
MODULE



4

AIDSCAP

EVALUATION TOOLS

APPLICATION
OF A
BEHAVIORAL
SURVEILLANCE
SURVEY
TOOL

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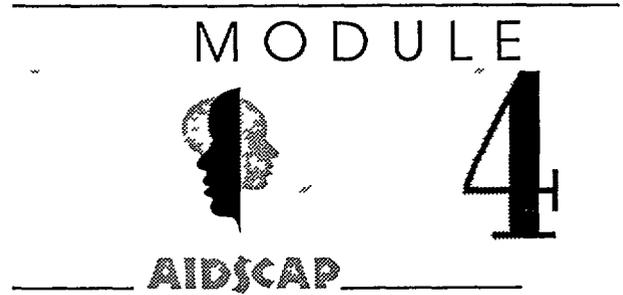
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Family Health International

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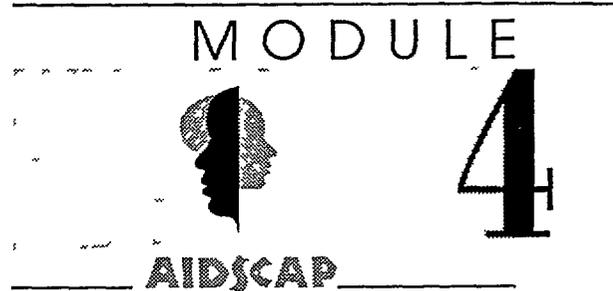


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SECTION



1

AIDSCAP

Introduction

The AIDSCAP Evaluation Tools Module series is designed as a practical reference primarily for AIDSCAP project monitors, managers, and field staff who are designing subprojects within country programs. The first module, *Introduction to AIDSCAP Evaluation*, explains AIDSCAP's approach to evaluating HIV/AIDS prevention programming in priority and associate countries, reviews types of evaluation, discusses various methodologies in general terms, and outlines types of indicators used to measure progress in AIDSCAP interventions.

The second module, *Conducting Effective Focus Group Discussions*, is a general overview of this data collection technique, which is most commonly used in AIDSCAP projects to complement quantitative evaluation research measuring sexual behavior change in targeted populations. The third module, *A Framework for Incorporating Evaluation into Project Design*, provides a detailed step-by-step methodology for designing an HIV/AIDS intervention and its evaluation plan, including an outline of the logical framework technique for identifying project objectives and their indicators of achievement.

This fourth module describes the process of conducting a Behavioral Surveillance Survey (BSS) in Bangkok, Thailand, and how the methodology has been used to evaluate comprehensive HIV/AIDS/STD prevention programming in the city. Data results from the initial two years of BSS appear near the end of the module. By using this module, and other generic survey methods manuals, others will be able to replicate the study in locations where high-risk behaviors may suggest potential trends in HIV prevalence that are not yet measurable. Future evaluation tools modules will address epidemiologic surveillance, survey and sampling methods, project monitoring, qualitative evaluation methods, STD facility assessment, institutional development, policy-related interventions, and condom programming and logistics. AIDSCAP supports interventions in all these areas and conducts evaluation of achievement of objectives for all interventions.



Background

The Behavioral Surveillance Survey (BSS) for HIV prevention programs is based on serologic sentinel surveillance survey methods used in many countries to detect the emergence of HIV and monitor epidemic trends. Behavioral surveillance surveys are systems for quantitatively assessing sexual behavior change, consisting of structured questionnaires, administered periodically to samples of target groups in specific geographic areas. National AIDS control programs conduct *blood* sentinel surveillance of HIV because even a small number of infected persons in some groups can lead to a rapid outbreak of HIV followed by diffusion of infection to larger sub-groups of the population. The data from blood sentinel surveillance help prevention programs set priorities on geographic areas and population subgroups in order to allocate resources cost effectively.

Sentinel surveillance of acute *sexually transmitted diseases* (STDs, e.g., gonorrhea, chancroid) has two basic disadvantages for HIV prevention: (1) HIV can and does spread in the absence of STDs, and (2) it is difficult to conduct the necessary diagnostics on otherwise healthy individuals due to limited diagnostic technology and the invasive nature of some diagnostic techniques (e.g., urethral swabs in males and vaginal smears in females).

Thus, the surveillance of *behaviors* can sometimes provide the only advance warning of an impending HIV epidemic among different population subgroups. Answers to questions on behavioral practices provide a profile of risk and vulnerability that can guide prevention programs in the early stages. Even after an HIV epidemic has been established, the BSS can help track behavioral changes within the epidemic, serve as a guide to social adaptation to the threat of HIV, and help evaluate prevention program effectiveness among targeted populations.

The BSS described in this monograph is a behavioral monitoring tool for measuring risk behavior for sexual transmission of HIV. The BSS differs from traditional blood sentinel surveillance surveys in that no blood specimens are taken at the time

respondents are interviewed. Some blood sentinel surveillance systems also involve asking a few questions of each sampled person, but this should not be considered “behavioral surveillance.” When behavioral data are collected and linked with a blood specimen from the same person, the objective is usually to conduct case-control comparisons of HIV+ and HIV- subjects to determine behavioral risks. However, in the BSS, the objective is solely to track known risk behaviors over time. The inclusion of clinical procedures during the BSS (e.g., drawing blood, examining genitals for STD) may cause certain individuals to refuse to participate in the BSS and thus limit access to those at risk. Furthermore, clinical procedures add costs and time to data collection protocols.

The BSS and traditional HIV sentinel surveillance surveys are typically not nationally representative samples of the population. Instead, they are a selection of individuals from sub-groups of the population who are vulnerable to the impact of the epidemic. The groups are often defined by geographic location (e.g., city, province, state, region) and by socio-demographic characteristics (e.g., occupation, sex, age, marital status). The concept of “sentinel” surveillance is not applicable to behavioral surveillance, as it has been applied in Bangkok. “Sentinel” implies that surveying teams return to the same sites for each surveying round. The BSS draws a new sample for each round of interviewing from updated lists of sites where target population members can be reached. Further below, this module provides a more detailed discussion of the pros and cons of fixed versus new site selection from round to round.

For AIDSCAP programs, the most important application of behavioral surveillance is for the evaluation of comprehensive targeted intervention programs. Although each subproject in an AIDSCAP country program is evaluated individually, it is the *combined effect* of multiple subprojects implemented among the same population that leads to the central outcome of behavior change to reduce risk for STDs and HIV. No single subproject evaluation can capture this combined effect. For example, an AIDSCAP outreach program encounters vulnerable individuals and explains the importance of STD diagnosis and treatment and where to get quality services. Some individuals in the target population follow this advice and go to an STD care giver who has been trained under a separate AIDSCAP subproject. At that site, the individuals receive further reinforcement of the advice given by the outreach worker and perhaps new information that increases motivation to change behavior. One behavioral option is use of condoms, and an AIDSCAP social marketing program in the target geographic area ensures that supplies are available, affordable, and of good quality. In this way, three separate subprojects interact together to facilitate and reinforce behavior change.

While the behavioral surveillance tool cannot and should not be used to evaluate the outcome of these individual subprojects, it is well-suited to measure the combined effect on behavior in the target population. Indeed, the BSS is one of the few tools available for measuring the outcome of AIDSCAP comprehensive programs within the life of our country programs.

SECTION



3

AIDSCAP

Objectives

The Behavioral Surveillance Survey consists of repeated cross-sectional surveys of population subgroups currently or potentially at risk for HIV or other STD infections. A major goal of the BSS is to monitor and track high-risk sexual behaviors at periodic intervals over time. Therefore, questions focus on a limited set of behaviors placing individuals at risk of HIV infection. Uses of the BSS include

- **Targeting prevention programs**

The BSS can show which population sub-groups are exhibiting risk behaviors and help in the complex decision-making process of determining how to distribute scarce prevention programming funds across various target groups.

