venues have low attendance. Clicker counts

conducted during Type I and Type II enumerations are used to calculate the estimated total number of patrons attending a venue during a specific VDT. This information is retained for each venue and is used when creating the monthly sampling frame (see Step 5).

Step 5: Random selection / Sampling Calendar Creation

Preparing for monthly random selection:

1. Update universe for monthly sampling frame
   a. Check by field verification or by phone if possible to see if any venues have closed, changed hours etc.
   b. Add any new venues that have come to the study team's attention: new venue elicitation can be added to the survey instrument to collect venue information from participants in "real time"
   c.Only include venues that meet the minimum requirements (e.g., safety, minimum yield and permission).

Random selection and Sampling Calendar Exercise:

Using this example, in Figure 3 we have determined that only one of the venues in the universe is not operating during the upcoming month. We have excluded Moe's from the **monthly sampling frame.**

Figure 3. Updated Monthly Sampling Frame (Note only one venue was not "current")

Venue Info			VDT Information: January 2006							
ID	Type	Venue	M	T	W	R	F	Sa	Su	Current
P001	Park	Independence Park			2000-0000		2000-0000	2000-0000	1800-2200	Y
S001	Street	Wall and Gower					2000-0000	2000-0000	1800-2200	Y
B001	Bar	Echo Bar	1600-2000		2000-0000			2000-0000	1800-2200	Y
D001	Dance	T-Cozy					2000-0000	2000-0000	2000-0000	Y
P015	Park	Noe Valley Playground					2200-0200			Y

The next step is to create a calendar indicating the days that are available for sampling events. The first two steps are determined by staffing needs and one-time events.

1. Block out staff days off (e.g., holidays) *
2. Schedule special events for the upcoming month (e.g., gay pride parade) or "one-off" events

* Generally, staff should expect to work late nights and weekends on a regular basis.

Figure 4. Sampling Calendar with one weekend and one holiday blocked off

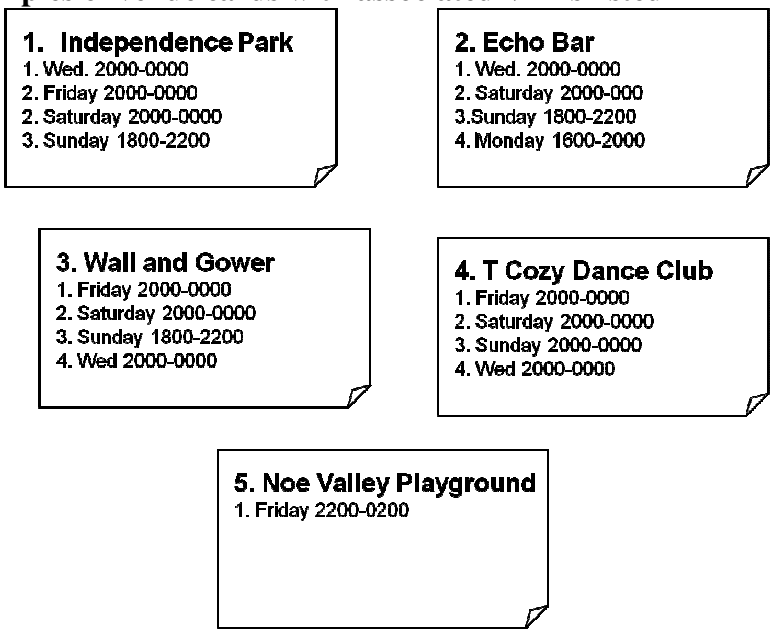
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27 Gay Pride 1000- 1400	28	29	30	31		

Steps 1 and 2: Now that we have blocked off the days that the team will not work and scheduled a sampling event for Gay Pride, we can proceed with steps 3-7.

Overview

3. Randomly select, without replacement, n venues (typically 14-16) – determined when setting up performance criteria.
4. Arrange venues in order of least VDTs to most VDTs
5. Schedule least VDTs first moving through most VDTs
6. When venues has more than one VDT use dice (or other random selection method) to choose which VDT to schedule. Schedule the randomly chosen VDT on the first available day of the week.
7. Continue until all *n* (.e.g., 14-16) events are scheduled

Figure 5. Examples of venue cards with associated VDTs listed



Step 3. Out of the five available venues (See Figure 5) we will first randomly select the number of venues for which we wish to schedule sampling events.

A variety of methods can be used for random selection (See Box 5), in this example we will use a web based random number generator.

In this simulation, we will only be scheduling three sampling events. Using www. random.org (Haahr, 2007) we ask for three random integers between 1 and 5. This is based on our list of 5 available venues and our desire to schedule 3 events.

Figure 6. Screenshot of random.org website

The site generated 2 (Echo Bar) 4 (T-Cozy) and 5 (Noe Valley Playground) as our random numbers.

Figure 7. Randomly generated numbers from random.org website

Step 4: Now we have to arrange the venues in order of how many VDTs each has. Venue 2, "Echo Bar" has four associated VDTs, venue 3 "T- Cozy" has three and venue 5 "Noe Valley Playground" has only one so we start by scheduling the venue with the least VDTs (least flexible).

Figure 8. Selected venues arranged least to greatest number of VDT

Step 5: We first schedule "Noe Valley Playground" on the first available Friday because it has only one VDT.

Figure 9. Noe Valley playground inserted on calendar

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4 Noe Valley Playground 2200-0200	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Next we will schedule "T-Cozy" because it has the next least number of VDTs.

Step 6: We randomly choose which of T-Cozy's VDTs should be scheduled. Random.org generated "2" as our random integer so we schedule T-Cozy on Saturday night between 2000 and 0000. Note that although usually sampling events are schedule on the first available day of the week, we scheduled T-Cozy on a later Saturday because it was available and because scheduling it on the 5th would have been two very late nights in a row for staff. At times two late nights in a row cannot be avoided but if possible avoiding back to back scheduling helps keep interviewers energized.

Figure 10. T-Cozy inserted on calendar

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4 Noe Valley Playground 2200-0200	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19 T-Cozy 2000-0000
20	21	22	23	24	25	26
27	28	29	30	31		

Step 7: Next, we randomly choose one of Echo Bar's four VDTs. "1" was our randomly generated integer so we schedule Echo Bar for the first available Wednesday night from 2000-0000.

Figure 11. Echo Bar inserted on calendar

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2 Echo Bar 2000-0000	3	4 Noe Valley Playground 2200-0200	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19 T-Cozy 2000-0000
20	21	22	23	24	25	26
27	28	29	30	31		

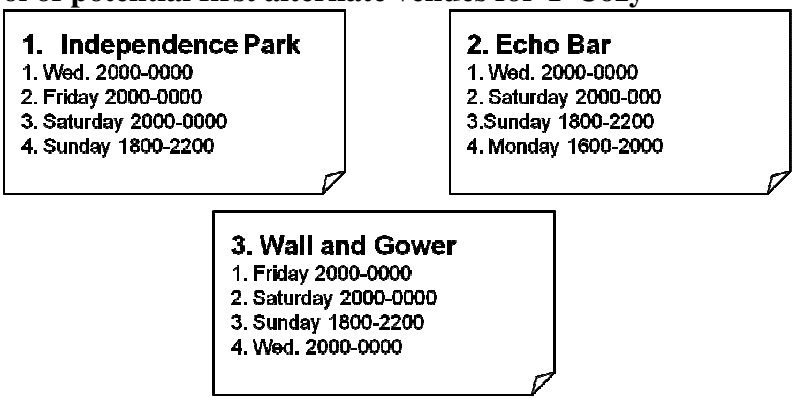
Next, we need to schedule alternate sampling venues. These alternate venues are your "insurance policy" that valuable staff time will not be wasted should the primary venue be inaccessible for some unforeseen reason. They also are randomly chosen to minimize selection bias.

Overview of scheduling alternate sampling events:

8. For each event, group or list venues which have VDTs starting within the time period of the primary event
9. From this group choose, randomly without replacement, two alternate venues
10. Repeat 8 and 9 until each primary event has 2 alternate events

Step 8: Starting with T-Cozy, we see that all but one of the other venues have VDTs on Saturday starting around 2000. Luckily, these remaining venues are in sequence so we do not have to renumber them for random selection but if they were not in sequence you would temporarily give them new numbers.

Figure 12. Pool of potential first alternate venues for T-Cozy

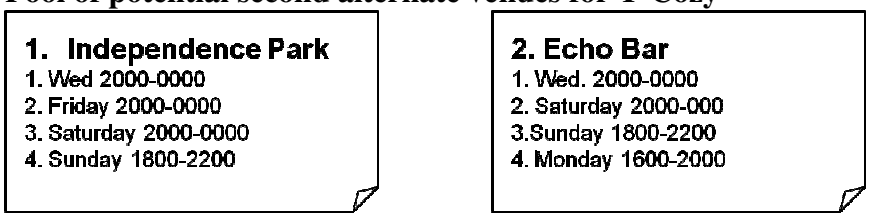


Step 9: Again, using random.org we randomly choose one integer between 1 and 3. "3" is the number generated so we schedule venue 3 **"**Wall and Gower" as the first alternate for T-Cozy.

Figure 13. Wall and Gower chosen as 1st alternate, and inserted on calendar

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2 Echo Bar 2000-0000	3	4 Noe Valley Playground 2200-0200	5 T-Cozy 2000-0000 A- Wall and Gower
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Figure 14. Pool of potential second alternate venues for T-Cozy



With "Wall and Gower" held out of the pool we now randomly select the second alternate. Random.org gives us "1" of Independence Park.

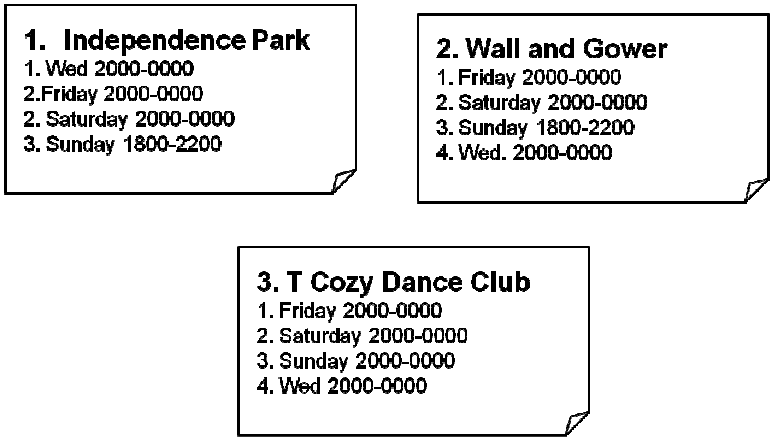
Figure 15. Independence Park chosen as 2nd alternate, and inserted on calendar

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2 Echo Bar 2000-0000	3	4 Noe Valley Playground 2200-0200	5 T-Cozy 2000-0000 A- Wall and Gower B- Independence Park
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Step 10: Repeat Steps 8 and 9.

Step 8. Next, we schedule an alternate for Echo Bar, Random.org generated "2" so we schedule "Wall and Gower" as the alternate for Echo Bar on Wednesday. Note that we had to update the venue list number because they were not in sequence.

Figure 16. Pool of potential first alternate venues for Echo Bar

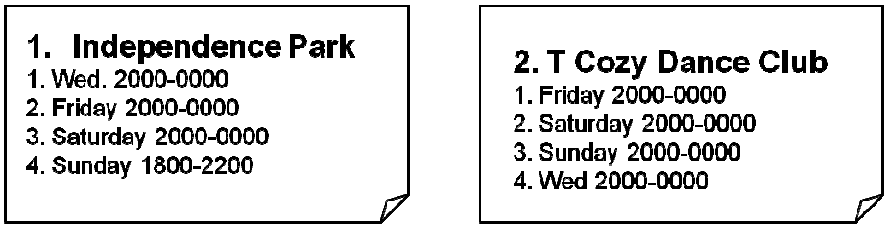


Random.org gives us "2" so we schedule "Wall and Gower" as the first alternate for "Echo Bar."

Figure 17. Wall and Gower chosen as 1st alternate, and inserted on calendar

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2 Echo Bar 2000-0000 A- Wall and Gower	3	4 Noe Valley Playground 2200-0200	5 T-Cozy 2000-0000 A- Wall and Gower B- Independence Park
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Figure 18. Pool of potential second alternate venues for Echo Bar



With “wall and Gower” held out of the pool we use random.org to generate another integer “2” and thus schedule “T Cozy” as alternate B.

