

UNAIDS/WHO
Working Group on Global HIV/AIDS/STI Surveillance

Initiating second generation HIV surveillance systems: practical guidelines



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Joint United Nations Programme on HIV/AIDS
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UNAIDS/02.45E – WHO/HIV/2002.17
(English original, August 2002)
ISBN 92-9173-219-2

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UNAIDS - 20 avenue Appia - 1211 Geneva 27 - Switzerland
Telephone: (+41) 22 791 36 66 - Fax: (+41) 22 791 41 87
E-mail: unaids@unaids.org - Internet: <http://www.unaids.org>

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Acknowledgements

The current guidelines are partly based on the experience gained in the implementation of a second generation surveillance project between 1999 and 2002 in eight countries in Africa, Asia and Latin America.

The project—‘Surveillance on HIV/AIDS’—was funded by the European Community (grant B7-6211/98/01) and implemented by UNAIDS, in collaboration with National AIDS Programmes, WHO, and other partners.

The authors, Jesus M Garcia Calleja and Cyril Pervilhac, gratefully acknowledge the valuable contributions of project participants in Africa (Burkina Faso, Mozambique, Nigeria and the United Republic of Tanzania); Asia (Myanmar and Vietnam); and Latin America (the Dominican Republic and Mexico).

We are also grateful to the following external reviewers: Rebecca Martin and Christopher Murrill (CDC Atlanta), Emil Asamoah-Odei (WHO/AFRO, Harare) and Paloma Cuchi (WHO/PAHO).

Acronyms

BSS	Behavioural surveillance survey
DHS	Demographic and health survey
IDU	Injecting drug user
KABP (study)	Knowledge, attitude, behaviour and practice (study)
M&E	Monitoring and evaluation
MoH	Ministry of Health
MSM	Men who have sex with men
NAP	National AIDS Programme
STI	Sexually transmitted infection
SW	Sex worker
SWOT (analysis)	Strength, weakness, opportunity and threat (analysis)

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Preface

The purpose of the guidelines is to assist National AIDS Programmes (NAPs) and Ministries of Health in implementing second generation HIV surveillance systems through a logical and standardized process. More specifically, the guidelines are primarily addressed to programme managers, epidemiologists, social scientists and other experts working in or with national programmes on surveillance issues.

The practical steps and recommendations place particular emphasis on the initial steps involved in the implementation of second generation surveillance systems. They include the following: assessment, consensus, plan and protocol development, implementation and, finally, monitoring and evaluation.

Introduction

The HIV/AIDS pandemic is composed of multiple and dynamic epidemics, even within a country. Therefore, HIV surveillance systems should be capable of being adapted and modified to meet the specific needs of each epidemic. For example, methods and surveillance activities in a country with a predominantly heterosexual epidemic should differ greatly from surveillance activities in a country where HIV infection is mostly found among men who have sex with men (MSM) or injecting drug users (IDUs). Second generation HIV surveillance systems are designed in accordance with these considerations.

The principles of second generation HIV surveillance aim to improve the quality of the information tracked by National AIDS Programmes (see *Guidelines for Second Generation HIV Surveillance: WHO/CDS/CSR/2000.5, UNAIDS/00.03E, 2000*).

The main objective of second generation surveillance is to monitor HIV and high-risk behaviour trends over time in order to provide essential data needed for the development of interventions and the evaluation of their impact. Therefore, there needs to be effective coordination between the surveillance and prevention programmes.

The main recommendations for second generation surveillance can be summarized as follows:

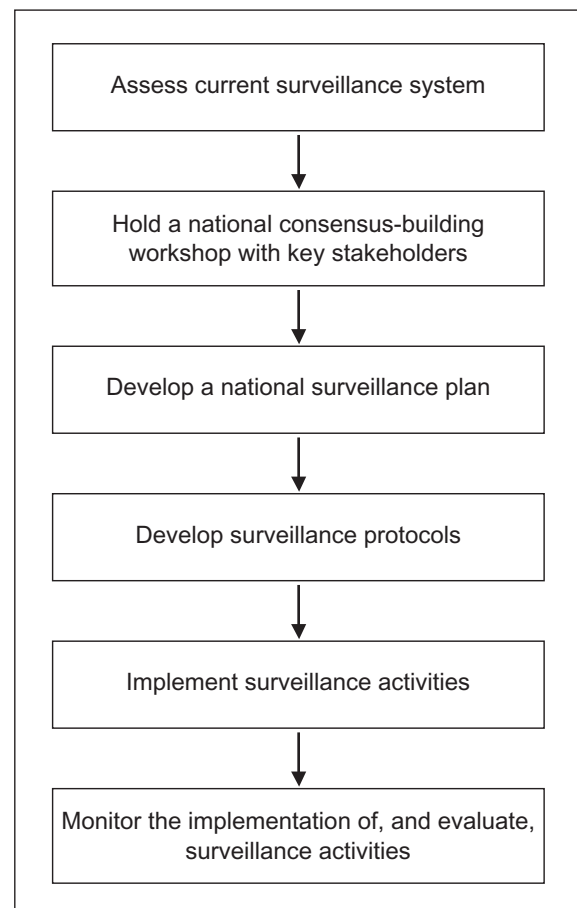
- In generalized epidemics where HIV prevalence is over 1% of the general population, surveillance systems should concentrate on monitoring HIV infection and high-risk behaviour in the general population, and also include groups such as sex workers.
- In concentrated epidemics where HIV is over 5% in any subpopulation at higher risk of infection (such as drug injectors, sex workers, men who have sex with men), surveillance systems should monitor infection and behaviour in those groups, paying particular attention to behavioural links between members of those groups and the general population. Groups linking subpopulations at higher risk of infection with the general population are called 'bridging populations'.
- In low-level epidemics where relatively low HIV prevalence (less than 5% in any subpopulation) is measured in any group, surveillance systems focus largely on behaviours and HIV infection in groups at high risk, looking for changes in behaviour that may lead to an increase in the rate of infection.

Second generation surveillance is built upon a country's existing data collection system. Therefore there is a need to evaluate the surveillance system, iden-

tifying what worked and which gaps remain. Once the limitations of the current system are identified, it becomes easier to elaborate a national plan for surveillance. National plans involve several key partners and professionals in order to implement these plans. An important step, therefore, and one of the best approaches to reaching a consensus for a sound surveillance plan, is to discuss the country's needs with the main partners involved in surveillance so that agreement can be reached about how to improve the information system. Second generation surveillance aims to improve the quality and diversity of information sources. In order to achieve that, standard and rigorous study protocols have to be developed and implemented using appropriate methods and tools. The monitoring and evaluation of surveillance activities facilitate this process.

The framework required to implement second generation HIV surveillance principles at the country level is illustrated in Figure 1.

Figure 1. Framework for implementing HIV second generation surveillance: practical steps



These guidelines are designed to assist National AIDS Programmes and Ministries of Health in implementing second generation HIV surveillance systems through a logical and standardized process. This document is primarily addressed to programme managers, epidemiologists, social scientists and other experts working in or with national programmes on surveillance issues. The practical steps and recommendations are partly based on experience gained in the first three years of a collaborative European Commission (EC)-funded project that started in 1999. The project, executed by UNAIDS, is being implemented by the National AIDS Programmes and partners at country level, and aims

to implement second generation HIV surveillance in eight countries in Africa, Asia and Latin America.

A HIV surveillance system does not occur in a vacuum, but in the context of National AIDS Programmes and in accordance with the varying circumstances in different countries. Thus it is important to understand the overall situation and context of AIDS programmes in the country and the role played by the stakeholders and main partners. The following section focuses on the role of second generation surveillance in the country context.

Role of second generation surveillance in the context of a National Strategic Plan

Since 1999, UNAIDS, WHO and other international organizations have proposed a set of principles to improve a country's response to its HIV/AIDS epidemic. The framework for achieving this has been a shift from a health-sector approach to a multisectoral approach. Many countries are in the process of establishing, or have established, National Strategic Plans to expand their response to the epidemic. Strategic planning defines the general strategies, the institutional framework and the steps and activities needed to mobilize society as a whole to prevent and mitigate HIV infection. Strategic planning is a flexible tool designed to respond to changing situations, their objectives and, therefore, the activities to be implemented. It uses a decentralization process as a way of ensuring that the needs at the community and local levels are met. There are three basic steps in establishing a National Strategic Plan: 1) situation and response analyses; 2) plan formulation; and 3) resource mobilization.