- **Identifying specific behaviors in need of change**

HIV risk behaviors can occur with different types of sexual partners (e.g. commercial sex workers, casual or infrequent partners, or long-term relationships). Asked correctly, questions in the BSS can point to which relationships are in need of interventions to decrease risk. For example, in many countries condom use has become the social norm among men and commercial sex workers. However, sexual behavior between non-paying casual partners continues to exhibit low rates of condom use.

- **Providing indicators of success and identifying persistent problem areas**

Since the BSS is conducted repeatedly, it can identify behavioral trends which may be attributable to a set of interventions. Though not designed to directly evaluate specific interventions, the BSS can illustrate that certain behavioral goals of sets of interventions are being met. Likewise, risk behaviors which

continue to persist over time in spite of the influence of interventions may suggest that other approaches are necessary

- **Serving as an advocacy and policy tool**

Quantitative information from BSS can be used for advocacy and policy purposes. For example, findings can be interpreted for journalists so that they are further disseminated through the mass media. Likewise, data can be used to convince policy makers and funding organizations of the need for more attention to HIV prevention.

With funding and technical assistance from AIDSCAP/FHI, Thailand has been conducting a large BSS exercise in Bangkok since 1993. Drawing on this experience and the lessons learned from implementation, this module will illustrate the utility of the technique and the proper procedures for conducting behavioral surveillance surveys.

SECTION



4

AIDSCAP

Methodology

Among field survey techniques, there are several issues unique to the BSS. These issues include the selection of sites for data collection, follow-up survey rounds, questionnaire development, interviewer selection, and data analysis.

Initial Site Selection

The first consideration in selecting sites for the behavioral surveillance is identifying target areas for HIV prevention interventions. If projects are targeting commercial sex workers (CSWs) and truck drivers in three cities, then certain brothels and truck stops in those cities should be included as survey sites. If vocational school students and low-income housewives are the focus of interventions, then vocational schools and slum households should be the survey sites.

As with blood sentinel surveillance, not all sites need to be selected, but a random selection of brothels, truck stops, schools, or slum households is essential. Similarly, within the randomly selected sites, not all individuals need to be selected, but a random sample of CSWs, truck drivers, vocational school students, and housewives is essential. Random selection of sites and individuals is important because it reduces the bias that may be introduced if a nonrandom sample is chosen. For example, if only those brothels with convenient access are chosen, then these sites might have better management and higher condom use rates than brothels with difficult access. If only truck stops with restaurant brothels nearby are chosen, then frequency of use of commercial sex workers by truck drivers may be higher than in other truck stops without these nearby outlets. Both these examples of nonrandom sampling may bias the results to either persistently higher or lower reported risk behavior than is found in other sites. A full range of sites will provide a variation in risk level that may help to explain why risk occurs or changes over time.

The number of sites to be sampled and the number of individuals to be sampled per site depend on budget, analysis plans, and the required precision in measuring change. Appendix I addresses sample size estimates for behavioral surveillance.

Follow-up Site Selection

Fixed sites versus random selection each round.

In the Thailand application of behavioral surveillance, two different approaches have been used for selecting sample sites in follow-up rounds. In the first approach the same sites were visited in the second round as in the first round. New sites were not to be selected again unless structural factors forced a change (e.g., closing down sampled brothels). However, individuals in the sampled sites were selected anew each round.

In this approach, if Vocational School "A" is sampled, then data are collected from that school at baseline (Round 1) and in all subsequent rounds by random selection of students each time. Since the surveillance approach is not a pure representative sample of the entire target population, a quota sample of individuals is recommended for convenience. Thus, in the example of Vocational School "A," 25 male students and 25 female students are randomly selected in each round. (Note that it is possible for some persons to be interviewed in more than one round. This is similar to the blood sentinel surveillance, in which some of the same CSWs are tested in multiple rounds by chance.) The size of the quota depends on the analysis plan and prevalence of the key behaviors of interest. (See Appendix I.)

The second approach is to select a new sample of sites each round, that is, to repeat the entire Round 1 methodology each time. The field experience of the AIDSCAP program in Bangkok has exposed advantages and disadvantages for each of these methods, summarized in Table 1.

Table 1
Comparison of
Advantages and Disadvantages of
Fixed Site versus Random Selection of Sites

METHOD	ADVANTAGES	DISADVANTAGES
Fixed survey sites	<ol style="list-style-type: none"> 1) The sampling need only be conducted once. This reduces cost and effort 2) The owner or manager of the site becomes familiar with the survey team and this may improve access in future rounds 3) The interview team learns the location of the sites and does not waste time trying to find new sites 4) Repeated sampling in the same sites may keep sampling bias constant 	<ol style="list-style-type: none"> 1) The universe of potential sites changes over time 2) The owner or manager of the site may become annoyed with the survey team for repeatedly disturbing the workplace or clinic 3) Important pockets of risk behavior may be missed 4) Repeated sampling in the same sites may cause behavior change due to survey process
New samples sites for each round	<ol style="list-style-type: none"> 1) This allows the selection of new sites that were created after the first round. This method is not affected by the closure or moving of former survey sites 2) A greater variety of respondents are available because more sites are eligible for selection 3) Sampling new sites removes the bias of repeated interviewing at the same sites 	<ol style="list-style-type: none"> 1) The listing of sites has to be updated before each round. This increases cost and fatigue 2) The local administration must issue new letters of introduction for the survey team each round 3) New sites may introduce unknown bias

In the first two rounds of the BSS in Bangkok, the first method (fixed site selection) was used. As noted in the table, “gatekeepers” at some of the sites became annoyed that the interview team planned to return every six months. These sites were mainly factories with production line quotas. Since one of the important purposes of the surveillance system is to uncover new areas of high-risk behavior, it is also important to allow new sites to be eligible for sampling each round. For example, over the past several years commercial sex establishments (CSEs) in Bangkok have been changing from “direct” (brothel houses where sex acts occur on the premises) to “indirect” (establishments where customers meet CSWs but sex acts occur elsewhere). Brothel houses (i.e., “direct”) have converted to restaurant-fronted brothels and bars where the waitresses and singers are CSWs (i.e., “indirect”). A fixed-site selection of direct and indirect establishments would miss this evolution of CSEs. The findings would probably underrepresent indirect establishments and the resulting changes in risk behaviors in the conversion from direct to indirect formats. Finally, just as with HIV, risk behavior is not evenly distributed across a population. There may be pockets of high-risk behavior that would be missed by a fixed-site selection approach.

An example of this occurred in the AIDSCAP Bangkok program. Outreach education teams learned that motorcycle taxi drivers in one area of the city had an unusually high reported level of unprotected sex with prostitutes and casual partners. This information was shared with the BSS team. In the next round of the BSS, more men with this lifestyle were included in the sample and, indeed, it was found that they may be playing an important role as a bridge population between CSWs and other sexually active women. Thus, re-sampling the survey sites randomly each round increases the probability that pockets of risk behavior will be uncovered.

Time interval between rounds

The time interval between rounds is determined by the speed at which behavior is changing, by local analysis capability, and by budget considerations. In Thailand, the national blood sentinel surveillance was conducted every six months from June 1989 through 1994 and is now conducted once annually for some sentinel groups. The Bangkok behavioral surveillance is currently conducted every six months, but will likely soon change to once annually as well.