Figure 19. **T-Cozy chosen as 2nd alternate, and inserted on calendar**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2 Echo Bar 2000-0000 A- Wall and Gower B- T-Cozy	3	4 Noe Valley Playground 2200-0200	5 T-Cozy 2000-0000 A- Wall and Gower B- Independence Park
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Finally, we do not schedule an alternate for Noe Valley Playground because none of the other venues have VDTs with a start time within the VDT of the primary sampling event.

Another sampling calendar is presented in Appendix D.

Box 5. Random selection Options

A variety of methods can be used to randomize venues for monthly sampling calendars. Three possibilities are described in this box. Any of these methods can be used.

Random Number Table

Select a random number table and select a beginning point on the random number table. Use the first three or four digits of the first random number and find the venue with the corresponding matching number on your list of eligible venues. After picking the first venue to be included in the sample, proceed in order on the random number table from top to bottom and left to right and select the next venue to be included in the sample by matching the first three or four digits of the number from the random number table with the venue number. If the first three or four digits of the random number do not match any venue number, skip to the next random number. Repeat this process until the required numbers of venues have been selected for the sample.

A random number table is included in Appendix F.

Web-based Random Number Generator

The website www.random.org allows users to generate lists of random integers within user-defined parameters. For example if 16 events are to be scheduled from a possible 60 venues the user would ask for a list of 16 random numbers between 1 to 60 and then schedule the venues that correspond to the numbers that are generated.

Note! Each month the list of included venues will have to be numbered sequentially.

The website can then be used to randomly select which VDT to schedule within venues with more than one VDT. For example, a venue with six possible VDTs would require staff to generate a random number between 1 and 6 and then schedule the VDT corresponding to the first random number generated.

Lottery Drawing and Dice

This method is decidedly low-tech but is also a fun way to involve study staff in the scheduling process.

Place a card or token representing each available venue in a container. Then without replacement have staff take turns drawing the number of venues corresponding to the number of sampling events to be held during a given month. Then arrange the drawn venues in increasing order of number of VDTs as in the other methods. Regular 6-sided dice can be used to randomly select specific VDTs within each venue.

With all these methods, it is a good idea to involve field staff in the scheduling of events. Many TLS teams have remarked that being involved in scheduling sampling events improves morale.

Practical considerations for the sampling calendar

Sampling Event Conflicts

Although venues are scheduled for sampling in order of increasing number of sampling periods, as the calendar becomes filled, scheduling conflicts will arise. Sampling events are scheduled on the calendar from the first through the last week. If the sampling period of one venue conflicts with a previously selected venue, that sampling period is scheduled in the following week(s). If no other days are available, then the remaining sampling periods of that venue are randomly selected until an event is scheduled. If there are still conflicts, then venues are randomly selected from the venues NOT yet chosen until the sampling calendar is full.

Canceling Events

If a sampling event must be cancelled due to lack of staff, sickness, or other reason, the event should be rescheduled or replaced to meet the expected number of monthly sampling events. Events can be replaced by ones that have not been chosen for the month or by **non-random** events.

Alternates

Any sampling event may be unproductive due to various reasons such as inclement weather or sudden venue closures. Therefore, two alternate sampling events are usually scheduled with each primary event. Only venues with sampling periods that begin on, within, or at the end of the primary venue's sampling period may be scheduled as alternates. If the primary venue is unattended or closed, staff may conduct sampling in an alternate venue. However, if there is a low traffic flow, staff must wait at least 30 minutes to determine if interviews are possible before moving to an alternate. The same rules apply for using a second alternate. In case the second alternate does not yield any interviews in the first 30 minutes, the field supervisor may chose to stay at the venue or return to the primary venue. On occasion, the primary venue and its alternates may not

yield any interviews. In that case, the sampling event can be cancelled for the day. In our experience however, this rarely happens.

Non-Random Events
Sites may purposefully (non-randomly) sample up to a recommended maximum of three *different* venues each month. This will allow staff the flexibility to recruit the target group at events that occur infrequently or become known only a few days before their occurrence (e.g., gay-pride events, TG yearly events, raves, house parties). In choosing non-random venues however, sites may only select from the set of venues included in the frame that have not already been selected for that month. At the discretion of the principal investigator or field supervisor, the three non-random venues may be used as either primary or alternate venues, and they may replace scheduled or canceled sampling events.

Definitions of Traffic Flow
The flow of foot traffic can be defined as the number of possible eligible people who cross an enumeration area in a certain time period (i.e. the enumeration or "clicker count"). In a fifteen minute interval, the flow of traffic is defined as:

Low flow = <20 clicked
Medium flow = 21-50 clicked
High flow = 50+ clicked

Flow is used to determine when to move to alternate venues, cease sampling or to adjust enumeration areas. We cover adjusting enumeration areas in upcoming steps.

All of the information generated during random selection and scheduling of sampling events should be kept on file. These documents serve to verify that procedures were followed correctly, avoid doubts in the future about the validity of the data, and helps minimize worries about selection bias.

Step 6: Sampling Events / Recruitment

Field Site Management
When staff arrives at the venue (e.g., bar, club, restaurant), they should let the venue managers/workers know that they will be conducting the survey. The field coordinator assesses the venue to determine which type of enumeration to conduct (see below). Once the enumeration type is determined, the field coordinator directs staff to their proper work spot. Enumeration, that is counting every potentially eligible person, can begin once the entire staff is ready to recruit participants.

Van/Mobile Units
It is at the discretion of the site to use a mobile unit. Vans and mobile units are recommended if the site conducts HIV/STD tests in the field. In setting up a field site (e.g., street/van/mobile unit location) a number of factors need to be considered. Findings from the formative assessment should be used to guide to determine where to establish sites. If using a van or car, it may be helpful to obtain a parking permit and identify a fixed parking location if necessary. For safety reasons, the mobile unit must be visible to the field coordinator during enumeration. Sites using a van should have one staff member

that monitors external surroundings and controls entrances to the mobile unit while interviews are being conducted. This staff member may or may not be a driver.

Materials

The following are suggested items to have readily available.

- Study materials: paper copies of survey, handheld computers (if using electronic data collection), consent forms, scripts, interviewer guide (if available), response cards, incentives, receipts/receipt book, appointment book, and calendar.
- Office supplies: file folder or binder, paper, pens/pencils, envelopes, and garbage receptacle.
- Testing materials: if phlebotomy; tourniquets, tubes, HIV lab slips, cotton, bandages, alcohol wipes, and biohazard container; if OraSure; test kit, pamphlet for participant.
- Risk Reduction Materials: condoms, lubricants, safer sex & injection pamphlets, STD information and referrals.

Key Activities during sampling events

- Enumeration – count all persons who cross into a recruitment area
- Intercepts – approach and speak with designated persons
- Eligibility – ask person questions to determine whether they are able to participate
- Enrollment – encourage person to enter into the study
- Complete survey – take the participant through the entire survey
- Counseling – provide information about HIV/STDs and appropriate referrals
- Specimen collection – collect blood, oral or other fluid for HIV/STD tests
- Reimbursement/Incentives – pay participant for their time in cash, vouchers/coupons, or tokens

Table 3. Staff Roles during a Sampling Event

Team Leader/Counter	- Knows protocol exceptionally well. Both theoretically and practically - Organizes team - Distributes incentives - Enumerates - Directs intercepts - Staff safety - Decides when to use alternates or cancel events - Monitors performance measures
Recruiter / Interviewer	-Approaches potential respondents as directed by team leader -Determines eligibility of subject -Enrolls -Consents -Interviews
Phlebotomist / Counselor*	-Draws blood -Sets up results appointment -Pre / Post test counseling -Makes referrals (social and health)

Project Coordinator	-Periodic observation and evaluation of sampling events for quality assurance and quality control -Quality assurance of paper data

* In practice, recruiter/interviewer/phlebotomist/counselor can all be the same person if staff have all those skills. Having one staff take each subject through the entire study process can increase rapport and efficiency.

Choosing Field Staff

In order to maximize the staff diversity (cultural and skill based) and flexibility of operations, having several interviewers is helpful. The interviewers should be motivated, able and willing to work outside the office and outside usual business hours. They should also be knowledgeable about HIV/AIDS, willing to work with the MARP, and know the language of the MARP. It is also recommended to have staff members that are members or former members of the MARP such as former IDU or former sex workers. Interviewers should be able to recognize and empathize with the participants' situations. They should be sensitive to the population's issues and risks surrounding HIV. Interviewers should have a non-judgmental attitude when conducting surveys and recruitment. The selection of the most appropriate staff for the event will make it successful. Using the formative research report will help in staff selection for a particular event. If possible, match the staff to the primary demographic characteristic of the venue (e.g., young gay male for young gay male venue). The number of staff at each sampling event should be proportionately allocated. For example, if a venue has a low flow of participants, it is not necessary to have 5 interviewers present. The primary duty of an interviewer is to conduct interviews and provide appropriate referrals. However, the same staff may also be trained to conduct HIV testing and counseling. The rapport between interviewer and client is enhanced when the interviewer also conducts the HIV testing. Below are some examples of useful trainings for the staff.

Examples of staff trainings

- Phlebotomy
- HIV counseling
- HIV rapid testing
- De-escalation techniques
- Outreach
- Safety issues
- Infection control
- Universal precautions
- Proper transport and storage of specimens

Systematic Sampling

- **Principle:** Count and consecutively intercept every person entering intercept zone for 4 hours
- **Practice:**
  - Enumerator counts every possible eligible person crossing intercept area
  - Recruiters systematically approach enumerated persons
    - Systematically in practice means that subjects are approached as staff are available and ready to recruit.

- Recruiter introduces study, assesses interest, determines eligibility, enrolls subject
- When all recruiters are occupied, enumerator continues to count
- When a recruiters is ready again, intercepts resume with the next person
- Enumerator can halt counting if problems arise
- Enumeration ends when the four hour time-period is complete.

Setting Up an Enumeration Area

Using information about the enumeration area gathered in Type I and Type II enumeration, enumeration/intercept areas are operationalized during the Type III enumeration/sampling event. This is summarized below.

Each venue will have unique physical characteristics. These features need to be taken into account when deciding on the placement and type of enumeration area and the number of staff needed to adequately cover the area. There are three general types of enumeration areas: line based, area based, and moving line. Note that there may be other ways to set up an enumeration area depending on unique situations such as inside bathhouses and waiting rooms.

Line Based

During **line-based enumeration**, people are counted as they cross an imaginary line for the first time during a sampling event. Line based enumeration is conducted in locations with high street traffic flow for example as shown in Figure 20. At locations where the external flow includes a mix of populations, line based enumerations help identify the priority population. Illustration 2 on the next page shows that the potential participants are enumerated as they cross the imaginary line on the sidewalk.

Figure 20. Line Based Enumeration

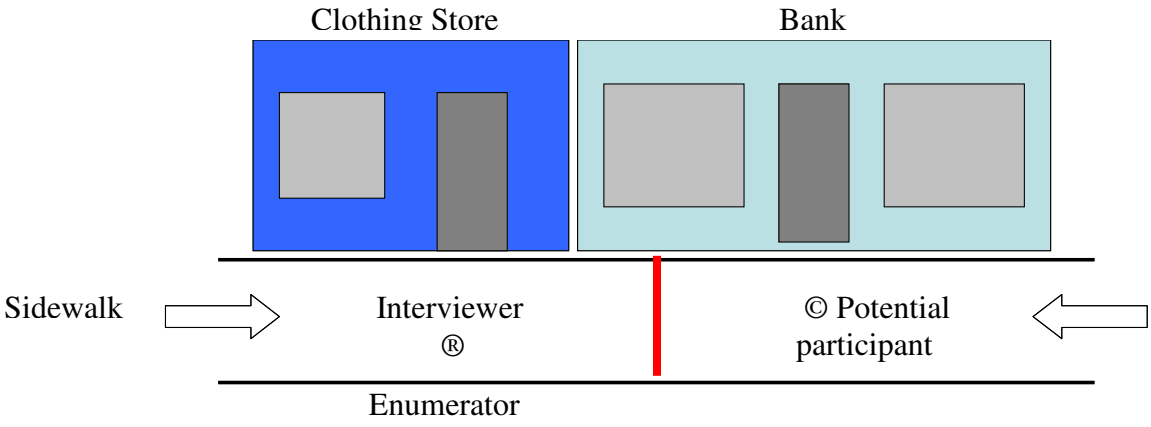
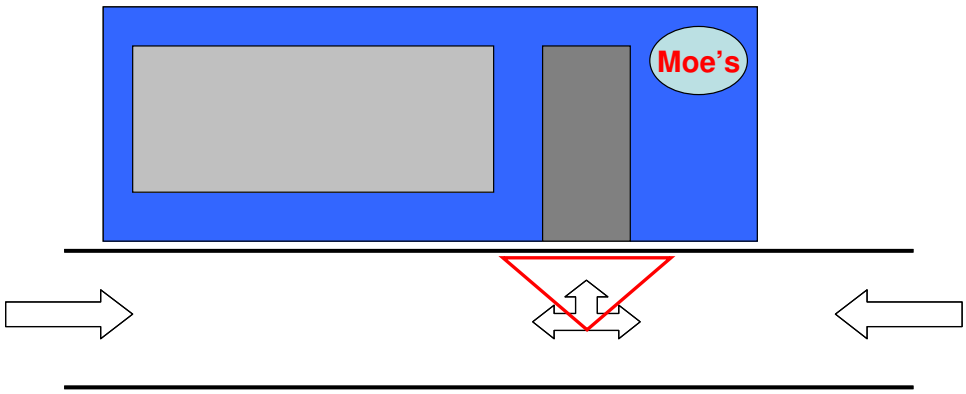


Illustration 2. Line Based Enumeration

Area Based

In the case of **area-based enumeration**, people are counted when they enter a defined area for the first time during a sampling event. Area based enumerations work best when there is a low flow of the population. The area can be small or large depending on the venue. In Figure 21, a triangle shaped enumeration area is chosen so all patrons entering the bar are enumerated as they turn into the bar's (Moe's Tavern) doorway.

