Repeatedly measuring risk behaviours over time in carefully selected population groups that are both at elevated risk of HIV infection and influential to the growth of the epidemic highlights not only where the epidemic has been, but also where it is going, and how programme managers can intervene.

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BEHAVIORAL SURVEILLANCE SURVEYS ELICIT IMPORTANT INFORMATION ON GROUPS ESPECIALLY VULNERABLE TO HIV INFECTION, SUCH AS THESE YOUNG NEPALESE SEX WORKERS AT THE SONAGACHI BROTHEL IN CALCUTTA, INDIA.

# MONITORING TRENDS IN HIV-RISK BEHAVIOURS: EXPERIENCE USING THE BEHAVIOURAL SURVEILLANCE SURVEY METHODOLOGY IN TAMIL NADU, INDIA, AND SENEGAL


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# MONITORING TRENDS IN HIV-RISK BEHAVIOURS: EXPERIENCE USING BEHAVIOURAL SURVEILLANCE SURVEY METHODOLOGY IN TAMIL NADU, INDIA, AND SENEGAL

## INTRODUCTION

Monitoring trends in HIV-risk behaviours is essential to understanding the underlying dynamics of HIV epidemics. Two previous UNAIDS Best Practice Case Studies have effectively demonstrated the value of such monitoring to explain and clarify factors influencing the ongoing worldwide HIV/AIDS pandemic.[1,2] These prior case studies from Uganda and Thailand show that an understanding of the sexual behaviours of a variety of target populations contributes to national AIDS prevention programme efforts in the following ways:

- Behavioural data serves as an early warning system for HIV and sexually transmitted infections (STIs).
- Behavioural data inform effective programme design and direction.
- Tracking behaviour improves programme evaluation.
- Behavioural data can help explain HIV transmission dynamics and variation in prevalence.
- Changes in behaviour help explain changes in HIV incidence.

While the Ugandan and Thai studies present and explain these and other benefits of conducting behavioural surveillance, they do not specifically address the most efficient, effective and sustainable means for its implementation. The objective of this case study, therefore, is to focus on behavioural surveillance surveys (BSSs) of populations that are highly vulnerable to HIV infection, including marginalized and difficult-to-access groups, and to discuss in detail the implementation and success of BSSs in two diverse settings: Tamil Nadu, India, and Senegal. These examples will also highlight the lessons learned from earlier efforts to institutionalize BSSs as a sustainable approach for national AIDS programmes.

## BACKGROUND

Behavioural monitoring in the context of national AIDS programmes has a short history. While pre- and post-intervention research designs and one-time behavioural surveys have been plentiful,[3-6] systematic, long-term surveillance of HIV-risk behaviours is rare. Few industrialized and even fewer non-industrialized countries have conducted multiple and systematic large-scale HIV-related behavioural surveys over time, either in the general population or in specific target groups.[7-12] Large-scale Demographic and Health Surveys (DHS), while not focused on HIV-risk behaviours, have none the less demonstrated the feasibility and utility of this approach, capturing general population trends

related to contraceptive availability and key family planning indicators in a wide range of non-industrialized countries worldwide.

During the period 1989 to 1998, many national AIDS programmes conducted national surveys to define basic indicators of sexual-partner networking (that is, patterns of risk behaviour, including numbers and types of partners) and condom use related to HIV risk among the general population.[5,13,14] There are considerable problems with the implementation of these studies, including the under-representation of young men, bias towards urban residents and limited sample sizes (n<3000), which do not allow disagregation of data beyond the large 15–49 age range.[5] Other limitations of these studies include the limited information collected on sexual networks and the need for more specific information on partner characteristics, such as duration of relationship, types and frequency of sexual behaviours with each partner and geographical distribution of partners.

**General population surveys** Large surveys containing a "module" devoted to HIV/AIDS have also been conducted by a variety of international and national organizations for population and family planning studies. These studies generally exhibit many of the constraints described above. In addition, they often confuse respondents by introducing questions on condom use for STI prevention after long sections focused on contraceptive use and by poorly defining multiple-partner classifications after sets of questions addressing family planning with regular partners.

The lack of success of these approaches has been particularly evident in their inability to gather information on high-risk individuals (for example, female sex workers and their partners, injecting drug users and men who have sex with men) and their lack of detailed information on the behaviours and protective strategies adopted by specific age groups (for example, 15- to 19-year-olds, 20- to 24-year-olds and 25- to 29-year-olds. By this point in the pandemic it is well known that these are the individuals and age groups most affected by the HIV epidemic, and that very different behaviours and risk reduction strategies characterize each age group.