In the early stages of an epidemic, when the speed of behavioral change is uncertain, data collection every six months appears to be an appropriate interval. As the epidemic matures and behavior change occurs and then perhaps decelerates, annual data collection may be more appropriate. Most epidemics in Asia are expected to be as rapid as Thailand’s unless intervention programs slow transmission significantly. Thus, at the present time, the interval between rounds in most Asian countries is about six to twelve months.

A balance has to be achieved between timely measurement of behavior change and the amount of time and resources necessary to analyze vast quantities of data. In order

to provide usable information to program managers in a timely fashion, data must be analyzed, interpreted, and presented as rapidly as possible. If data collection activities occur too closely together and require very large sample sizes (in order to detect changes in certain behaviors), there is an increasing chance that the results will not be available in time to assist in adjusting or redirecting intervention efforts.

Revisiting sites too often can strain the relationship between the BSS team and the gatekeepers for the target population (e.g., school headmaster, worksite manager). The BSS team should explain in advance to gatekeepers at each site the need to return several times on a given schedule to conduct repeat surveys. This will ease access for future visits, as long as the visits are not so frequent that they disrupt the lives of respondents or their employers and gatekeepers.

Questionnaire Development

The development of the questionnaire for behavioral surveillance should follow standard social science methods. The major steps include using appropriate quantitative and qualitative formative research to identify essential independent and dependent variables, reviewing existing questionnaires, drafting and pre-testing questions, and compiling the complete questionnaire with introductions, skips, and notes to interviewers. Because of the large number of interviews in the BSS and the limited time that respondents have to give to the interviewer, the BSS questionnaire *must be as short as possible*. No exploratory or nonessential questions should be included unless they are used as warm-up or lead-in questions to sensitive topics. Typically, the BSS interview should take no more than 30 minutes per person. At the same time, however, the questionnaire should not be much shorter than 15 to 20 minutes. In the Thai experience, it takes about a quarter of an hour for sufficient rapport and trust to develop for the respondent to reveal intimate information about his or her sex life. If the questionnaire is too short and leads abruptly to questions about sex, much of this information will be underreported.

Appendix II displays some of the key sections of the questionnaire used in the Bangkok setting among men and women aged 15 to 29. These key questions, some of which are core prevention indicators developed by WHO/GPA and AIDSCAP for monitoring national AIDS control programs, are repeated in every round of the BSS. Other questions may be added or deleted depending on behavioral issues that may be important during a certain time period.

The process of pre-testing the questionnaire deserves special consideration. In the Thailand BSS, focus group discussions were conducted to improve the draft questionnaire. Five different group discussions lasting from 50 to 80 minutes were conducted with sex workers, male and female office workers, and female vocational students. A Thai social scientist analyzed the Thai transcripts using content analysis techniques. An important result of reviewing questionnaire wording emerged around the issue of interviewing women about sexual behavior. The researchers determined that a self-

administered questionnaire produced better quantitative data on single female behavior than an in-depth interview. When surveying women with a structured questionnaire, it is important to begin with less sensitive questions. Then, at an appropriate point in the interview, the interviewer passes a self-administered questionnaire containing only those questions relating to the respondent's sexual behavior and leaves the room. The respondent puts the completed questionnaire into a box with only a code number as identification. The interviewer then returns to finish the structured questionnaire. The input from the focus group participants was critical to the development of a culturally appropriate questionnaire. (The reader is referred to AIDSCAP Evaluation Module #2 for other examples of combining qualitative and quantitative data collection to improve HIV prevention programming.)

Interviewer Selection and Skills

The essential questions in a BSS concern sensitive topics about personal behavior. Therefore, interviewers need to be well-trained and non-judgmental about the respondent population. *It should not be assumed that anyone with higher education can administer the BSS questionnaire.* The techniques of establishing rapport, trust, and a relaxed atmosphere require training and experience. In order to obtain complete and truthful information it is imperative that interviewers be skilled in these areas.

In the first two rounds of the BSS in Bangkok, six male and female interviewers were recruited from a pool of university graduates at the bachelors level. Each received five days of training from an experienced group of male and female field supervisors. The six interviewers operated as a single team with one permanent supervisor. The interviewers and supervisor were full-time salaried workers. They collected, edited, and entered the data into computers themselves. Using full-time interview teams has the following advantages:

- Recruitment and training are completed at the beginning of the BSS and usually do not have to be repeated.
- Interviewers become highly practiced in administering the questionnaire.
- Having interviewers involved in data editing and entry helps them to see the value of collecting complete information that is easy to transmit.
- Full-time interviewers can be upgraded to supervisors with little additional training.
- Some of the full-time interviewers can participate in the data analysis and interpretation phase, provide insightful explanations of results, and suggest analysis strategies.

For the third and subsequent rounds, AIDSCAP has modified the methodology to include full-time team supervisors with part-time interviewers. This modification

was introduced because of the increased sample size and the need to conserve costs. With full-time interviewers and a sample of 3,000 per round, the cost per interview in Bangkok is \$13. In contrast, hiring part-time interviewers and using full-time supervisors results in a cost per interview of \$6. This cost savings may be at the sacrifice of data quality, however.

Data Analysis

Analysis of BSS data need not be sophisticated. Simple time trend tables and graphs are interpretable by most managers and policy makers and by HIV prevention workers. Some simple statistics should be used to rule out apparent trends that are due to chance variation. For example, data from two rounds may suggest an increase in condom use among vocational students, but statistical analysis finds that the increase is not statistically significant (i.e., it is the result of random variation in the sample composition). In many cases, showing the “confidence interval” surrounding a given percentage will illustrate how “exact” the estimate is of the behavior being measured.

BSS data are *not* designed to be grouped across surveyed populations. Thus, data for female vocational students *should not be combined* with data for housewives, data for male students are not combined with truck drivers. When data for multiple rounds are available, *trend data should be presented for each surveyed population separately*. Statistical comparisons are not made between trends in behavior of CSWs with trends for housewives. They should be treated as separate, individual samples with separate analysis.

Also, certain characteristics of the sub-populations that may influence risk behavior should be similar from round to round. For example, if “male blue collar workers” is one of the selected sub-populations, then the proportion of the sample who are factory workers, construction workers, and motorcycle taxi drivers should be kept constant over rounds. Otherwise the prevalence and trends in risk behavior could change merely by adjusting the proportions of each of these groups in the sample. Unfortunately, it is not always possible to know in advance what characteristics are associated with risk. Female students at private vocational schools may have significantly higher risk than those in government vocational schools.

However, this may not become apparent until the first survey round is complete. To guard against bias in subsequent rounds, then, the same proportion of government and private vocational school students should be maintained for the female sample.

Several statistical techniques can be used to determine whether changes over time are significant or are due to survey error. They include standard Chi square analysis, Chi square analysis for trend, test of a difference in proportions, and multiple classification analysis of independent variable effect on key dependent variables. A statistician should be consulted for proper use of these procedures.

Dependent Value Selection

The World Health Organization and the U S Agency for International Development have defined the following minimum set of core prevention indicators for HIV programs

- Knowledge of prevention practices
- Condom availability
- Condom access
- Self-reported non-regular sex partners
- Condom use with non-regular partners
- STD diagnosis and treatment
- STD facility-based health education
- STD seroprevalence in women
- Self-reported STD incidence in men
- HIV seroprevalence in women

The fourth and fifth indicators are behavioral indicators and should be included in any BSS to enable comparison with other programs. Additional behavioral items should be added to reflect the local risk environment and intended impact of the intervention. For example, if the intervention is targeting group alcohol consumption (to intoxication) as a behavior to be changed among men, then a few questions on this practice must be included in the BSS questionnaire. This example makes it clear that the designers of the BSS questionnaire must work closely with the intervention program staff to ensure consistency between prevention goals and the behavior that is monitored.