Figure 21. Area-based Enumeration



Moving Line

A moving line can be used when there is a large physical space such as a park where members of the population are congregated but are not moving around. Staff starts at one end of the area and slowly walk side by side through the area. All persons are counted as an imaginary line crosses the people. Illustration 3 below shows the start of a moving line enumeration. The star represents the enumerator and the smiley faces represent the interviewers. As the interviewers move through the crowd making intercept approaches, the enumerator systematically counts all members of the MARP in the area.

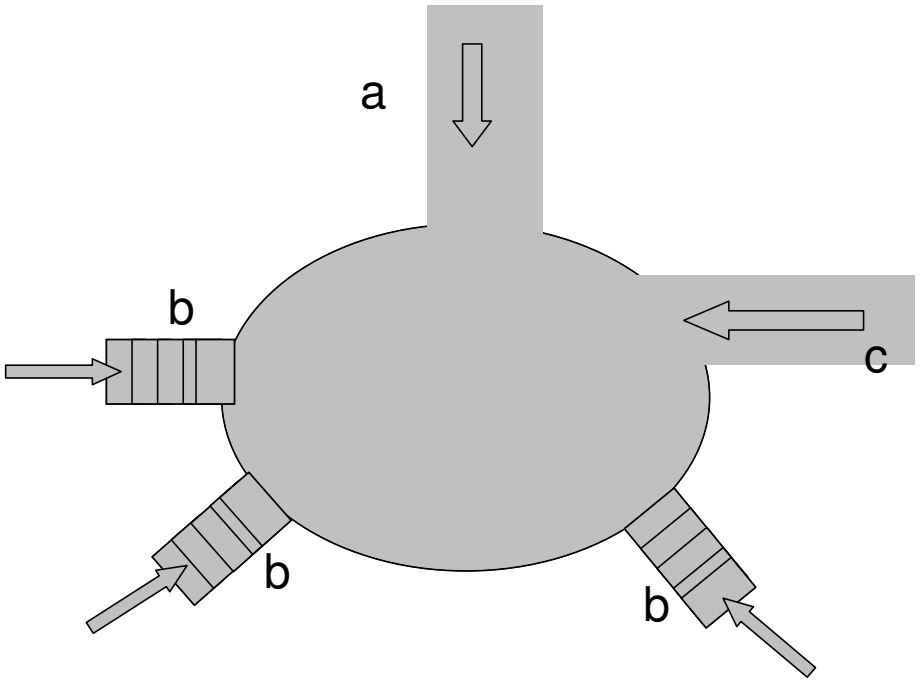
Illustration 3. Moving-line enumeration

At times enumeration areas can be complex in terms of the number of entrances and exits and in the traffic flow. The following exercise should help illustrate this kind of situation.

Exercise 2.

Using the diagram below draw enumeration boundaries appropriate for the following scenarios. 1) Low flow 4 interviewers, 2) Medium flow, 2 interviewers, 3) High Flow, 3 interviewers. Mark each with the scenario it represents. Remember that there is no one "right" answer. The key is to use an enumeration type that works best with staffing, foot traffic and the physical location!

Entry Landing to Volunteer Park: Foot traffic passes through the oval area from a foot bridge over the railway (a), stairs up from the adjacent park (b) and from a sidewalk to the right (c). On Sunday afternoons, many CSW stroll through and around the park looking for customers.



Strategies to successfully complete intercepts and enroll eligible subjects

Frequently, it will take personality and persuasion to get potential subjects to stop and agree to be screened for eligibility. Having lists of common reasons and retorts for **non-participation is recommended. It is helpful to practice these responses in advance of sampling events (e.g., role play with staff).**

Using the following guidelines create an initial list of responses to reasons for not participating.

- Create first "pitch" scripts.
    - A good opening "line" can help engage people and begin creating rapport. Ex: "*Hi, how are you*?"
- Have responses to take advantage of openings potential subjects may give. *"If your friend is eligible as well, you can both participate at the same time."*

- Be prepared to block & parry reasons for non-participation. "*All your information is confidential and will not be shared with anyone."*
- Always have options to offer. "*If you'd like to come back after lunch, we can save a space for you."*
- Focus on the positive aspects of participation. "*You would help out your community."*
- Be realistic about what the potential subject is agreeing to do but also describe the best situation. "*Thank you for taking the time to participate. We'll try our best to have you finished soon."*

Exercise 3. In the following box, try creating a response to some common reasons given for non-participation

•**Time:** "I don't have time"

–Retort:

•**Disinterest:** "I am not interested"

–Retort:

•**Friends and partner:** "I don't want to leave my friends"

–Retort:

•**Privacy:** "I don't want to give my name"

–Retort:

NOTE: In order to get an idea of why people do not participate, recruiters can ask for reasons. Keeping track of responses allows the recruiters to be prepared with retorts. There are reasons not to recruit, or to be too aggressive ranging from curt to physical safety. The following are examples of when not to recruit.

When to not try to recruit

- Safety concerns
- People walking too fast (marathon walker)
- People on cellular/mobile phones, MP3 players
- Physical gestures / Body language
- Too high or drunk
- *Very* firm refusal
  - If possible, get their reason for refusal
  - Inquire about participating later (ODA/LDE See pg 37)

Type III Enumerations (Intercepts and determination of eligibility)

Type III Enumeration is conducted at venues or specific VDTs during every sampling event. The key elements of a Type III enumeration are a) venue identifiers b) enumeration counts (clicker count), c) intercepts eliciting key information from patrons that establish study membership in the priority MARP (e.g., gender, sexual behavior,

IDU behavior) and d) whether intercepted persons are eligible for the study. Type III enumerations do require interaction with potential MARP persons. If a person is found eligible for the study after the screening, the person may proceed with the interview.

Type III enumerations differ from Type II enumerations in two main ways. First of all, instead of a 30 minute enumeration period, Type III enumerations are conducted during the entire sampling event from the beginning of recruitment until the last participant is recruited. Secondly, Type III enumeration uses a different form and has different questions. These questions include eligibility and reasons for refusal.

Two versions of Type III enumeration forms are found in Appendix E

Interview Options

Not every potential subject will be able to participate in your survey on the spot but may be willing to participate at a later time or at another location. Although the optimal situation is when the subject can participate on the spot, there is no reason to not attempt to accommodate participants who just cannot or do not want to participate on the spot. Experience has shown the benefit of acquiring and enrolling people on the spot. Some participants may follow up with an appointment if they are unable to participate. It is more beneficial to try and set up an appointment with a potential participant than to completely lose that person. The following table lists the various methods to maximize participation in your surveillance activity.

Table 4. Recruitment Options

Gold Standard: -Immediate interviews on site	•Best option •Interview follows recruitment •No loss to follow-up •Not always practical or desirable to respondents
Silver Standard: —Same Day Appointments (SDA's)	**Same Day Appointments** •Used when interviewers are unavailable or respondent needs some time •Appointment is set for later in the field event •Enumerator tracks appointments to prevent conflicts •Potential loss to follow-up
Bronze Standard: —Other Day Appointments (ODA's) —Last Ditch Efforts (LDE's) •All help minimize participation bias •By having some information on these potential subjects its possible to understand the direction of potential bias	**Other Day Appointments** •Used when time or conditions aren't conducive to immediate interview •Scheduled for the office or another location on another date •Contact information obtained, if accepted •Potential loss to follow-up, esp. without contact information

	Last Ditch Efforts •Used when the study is coming to an end •Contact information may still exist from **SDA**s and ODAs Attempts to contact, screen and interview these potential subjects can only increase your sample size

Performance Criteria for Quality Assurance/Quality Control

Performance criteria should be monitored on an event-by-event basis to provide feedback to staff in order to achieve the highest possible enrollment. Progress reports should be shared with field staff so that they can contribute to accomplishing these goals.

Example of performance criteria

- Data collection for no less than six months and no more than 12 months
- Completing 14 sampling events per month
- A minimum of 4 completed interviews per event
- Completing 100% of sampling events
- Complete ≥90% of the intercepts
- Enroll ≥75% of the eligible men
- Collect specimens with 80% of enrolled men
- 500 subjects total (or calculated sample size)

Step 7: Behavioral Survey

A number of sources can provide model behavioral surveys for various populations. Make sure that these instruments are tailored for your geographic area and for the unique characteristics of the MARPs in your area.

Certain criteria should be followed to determine whether questions should be included in the behavioral survey. They include:

- The relationship of the variable to personal behaviors linked to promoting health and preventing disease
- The suitability of the question
- The pertinence of the variable to the survey's objective
- The need to measure the variable over time
- The need to have specific information on certain geographic areas
- The relationship of the variable to other topics covered in the survey
- The validity of the question
- Its effect on the questionnaire length

Basic Domains

- demographics
- risk indicators
- service programs
- multipliers
- basic HIV/AIDS knowledge

Streamlined survey instruments reduce time burden on study subjects and also enables the field team to sample more subjects in a four hour sampling event.

Good examples of behavioral surveys can be found at Family Health International's (FHI) website www.fhi.org and in FHI's Big Red Book (Family Health International, 2003).

Step 8: Specimen Collection / Risk Counseling/ Referrals

Sites should follow local procedures and guidelines for specimen collection and risk counseling. Here we outline standard methods used in the US.

Participants offered an HIV test may be asked to provide informed consent for the survey and HIV test at the same time. Staff involved with specimen collection must be trained in the proper procedure for obtaining specimens for all testing provided by the site. Protocols for specimen collection need to be explicit and made clear to all staff. Sites should also develop a system for tracking and returning HIV test results.

HIV testing should be voluntary and free of coercion. Informed consent before HIV testing is essential. Information regarding consent may be presented orally or in writing and should use language the client can understand. Accepting or refusing testing must not have detrimental consequences to the quality of care offered. Governmental or local laws and regulations governing HIV testing should be followed.

Information regarding consent may be presented separately from or combined with other consent procedures for the surveillance survey. However, if consent for HIV testing or other procedures is combined, the inclusion of HIV testing should be specifically discussed with the client.

Testing occurs after the behavioral survey is administered. The participant becomes more engaged in the testing because they become aware of their behavioral risks. As a result, the participants may become vested in their own health.

After the behavioral survey, interviewers provide HIV counseling as appropriate. HIV counseling seeks to reduce HIV transmission through information and education. It should focus on the client's own circumstances and risk and should help the client reach and change behavior as to reduce the risk for HIV. The counseling and testing process is a cooperative endeavor that includes giving information and assisting the client in identifying his/her HIV prevention needs as well as developing a strategy to address those needs. During the interview, the client may reveal misconceptions about HIV. The interviewer should make a note of it and correct it during the counseling session.

When performing venipuncture, it is necessary to perform in a closed setting. The test may be performed in a clinic, office or mobile testing unit such as a van. Closed settings ensure participant's confidentiality and allow the testing to be performed in a sterile environment.

NOTE: Staff may need additional training in regards to specimen collection such as: blood borne pathogen training, infection control and universal precautions, and proper storage and transport of specimens.

A rapid HIV test should be performed after a behavioral survey. If it is performed before the survey, the participant may be preoccupied and be thinking about the results. Therefore, their responses to the behavioral questions may be biased because their answers may change due to the added pressure of the HIV test. Their focus would be on the test and not the survey at hand. If a person were to test positive before the survey was administered, they may not be any chance at all to begin the survey.

To ensure ongoing, high-quality services that serve client and community needs, providers should develop and implement written protocols for testing and written quality assurance procedures.