To conduct a situation analysis, it is important to know who is infected with HIV, and who is vulnerable to infection, as well as identifying the main determinants of the HIV epidemic. This information is collected through second generation surveillance systems. In contrast to a traditional analysis, a situation analysis looks further into the social, economic and cultural contexts of HIV transmission. Ultimately, this will help clarify priorities and scopes of intervention. Even though there are underlying factors that lead people to engage in risky behaviour that can expose them to HIV, the epidemiological factors are the final determinants in explaining how HIV is spread. For example, are sex workers (SWs) also intravenous drug users (IDUs)? What are their behaviours and relationships with their clients, friends or partner(s)? The answers to these questions will lead to the planning of prevention programmes and contribute to the monitoring of their success.

The general objective of the national strategic planning process is that of contributing to countries' efforts to adapt to changing situations and to plan for, and effectively implement, efficient, affordable, sustainable, equitable and relevant expanded responses. To measure the progress and impact of these objectives, a monitoring and evaluation (M&E) system should be developed and put in place. An M&E system tracks what is being done and whether programmes are making a difference. It allows programme managers to calculate how to allocate resources in order to achieve the best overall result. A good national-level M&E system addresses three key questions that will be answered by the surveillance system:

- What is the trend in HIV prevalence, especially among young people or other vulnerable populations?

- If HIV prevalence among vulnerable populations increases or decreases, can this be attributed to changes in sexual behaviour, or other main determinants?
- If sexual behaviour or other main determinants change, can this be attributed to interventions?

UNAIDS, WHO, UNICEF and their main partners (CDC, USAID, FHI, DFID, EC, and the World Bank) have developed a *Guide to Monitoring and Evaluation for National AIDS Programmes* (UNAIDS/00.17E, June 2000), in which the main indicators are selected according to the state of a country's epidemic. The list of indicators is not exhaustive but several core and additional indicators are listed with regard to monitoring progress and achievements (Box 1). Second generation HIV surveillance systems will provide basic information for some of the programme areas of the National Strategic Plans.

Box 1. Programme area indicators for M&E of National Strategic Plans

- Policy
- Condom availability and quality
- Stigma and discrimination*
- Knowledge*
- Voluntary counselling and testing*
- Mother-to-child transmission
- Sexual negotiation and attitudes*
- Sexual behaviour (includes that of men who have sex with men and that of sex workers)*
- Young people's sexual behaviour*
- Injecting drug use*
- Blood safety/nosocomial transmission
- STI prevention and care*
- Care and support
- Health and social impact

* Data generated by second generation surveillance systems through behavioural surveillance survey

Source: UNAIDS et al., *National AIDS Programmes; A Guide to Monitoring and Evaluation, 2000*

In conclusion, second generation HIV surveillance is not an isolated system, but an important component that contributes to the understanding of the dynamics of HIV in the country context. These systems provide basic information for focusing and designing interventions as well as for monitoring the impact of interventions proposed within the strategic planning process. Information from these systems will provide decision-makers with key elements that will help them understand the impact of the prevention activities in different populations.

Assessment of HIV, sexually transmitted infections, and behavioural surveillance systems

Rationale

Since the late eighties or early nineties, most countries have established, with varying degrees of success, national HIV/AIDS surveillance systems. Sexually transmitted infections (STIs) are regularly reported either as syndromes or etiologies by the standard health information system. Demographic health surveys (DHS), knowledge, attitude, practice and behaviour (KABP) studies or other kinds of behavioural studies may have been conducted. Therefore, the first step is to identify what has been done in the past and what is currently being done regarding the monitoring of HIV infection and its sexual determinants.

The objective of assessing surveillance systems is to analyse the relevance of the information collected by the different subsystems, in relation to the epidemic's state, and the use of this information. The ultimate goal of the assessment is to identify the strengths, limitations, problems and gaps in the system in order to plan activities to improve the quality of information provided to the NAP and its relevant partners.

It is very important that NAPs, donors and other key stakeholders that are involved in surveillance activities or sexual behaviour studies agree on the objectives in order to join forces on a common agenda instead of carrying out independent ad hoc studies.