In the BSS tool used in Bangkok, the following indicators have been selected for illustrative analysis in this document:

General Male Population

- Percent who had commercial sex in the past N months (for example, three months, six months, or one year)
- Percent of males who had both commercial and non-commercial sex in the past year
- Percent of men with pain/burning during urination or discharge in the past N months (for example, three months, six months, or one year)

General Female Population

- Percent of single women who had sex in the past year
- Percent of married women who used condoms at last sex

Female Commercial Sex Workers

- Percent of CSWs who report that all customers use condoms every time
- Percent of CSWs who had non-paying partners in past year
- Percent of CSWs who used a condom with the last non-paying partner
- Percent of CSWs who seek treatment of STDs from government STD clinics

SECTION

5
AIDSCAP

Selected results from the Bangkok BSS

The Bangkok behavioral surveillance survey is part of the comprehensive Bangkok AIDS prevention program funded in part by AIDSCAP/USAID and coordinated through the Bangkok Metropolitan Administration. The survey work and preliminary data tabulations are conducted under contract by the Office of Population Technical Assistance (OPTA). The BSS was implemented in six pilot districts during 1993-94 (see Appendix II) among the following sub-populations:

- Office workers (male and female, age 15-29 years)
- Service worksite laborers (male and female, age 15-29 years)
- Vocational school students (male and female, age 15-29 years)
- Ante-natal clinic clients (female, age over 15 years)
- STD clinic clients (male, age over 15 years)
- Lower-fee commercial sex workers (female, over 15 years)
- Higher-fee commercial sex workers (female, over 15 years)

The sites for the office workers include banks, department stores, automobile companies and so on. The sites for service worksite laborers include large and small factories, motorcycle taxi queues, gas stations, restaurants, and so on. Vocational school students are drawn from commercial colleges, technical colleges, and vocational schools. Clients attending government ante-natal and STD clinics comprise the BSS populations for these two groups. Lower-fee commercial sex workers are sampled through tea houses, barber shops, and hotels. Higher-fee commercial sex workers are sampled from cafes, night clubs, bars, karaoke lounges, and so on.

Approximately 3,000 persons were included in the first two survey rounds for all six districts combined. This resulted from a quota selection of 50 males and 50 females

from the relevant categories per district. The sampling methodology was changed for the third and subsequent rounds to increase the sample size for certain sub-populations of special interest (see Appendix I). Individuals were included regardless of marital status as long as they met the age and employment category criteria. Although AIDSCAP is not supporting HIV prevention activities directly in all groups, these populations are expected to provide a range of experience whose behavior will change over time in response to HIV prevention programs.

Figures 1—9 and the accompanying tables present data from the first two rounds of the Behavioral Surveillance Survey in Bangkok. Round one (T1) is assigned to mid-1993 while the second round (T2) corresponds to a period approximately six months later, although the actual field work for each round took several months. The data are presented for the six surveillance populations. The data for males and females are analyzed separately in recognition of the different level of sexual networking of men and women in Thai society. Only the data on sexual behavior and STDs are presented in this monograph, although data were collected on awareness of prevention, self-risk assessment and other variables.

The following graphs, table and narrative are provided as illustrations. A full report of the two rounds of BSS data will appear in early 1995. When viewing the following data it is important to recall that the surveyed population is not a representative sample of Bangkok. Instead the data are used to indicate the presence of risk behavior in certain groups and to identify trends over time.

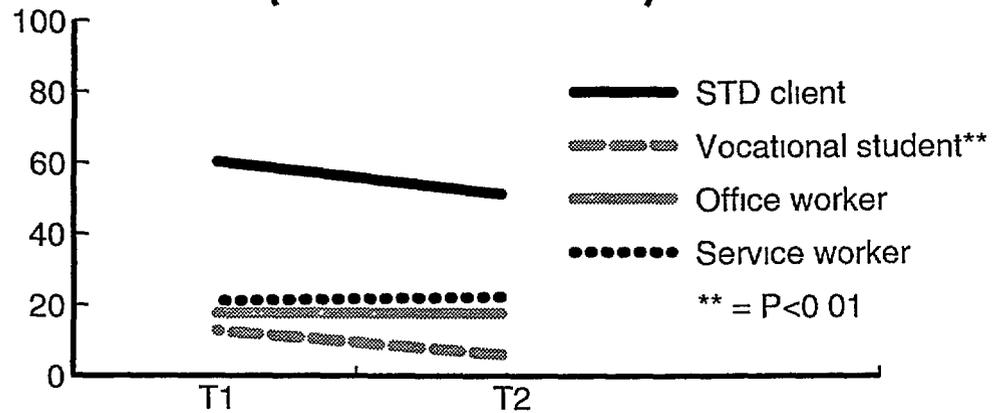
Caution Although some of the trend lines in the following graphs appear to be significant, some of the differences are not statistically significant. When analyzing and interpreting trend data to policy makers and managers it is important to be conservative in how you treat the data, or misguided program decisions could result. We have taken a conservative approach to analyzing the BSS data for Bangkok. Thus, variations in the levels between T1 and T2 are only considered significant when the probability of a different result (*p* - value) is less than 5% (< 0.05) and the 95% confidence intervals around the mean do not overlap. The data in the tables show the value for a variable at the first and second rounds and include the confidence interval around each value.

Commercial sex.

Thai male patronage of commercial sex workers was the driving force for the heterosexual epidemic of HIV in Thailand during 1989-91. Figure 1 shows that one in five office workers (white collar) and one in six service workers (blue collar) had sex with a prostitute in the previous year. The trend is constant over time. By contrast, commercial sex patronage decreased by half among vocational school students from 13% to 6% although this trend is only marginally significant. It is noteworthy that a large proportion of male STD clinic clients report that they did not have commercial sex in the previous year. Men go to STD clinics for a variety of reasons, including HIV

and STD checks required by an employer or for counseling. But nationally, due to declining patronage of commercial sex establishments, more STDs are being transmitted between men and single women during non-commercial interactions than in the past.

Figure 1
Percent males who had commercial sex
in past year
(from total men)

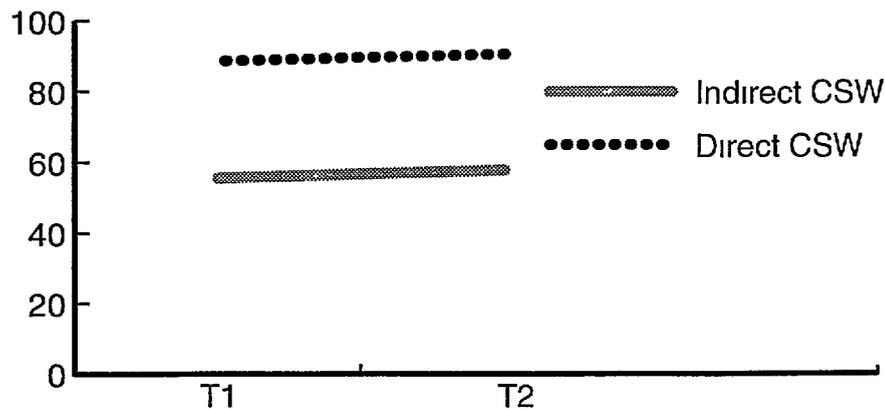


Source: Behavioral Surveillance Surveys (BSS) — Scope 6 Phase I Districts

Target group	Percent sample sizes	T1	T2	95% CI T1 (min,max)	95% CI T2 (min,max)	Sig	Total "N"
Service worker	% ("N")	21.1 374	22.3 503	0.170 0.252	0.187 0.259	0.685	877
Office worker	% ("N")	17.7 300	16.7 300	0.134 0.220	0.125 0.209	0.840	600
Vocational student	% ("N")	12.7 299	6.0 300	0.089 0.165	0.033 0.087	0.005 **	599
STD client	% ("N")	60.3 242	51.2 209	0.541 0.665	0.444 0.580	0.051	451

It has been scientifically shown that condoms reduce risk for STDs, including HIV. Thus, condom use in commercial sex is an important prevention program indicator for Thailand. Figure 2 presents data on reported condom use by direct and indirect commercial sex workers. 90% of direct CSWs use condoms every time with customers, while less than 60% of indirect CSWs report doing so. Although direct sex workers have higher condom use levels, they also have nearly nine times as many customers as indirect sex workers, which means they probably have more exposure to HIV in a given time period (data not shown).