Referrals

Referral is the process by which immediate client needs for care and supportive services are assessed and prioritized. The referral process may also include assistance to accessing the services. Clients should be referred to services that meet their priority needs and appropriate to their culture, language, sex, sexual orientation and age.

Examples of services

- **Medical evaluation, care and treatment**
- **Drug and alcohol prevention treatment**
- **Mental health services**
- **STD screening and care**
- **Legal services**
- **Housing/shelter**
- **Domestic Violence services**

Step 9: Safety

The objective of these guidelines is to provide a general overview of safety issues. Participating sites should develop local safety procedures and train field staff on those procedures. It is important for staff to avoid trouble through common sense and advance planning. Staff must be alert to their safety and to that of their co-workers at all times. A basic awareness of one's surroundings is critical when working in the community. By adopting the recommendations in these guidelines, staff will be able to effectively recruit and interview participants while still maintaining their personal safety.

Plan Ahead

Have an emergency action plan. Know what you are going to do ahead of time in case things suddenly go very wrong. Know whom to contact in case of emergency. Always know the location of all exits from any point in the storefront. During interviews, always position yourself closest to the door if indoors. You do not want an unruly participant to be stationed between you and the exits. Consider developing a code word or action to call for assistance from a co-worker. For example, you might use something like the phrase

"bring the red folder." If a staff member was not comfortable interviewing participants by themselves or needed help with an uncooperative participant, they would ask one of their co-workers to bring them the "red folder" to indicate that they needed assistance. Call the local emergency services phone number without hesitation if you feel that you are in danger.

Be Alert

Be aware of your surroundings. If a threatening situation arises, remove yourself from the location immediately. Leave quickly, but do so carefully and with a "cool head." Use all of your senses to assess a situation. If something does not "feel right," do not discount that feeling. Approach every potential respondent as though s/he is welcoming, but be cautious if you have concern about an individual.

Use common sense

Limit the amount of cash available during each sampling event (including participant incentives). Only bring the amount of cash that is needed for the sampling event. For example, if it is only necessary to conduct 7 interviews for the night, then only bring that much money. Avoid wearing or carrying articles that look valuable; jewelry, expensive watches and purses may invite theft. Do not leave any valuables or project materials unsecured or in view

End the interview at any point if you feel threatened by the participant or the environment

- Aggressive or threatening individuals

  If directly confronted by an individual, employ verbal de-escalation techniques: position yourself at an angle and allow extra space between you and the other person; do not smile; let them vent; listen to and acknowledge their concerns; avoid becoming defensive; lower your voice, tone and tempo; and respond to valid complaints. Local safety officials may be able to provide de-escalation training to project staff.

- Sexual harassment

  If a respondent is sexually coming on to you or sexually harassing you, you have the right to terminate the interview. If you feel the respondent is behaving inappropriately, you should first remind them that you are only there to interview them and that you are not interested in any sexual offers. If the respondent continues, tell them that you are going to terminate the interview if they cannot stay focused on the question. If this does not work, terminate the interview. In turn, it is also inappropriate for interviewers to sexually harass their clients. Staff should be trained in sexual harassment issues if possible.

- Drunk, high, or drowsy respondents

  A respondent may not be able to complete the interview or give accurate responses for a variety of reasons. If they had little sleep or have recently used alcohol or drugs, they may be unable to give coherent answers to questions, nod off, or appear to be very drowsy during the interview. If you are screening someone for eligibility and they cannot give coherent answers, complete as much of the eligibility screener as possible and document in the interviewer notes that the individual was not a candidate for interview because of this condition. If you have begun the interview and the participant is no longer giving coherent answers, stop the interview, thank the respondent for their

time, and describe what happened in the interviewer comments. If working with the IDU community, there may need to be a bit more flexibility with this. For example, if an IDU person nods off once or twice, the interview can continue. However, if and IDU client continuously nods off during the interview, the interview should be terminated.

Develop field incident reporting procedures

- Set up local safety guidelines and procedures for incident reporting prior to starting work in the field.

Exercise 4. Field Incident Report

Make a list of the types of information you would want on a field incident report. Think of fields that should be included in the report such as location of incident, who is involved etc. What important information should be gathered about the incident? Who should incidents be reported to?

Step 10: Results Return

Follow local standards and policy in regards to returning HIV test results. This illustrates what we do in the US.

The overall main goal of HIV testing is to maximize the number of people aware of their HIV status and to receive care or prevention services. Once the specimen has been collected for the HIV test, the methods of returning results must be determined locally according to lab turn around and the availability of sites for post-test counseling. Health care workers or authorized persons can return both positive and negative results either in person or with no in-person interaction (e.g., phone call). Due to associated stigma and possible discrimination, family and friends should not serve as interpreters when test results are given. Sites should be actively trying to return test results to its participants. Adhere to local laws governing these procedures. The following ways are only suggestions on how to return results.

Determine method for returning test results

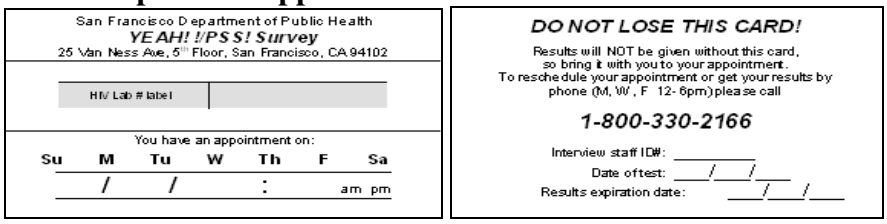
Follow local guidelines for returning test results. The following are examples of test return methods.

- For Rapid Tests: results should be returned after the counseling session and after the test has fully developed (approximately 20 minutes). If the test result is preliminary positive, refer to options for standard tests to determine how to return the confirmatory test result.

- For Standard Tests: results for a standard or confirmatory test may be returned in person or over the phone. Sites should refer to local policies before implementing the telephone results system.

1. In-person results – schedule a counseling session for the participant to return at a later date for their result. An appointment Card with the day, time, survey ID, and location of the counseling session would be helpful in retrieving the results.

Figure 22. An example of an appointment card



2. Phone results –give the participant a Phone Results Card and fill in the Telephone Results Log. Provide participant with a Phone Results Card that has the phone number, lab and/or survey ID, venue ID, and interviewer's first name.

Appointment reminder
Sites should locally determine whether to conduct an appointment reminder system. When post-test appointments are made for a participant, the interviewer will notify the participant of a reminder service. The participant can choose to have a reminder phone call prior to their scheduled appointment. Note: information used for this reminder phone call should never be recorded on, or associated with a specific survey or test results to maintain anonymity.

Step 11: Data Management

Standard data management practices are used to ensure the highest quality data possible.

A few points for data management to consider while using TLS:

Techniques for minimizing errors for interview:

- Practice, practice, practice
- Minimize interruptions
- Work with lead interviewers or supervisors to find solutions
- Make sure you have everything you need before the interview begins
- If possible, work in an area where respondents will not be distracted
- Stay focused
- Read the questions (and possible responses, where instructed) as written
- Listen to the respondent
- Make sure questions (and answers) make sense
- Maintain eye contact with subject
- Add an additional step to data entry (double data entry)

Step 12: Analysis

Of course, the product of any surveillance activity is to use the data for public health action. To get to that point collected data must be analyzed. TLS is used as a key component of second-generation HIV surveillance as recommended by the WHO. Second-generation surveillance:

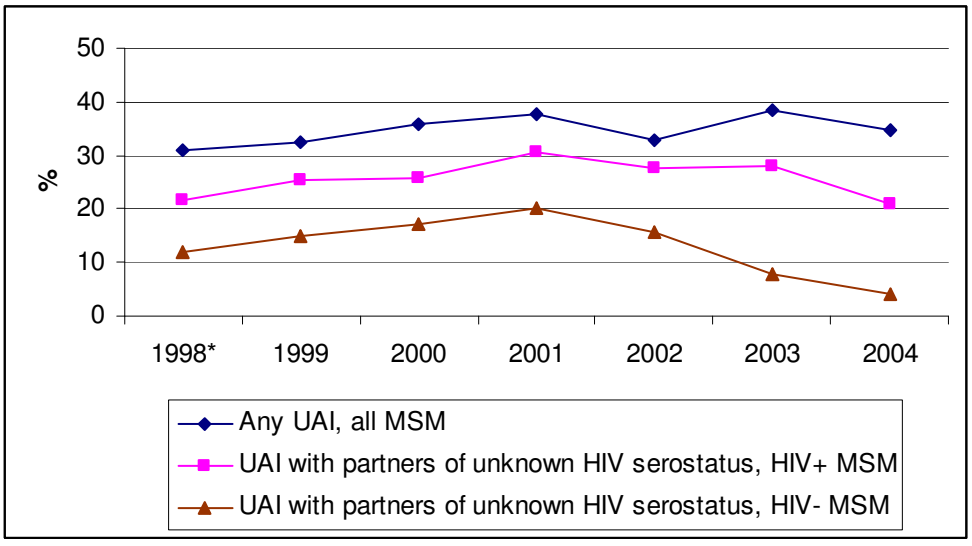
- Relies on multiple types of data
- Is flexible with sources of data
- Focuses on trends
- Focuses on behaviors that drive epidemic
- Makes better use of data

Furthermore, it is important to remember that surveillance data will not be used if:

- The study is too time consuming (e.g., sample size too large)
- The study is too costly to repeat
- The analysis is too complicated for local health departments to routinely do
- The analysis is too complicated to understand for those who need the data

Therefore, basic, simple analysis is most useful. For example trends in risk indicators over time as shown in Figure 23.

Figure 23. Example of trends in risk indicators over time



Weighted Analysis

TLS is held to approximate random sampling in that each venue/VDT has an equal chance of inclusion. Given a high chance that individuals in target populations will attend an included venue and if enough venues/VDTs sampled, with no bias in selection of venue/VDT or selection of subjects TLS thus approximates a random sampling of the population. Nonetheless, differences in attendance patterns and differences in who attends certain venues does potentially introduce different sampling probabilities and clustering.

A number of weighting methods and statistical adjustments have been proposed for TLS. However, in practice weighting has not often been used because key outcomes were not found to be associated with venues and venues have shown high heterogeneity of attendees. (For further details on weighting schemes in the literature please see Appendix G on page 63). Moreover, TLS usually produces many small clusters rather than a few large homogenous clusters which generally ten to minimize design effects and changes between crude and adjusted analyses. Nonetheless, it may be necessary to statistically adjust data collected using TLS.

We present here a simplified approach based on enumeration counts of each sampling event which produce probability weights (p weights). Weighting can be achieved by using the enumeration count of each event as the basis for the weight. In many cases, each event is different enough to warrant this approach.

In brief, the adjustment should produce estimates that reflect the ratio of the number of persons enrolled to the number of eligible persons at each recruitment event. If the same ratio is conserved across all recruitment events then the sample is self-weighted or no adjustment would be needed.

To show how to weight, the following table illustrates a fictional TLS study, its' enumeration counts for each event and the total number of interviews completed at each of those events. Column 2 shows the total number of potential subjects enumerated at each event, column 3 is the proportion that each event represents of the total enumeration count for the entire study (for event 2 that would be 107/6678 = 0.0162023), column 4 is the total number of interviews completed at each event and column 5 is the proportion of the total number of completed interviews that each event represents (for event 2 that is 19/435 = 0.043678). Finally column 6 shows the calculated p weight for each event (for event 2 0.016203/0.043678 = 0.366836904). This p weight would then be applied to each interview completed during that event.

Table 5. Weighting Example

1	2	3	4	5	6
Event ID	Enumeration Count	p of enumeration	Interview Count	p of interviews	P WEIGHT
1	16	0.002396	1	0.002299	1.042228212
2	107	0.016023	19	0.043678	0.366836904
3	67	0.010033	11	0.025287	0.396757331
4	60	0.008985	10	0.022989	0.39083558
5	913	0.136718	20	0.045977	2.973607367
6	353	0.05286	15	0.034483	1.532943995
7	102	0.015274	22	0.050575	0.302009311
8	65	0.009733	10	0.022989	0.423405211
9	132	0.019766	23	0.052874	0.373842728
10	397	0.059449	19	0.043678	1.361067764
11	443	0.066337	22	0.050575	1.311667892
12	235	0.03519	25	0.057471	0.612309075
13	195	0.0292	24	0.055172	0.529256514
14	189	0.028302	23	0.052874	0.535274815
15	3	0.000449	3	0.006897	0.065139263
16	59	0.008835	6	0.013793	0.640536089
17	100	0.014975	14	0.032184	0.465280452
18	470	0.07038	27	0.062069	1.133905694
19	181	0.027104	17	0.03908	0.693541568
20	654	0.097934	21	0.048276	2.02862277
21	85	0.012728	8	0.018391	0.692104672
22	509	0.07622	20	0.045977	1.65779425
23	190	0.028452	20	0.045977	0.618823001
24	88	0.013178	6	0.013793	0.955375861
25	89	0.013327	7	0.016092	0.828199204
26	409	0.061246	18	0.041379	1.480108815
27	217	0.032495	17	0.03908	0.831483537
28	350	0.052411	7	0.016092	3.256963163
Totals					
28	**6678**	1	**435**	1	27.49992104

Enumeration counts for each event must be attached to each observation made at that event. There are two main ways to accomplish this. 1) If using paper and pencil instruments, the enumeration count for each event can be recorded on the cover of each survey completed at that event. 2) Enumeration counts for each event can be added to each observation in your final dataset after data collection has ended. Thus, simple fractions for groups of participants are based on the relative numbers of persons at the venues when recruitment occurred.