**High-risk and vulnerable population surveys** Focused research on specific high-risk and vulnerable populations has been conducted in many non-industrialized countries. However, these studies often use incomparable methodologies and indicators and poorly characterize the populations to which their results are generalizable. In addition, many of these studies are conducted within the context of a specific programme evaluation and are therefore confined to particular geographical zones or to the clients of the interventions. A further weakness of these studies is that they are constrained by project funding, and therefore collect data only at baseline and at a single follow-up point in time. Assessing broader trends (in terms of population groups or time periods) is usually beyond the scope of such research.

**Qualitative, ethnographic and hybrid research approaches** In response to these limitations, many researchers have emphasized qualitative and ethnographic studies exploring in detail the contextual factors related to HIV risk.

While these studies have an indisputably important role to play in explaining the dynamics of the HIV epidemic and informing strategic programme approaches, they are not suitable as repeated measures to track and explain HIV trends because they are neither representative nor reproducible. Hybrid approaches, such as small-scale target population quantitative studies, have had some success,[16] but have also been criticized for their lack of strict sampling methods and non-standardized indicators, which results in their being neither generalizable nor replicable.

**Conclusions** Overall, experience in measuring HIV-risk behaviours over the last 10 to 15 years has led to several conclusions and lessons learned.[17,18] At the core of these lessons is the recognition that behavioural data-collection systems for national programmes should have at their foundation two repeated, cross-sectional methods:

- one covering the general population using a household-based sampling methodology
- one focusing on selected population groups using non-household-based sampling methods (i.e., BSS)

The specific balance between these two methods and the use of complementary qualitative methods will clearly vary by country. The overall design of the behavioural monitoring system will reflect the needs of the national AIDS programme as well as the stage of the epidemic, the response so far and the political and social environment of each country.

Much as HIV sero-sentinel surveillance systems function to monitor trends in HIV prevalence, behavioural surveillance provides programme managers with essential and timely information to predict the future course of the epidemic. Repeatedly measuring risk behaviours over time in carefully selected population groups that are both at elevated risk of HIV infection and influential to the growth of the epidemic highlights not only where the epidemic has been, but also where it is going, and how programme managers can intervene.

General population household-based studies have a more established history and use in the study of HIV/AIDS-related risk behaviour, whereas targeted population, non-household-based studies are more recent innovations. Therefore, this case study will focus on the latter, presenting the experience and lessons learned to date from the implementation of such studies.

### BEHAVIOURAL SURVEILLANCE SURVEYS IN SELECTED POPULATIONS: AN OVERVIEW

Similar in philosophy to HIV-seroprevalence sentinel surveillance, which collects repeated measures of HIV-seroprevalence in selected populations in order to assess trends, BSSs are repeated, cross-sectional behavioural surveys designed to collect information on trends in HIV-risk behaviours in selected sub-population groups at regular intervals.

Three main questions immediately emerge when considering the implementation of BSSs in national AIDS programmes: who should be included, how shall they be reached (or sampled) and what results can be expected? Clearly, the answers to these questions lie in the detailed context of a specific national programme and the dynamics of the HIV/AIDS epidemic it faces. However, several basic principles can be considered in the overall balance of designing a behavioural surveillance system.

**Whom to target** Targeted behavioural surveys in sub-populations generally aim to collect data on groups whose behaviour may put them at high risk of HIV infection, but who are normally under-represented in household survey approaches—particularly young, mobile and marginalized populations. These groups often drive the growth of the epidemic in its early stages and continue to fuel more mature epidemics, while providing transmission routes for HIV into the broader population. Thus, reducing the level of risk behaviours among these individuals is absolutely essential to effective national prevention efforts.

The choice of groups will vary according to the risk situation in each country and the needs of the various individuals, communities and organizations that may use the results. An example of the diversity of populations included in BSSs in a few selected countries is illustrated in Table 1 below.

TABLE 1

**Examples of Behavioural Surveys in Selected Population Groups**

| Country | Female | Male |
|---|---|---|
| **Cambodia** | Sex workers<br>Beer vendors<br>Working women | Military/Police<br>Motorcycle drivers<br>Vocational students |
| **Kenya** | High-paid sex workers<br>Low-paid sex workers<br>Youth | Bus drivers<br>Youth |
| **Indonesia** | Brothel-based sex workers<br>Non-brothel based sex workers<br>Factory workers<br>High school students | Truck drivers<br>Sailors and seaport workers<br>Factory workers<br>High school students |
| **Senegal** | Registered sex workers<br>University students<br>Secondary school students<br>Domestic housekeepers<br>Women in income-generating groups<br>Office workers | University students<br>Secondary school students<br>Truck drivers<br>Apprentices in the informal sector<br>Workers |
| **Thailand** | Direct sex workers<br>Indirect sex workers<br>Factory workers<br>Vocational students | Army conscripts<br>Factory workers<br>Vocational students |

In countries where little behavioural information is available or target populations are not clearly defined, BSSs might include an initial pilot phase with more in-depth formative research to, for example, establish the characteristics of clients of sex workers. Alternatively, the pilot phase may be built into the first round of data collection, with multiple target populations included. Some of these target populations may be dropped in later rounds or included only in alternate waves.