Figure 2
Percent CSWs used condom every time with client



Source: Behavioral Surveillance Surveys (BSS) — Scope 6 Phase I Districts

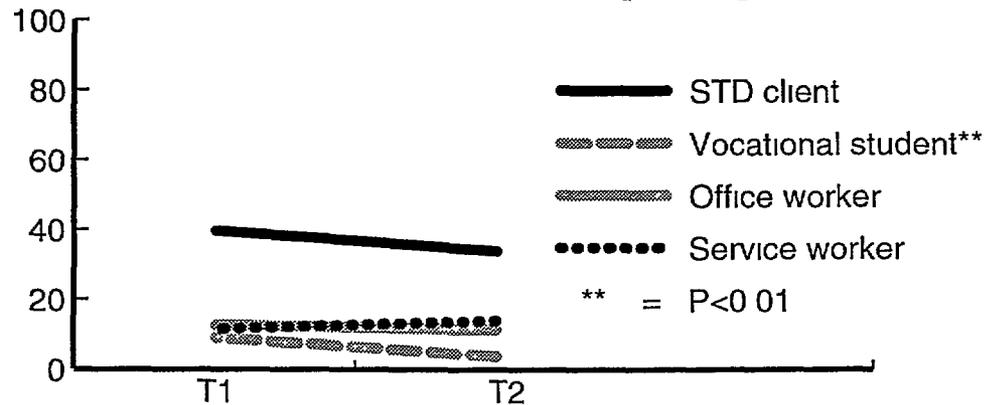
Target group	Percent Sample sizes	T1	T2	95% CI T1 (Min,Max)	95% CI T2 (Min,Max)	Sig	Total "N"
Direct CSWs	% ("N")	88.6 263	90.6 212	0.826 0.906	0.867 0.945	0.172	495
Indirect	% ("N")	55.6 279	57.9 273	0.498 0.614	0.520 0.638	0.582	552

Non-commercial sex.

What is potentially most devastating about the HIV epidemic in Thailand is the bridge between commercial and non-commercial sex relationships. Traditionally, men pro-

vided the link between the very high-risk brothel environment and otherwise low-risk marital sex relationships. The following graphs and table suggest that new “bridges” are developing that provide expanding transmission opportunities for HIV. A sensitive indicator of sex networking is the proportion of men who have both commercial and non-commercial sex. Figure 3 shows that male surveillance populations still mix commercial and non-commercial sex, which decreases significantly only for vocational school students. Blue collar and white collar groups have similar levels of mixing at slightly over 10%. Over one-third of male STD clinic clients are part of the transmission bridge.

Figure 3
Percent males had sex with CSWs and non-commercial sex in past year

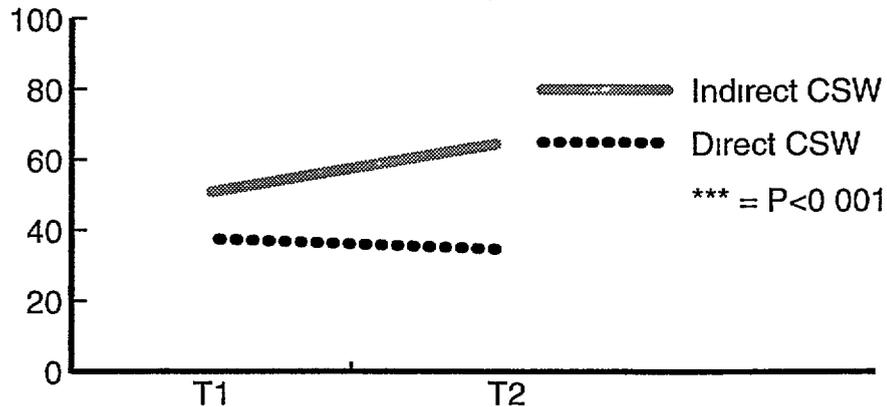


Source: Behavioral Surveillance Surveys (BSS) — Scope 6 Phase I Districts

Target group	Percent Sample sizes	T1	T2	95% CI T1 (Min,Max)	95% CI T2 (Min,Max)	Sig	Total "N"
Service worker	% ("N")	11.5 (374)	13.9 (503)	0.083 0.147	0.109 0.169	0.290	877
Office worker	% ("N")	12.7 (300)	11.3 (300)	0.089 0.165	0.077 0.149	0.615	600
Vocational student	% ("N")	9.0 (299)	3.7 (300)	0.058 0.122	0.016 0.058	0.007 **	599
STD client	% ("N")	39.7 (242)	34.0 (209)	0.335 0.459	0.276 0.404	0.211	451

However, a new phenomenon is emerging that threatens to increase the level of mixing of commercial and non-commercial sex in the Bangkok population. Figure 4 shows that over one-third of direct CSWs and more than half of the indirect CSWs had non-paying partners in 1993. This level increased significantly to 64% of indirect CSWs by 1994.

Figure 4
Percent CSWs had non-paying partner in last year



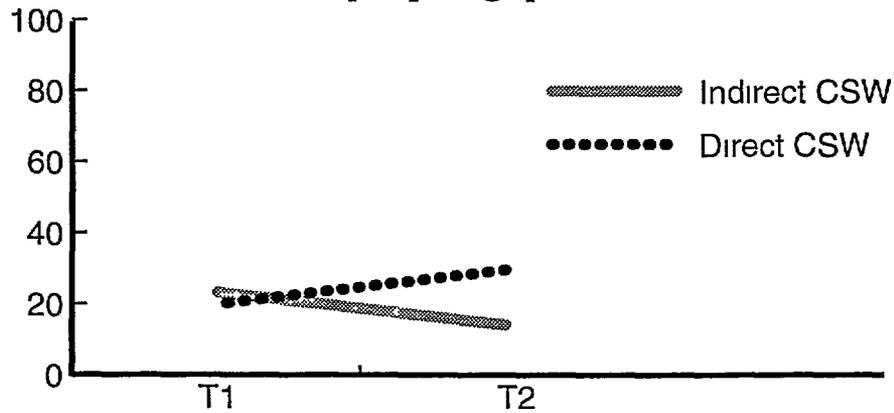
Source: Behavioral Surveillance Surveys (BSS) — Scope 6 Phase I Districts

Target group	Percent Sample sizes	T1	T2	95% CI T1 (Min,Max)	95% CI T2 (Min,Max)	Sig	Total "N"
Direct	% ("N")	37.5 280	34.7 213	0.318 0.432	0.283 0.411	0.528	493
Indirect	% ("N")	50.9 279	64.5 273	0.450 0.568	0.588 0.702	0.001 ***	552