Adjustment for Clustering

In the case where venues do attract similar types of people, the there may be substantial homogeneity among persons sampled at each venue. This homogeneity can result in a widening of the standard errors of estimates. Therefore, the standard errors need to be adjusted accordingly using standardized commands in statistical software packages (e.g., Sudaan, SAS or in survey commands in STATA). Statistical software provides these adjustments by designating the venue as the group or cluster. Again, in typical practice

where the numbers of venues is high, the subjects per venue is small and there is heterogeneity at the venue, the adjustments to the standard errors will likely be small.

Should your FA or field experience indicate that a venue is differently attended by very different members of the MARP during specific day time periods could be counted as a separate cluster. In practice, this distinction should already have been addressed by adding these venues to the universe of venues as separate unique venues with their own unique VDTs.

Effect of Weighted and Cluster Analysis: An Example

To show how the weighting may change the point estimates and standard errors in a TLS study, we present an example adapted from a real-life survey of MSM in San Francisco (n = 435). The crude data, that is treating as a simple random sample, show the proportion reporting any unprotected receptive anal intercourse (URAI) as 24.49 % (standard error [SE] 2.38).

Adjustment using the survey weights based on attendance and sampling fractions as described above produces the proportion with URAI as 25.7912% (SE 2.5677).

Accounting for the clustering effect of each venue-day-time sampling event, that is taking into account the homogeneity of persons attending a specific venue (34 in this case), the adjustment produces a proportion with URAI as 24.4898% (SE 2.6127).

Combining both the weighting and clustering adjustment estimates the proportion as 25.7912 (SE 2.721).

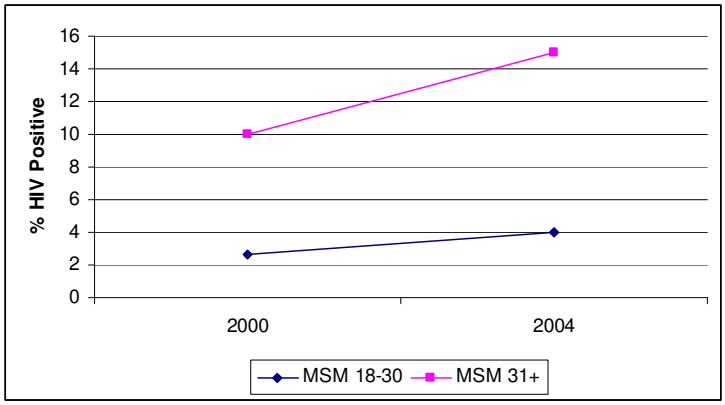
Comparing the crude estimates to the adjusted finds a small relative change in the point estimate (about 5%), whereas there is a nearly 17% change in the standard error. Such changes suggest that in this survey point estimates may not change too severely; however, interpretation of differences and odds ratios predicting URAI may change when the sample is weighted.

Stratified Analysis

When comparing year-to-year, target populations and methods may change. Be sure to account for this in analysis of changes or trends. For example:

> In one year of a TLS among MSM the sample was generally older and had a higher HIV prevalence. In the second year of TLS in the same community, the sample was generally younger and had a lower HIV prevalence. Before reporting that prevalence had declined, stratified or multivariate analyses, controlling for the differences in age of the two samples, will give a more accurate estimate of the trend in HIV prevalence.

Figure 24. Stratified HIV Prevalence Trend



Step 12: Dissemination and Use of Data

The product of any surveillance activity is to use the data for public health action. Planning for dissemination should start at the very beginning when planning your surveillance activity. Dissemination beyond internal reports or publication in scholarly journals is strongly encourages. Some other ways in which data from surveillance is disseminated include but are not limited to public meetings and forums, particularly targeted at the MARP that was studied, presentations to other researchers, presentations to policy setting bodies and local NGOs.

F: Examples of Uses of TLS

Monitoring and evaluation of HIV prevention efforts

Are HIV prevention programs working?
In aggregate, use of trends in TLS
Are specific HIV prevention programs reaching their target populations?
What percent of target population:
Is aware of the specific program?
Has used the program in the last year?
Client satisfaction with program
Self-assessed impact on client behavior

Reaching rare and hidden sub-populations
Tracking the leading edge of the epidemic

HIV Behavioral Surveillance among MSM in Bangkok, Thailand.

Detected a previously unknown high level of HIV infection among Thai MSM. The second round confirmed and showed an alarming trend in HIV infections. (17% to 23% over two years) [van Greinsven, F., et. al., 2004; Manserg, G., et. al., 2005].

Estimating the Size of "MARPS"

Multiplier Method (FHI, 2003).
Use existing databases with numbers of clients served in specified time period
Example: 588 SF MSM clients tested anonymously for HIV in San Francisco in 9 months of 2003
Use TLS data for "multiplier":
Example: 0.9% of TLS respondents reported testing anonymously for HIV in San Francisco in same period
588 ÷ 0.009 = 65,333 MSM in San Francisco

[San Francisco HIV Prevention Planning Council, 2004]

Use of TLS for HIV prevention research

Use of TLS to evaluate a randomized community level HIV prevention intervention in Zimbabwe
[Fritz, K.E., et. al., 2002].
–Zimbabwe Sahwira AIDS Prevention Project
•Beer hall based intervention, peer education: "Designated Driver for Sexual Health"
•Randomize venues to control and intervention

•Evaluated using TLS at control and intervention beer halls

Illustration 4. Locations of venues (beerhalls) where men can be found in Harare

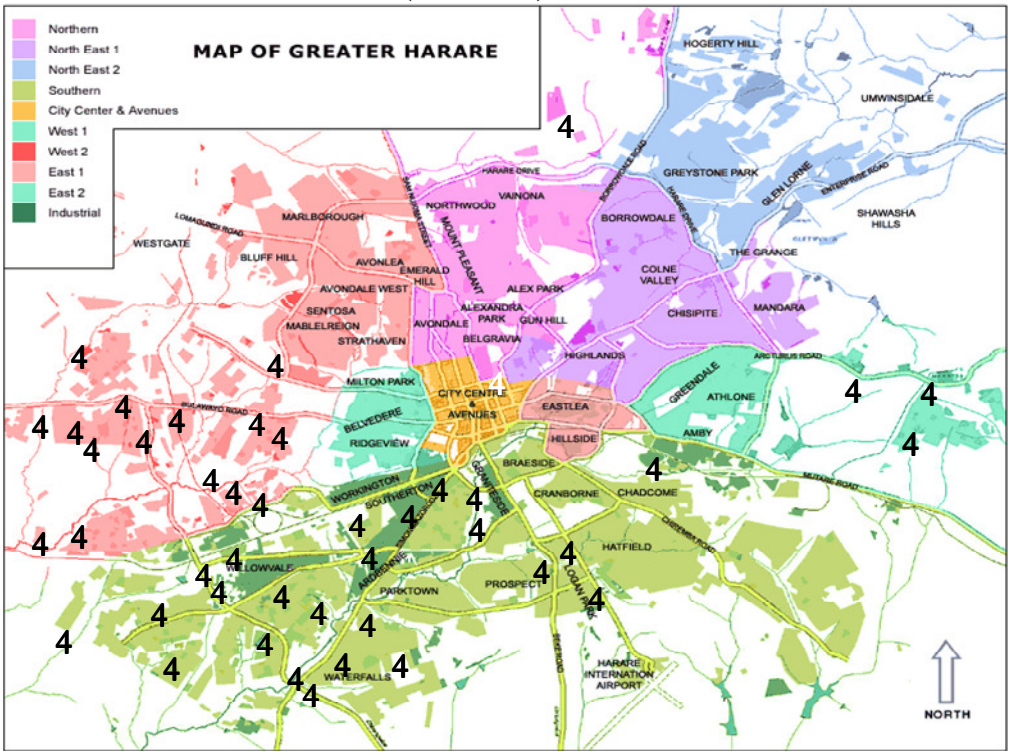


Illustration 5. This photo illustrates the enumeration line at a beer-hall in Harare

G: References / Bibliography

Bluthenthal, R.N., Watters, J.K. (1995). "Multimethod research from targeted sampling to HIV risk environments." Pp 212-230 in *Qualitative Methods in Drug Abuse and HIV Research*, National Institute on Drug Abuse, 157.

Carlson, R.G., Wang, J., Siegal, H.A., Falck, R.S., Guo, J. (1994). An ethnographic approach to targeted sampling: Problems and solutions in AIDS prevention research among injection drug and crack-cocaine users. *Human Organization,* 53(3), 279-286.

Family Health International, *Guidelines for repeated behavioral surveys in populations at risk of HIV.* Family Health International, Washington DC. (2000).

Family Health International. *Estimating the size of populations at risk for HIV infection.* Family Health International. Washington DC. (2003).

Fritz, K.E., Woelk, G.B., Bassett, M.T., McFarland, W.C., Routh, J.A., Tobaiwa, O., Stall, R.D. (2002). The association between alcohol use, sexual risk behavior, and HIV infection among men attending beerhalls in Harare, Zimbabwe. *AIDS and Behavior*, 6, 221-228.

Haahr, M. (2007). www.random.org. Accessed April 10, 2007. www.random.org.

Lemp, G.F., Hirozawa A.M., Givertz D., Nieri G.N., Anderson L., Lindegren M.L, Janssen R.S., Katz M., (1994). Seroprevalence of HIV and risk behaviors among young homosexual and bisexual men. The San Francisco/Berkeley Young Men's Survey. *JAMA.*;272:449-454.

MacKellar, D., Gallagher, K., Finlayson, T., Sanchez, T., Lansky, A., Sullivan, P. (2007). Surveillance of HIV risk and prevention behaviors of men who have sex with men-a national application of venue-based, time-space sampling. *Public Health Reports.* 122 (Supp. 1): 39-47.

MacKellar, D., Valleroy, L., Karon, J., Lemp, G., Janssen, R. (1996). The young men's survey: Methods for estimating HIV seroprevalence and risk factors among men who have sex with men. *Public Health Reports*. 111 Suppl l, 138-144.

Magnani, R., Sabin, K., Saidel, T., Heckathorn, D. (2005). Review of sampling hard-to-reach populations for HIV surveillance. *AIDS.* 19 Suppl 2, S67-S72.

Mansergh, G., Naorat, S., Jommaroeng, R., Jenkins, R., Jeeyapant, S., Kanggarnrua, K., Phanuphak, P., Tappero, J., Van Griensven, F. (2006).Adaption of venue-day-time sampling in Southeast Asia to access men who have sex with men for HIV assessment in Bangkok. *Field Methods.* 18, 2, 132-152.

Muhib, F.B., Lin, L.S., Stueve, A., Miller, R.L., Ford, W.L., Johnson, W.D., Smith, P.J., Community Intervention Trial for Youth Study Team. (2001). A venue-based method for sampling hard-to-reach populations. *Public Health Reports.* 116(Supp. 1) 216-222.

San Francisco HIV Prevention Planning Council. (2004). San Francisco HIV Prevention Plan, 2004. http://sfhiv.org/community.php. Accessed 9-9-2007.

Stueve, A., O'Donnell, L. N., Duran, R., San Doval, A., Blome, J. (2001). Time-Space sampling in minority communities: Results with young latino men who have sex with men. *American Journal of Public Health*. 91, 6, 922-926.

van Griensven, F., Thanprasertsuk, S., Jammaroeng, R., Mansergh, G., Naorat, S., Jenkins, R.A., Ungchusak, K., Phanuphak, P., Tappero, J.W. (2005). Evidence of a Previously undocumented epidemic of HIV infection among men who have sex with men in Bangkok, Thailand., *AIDS*, Mar 25;19(5):521-6.a

Watters, J.K., Biernacki, P. (1989). Targeted sampling: Options for the study of hidden populations. *Social Problems.* 36(4): 416-430.