The key requirements for successful surveys in targeted groups are definable populations and workable sampling frames. It is important that a chosen population is at least minimally stable and cohesive so that it is possible to describe the population and repeat surveys in the group over time in order to measure trends. Gathering information on HIV-risk behavioural trends in a population with rapid, complete turnover and constantly changing demographic dynamics would clearly be impossible to interpret.

**How to sample BSS target populations**
Populations such as sex workers may contain sub-populations with more or less stability (for example, brothel-based and non-brothel-based workers). Similarly, men who have sex with men may be easier to identify and sample in areas where there are organized social settings, such as gay bars, than in places where male–male sex is highly stigmatized and clandestine. In these situations, careful ethnographic research must be used to describe the multiple settings in which risk behaviours occur and to create a representative list of locations and estimate of populations (sample frame) accessible at each site.

Where the locations of risk behaviours or populations-at-risk are rapidly changing, reconstruction of the sample frame may be required prior to each survey round. BSSs, unlike HIV-seroprevalence surveillance, do not require that specific site locations be maintained in each round. While the maintenance of sites is generally preferable from a practical point of view, methodologically it is not absolutely required.

Sampling approaches should be consistent and repeatable so that trends in the selected populations can be measured over time. To improve the quality of the results, probability sampling is encouraged whenever possible.

**What can be measured?** The repeat cross-sectional methodology of target-group-based behavioural surveys provides programmes with more immediate short-term indications of progress, as opposed to epidemiological data such as HIV-prevalence trends, in which the impact of a prevention programme is not evident for several years and is likely to be influenced by many other factors unrelated to interventions. Specific indicators related to condom use, the number of non-regular (or casual) partners, awareness of STI symptoms and appropriate treatment approaches can all be included in BSS systems. (Recommended indicators are included in Appendix I.)

It is important to keep in mind that programme evaluation in general, and behavioural surveillance research in particular, are often expected to answer more questions than is possible. For behavioural surveillance to be successful, certain trade-offs often must be made between the objectives of a surveillance system, an evaluation system and an intervention research system. Each context implies a different set of methodological questions, strengths and weaknesses and possible outcomes of interest. As with any research endeavour, clearly defining and articulating the objective of behavioural surveillance in a participatory manner is essential for its success.

**Conclusions** The experience of conducting target-population BSSs in nearly a dozen countries worldwide has proven the value of the approach as a best practice methodology and an essential complement to the information provided by general-population behavioural and biological surveys. However, the experience of implementing BSSs in these settings has also demonstrated the importance of tailoring the strategy to the local conditions and needs. The remainder of this case study will focus on two examples of how the BSS approach was tailored in the diverse settings of Tamil Nadu, India, and Senegal. While the examples illustrate the common steps taken in designing and implementing the methodology, they also show how the requirements of each programme demanded different specific details.

## BSS IN TAMIL NADU, INDIA

### Overview of BSS planning and implementation

Planning for the BSS in the Indian state of Tamil Nadu began well before the first round of data collection, which was carried out in 1996. The first step was to build consensus by involving all stakeholders from the earliest stages. Planning meetings and workshops were conducted by the United States Agency for International Development (USAID)-funded AIDS Prevention and Control Project (APAC) of Voluntary Health Services in Chennai (formerly Madras), Tamil Nadu, India, in collaboration with local and international non-governmental organizations (NGOs,) university researchers and representatives from the government and donor communities. Participants in these meetings carefully examined the available information related to HIV/AIDS seroprevalence and risk behaviours and identified the additional information required to increase understanding of the dynamics of the HIV epidemic in Tamil Nadu and determine future needs. These meetings led to stakeholder agreement on how to best implement BSS to complement the HIV sentinel surveillance system directed by the Tamil Nadu State AIDS Control Society (a nongovernmental institution set up by the state government) and which target groups to include.