Figure 5 shows why these relationships threaten prevention programs that focus solely on commercial sex encounters. Condom use in non-commercial relationships is only a fraction of that in paid-sex encounters. In fact, at a time when indirect CSWs are reporting more non-commercial episodes, condom use is not increasing in those

partnerships The existence and importance of non-commercial sex relationships of female prostitutes has been largely ignored by prevention programs The BSS data suggest that significant risk of HIV transmission exists and that female indirect sex workers may be an increasingly important bridge between high-risk and lower-risk males

Figure 5
Percent CSWs used condom with non-paying partner



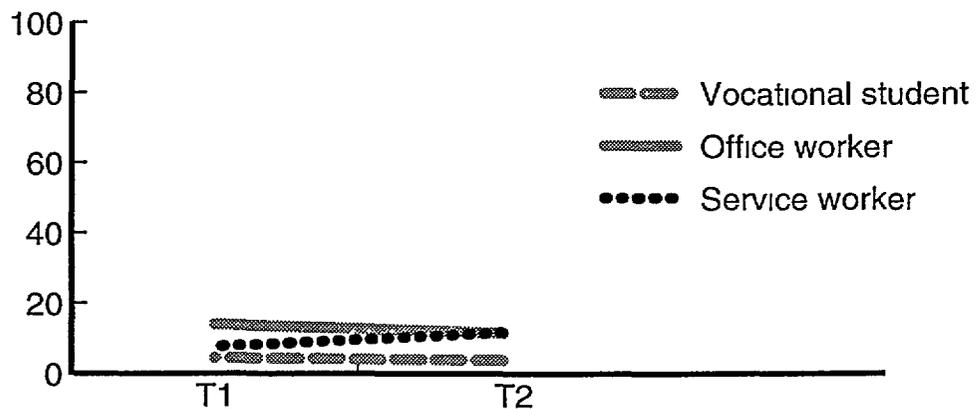
Source Behavioral Surveillance Surveys (BSS) — Scope 6 Phase I Districts

Target group	Percent Sample sizes	T1	T2	95% CI T1 (Min,Max)	95% CI T2 (Min,Max)	Sig	Total "N"
Direct	% ("N")	20.0 105	29.7 74	0.123 0.277	0.193 0.401	0.133	79
Indirect	% ("N")	23.2 142	14.1 177	0.163 0.301	0.090 0.192	0.036 *	319

The BSS also asked single and married women about their sex behavior in the past year This was done discreetly through anonymous, self-administered portions of the questionnaire Despite anecdotal information that single women in Bangkok are increasingly sexually active, the BSS found stable but relatively low levels of sexual intercourse

Figure 6 and the accompanying table show that about 12% of both blue collar and white collar single women were sexually active in 1993-94. Only 4% of female vocational students reported having sex. These are probably underestimates, and in-depth data collection techniques without written forms would probably produce more complete information. The BSS data suggest what the minimum levels are in these populations. Married women are also part of the sexual network through the behavior of their husbands and their own previous marriages. Although condom use for contraception has traditionally been very low in Thailand, reported condom use for last sexual encounter among married women is quite high. Nearly 20% of office workers and 8% of service workers reported using a condom at last sexual encounter (Figure 7).

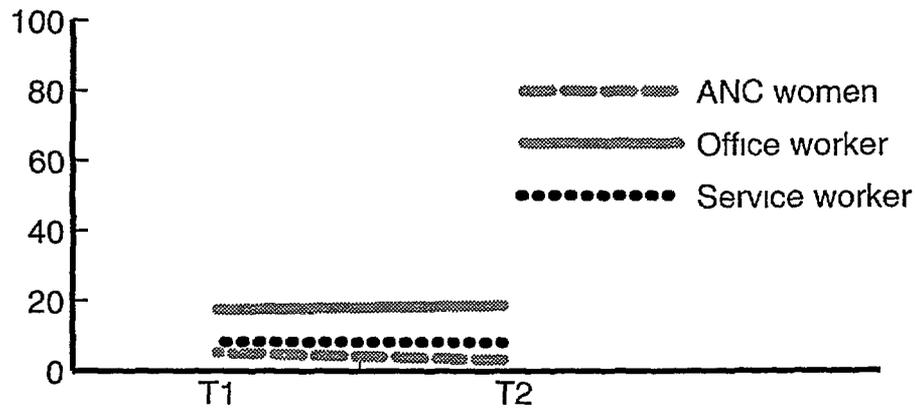
Figure 6
Percent single women who had sex
in past year (from all single female)



Source: Behavioral Surveillance Surveys (BSS) — Scope 6 Phase I Districts

Target group	Percent Sample sizes	T1	T2	95% CI T1 (Min,Max)	95% CI T2 (Min,Max)	Sig	Total "N"
Service worker	% ("N")	7.6 172	11.7 196	0.036 0.116	0.072 0.162	0.178	368
Office worker	% ("N")	13.9 187	11.5 183	0.089 0.189	0.069 0.161	0.483	370
Vocational student	% ("N")	4.4 296	3.7 299	0.021 0.067	0.016 0.058	0.658	595

Figure 7
Percent married women used condom
for last sex



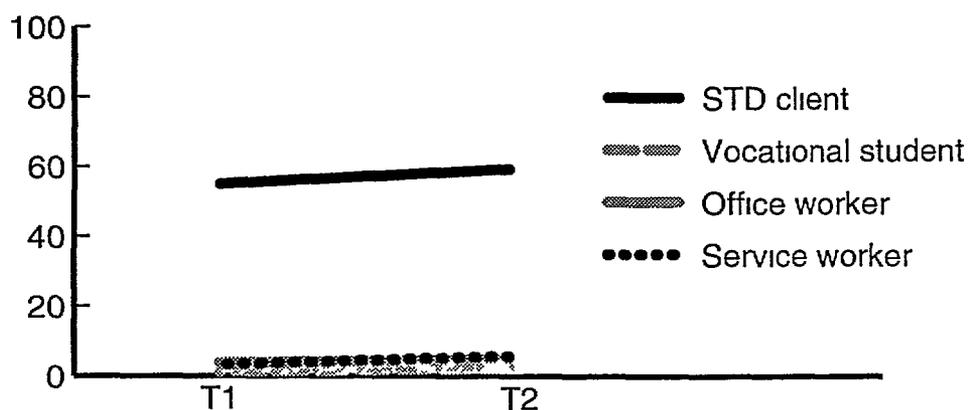
Source Behavioral Surveillance Surveys (BSS) — Scope 6 Phase I Districts

Target group	Percent Sample sizes	T1	T2	95% CI T1 (Min,Max)	95% CI T2 (Min,Max)	Sig	Total "N"
Service worker	%	8.3 ("N")	8.1 156	0.040 186	0.042 0.126	0.928 0.120	34
Office worker	%	17.4 ("N")	18.6 46	0.064 59	0.087 0.284	0.8686 0.285	105
ANC women	%	5.2 ("N")	3.1 289	0.026 290	0.011 0.078	0.2078 0.051	579

Sexually transmitted disease and treatment seeking.

The BSS tool can also be used to assess levels and trends in self reported STDs when more sophisticated prevalence surveys and diagnostics are not available. Men in all three groups (male STD clinic clients excluded) report either urethral discharge or a genital ulcer in the year prior to the survey. The levels are below 6% and are similar for blue-collar and white-collar males (Figure 8). In Bangkok, standard STD diagnosis and complete treatment can be obtained at government STD clinics. However, for a variety of reasons many patients prefer to obtain services from the private sector, where diagnosis and treatment may be less complete. Interventions in Bangkok are trying to increase use of government outlets. When seeking treatment for STDs, a significantly increasing proportion of indirect CSWs are using government services (Figure 9). The pattern for direct CSWs did not change over rounds.