Watters, JK., & Cheng, Y.T (1991). Toward comprehensive studies of HIV in intravenous drug users: Issues in treatment-based and street-based samples. Pp 63-74 in longitudinal studies of HIV infection in intravenous drug users, National Institute on Drug Abuse. 109.

H: Appendices

Appendix A Model Formative Research Interview Guide.

Formative Research Questionnaire: _____ community & venues

Date: _____

Person interviewed: _____

Affiliation: _____

Interviewer: _____

Introduction:

- Thank you for meeting with me.
- The information you provide me today will be used to develop a local HIV risk behavior survey.
    - The goal of the survey is to collect information that can be used to help improve local HIV prevention programs and services for groups at risk for HIV.
    - At this time we are developing the survey of _____ (MARP)
    - We wish to recruit _____
    - We are looking for nearly any type of public location where MARP might gather
    - Public locations can include high-traffic street corners, dance clubs, bars, retail businesses, health clubs, adult bookstores, bathhouses, and parks.
    - We know some of these locations but not all of them.
- Given your knowledge and expertise with this group, we were wondering if you could answer some questions and share your thoughts about this project.
- Do you have any questions before we get started?

Most At Risk Population

1. **How would you describe the general population of (MARP) in the local area, in terms of their age, race, or ethnic group?**

    a) **Are there any other characteristics about this group that you think are important when describing them?**

2. **What do you know about men who do not identify as gay or are closeted?**

3. **What age, race or ethnic groups of local (MARP) are you most familiar with?**

Interviewer: If respondent is familiar with a particular group of MARP please insert that characteristic (e.g., young, older, African American, etc.) in the blank. Otherwise, probe the respondent after each question to clarify what different groups of (MARP) are frequenting a venue

VENUES

4. **Can you tell me where _____ MARP go to spend time or hang out with other (MARP)?**

5. **If _____ MARP were interested mainly in finding other MARP to have sex with, how would they go about finding such people?**

6. **Where do _____ MARP go to pay for sex?**

7. **Where do _____MARP who do not want their family, friends or co-workers to know they have sex with a person of the opposite/same sex go to meet their partners?**

Interviewer: Give a list of the venues to the respondent.

Here is a list of some venues frequented by MARP in the local area. Do any organizations conduct outreach prevention or research at any of the venues on the list?

8. **Are there any venues we should add to the list?**

If so,

Venue	***Days / Times***	***Type of men***	***Notes:****

***Are there any particular recruitment barriers, such as large crowds, unfriendly management, or unsafe environments that we might expect at those locations?**

SURVEY METHODS

9. **What do you think is the best way to approach and recruit _____ MARP?**

   a) **What would motivate these people to participate in our survey?**

10. **What should we definitely** not **do or** not **say as part of our recruitment effort for _____ MARP?.**

    a) **What would prevent or inhibit these people from participating in our survey?**

11. **Who else do you know might be particularly good at helping us figure out where and how to conduct our survey? May I use your name as a reference?**

NAME	LOCATION/PHONE	REFERENCE
		Y / N
		Y / N

12. **Do you have any other recommendations for us?**

****

CLOSING

- **Thank you for helping us.**

If you have questions, feel free to contact me at:

APPENDIX B
TYPE II ENUMERATION FORM

Behavioral Surveillance TYPE II Enumeration

Page _____ of _____

Staff ID#: ___ | ___ | ___ Event #: ___ | ___ | ___ Venue ID #: ___ | ___ | ___ | ___ Venue Name: _____

Date: ___ | ___ | ___ S-Time: ___ : ___ a.m. p.m. E-Time: ___ : ___ a.m. p.m. Day of the Week: Sun M T W Th F Sat EID_____ # Clicked: _____

#	Refused Intercept	Age	Ethnicity	County of Residence	Language	Previous Encounter	Ever had Sex	Sexual Behavior	Study Eligible
1	Y N		A B H N W U		E S B O	Y N U	Y N U	M W B N U	Y N U
2	Y N		A B H N W U		E S B O	Y N U	Y N U	M W B N U	Y N U
3	Y N		A B H N W U		E S B O	Y N U	Y N U	M W B N U	Y N U
4	Y N		A B H N W U		E S B O	Y N U	Y N U	M W B N U	Y N U
5	Y N		A B H N W U		E S B O	Y N U	Y N U	M W B N U	Y N U
6	Y N		A B H N W U		E S B O	Y N U	Y N U	M W B N U	Y N U
7	Y N		A B H N W U		E S B O	Y N U	Y N U	M W B N U	Y N U
8	Y N		A B H N W U		E S B O	Y N U	Y N U	M W B N U	Y N U
9	Y N		A B H N W U		E S B O	Y N U	Y N U	M W B N U	Y N U
10	Y N		A B H N W U		E S B O	Y N U	Y N U	M W B N U	Y N U

Behavioral Surveillance
TYPE II ENUMERATION FORM

Contact Person (Name, title, phone #)

_____

_____

_____

Reviewed by:

Staff ID#: ____ ____ ____ Date: ____/____/____

Clicker #: ____ ____ ____ Date: ____/____/____

Supervisor #: ____ ____ ____ Date: ____/____/____

Comments (Weather, safety, etc.):

Year of Birth	Age if birthday is on or before today	Age if birthday is after today

Draw intercept line/area in box below.

CODES:

Ethnicity:

A = API	**B= Black**	**H = Hispanic Latino**	**N = Native American**
W- White	**U** = Unknown		

County of Residence:

SF=San Francisco	**A**=Alameda	**CC**=Contra Costa	**M**=Marin	**SM**=San Mateo	**SC**=Santa Clara
SCz = Santa Cruz	**N- Napa**	**SA-** Sonoma	**SO-**Solano	**O**=Other	**U**=Unknown

Language:

E=English only	**S = Spanish**	**B**=Both equally

Sexual Behavior:

M=Men Only	**W**=Women Only	**B**=Both Men & Women	**N**=No Sex	**U**=Unknown

Willing to Participate? (Yes)

Appendix C Example of Venue Universe

Venue Sampling Frame				VDT Sampling Frame						
Venue ID	**Name**	**Address**	**Phone**	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**	**Sunday**
12F001	Power Fitness	2230 18th Street	239-4287	6p – 10p		6p – 10p				
12X002	West End Video	1984 West End Place	234-2390			8p – 12a	8p – 12a	8p – 12a	8p – 12a	
12C019	Café Noir	28 Sheppard	834-4823		6p – 10p	6p – 10p	6p – 10p	6p – 10p 10p – 12a	6p – 10p 10p – 12a	4p – 8p
12P007	Northside Park	Northside Park	NA						2p – 6p	4p – 6p
12D101	End Up @ Salvation	293 Washington	932-1389					11:30p – 3:30a		
12R045	Fresh Concepts	1987 Houston	843-2947	6p – 10p	6p – 10p	6p – 10p	6p – 10p	6p – 10p	6p – 10p	
12S033	Market and Meridian	Market and Meridian	NA	4p – 8 p 8p – 12a 12a – 2a	4p – 8 p 8p – 12a 12a – 2a	4p – 8 p 8p – 12a 12a – 2a	4p – 8 p 8p – 12a 12a – 2a	4p – 8 p 8p – 12a 12a – 2a	4p – 8 p 8p – 12a 12a – 2a	4p – 8 p 8p – 12a 12a – 2a
12D052	Vinyl Factory	8342 Davidson	883-9898			8p – 12a	8p – 12a	8p – 12a	8p – 12a	
12O004	Men's Choir	1438 Oak	NA			8p – 9p				
12O008	GLBT Youth	1329 Manor	843-4892		1st and 3rd Tuesday 7p –10p					
12Z001	Gay Skate	1539 Jefferson	239-8902	8p – 12a						
12X021	Men's Club	89 Frost	234-1098	6p – 10p 10p – 2a	6p – 10p 10p – 2a	6p – 10p 10p – 2a	6p – 10p 10p – 2a	6p – 10p 10p – 2a	2p – 6p 6p – 10p 10p – 2a	2p – 6p 6p – 10p 10p – 2a
12S001	San Jose and Meridian	San Jose and Meridian	NA	6p – 10p	6p – 10p	6p – 10p	6p – 10p	6p – 10p 10p – 12a	6p – 10p 10p – 12a	4p – 8p 6p – 10p
12C001	Polk Street Tavern	14th and Polk	932-5490	6p – 10p	6p – 10p	6p – 10p	6p – 10p	8p – 12a	8p – 12a	

Appendix D Sampling Calendar

MSM 2003 SAMPLING CALENDAR

November 2003

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
					1 D006 10-2a D003 B031	2 B039 4-8p B002 B003
3	4	5 X001 8-12a B047 R001	6 D010 10-2a B001 B002	7 D002 4p-8p F002 B015	8	9 D008 8a-12n O006 D004 4p-8p B003 B002
10	11 HOLIDAY	12 B015 4-8p F001 B029	13	14 B038 6-10p F005 F004	15	16 O006 11a-3p S001 S002 B047 8p-12m R001 R002
17	18	19 R002 8p-12a X001 R002	20	21 S002 10p-2a B001 D008	22 B001 10-2a B006 B014	23 O001 7p-11p R004 B025
24 F002 5p-9p X003 F004	25	26	27 HOLIDAY	28 HOLIDAY	29 OFF	30 OFF

APPENDIX E **Type III ENUMERATION FORM**

Event #: ____ | ____ | ____ Venue ID #: ____ | ____ | ____ | ____ Interviewer ID#: _____ Date: ____ | ____ | ____ Bath Number:_____

Selection Type: P 1A 2A B-Time: ____ : ____ a.m. p.m. E-Time: ____ : ____ a.m. p.m. Count: ____ | ____ | ____

Line #	Age	Race/Ethnicity	First Name	Declined, don't know if eligible	Not eligible	Eligible, but declined	Partially completed interview	Completed interview	ODA date
01		W A/PI AA L O O: _____							
02		W A/PI AA L O O: _____							
03		W A/PI AA L O O: _____							
04		W A/PI AA L O O: _____							
05		W A/PI AA L O O: _____							
06		W A/PI AA L O O: _____							
07		W A/PI AA L O O: _____							
08		W A/PI AA L O O: _____							
09		W A/PI AA L O O: _____							
10		W A/PI AA L O O: _____							

Draw diagram of intercept line/area below.

Reason for intercept or enrollment refusal:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

BSS TYPE III ENUMERATION FORM

Contact Person (Name, title, phone #)

_____

_____

Reviewed by:

Interviewer ID#: ____ ____ ____ Date: ____/____/____

Clicker #: ____ ____ ____ Date: ____/____/____

Supervisor #: ____ ____ ____ Date: ____/____/____

Comments (Weather, safety, etc.)

_____

_____

_____

_____

Year of Birth	Age if birthday is after today	Age if birthday is on or before today
1982	17	18
1981	18	19
1980	19	20
1979	20	21
1978	21	22
1977	22	23
1976	23	24
1975	24	25
1974	25	26
1973	26	27

CODES:

Interviewer ID#:
201 = Sean **202** = Howard **205** = Joe **206** = Theresa **207** = Christopher **208** = Eric **209** = Lina

Selection Method:
R = Random, **N** = Nonrandom

Selection Type:
P = Primary, **1A** = 1st Alternate, **2A** = 2nd Alternate

Race/Ethnicity:
C = Chinese, **F** = Filipino, **J** = Japanese, **V** = Vietnamese, **U** = Unknown/Refused, **O** = Other/Multiracial (Specify)

***ACT Resident Counties*:**
A = Alameda, **CC** = Contra Costa, **M** = Marin, **SF** = San Francisco, **SM** = San Mateo, **SC** = Santa Clara, **O** = Other (Specify))

LDE:
LC = Last Ditch Effort (LDE) with contact information (card number), **LN** = Last Ditch Effort (LDE) with **NO** contact information (card number)

Type III Enumeration Form, Palm Size

Front

Event:_____ Venue ID#:_____ Staff ID#: _____

Date:_____ Method: R N Type: P 1A 2A Page#:_____

B-Time:_____:_____am pm E-Time:_____:_____am pm Count:_____

REC/BSI: R / B

1	2	3	4	5	6	7	8	9	10

Refused Intercept: Y / N

AGE:

Race/Ethnicity: A / B / H / N / W / U*

Resident: A / CC / M / SF / SM / SC / SCz / N/ SA/ SO / O*

Previous Respondent (Enrolled): Y / N / U

Previous Non-Respondent (Eligible, asked, but refused enroll.): Y / N / U

Eligible: Y / N / U

Enrolled: Y / N*

ODA/LDE: O / LC(Mark C and Card #)* / LN(Mark N and Card #)* / N

Back

Race/Ethnicity: Resident:

Other:	Other:
1._____	1._____
2._____	2._____
3._____	3._____
4._____	4._____
5._____	5._____
6._____	6._____
7._____	7._____
8._____	8._____
9._____	9._____
10._____	10._____

Reason for Study intercept or enrollment refusal:

1._____
2._____
3._____
4._____
5._____
6._____
7._____
8._____
9._____
10._____

Appendix F. Table of Random Numbers

83760	32155	71609	89887	00940	54355	44351	89781	58054	65813
66280	56046	50526	33649	87067	02697	06577	16707	96368	47678
70218	28376	98535	34190	96911	81578	97312	20500	48030	27256
02349	88955	52760	73696	91510	38633	38883	90419	26716	98215
93606	21415	34843	12969	84847	06280	95916	12991	08262	58385
24274	18747	37327	06780	08032	98544	24902	81607	87914	22721
67778	70496	57588	89813	71211	83848	93494	27946	79722	70315
89134	06458	40897	73025	04191	77144	49340	89446	71852	80854
83625	00097	71092	12009	63223	37993	50067	25688	98179	34628
03324	68196	72460	55616	27006	50790	28629	88726	97143	63218
84392	36623	91964	03505	46525	40490	77787	68545	02795	72676
76926	10866	39734	50512	04181	78012	78705	86194	28371	54535
06612	60200	49085	85108	71438	10099	99027	65081	82492	77584
76721	02889	95600	07984	31925	59685	91510	40039	43205	37149
64599	51953	55612	89088	58436	21501	86219	74528	59805	65020
79440	99677	49530	55291	34867	54774	52449	23294	94815	95124
35839	00177	57742	09502	42624	29017	94284	81409	36904	54329
83013	94568	75490	12138	24067	86954	00910	61171	82982	87191
19980	47085	46064	19102	26297	79745	99611	04555	52501	32088
55716	10350	67645	62922	81919	47925	91448	36025	20611	38939
36624	03992	27656	33092	22252	54461	83386	55340	11313	23290
50678	33814	07643	81452	60689	48745	49894	27285	90420	31188
17932	27351	34623	55864	58659	06992	88558	45742	56792	71027
76795	23022	20409	60100	59507	40596	16971	96490	47676	49129
20654	64916	59927	62495	81133	29095	64024	02792	39809	85302
73601	60099	50404	41700	53664	54397	49600	46980	13882	54275
59678	14528	96293	12957	68229	95753	15727	75113	09892	71487
92132	51012	09399	30175	73025	99849	34334	20089	19323	95149
76143	16802	32819	34057	94227	25779	93959	89810	47627	70561
99617	64239	13967	90188	60291	38478	09723	10697	78020	51388
02841	25077	02368	75931	42679	70900	33040	08871	46696	18647
57979	28621	03155	03704	98473	25894	26753	62390	54746	84189
41233	68027	17036	28310	50551	84295	80793	93235	78902	18351
48049	09367	15040	29166	64290	16439	67192	16681	46304	68190
10984	97394	23070	90585	53139	96998	39834	27678	42288	33778
59531	76937	15645	70938	00036	72773	25984	06507	27933	46779
36874	61476	74611	74476	48713	36124	98549	70465	58742	28707
49377	53222	14506	80260	59070	47101	02248	99520	08803	79772
59707	00510	29216	53012	47115	39798	79797	06491	72669	05055
63469	49151	35960	88792	43961	62352	78114	77810	95638	84227

Appendix G. **Weighting TLS Data**

Proposed Methods

1. Weighting by individual attendance patterns at types of or specific venues

Sampling probabilities differ for individuals based on their personal attendance patterns at types / specific venues. Those attending more often have a greater chance of being sampled than those that attend less frequently. Frequent attenders are given less weight than those who attend infrequently.

Data Required:

a. Attendance patterns from each individual
b. The probability of choosing each venue for sampling within this pattern of attendance
c. Sampling fraction of each sampling event

2. Weighting by number of persons attending venues.

Subjects from high attendance venues are given more weight than those from lower attended venues. In essence it is more likely that a low attendance venue will have more of its patrons interviewed while fewer at the high attendance venue will be sampled, thus the high attendance venue is under-sampled.

Data Required:

a. Sampling fraction of each sampling event

3. Adjustment by clusters of venues and / or calendar dates using generalized estimating equations (GEE).

Observations in clustered venues or taken on same calendar dates are weighted depending on the size of the cluster so that clusters with greater numbers of venues are not over represented in analyses.) to adjust for the effect of repeated observations on clusters of venues (i.e. multiple observations per venue cluster).

Data Required:

a. Geographic information on location of venues
b. Calendar dates

Prehistory:

1. Sudman et al. (1988). Sampling rare and elusive populations. *Science.* 240: 991-996.

2. Kalton. (2001). Practical methods for sampling rare and mobile populations. Proceedings of the Annual Meeting of the American Statistical Association. August.

Discussions of adjustment:

(proposes methods or discusses challenges)

1. MacKellar, D., et al (1996). The young men's survey: methods for estimating seroprevalence and risk factors among young men who have sex with men. *Public Health Reports.* 111 (Sup 1).

2. Karon, J. (2005). The analysis of time location sampling study data. ASA section on Survey Research Methods.

3. MacKellar, D., et al. (2007). Surveillance of HIV Risk and Prevention Behaviors of men who have sex with men- A national application of venue based, time space sampling. *Public Health Reports.* 122 (Sup 1).

4. Muhib F., et al. (2001). A venue based method for sampling hard to reach populations. *Public Health Reports.* 116 (Sup 1).

Uses a weighting scheme:

1. van Griensven F. et al. (2005) Evidence of a previously undocumented epidemic of HIV infection among men who have sex with men in Bangkok, Thailand. *AIDS.* 19:521-526. (clusters of venues / calendar dates, GEE)

2. Cardoso Ferreira et al (in review). Sexual behavior of Brazilian long distance truck drivers, 2005 (venue cluster adjustment, n recruited/ n enumerated, more weight to subjects of highly attended venues).

Various TLS applications , no adjustment:

US Young Men's Studies

1. MacKellar, D. et al. (2006). Recent HIV testing among young men who have sex with men: Correlates, contexts and HIV seroconversion. *STD.* 33 (3) 183-192.

2. Sifakis, F. et al. (2007). Prevalence of HIV infection and prior HIV testing among young men who have sex with men. The Baltimore Young Men's survey. *AIDS Behav.* DOI 10.1007/s10461-007-9317-5

3. Sifakis, F., et al., (2007) Racial disparities in HIV incidence among young men who have sex with men. The Baltimore Young Men's Survey. *JAIDS.* Epub ahead of print.

4. Valleroy L. et al. (2000). HIV prevalence and associated irks in young men who have sex with men. *JAMA.* 284 (2) 198-204.

5. MacKellar D., et al (2002). Repeat HIV testing, risk behaviors, and HIV seroconversion among young men who have sex with men: a call to monitor and improve the practice of prevention. *JAIDS.* 29(1)76-85.

6. CDC (2002). Unrecognized infection, risk behaviors and perceptions of risk among young black men who have sex with men- six US Cities, 1994-1998. *MMWR.* 51(33)733-6.

7. CDC (2003). HIV/STD risks in young men who have sex with men who do not disclose their sexual orientation- six US cities, 1994-2000. *MMWR.* 52(5)81-6.

8. CDC (2001). HIV incidence among young men who have sex with men-- six US cities, 1994-2000. *MMWR.* 50(21) 440-4.

9. MacKellar D. et al. (2001). Two decades after vaccine license: hepatitis b immunization and infection among young men who have sex with men. *AJPH.* 91(6) 965-971.

10. Bingham T. et al. (2003). The effect of partner characteristics on HIV infection among African American men who have sex with men in the Young Men's Survey. Los Angeles, 1999-2000. *AIDS Ed and Prev.* 15 (sup A) 39-52.

11. MacKellar D. et al. (2005) Unrecognized HIV infection, risk behaviors and perceptions of risk among young men who have sex with men: Opportunities for advancing HIV prevention in the third decade of HIV / AIDS. *JAIDS.* 38(5) 603-614.

12. Celentano D. et al. (2005). Race/ethnic differences in HIV prevalence and risks among adolescent and young adult men who have sex with men. *JUH.* 82(4)610-621.

13. Koblin B. et al. (2003). Attitudes about combination HIV therapies: the next generation of gay men at risk. *JUH.* 80(3)510-519.

14. Koblin B. et al. (2000). High prevalence of HIV infection among young men who have sex with men in New York City. *AIDS.* 14: 1792-1800.

15. Waldo C. et al (2000). Very young gay and bisexual men are at risk for HIV infection: the San Francisco Bay Area Young Men's Survey II. *JAIDS.* 24:168-174.

16. Diamond C. et al. (2003). Viral hepatitis among young men who have sex with men: prevalence of infection, risk behaviors and vaccination. *STD.* 30 (5) 425-432.

17. Celentano D. et al. (2006). Associations between substance use and sexual risk among very young men who have sex with men. *STD.* 33(4)265-271.

18. Diamond, C., et al. (2001). Seroepidemiology of human herpesvirus 8 among young men who have sex with men. *STD.* 28(3) 176-183.

19. Choi KH. et al. (2005). High level of hepatitis B infection and ongoing risks among Asian / Pacific Islander men who have sex with men, San Francisco, 2000-2001. *STD.* 32(1)44-48.

20. Katz M. et al. (1998). Continuing high prevalence of HIV and risk behaviors among young men who have sex with men: the young men's survey in the San Francisco Bay Area in 1992-1993 and in 1994-1995. *JAIDS.* 19(2)178-81.

21. Do T. et al (2005). HIV testing patterns and unrecognized HIV infection among young Asian and Pacific Islander men who have sex with men in San Francisco. *AIDS Ed and Prev.* 17(6)540-554.

22. Choi KH et al. (2004). An opportunity of prevention: Prevalence, incidence and sexual risk for HIV among young Asian and Pacific Islander men who have sex with men, San Francisco. *STD.* 31(8) 475-480.

US National HIV Behavioral Surveillance

23. Berry M. et al. (2007). Same race and older partner selection may explain higher HIV prevalence among black men who have sex with men. *AIDS*. 21(17):2349-50.

24. Berry M et al. (in press) The Internet, HIV serosorting and transmission risk among men who have sex with men, San Francisco. *AIDS.*

Others

25. Kipke M. et al. (2007). Residential status as a risk factor for drug use and HIV risk among young men who have sex with men. *AIDS Behav.* 11:S56-S69.

26. Kipke M. et al. (2007). The health and health behaviors of young men who have sex with men. *Journal of Adolescent Health.* 40 342-350.

27. Kipke D. et al. (2007). Club drug use in Los Angeles among young men who have sex with men. *Substance Use and Misuse.* 42(11) 1723-43.

28. Parsons JT. et al. (2006). Differences in club drug use between heterosexual and lesbian / bisexual females. *Addictive Behaviors.* 31: 2344-2349.

29. Kelly BC. et al. (2006). Prevalence and predictors of club drug use among club-goiing young adults in New York City. *JUH.* 83(5) 884-895.

30. Kelly BC. et al. (2007). Prescription drug misuse among club drug using young adults. *American Journal of Drug and Alcohol Abuse.* 33(6) 875-884.

31. Steuve A., et al (2001) Time space sampling in minority communities: Results with young Latino men who have sex with men. *AJPH.* 91 (6) 922-926.

32. Mansergh, G. et al. (2006). Adaptation of venue day time sampling in southeast Asia to access men who have sex with men for HIV assessment in Bangkok. *Field Methods.* 18 (2) 135-152.

And finally, FHI and SEARO (WHO) mention time space “like” sampling. They propose only two options for the second stage of sampling. Take all or a fixed number of respondents per cluster thus their weighting methods are based on those options.

http://www.searo.who.int/EN/Section10/Section18/Section356/Section411_1908.htm

I: Glossary

Glossary terms used throughout TLS module are identified in **bold** print.

Area-based enumeration - In area-based enumeration, people are counted who appear within the age criteria and who enter a defined area for the first time during an enumeration or sampling event. Areas can be relatively small (e.g., a section of sidewalk in front of a bar) or large (e.g., part of a park). Area-based enumeration should be conducted at locations where outside flows of people are predominately the target population.

Associated-day-time-periods – Associated-day-time-periods are time periods that reflect high-attendance in their associated venues.

Brief-eligibility Interview (BEI) - BEIs are brief eligibility interviews of people who are counted during enumeration and sampling events. The purpose of BEIs during enumeration events is to determine the percentage of eligible people who attend a venue. The purpose of BEIs during sampling events is to identify eligible people for recruitment and to obtain data necessary to characterize recruitment outcomes.