### Step 1: Choosing target groups for BSS

A variety of epidemiological, evaluation, accessibility and political-cultural factors affected the choice of target groups in Tamil Nadu. The specific characteristics of the Tamil Nadu epidemic—one of the most severe in India—pointed to sex workers as a prime group to target. Existing behavioural research, both qualitative and quantitative, suggested that clients of sex workers came from various social and economic strata in the population. In order

to capture trends from a manageable variety of these strata, as well as to confirm levels of risk beyond anecdotal data, the following male groups were chosen:

- truck drivers and their helpers
- male factory workers
- male students (late high school/ early college)

One additional group, male STI clinic attendees, was added to obtain information on the characteristics of individuals who attend government clinics. This group was added despite recognition that tracking its behavioural trends would be problematic due to the changing profile of STI clinic attendees and the correlation between STIs and behavioural risks. (In other words, men with reduced risk behaviours—and consequently reduced risk of having an STI—would drop out of the population, changing the group dynamic over time).

In addition to sex workers, two groups were chosen to track risk in female sub-population groups: female students (same definition as male students) and female factory workers. These groups were selected because qualitative research results suggested that they were more vulnerable to HIV infection as a result of early sexual initiation, unstable partnerships and the possibility of indirect commercial and casual sex (primarily among the factory workers).

**Step 2: Defining the sampling approach**

A two-stage cluster sampling approach was used. In the first step, a list was drawn up of 48 priority urban areas in Tamil Nadu. Ten of these were chosen as areas where large concentrations of the sample target groups were located. In each area, a cluster sample of sites was selected from among all known sites. The minimum number of sites was set at three in each town. With the assistance of nongovernmental and governmental organizations familiar with the sample groups, a mapping exercise was conducted to locate sites and to make reasonable estimates of the sizes of all target groups in all sites in the specified towns.

Because the purpose of the BSS is to measure changes over time, sample sizes were calculated to detect a certain level of change. For the purposes of the BSS in Tamil Nadu, an absolute change of between 10 and 15 percentage points was considered appropriate. Since not all individuals in every sample group reported risk, sample sizes were inflated to ensure that the sample size requirements for the variables of interest could be met. Further sample size inflation was calculated to account for the design effect of a cluster sample.

For the first wave of data collection, baseline levels of risk were unknown in many of the groups (for example, students and factory workers) and had to be estimated for sample size calculations. The sample sizes were updated for the second wave of data collection using the actual data from the first wave, which allowed for more appropriate sample sizes. Table 2 illustrates the estimated percentage of each target group who had non-regular sex partners (which were used to calculate inflated sample sizes) and the final sample sizes of the first wave.

TABLE 2

**Selected population groups, levels of risk behaviour and estimated sample sizes for the first round of BSS in Tamil Nadu, India**

| Sample Group | Estimated % Who Had Non-Regular Sex Partners | Sample Size |
|---|---|---|
| Female sex workers | 100 | 400 |
| Male STI clinic attendees | 60 | 600 |
| Truck drivers and helpers | 60 | 600 |
| Male factory workers | 25 | 1300 |
| Female factory workers | 20 | 1600 |
| Male students | 20 | 1700 |
| Female students | 10 | 6000 |

**Step 3: Determining behavioural indicators**
In collaboration with USAID and the AIDS Control and Prevention (AIDSCAP) Project of Family Health International (FHI), and drawing upon international experience in indicator development, the APAC Project chose a robust set of nine project indicators. These indicators included four knowledge indicators, two behavioural indicators of non-regular sex partnerships and condom use, one risk perception indicator, one STI symptom indicator and one STI treatment-seeking behaviour indicator (see Appendix I).

The project indicators were a small subset of a variety of knowledge and behavioural variables that were included in the target-group-specific questionnaires. The questionnaires were adapted and pretested from a core set of instruments for use with the BSS methodology. These instruments have been developed from the cumulative experience of hundreds of studies worldwide, and they provide standardized indicators suitable for comparison with other programmes both within and outside India.

**Step 4: Analyzing and disseminating results**
The BSS in Tamil Nadu was conducted in 1996, 1997 and 1998, under the auspices of the APAC Project, by the Asian Information, Marketing & Social Research (AIMS) research organization. The most important results showed significant decreases ($p < .05$) in non-regular partnerships and increases in condom use—two factors that have a direct impact on the spread of the epidemic.

Results show that two key male population groups—truck drivers and factory workers—reported increases in condom use with both their commercial sex partners and other non-regular sex partners. Truck drivers reporting that they had used a condom during their most recent sexual intercourse with a sex worker increased from 55 per cent in 1996 to 66 per cent in 1997, and up to 75 per cent in 1998. They reported similar increases in condom use with other non-regular partners, from 44 per cent in 1996 to 66 per cent in 1998.

Among male factory workers—who are more representative of the general population—condom use with sex workers increased from 28 per cent in 1996 to 41 per cent in 1997 and 67 per cent in 1998. The factory workers likewise reported an increase in condom use with other non-regular sex partners—from 17 per cent in 1996 to 50 per cent in 1998.