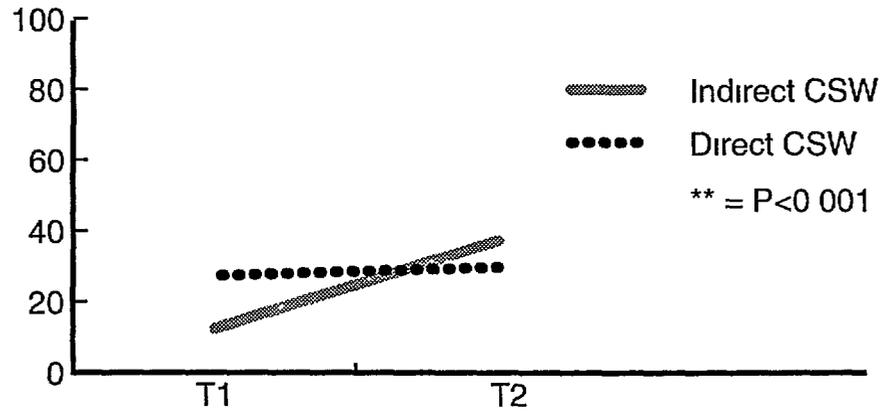
Figure 8
Percent males who has STD symptoms
in past years



Source Behavioral Surveillance Surveys (BSS) — Scope 6 Phase I Districts

Target group	Percent Sample sizes	T1	T2	95% CI T1 (Min,Max)	95% CI T2 (Min,Max)	Sig	Total "N"
Service worker	% ("N")	3.2 374	5.8 503	0.014 0.050	0.038 0.078	0.070	877
Office worker	% ("N")	3.7 300	4.7 300	0.016 0.030	0.023 0.058	0.530 0.071	60
Vocational student	% ("N")	1.0 299	2.3 300	0.000 0.021	0.006 0.040	0.203	599
STD client	% ("N")	55.0 242	59.3 209	0.487 0.613	0.526 0.660	0.349	45

Figure 9
Percent CSWs who seek treatment from government STD clinic
(from CSWs who seek medical treatment)



Source Behavioral Surveillance Surveys (BSS) — Scope 6 Phase I Districts

Target group	Percent Sample sizes	T1	T2	95% CI T1 (Min,Max)	95% CI T2 (Min,Max)	Sig	Total "N"
Direct CSW	%	27.3	29.8	0.194	0.200	0.697	205
	("N")	121	84	0.352	0.396		
Indirect CSW	%	12.4	37.3	0.056	0.264	0.000	164
	("N")	89	75	0.192	0.482		

Summary.

The BSS suggests that certain types of relationships need further in-depth study, as they have implications for improving interventions. Because of the need for confidentiality and anonymity, it is not possible to record the name and address of a respondent for further interview. Instead, in-depth follow-up must occur with a qualitative instrument some time shortly after the BSS interview. Referral coupons for a telephone conversation might be one approach.

The following types of individuals should be interviewed at greater length to help define the nature of their sexual relationships. This will provide prevention programs with greater insight into the sex-networking dynamics and prevention solutions that are constantly evolving in the age of AIDS. Individuals in the following relationships are appropriate for in-depth study:

- CSWs with non-paying partners, especially indirect CSWs
- Married women who report condom use by male partners
- STD clinic male clients whose last unprotected sex was not with a CSW



Conclusions

How are these data useful to AIDSCAP and its counterpart agencies?

- First, they provide evidence to managers and policy makers that risk behavior exists at significant levels and across a range of socioeconomic levels, among men and women, single and married, teenagers, youth, and mature adults
- Second, the data help provide a baseline by which to measure the impact of comprehensive prevention programming for the Bangkok population
- Third, the data can be (and have been) used immediately by those conducting outreach communication and mass media campaigns. One important example is the level of single women who are sexually active yet not using condoms. The data from the BSS convinced the CBP program to direct outreach services and mass media to single women who are not commercial sex workers
- Finally, the BSS provides cross-sectional behavioral snapshots of the changing Bangkok population. This should help guide future strategies for anticipating vulnerable populations before an outbreak is documented by serological screening for HIV. Only in this way can programs keep a few steps ahead of this remarkably rapid epidemic

AIDSCAP staff would like to hear from others who have experience implementing behavioral surveillance surveys in other parts of the world. Please address correspondence to

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Appendices

Appendix I

Illustrative Sample Size Calculation Methodology for Round 3

For all target groups, it is essential to have adequate sample sizes of subgroups engaging in the behavior(s) of interest. For example, one of the main goals of AIDSCAP is to increase condom use. In order to analyze this behavior, the sample requires adequate numbers of men who report visiting a CSW in the past year or, among single women, those who report having sex in the previous year. The following sample sizes have been calculated based on data from other surveys of risk behavior in the Bangkok population. Based on the expected level of response, the required sample size can be back-calculated to ensure a minimum number of eligible respondents. In the cases below, the desired minimum number of eligible respondents in the specific behavior of interest was 50. This amount permits reasonable statistical analysis of sub-groups to compare changes over time.

1. Male vocational students

Important groups to analyze

- (a) CSW customers in past year
Approximate number 62% visited CSWs, of which 48% visited in the past year
- (b) Men with other partners
Approximate number 65% had sex with someone other than CSW in past year

"N" \times 400 will yield "N" \times 120 for group (a)

"N" \times 260 for group (b)

2. Female vocational students

Important groups to analyze

- (a) Single women who had sex in the past year
Approximate number 99% are single, of which 13% ever had sex,
35% of those had sex in the past year

“N”=1,300 will yield “N”=60 for group (a)

3. Male service workers

Important groups to analyze

- (a) CSW customers in past year
Approximate number 68% had visited a CSW of which 40% did in
the past year

- (b) Men with other partners (not CSWs)
Approximate number 20%

“N”=400 will yield “N”=109 for group (a)

“N”=80 for group (b)

4. Single female service workers

Important groups to analyze

- (a) Women who had sex in past year
Approximate number 12% ever had sex of which 62% did in
previous year

“N”=800 will yield “N”=60 for group (a)

5. Antenatal Clinic (ANC) clients

Important groups to analyze

- (a) Women who had sex in previous year
Approximate number 100%

“N”=400 will yield “N”=400 for group (a)

6. STD males

Important groups to analyze

- (a) Men who report STD symptoms
Approximate number 100%

"N"=400 will yield "N"=400 for group (a)

7. Indirect CSWs

Important groups to analyze

- (a) CSWs with customers in the past year
Approximate number 100%

"N"=400 will yield "N"=400 for group (a)

8. Direct CSWs

Important groups to analyze

- (a) CSWs with customers in the past year
Approximate number 100%

"N"=400 will yield "N"=400 for group (a)

Appendix II

Behavioral Surveillance: Questionnaire sections for the data in the accompanying graphs and tables

THIS SECTION IS FOR MEN ONLY

Q 203 The following questions are very personal. They are about such things as sex and condoms. Please tell me the truth about all these, but don't worry about revealing personal information because everything is completely confidential. No one will be able to find out what you tell me.

Q.204 Have you ever had sexual intercourse with a woman before?

Yes	1
No (Skip to Q 601)	2
No answer (Skip to Q 601)	9

Q.205 How old were you the first time you had sexual intercourse with a woman?

Age (years)	—
Don't know, can't remember	88
No answer	99

Q.206 Have you ever used condoms?

Yes	1
No (Skip to Q 401)	2
No answer (Skip to Q 401)	9

Q.207 Has a condom you were using ever broken while having sex?