Biological behavioral surveillance – Monitors HIV and other sexually transmitted infections' prevalence through biologic testing (urine, saliva, blood) in addition to monitoring peoples HIV risk behaviors.

Chain referral sample – A convenience sample. Findings cannot be extrapolated to represent all members of the target population.

Checklist form – The form is used to keep track of each participant from the moment he or she is recruited until he or she is given their incentive. This form is useful when there are many steps involved in completing a TLS study.

Community Interview – A type of formative research interview conducted with members of the community who work or interact with the study groups or conduct HIV prevention activities. These individuals may have a vested interest in the outcome of the surveillance.

Convenience Sampling – Can be used in exploratory research where the researcher is interested in getting an inexpensive approximation of the truth. As the name implies, the sample is selected because they are convenient, such as interviewing available people walking by a store. This *non*probability method usually doesn't incur the cost or time required to select a random sample.

Enumeration - Enumeration is the process of counting people who appear to fit the eligible criteria of the target population and who attend the identified venues during enumeration or sampling events. During the formative research phase, the purpose of enumeration is to determine whether venues and venue day-time periods yield sufficient people to be included within sampling frames. The purpose of enumeration during sampling events is to obtain a base count of people who might be eligible for the survey and to help standardize the recruitment process across sites and venues.

Formative research – Research conducted before a study begins. Researchers conduct focus groups, in-depth interviews, mapping or observations of the target population and individuals who work with them to learn more before the study begins. This process aids public health practitioners define the study population, the attributes of the study population relevant to the specific public health issue, and ways to access the population.

Gatekeeper – A valuable source within a targeted population that can provide insight on where MARPs can be found and best approaches to use when working with that community. A gatekeeper is usually well known to the target community and possibly a trusted member as well.

HIV behavioral surveillance – The monitoring of people's behaviors in relation to HIV/AIDS.

HIV prevention activity – Any effort made to prevent HIV infection. Such efforts may be indirect. For example, reducing drug use may indirectly lead to lower rates of unsafe sex.

Incentive – This is a reward or reimbursement given to participants in a TLS study.

Key informant interview – A type of formative research interview conducted with members of the target population. These individuals are different from community members in that they do not have a vested interest in the outcomes of the surveillance.

Lessons learned – This is information recorded (learned) from previous studies that are useful in making decisions when planning an upcoming study.

Line-based enumeration - In line-based enumeration, people are counted who appear to fit the eligibility age requirement and who cross a line for the first time during an enumeration or sampling event. Line-based enumeration is conducted at locations where outside flows include men who have only had sex with women.

Markov process – A theory which states that biases introduced into a chain referral sample by the non-random selection of an individual (seed) are weakened with each recruitment wave and ultimately eliminated.

MARP- Most at risk population**.**

Masking – Sampling bias whereby reclusive respondents are under-sampled.

Non-probability sample – A sampling method that involves selecting members from the target population in a non-random manner (there is no known probability of selection). These types of sampling methods (snowball, judgment, quota, etc.) are not usually representative of the target population from which the sample was taken.

Non-random mixing – The tendency for people to preferentially recruit others like themselves.

Operations manual – A study document that describes the steps and procedures involved in a study. An operations manual can also be referred to as a procedural protocol or study manual or some other title. A sample operations manual is provided in the appendix to this manual.

Probability sampling – In this sampling method, each member of the target population has a known, non-zero probability of being selected. Probability sampling methods include random sampling, systematic sampling, and **stratified sampling**. The advantage of a probability sampling method is that sampling error can be calculated.

Protocol (or study protocol) – A study document that describes the methodology and procedures in a study. A generic protocol is provided in the appendix of this manual.

Respondent driven sampling – The sampling method that relies on social network properties to sample hard-to-reach populations.

Safety protocol – The protocol that describes how to respond to, avoid or document field incidents or adverse events.

Sampling – A statistical practice concerned with the selection of individuals from a target population, such as IDUs, SWs, and MSM. It is intended to yield some knowledge about a total target population, especially for the purposes of statistical inference. Sampling methods are classified as either probability or non-probability.

Sampling error – The degree to which a sample might differ from the population. When inferring to the population, results are reported plus or minus the sampling error. In non-probability sampling, the degree to which the sample differs from the population remains unknown.

Sampling event - Sampling events are the days, times, and locations where staff enumerate, approach, recruit, interview, distribute reimbursements, and provide referrals to the target population.

Sampling-event calendar - The sampling-event calendar is the schedule of sampling events in a given month. Each sampling event on the calendar is denoted by the primary venue and its associated time period and up to two alternate venues. For further information, refer to Methods: Type 1 & 2 Sampling, and Unit 5 Activity.

Sampling frame – A list of venues that have at least one venue-specific-day-time period (VDT) which is expected to produce 8 eligible participants during a four-hour period. This will be used for sampling the population to be included in the study.

Same-day appointments (SDAs) - SDAs are appointments for clients who either wish to be interviewed at a later time during the sampling event or who can't be interviewed immediately because all interviewers are occupied. SDAs are used to maximize enrollment opportunities during low-attendance sampling events.

Stage 1 sampling - Stage 1 sampling is the process by which venues are randomly selected without replacement from the updated venue-sampling frame. For further information, refer to Methods: Stage 1 & 2 Sampling.

Stage 2 sampling - Stage 2 sampling is the process by which venue-day-time periods (VDTs) are randomly selected for each venue chosen in stage 1. For further information, refer to Methods: Stage 1 & 2 Sampling.

Stage 3 sampling - Stage 3 sampling is the process by which men are enumerated, approached, determined to be eligible, and enrolled into the study during sampling events. For further information, refer to Methods: Stage 3 Sampling.

Snowball sampling – In this non-probability sampling method, each individual recruits his or her peers into a study.

Stratified sampling – A sampling method that recruits individuals based on their stratums and their actual representation in the population.

Target population – A specific hard-to-reach population group that the study centers around.

Targeted sampling – This sampling method recruits individuals from specific locations. Time-location sampling is an example of targeted sampling.

Time-location sampling – This is a sampling method that recruits individuals from specific locations during specific time periods. Time-location sampling can be a probability sample based on the accuracy of the

sampling frame to include all the venues and the size of the target population that frequents these venues. Time-location sampling is also referred to as venue based sampling, venue-time based sampling, time-location cluster sampling, and time-space sampling.

Type 1 enumeration - Type 1 enumerations are conducted at venues and day-time periods (VDTs) with unknown attendance patterns of the target population. Type 1 enumerations are conducted by one person who counts the number of people who appear within the age criteria and who attend the VDT during a 30- to 60-minute period. Type-1 enumeration data are used to determine if venues yield sufficient people to be included in sampling frames.

Type 2 enumeration. - Type 2 enumerations are conducted at venues and VDTs that are suspected of being attended by ineligible people such as men who only have sex with women in a MSM study. Type-2 enumerations are conducted with teams of two. One team member counts people who appear to be within the age criteria during a 30- to 60-minute period, and the other member conducts brief-street eligibility interviews (BSIs) on a sample of counted people. BSIs collect demographic, residence, and sexual-behavior information necessary to determine attendance by eligible people. For further information, refer to Methods: Sampling Frame Construction, and Appendices H-1 through H-3.

Unbiased estimates – These are estimates from a sample that can be extrapolated to the target population.

Venue - Locations where the target population congregates. This may include dance clubs, street locations, social organizations, parks, etc. Excluded are clinical or other settings that routinely provide medical, social services, or HIV/STI diagnostic or treatment, and other prevention activities.

Venue sampling frame - The venue-sampling frame is the list of venues that have at least one venue-specific-day-time period (VDT) which is expected to produce 8 eligible clients during a four-hour period.

Venue-day-time periods (VDTs) - Manageable 4-hour blocks of time that are venue, day, and time specific. VDTs are identified through a-priori staff knowledge, community interviews, and type-1 enumerations. Although most VDTs are four-hour periods, some may be as short as one hour. All venues included in sampling frames have at least one VDT.

VDT sampling frame - The VDT sampling frame is the list of day-time periods that are available for sampling for each venue listed in the venue sampling frame.

Venue owner – A venue owner is a person who can allow or prevent sampling events from occurring at any given time. Often venues may have more that one venue owner. These individuals can include managers of business establishments, door attendants at bars/clubs, club/event promoters, and meeting coordinators.

J: Exercise and Discussion Answers

Exercise 1. Venue Brainstorm

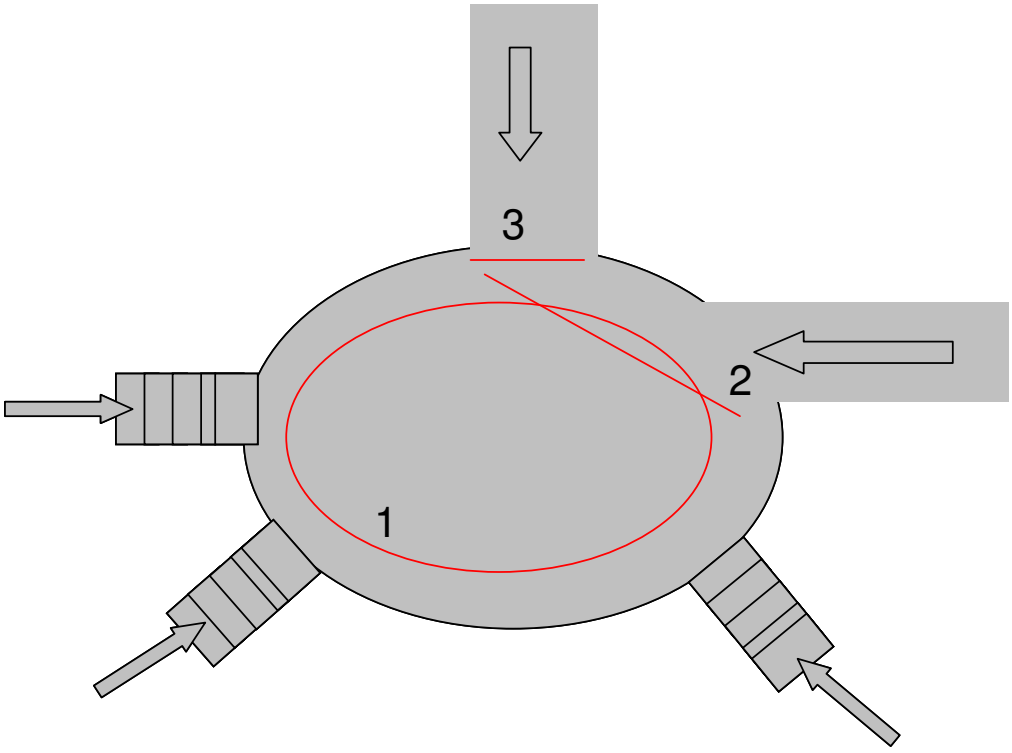
Examples of Venues:

MSM – Bars, Restaurants, Disco, Bathhouse, Park, Stores
IDU – Bars, Need Exchange, Parks, Outside Methadone Clinics
CSW – Brothels, Street Corners, Waterfronts, Hotels
Youth – Parks, Bars, Clubs, Beaches, Street Locations

*There are additional types of venues than those listed above.

Exercise 2. Enumeration Areas

Using the diagram below indicate a enumeration boundary in the following scenarios. 1) Low flow 4 interviewers, 2) Medium flow, 2 interviewers, 3) High Flow, 3 interviewers. Mark each with the scenario it represents.



Scenario 1: You might choose to consider the whole oval area of the landing the enumeration area, counting and attempting intercepts with all the MARPs that enter the area.

Scenario 2: Although the flow is greater than in S1, having fewer interviewers requires that the enumeration area be smaller and defined, otherwise a low proportion of those

counted can be approached. If most of the foot traffic appears to be coming from the bridge (top) and the sidewalk to the right a line enumeration covering both entries would be best.

Scenario 3: With high flow coming from the bridge entrance to the park, focusing all interviewers in that area with a line based enumeration will be most effective.

Exercise 3. Retorts

- **Time:** "I don't have time"
  - Retort: "It will only take 15 minutes"
- **Disinterest:** "I am not interested"
  - Retort: "This is valuable for the whole community"
- **Friends and partner:** "I don't want to leave my friends"
  - Retort: "Your friend can hang out with my coworkers while we do the interview and have a coke"
- **Privacy:** "I don't want to give my name"
  - Retort: "This is an anonymous survey – you don't need to provide your name"

Exercise 4. Elements of an incident report

All incidents should be reported to the Field Supervisor. The following are types of information gathered in the incidence report:

Name of person writing report
Date of incident
Staff involved
Location of incident
Description of incident
Recommendations
Solution to incident/problem