These reported increases in condom use were corroborated by measurements of condom use among the sex worker sample in the BSS. Comparisons of the three data points across time indicated increases in reported condom use among sex workers with their last client—from 56 per cent in 1996 to 80 per cent in 1998.

The BSS also indicated significant change in male patronage of female sex workers. Twenty-five per cent of truck drivers reported visiting at least one sex worker during the past year in 1998, down from 38 per cent in 1996 and 27 per cent in 1997. Factory workers also reported lower levels of commercial sex: 7 per cent in 1996, 4 per cent in 1997 and 5 per cent in 1998. (The differences in the 1997 and 1998 levels are not statistically significant.)

Other non-regular sexual partnerships were also reported to have declined. Truck drivers reporting having had at least one non-regular sex partner in the past year decreased from 48 per cent in 1996 to 32 per cent in 1998. Factory workers also indicated reduced risk, from 15 per cent in 1996 to 9 per cent in 1998. Analysis of HIV-risk behavioural trends was accomplished using the chi-square for trend. Selected results are illustrated in Figures 1 and 2.

FIGURE 1

**Condom use during commercial sex among select target populations, Tamil Nadu, India, 1996–1998**

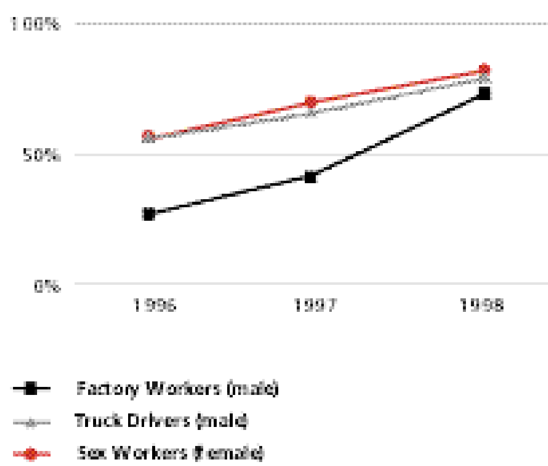
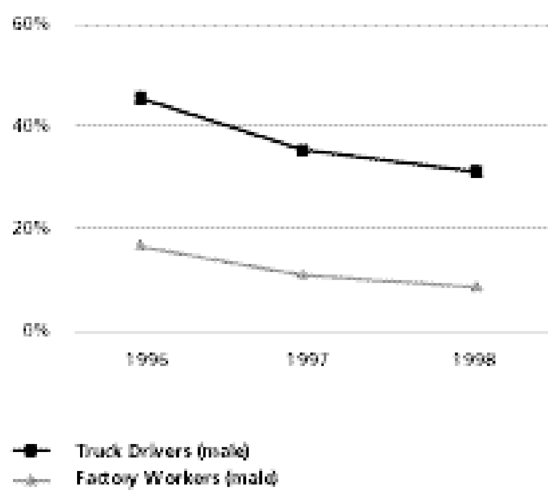



FIGURE 2

**Per cent reporting non-regular partnerships in past 12 months, Tamil Nadu, India, 1996–1998**



The dissemination of the Tamil Nadu BSS results has occurred through multiple channels, including local workshops, state, national and international conferences and detailed publications. The objectives of the dissemination have been to use the Tamil Nadu results to guide programme design, provide donors with evaluation results and explain and anticipate trends in HIV-seroprevalence data.

**Lessons learned from the Tamil Nadu BSS**

- The BSS proved to be an effective tool for monitoring behavioural trends in the Indian state of Tamil Nadu, complementing HIV surveillance.
- Sample sizes need to be recalculated after the initial round of data collection wave to confirm that they are large enough to detect trends.
- Knowledge indicators tend to change quickly and become less useful for evaluation over time. Behavioural risks are more challenging to monitor and change.

The student groups in the Tamil Nadu BSS indicated lower risk than was expected; therefore, they were not included after the second wave. Group coverage and inclusion should be re-examined following each wave. If, for example, some groups exhibit low levels of risks, then tracking risks in that group may no longer be feasible or efficient. Conversely, new data may emerge indicating the population sub-groups that should be included in behavioural surveillance.

## BSS IN SENEGAL

**Overview of planning and implementation of BSS** The HIV epidemic in Senegal can be classified as a concentrated epidemic, with greater than 5 per cent HIV prevalence in so-called core groups (such as sex workers in the case of Senegal) and lower than one per cent prevalence in the general population (usually measured through antenatal clinic attendees, i.e., pregnant women). Very little quantitative information on HIV-risk behaviours was available in Senegal prior to the implementation of BSS in 1997. Only one large-scale population survey had been conducted in the capital, Dakar, in 1989, and limited data relevant to HIV/AIDS was collected from a Demographic and Health Survey (DHS) conducted in 1992.