Yes	1
No	2
Don't know/can't remember	8
No answer	9

**MALE QUESTIONNAIRE SECTION 4:
SEXUAL INTERCOURSE WITH PROSTITUTE**

Now I am going to talk to you about people who sell sex for money. This includes women who work in brothels, tea houses, and massage parlors as well as bars, restaurants and coffee shops.

Q.401 Have you ever had sex with a prostitute?

Yes	1
No (Skip to Q 409)	2
No answer (Skip to Q 409)	9

Q.402 When was the last time you had sex with a prostitute?

No of months	—
Don't know/can't remember	888
No answer	999

If the response is more than 12 months, probe

“Try to think back to within the past year. Did you have sex with a prostitute during the last year?”

Yes	1
No (Skip to 409)	2
Don't know/can't remember (Skip to Q 409)	8
No answer (Skip to Q 409)	9

Q.403 Where did you go to find this prostitute?

Member club	01
Hotel	02
Brothel	03
Tea house	04
Traditional massage	05
Massage	06
Barber Shop	07
Restaurant	08
Food garden	09
Coffee shop	10
Cafe	11

Pub	12
Cocktail lounge	13
Discotheque	14
Nightclub	15
Bar	16
Beer-bar	17
Go-go bar	18
Ramwong bar	19
Call girl	20
On the street	21
Other (specify)	
Don't know/can't remember	88
No answer	99

Q.404 How much did you pay to sleep with her?

Amount of money	—
Don't know/can't remember	8888
No answer	9999

Q.405 Where did you have sex with her?

Her work place (Skip to Q 407)	1
Other place	2
No answer	9

Q.406 If not in her work place, where did you have sex with her?

Hotel	1
Guest house	2
Motel	3
Dormitory	4
Other (specify)	—
Don't know	8
No answer	9

Q.406.1 Did you use a condom that time?

Yes	1
No	2
Don't know/can't remember	8
No answer	9

Q.407 Re-check Q.402 if the response to that item was more than three months ago; then skip to Q.409.

Q.408 In the last three months, how many prostitutes have you had sex with?

No of prostitutes	—
Don't know/can't remember	88
No answer	99

Q.408.1 (From Q.408) How many of these CSW partners did you use condoms with?

No of CSWs	—
Don't know/can't remember	88
No answer	99

Q.409 During the last year, aside from prostitutes, have you had sex with any other women such as your wife or girlfriend?

Yes	1
No (Skip to Q 501)	2
No answer (Skip to Q 501)	9

Q.410 How many partners?

No of women	—
Can't remember	88
No answer	99

Q.411 Please tell me what is the relationship between you and those women?

Circle the code for every response

Wife	1
Girlfriend/fiancee	2
Friend	3
Known person	4
Other (specify)	—
No answer	9

Q.416 During the past three months, how many times have you had sex with (third woman mentioned in Q.411)?

No of sexual episodes	—
Don't know/can't remember	88
No answer	99

Q.415 During the past three months when you have had sex with your (third woman mentioned in Q.411) how many times did you use a condom?

No of times used a condom	—
Don't know/can't remember	88
No answer	99

SECTION 5: STDs

Q 501 Now I would like to talk to you about illnesses you can get by having sex

Q.502 Have you ever experienced any pain or burning during urination?

Yes	1
No (Skip to Q 506)	2
No answer (Skip to Q 506)	9

Q.503 When was the last time you experienced pain or burning during urination?

No of months ago	—
Don't know/can't remember	88
No answer	99

Q.504 Did you seek medical treatment for this problem?

Yes	1
No (Skip to Q 506)	2
Don't know/can't remember (Skip to Q 506)	8
No answer (Skip to Q 506)	9

Q.505	Where did you go for this examination?	
	STD clinic	1
	MCH clinic	2
	FP clinic	3
	General clinic	4
	Gov't private hospital	5
	Other (specify)	—
	Don't know/can't remember	88
	No answer	99

Q. 506	Have you ever experienced any discharge during urination?	
	Yes	1
	No (Skip to Q 601)	2
	Don't know/can't remember (Skip to Q 601)	8
	No answer (Skip to Q 601)	9

Q.507	When was the last time you experienced discharge during urination?	
	No of months ago	—
	Don't know/can't remember	88
	No answer	99

THIS SECTION IS FOR WOMEN ONLY

Q 203 The following questions are very personal. They are about such things as sex and condoms. Please tell me the truth about all these, but don't worry about revealing personal information because everything is completely confidential. No one will be able to find out what you tell me.

Q. 204	Have you ever had sexual intercourse with a man before?	
	Yes	1
	No (Skip to Q 601)	2
	No answer (Skip to Q 601)	9

Q. 205 How old were you the first time you had sexual intercourse with a man?

Age (years)	—
Don't know, can't remember	88
No answer	99

Q. 206 Has the man you had sex with ever used a condom with you?

Yes	1
Never (skip to Q 301)	2
Can't remember (skip to Q 301)	8
No answer	9

Q. 301 When was the last time you had sex?

No of months ago	—
Don't know/can't remember	88

Q. 302 What was your relationship with the man?

Husband	1
Lover/fiance	2
Boyfriend	3
Known person	4
Other (specify)	

Q. 303 The last time you had sex with him did (partner mentioned in Q. 302) use a condom?

Yes	1
No (Skip to Q 305)	2

Q.304 Whose idea was it to use the condom?

My idea	1
His idea	2
Both	3
Other (specify)	
Don't know/can't remember	8

Q. 305 During the last three months, how many times did you have sex with (partner mentioned in Q. 302)?

(Estimate where necessary)

No of sexual intercourse	—
Don't know/can't remember	88

Q. 306 How many of those times did you and (partner mentioned in Q. 302) use a condom?

No of times used a condom	—
Don't know/can't remember	88

Q. 307 How long have you been having sex with (partner mentioned in Q. 302)? (Estimate where necessary)

No of months ago	—
Don't know/can't remember	88

Q. 308 During the past 12 months have you had sex with anyone else beside (partner mentioned in Q. 302)?

Yes	1
No	2
Don't know	9

FEMALE COMMERCIAL SEX WORKERS QUESTIONNAIRE

Q.201 Did you have any sexual intercourse with customers last night?

Yes (Skip to Q 203)	1
No	2
No answer	9

Q.202	When was the last time you had sexual intercourse with customers?	
	No of days/nights ago	—
	Don't know/can't remember	88
	No answer	99

Q.203	How many customers did you have the last working day?	
	No of customers	—
	Don't know	88
	No answer	99

Q.204	How many customers (from Q.203) used condoms with you?	
	No of customers who used condoms	—
	Don't know	88
	No answer	99

IF NO CUSTOMERS USED CONDOMS SKIP TO Q 207

Q.205	Did your last customer use a condom?	
	Yes	1
	No (Skip to Q 207)	2
	Don't know (Skip to Q 207)	8
	No answer (Skip to Q 207)	9

Q.213	During the past one year (12 months), have you ever had sexual intercourse with men other than your customers?	
	Yes	1
	No (Skip to Q 301)	2
	Don't know (Skip to Q 301)	8
	No answer (Skip to Q 301)	9

Q.214	If yes, when was the last time you had sex?	
	No of nights ago	—
	Don't know	88
	No answer	99
Q.215	Did he use a condom when he had sexual intercourse with you at that time?	
	Yes	1
	No	2
	No answer	9
Q.216	In general, when you have sexual intercourse with him how often does he use condoms?	
	Never uses	1
	Once in a while (rarely used)	2
	Sometimes	3
	Most of the time	4
	Every time	5
	Other (Specify)	—
	Don't know	8
	No answer	9

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