Senegal was the site of one of the earliest BSS implementations, following successful efforts in Thailand, India and Indonesia. It was the first in Africa, yielding important insights into the implementation of behavioural surveillance in the African setting.

In Senegal, as in Tamil Nadu, the first step in the planning and implementation of the BSS was to build consensus by involving all stakeholders. Planning meetings were conducted in collaboration with the National AIDS Programme and all the major donors working in HIV/AIDS prevention, including the United Nations Children's Fund (UNICEF), the United Nations Development Programme (UNDP), the World Health Organization's Global Programme on AIDS (WHO/GPA), its successor, the Joint United Nations

Programme on HIV/AIDS (UNAIDS), the United States Agency for International Development (USAID) and other bilateral donors. At first some stakeholders were sceptical of the viability of the BSS, but interest grew slowly among the various partners and developed into enthusiastic support as results from the first wave of data collection became available.

**Step 1: Choosing target groups for BSS** Due to the lack of established sampling frames from high-risk populations in Senegal, it was decided to conduct BSS initially among the most easily definable and accessible young and mobile populations (secondary and university students). Because of the paucity of behavioural data on the general population, a male general population group of office workers was also included. Registered sex workers were also accessible, and therefore included.

In hindsight it is clear that the accessibility of the student populations and the general characterization of these groups as particularly "vulnerable" should not have outweighed their relatively low levels of risk behaviours when target groups were chosen. Particularly in the context of a concentrated epidemic, secondary and university students should not have been a high priority in the selection of target populations. In fact, it was the higher-risk groups—registered and non-registered sex workers and their partners (clients)—who would have been most appropriate to target in the initial wave.

Defining the geographical regions to include was also a challenge, as donors were involved in various zones of the country, creating a patchwork of programmes, messages and targeted audiences. Due to the challenges of designing the BSS in this context, many negotiations and compromises were made. The eventual choice of target groups and geographical zones represented a concession to practical constraints without ignoring key criteria for behavioural-surveillance systems.

The first wave of BSS was constructed as a start-up phase, with three female and three male populations chosen in the four main provincial zones of the country (Dakar, Thies, Kaolack and Ziguinchor, together home to more than 50 per cent of the Senegalese population). In the second wave the BSS was expanded to cover some of the harder-to-reach groups believed to have higher levels of risk behaviours, such as truck drivers and male apprentices. Since the main objective of the BSS is to provide trend data, it also covered female workers and provided repeat measures for students and registered female sex workers (FSWs). Data collection was also expanded to the entire country during the second wave, and sample sizes were increased to allow for separate analysis in the major metropolitan zones with a longer history of HIV/AIDS-prevention programmes and the minor zones with less exposure to interventions. Target populations and sample sizes are summarized in Table 3.

TABLE 3

**Senegalese Target Populations and Approximate Sample Sizes**

| | Sex | Target Population | Approx. Sample Size |
|---|---|---|---|
| Wave 1 | Male | Secondary students | 400 |
| | | University students | 500 |
| | | Workers | 400 |
| | Female | Secondary students | 400 |
| | | University students | 500 |
| | | Registered FSWs | 400 |
| Wave 2 | Male | Workers | 500 |
| | | Truck drivers | 900 |
| | | Secondary students | 1100 |
| | | Apprentices | 500 |
| | Female | Young domestic workers | 500 |
| | | Secondary students | 1200 |
| | | Workers | 1200 |
| | | Women's cooperative members | 1200 |
| | | Registered FSWs | 650 |

**Step 2: Defining the sampling approach and frequency of data collection** Sampling approaches in Senegal generally followed the model developed for the first BSS in Thailand. Considerable effort was expended in developing sampling frames for every target population, and much was learned about how to sample hard-to-reach, hidden populations. During this period of BSS methodology development, the focus in sampling was increasingly on the use of probability methods whenever possible and, where they were not possible, the use of random, systematic, repeatable approaches.

Many of the BSS target groups chosen for the initial wave proved to have low levels of risk behaviours. This meant that measuring changes in behaviour would be difficult and would require very large sample sizes. Consequently, it was decided during the second wave to conduct future waves among low-risk groups on a biannual basis, allowing greater changes to occur in the context of ongoing interventions. For higher-risk groups, it was decided to maintain annual data. This decision facilitated the selection of a greater overall number of target populations, as requested by the national programme.

Despite the adaptations, by the end of the second wave of data collection the practical constraints of conducting repeated behavioural surveys among low-risk groups—low levels of risk behaviour and consequent difficulty documenting change—became increasingly evident. Current BSS guidelines do not include low-risk groups at all, but rather recommend covering these populations through general population household surveys.

**Step 3: Determining behavioural indicators**

As in Tamil Nadu, behavioural indicators were chosen for Senegal in collaboration with programme managers and other stakeholders according to internationally recommended standards (see Appendix I). The Senegalese researchers used core questionnaires already developed for behavioural surveillance surveys and customized them through a rigorous process of pretesting that involved focus group discussions with members of each target group.

**Step 4: Analyzing and disseminating results**

The analysis of first wave results in Senegal was very important to the assessment of programme success and future programme planning. The results were disseminated widely with the active participation of all stakeholders, which was useful for ensuring continued support of the BSS into the second wave. In fact, enthusiasm for the first wave of BSS results led to increased participation and funding from such donors as UNICEF and UNDP.

Results in Senegal show that the percentage of sexually active men who reported visiting a sex worker in the previous 12 months was relatively low: 9 per cent of male workers (n=465) and 5.3 per cent of male truck drivers (n=837) in 1998. However, 21.5 per cent of male workers and 21.8 per cent of truck drivers reported one or more non-regular partners. In addition, 29 per cent of all male workers sampled (n=500) and 32.7 per cent of all male truck drivers sampled (n=900) reported more than one regular partner in the previous 12 months. There are no trend data yet available from these two groups since they were not monitored in the first waves of data collection. However, it will be important in the future to try to understand whether the lower rates of commercial sex among men compared to Tamil Nadu, despite other multiple partners, are in part responsible for lower levels of HIV in Senegal relative to other countries.

Also of note in Senegal was the very high percentage of sexually active male youth reporting more than one sexual partner in the previous 12 months. In 1998, 40 per cent of sexually active male apprentices (n=186) and 48 per cent of sexually active male secondary school students (n=480) reported more than one sexual partner in the previous 12 months. Sixteen per cent of the apprentices and 22.5 per cent of the students reported more than two different partners in the previous 12 months. It will be important to monitor these groups in the future, especially if HIV levels in Senegal begin to rise.

**Lessons learned from the Senegal BSS**

The Senegal BSS was the first of its kind conducted in Africa. The fact that it provided crucial data on previously unmonitored groups playing potentially critical roles in the spread of the HIV/AIDS epidemic had

obvious importance, and the experience led to the initiation of BSS systems in several other African countries. Many lessons emerged from the Senegal BSS that have helped pave the way for changes in the BSS methodology. These touch on a range of issues, from the criteria for selecting target groups and geographical locations, to the importance of building an institutional base for maintaining the system.

In terms of the selection of target groups, the most important lesson was that due to the low HIV-prevalence levels in Senegal, surveillance could have been restricted to high-risk groups only (sex workers and their clients). Although registered sex workers were included in the first wave, the BSS also should have included clandestine sex workers, since this group is often said to be at higher risk than registered sex workers. Unlike registered sex workers, who are required to undergo regular STI screening and have an established network that facilitates delivery of support programmes and services, clandestine sex workers often have fewer safer-sex negotiating skills (such as insistence on condom use) and less access to HIV/STI information and services. Researchers historically shy away from hidden groups such as clandestine sex workers because sampling and interviewing them is difficult. However, even if it is not possible to sample such groups using strict probability methods, it is important to find systematic and repeatable ways to sample them because of their potential epidemiological significance. Continual avoidance of difficult groups can result in missed opportunities to slow the HIV/AIDS epidemic.

Another lesson from Senegal was the importance of disaggregating data from different geographical locations. Although it requires fewer resources to include everyone in one large sampling domain, the failure to obtain separate samples by region precludes the possibility of examining site differences, urban/rural differences or differences that may be related to factors such as border proximity, mobility of the population, migration and possible local differences in sexual practices.

In addition to these lessons, the importance of developing the technical capacity of a local institutional base to conduct behavioural surveillance was seen to be of paramount importance. The involvement of independent private research firms without a vested interest in the continued use of the data is problematic and threatens the sustainability of the system. While this was not strictly the case in Senegal, it is clear that without sufficient capacity building and commitment from the national government and international donors, a high-quality surveillance system cannot be maintained. In addition, although in many countries there is increasing focus on decentralization and participation at the regional/provincial level, there is still a need for a solid institutional base at the central level in order to maintain national standards for surveillance.

## CONCLUSIONS

Repeated surveys among hard-to-reach populations with high levels of HIV risk are new to most countries. They require skill,

sensitivity and the backing of the communities involved, all of which take time to build. These skills and community involvement must then be maintained over time, requiring careful selection of a community or institutional base that is sustainable. None the less, the value of the information they provide make such efforts worthwhile, and the increased capacity of research institutions will serve data collection activities for the country as a whole. It is the responsibility of the government and the donors to provide the support needed to maintain data collection capacity at a consistent level.

As with general population surveys, repeat behavioural surveys in specific populations should be complemented by qualitative follow-up in order to interpret their findings in a meaningful way that can inform programme direction and design. While HIV-risk behavioural surveillance fills a long-observed gap in efforts to monitor the HIV epidemic, it is not a panacea for all questions about risk behaviours and their correlates.

### BEST PRACTICE CRITERIA

Application of BSS methodology to collect behavioural data for national AIDS prevention programmes is an efficient and effective use of resources and can therefore be considered a "best practice." Specifically, BSS methodology provides:

**Relevance** The repeated cross-sectional methodology of target-group-based BSS provides programmes with more immediate short-term indications of progress than epidemiological studies. With HIV-prevalence trends, for example, the effects of prevention programmes are not evident for several years.

**Efficiency** BSS methodology offers a better chance of providing high-quality data than the usual behavioural studies because the methodology is standardized and the research is carried out by firms specialized in data collection, rather than individual project implementers trying to collect their own pre-/post-KABP (knowledge, attitude, beliefs, practices) data among their own constituencies.

**Effectiveness** Coordinating data collection among target groups across multiple sites is more cost-efficient because it eliminates the need to collect KABP data separately among smaller groups reached by a multitude of separate projects. Such coordination also allows more effective comparison of data across target populations and geographical sites by ensuring that comparable indicators are collected at comparable points in time. Individual KABP and qualitative methods often fail to allow for direct comparisons and are subject to considerable inconsistencies and subsequent difficulties in interpretation.

**Sustainability** Implementation of BSS often requires considerable planning and consensus building from all stakeholders. This process of capacity building and the development of "ownership" among stakeholders is the first step in ensuring sustainability. The utility of the results provided by BSS is a key second step.

**Replicability** Since the introduction of BSS in Bangkok in 1993, the BSS model has been implemented in more than 15 countries, with further sites in the planning process.

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# APPENDIX I

### RECOMMENDED INDICATORS FOR TARGET BASED BEHAVIOURAL SURVEILLANCE SURVEYS

**Indicators recommended for all target groups:**

1. Percentage of the entire target population citing at least 2 acceptable (accurate) ways of reducing risk of HIV infection (unprompted).

2. Percentage of the entire target population citing at least 2 acceptable (accurate) sex-specific STI symptoms (unprompted).

3. Percentage of the entire target population who know where to obtain a male or female condom.

4. Percentage of the sexually experienced target population reporting that they ever used a male or female condom.

5. Among those reporting STI symptoms during the previous 12 months, the percentage of the target population who report having sought appropriate treatment for their last STI symptom.

6. Among those reporting STI symptoms during the previous 12 months, the percentage of the target population who report obtaining medications for STI symptoms from an appropriate source during the previous 12 months.

7. Percentage of the entire target population who report knowing someone who is infected with HIV or who has died of AIDS.

8. Percentage of the sexually experienced target population who have had an HIV test and know the result.

9. Percentage of the female target population sexually active in the past 12 months who report having been forced to engage in sexual intercourse during the previous 12 months.

10. Percentage of entire target population reporting exposure to a given intervention.

**Indicators appropriate for youth:**

11. Percentage of entire youth target population ever sexually active.

12. Percentage of youth target population sexually active in the past 12 months reporting more than one sexual partner during the previous 12 months.

**Indicators appropriate for adults (non-FSW):**

13. Percentage of target population sexually active in past 12 months reporting sexual intercourse with at least one non-regular partner during the previous 12 months.

14. Percentage of target population sexually active in past 12 months reporting at least one commercial sex partner during the past 12 months.

15. Percentage of target population with a non-regular partner in past 12 months reporting condom use during the most recent act of sexual intercourse with a non-regular sex partner during the previous 12 months.

16. Percentage of target population with a regular sex partner in past 12 months reporting condom use during the most recent act of sexual intercourse with a regular sex partner during the previous 12 months.

17. Percentage of target population with a non-regular partner in past 12 months reporting consistent condom use with non-regular sex partners during the previous 12 months.

18. Percentage of target population with a commercial partner in past 12 months reporting consistent condom use with commercial sex partners during the previous 12 months.

19. Percentage of the entire target population reporting unprotected sex with any non-regular or commercial sex partner during the previous 12 months.

20. Percentage of target population with a regular sex partner who has ever discussed HIV/STIs with a regular partner.