An assessment of the HIV surveillance systems addresses the following questions:

- If HIV is present, what are the most vulnerable groups?
- Does the system allow for monitoring HIV or sexual behaviour indicator trends in those groups?
- Does the system allow a country to study to what extent HIV has been disseminated to different geographical areas or populations in the country?
- Are sexual behaviour indicators being monitored?
- What are the trends of the main cofactors for HIV transmission, such as STIs?

Even the most simplified surveillance systems have many components that need to be coordinated in order to collect relevant information. Not all countries have conducted regular evaluations of their surveillance systems. In many countries, surveillance ac-

tivities have been conducted routinely, repeating the same survey every year, rather than adapting the HIV surveillance system to meet the needs created by the evolving epidemic. In order to build a better surveillance system, the most relevant strengths and weaknesses of the system must be identified so that any gaps can be filled in.

Sometimes an assessment is confused with an evaluation. Although they have similar objectives, they are slightly different. Assessments are usually a faster process, allowing for rapid action, and they require less input and information than do evaluations. Assessments attempt to collect basic information about the most relevant issues, whereas evaluations review all the elements in much more detail, require larger teams, use more in-depth analysis of the system, and therefore require more resources and time to obtain and release the information. Some NAPs have conducted regular or periodic evaluations of the HIV surveillance systems, using the information obtained as an important basis for the development of second generation surveillance systems in the country. In countries where such evaluations have not taken place for three or four years, a rapid assessment of the HIV/AIDS/STI and behavioural studies surveillance system is necessary. Rapid assessments should be repeated every two-to-three years so as to regularly adjust the system in accordance with the changing epidemic.

How to proceed with a rapid assessment?

The present section describes the rapid assessment more relevant to sentinel serosurveillance systems (HIV and STI). The assessment of behavioural systems follows in the next section.

The rapid assessment is carried out in four or five days by a small team of three-to-five people, maximum, and uses simple instruments. The outcome is a brief 10–20-page report, usually available within one month of the review. This contrasts with other reviews, which are more costly and complex and the results of which are often only available six months or more after the review has been carried out.

There are different ways to conduct an assessment. For example, it can be done through a survey. A questionnaire is prepared with the most relevant questions

regarding the surveillance system. This questionnaire is addressed to the persons involved in the surveillance system at the different levels and bilateral and multilateral cooperation agencies involved in surveillance activities. Information is then collected and analysed. Different questionnaires need to be developed because of the differing partners and levels of involvement in the surveillance system. For example, the questions for national epidemiologists will differ from the questions for the laboratory personnel or health personnel collecting the blood samples.

Another approach, equally effective and more expedient, is to review documents related to surveillance activities, such as surveillance protocols and reports, and to conduct interviews of the key personnel involved in implementing the HIV surveillance system. Small group discussions are carried out with NAP personnel and key informants from the main partners involved in surveillance. This method provides enough information for the assessment team to have a clear understanding of what the level of performance is and the efficiency of the HIV surveillance system. At the same time, it will help to identify the main partners or possible partners involved in surveillance activities. This information helps later on in the process of building up a consensus for an improved surveillance system. The main components of an assessment are summarized in Box 2.

An important aspect of the assessment is to verify whether surveillance activities are carried out according to the procedures described in the surveillance protocol. During visits to the sentinel surveillance sites and laboratories, the conditions in which samples are collected and analysed can be observed. As an example, in one country, the surveillance guidelines established that anonymous, unlinked tests were collected for surveillance among pregnant women. When one of the sentinel sites was visited, however, it was found that the health centre had a log book with the names of the women whose blood had been collected and the HIV results provided by the laboratory, obviously breaking the anonymity provided by unlinked, anonymous testing. A lack of supervision by the person responsible at the central level was one reason why this occurred.

Box 2. Components for conducting an assessment

- Review documents (including protocols)
- Discuss with experts group (e.g. in-country national and international experts in surveillance)
- Interview key informants
- Visit sites that conduct surveillance activities
- Summarize and discuss main findings with NAP and partners
- Share findings with key partners

Whether a more formal evaluation process, a situation analysis that is done as part of the national strategic plan, or a rapid assessment is used, the main components of the second generation surveillance system need to be reviewed (Box 3). The assessment does not need to look at these components in a sequential fashion, but it must be effective in examining all the components and addressing all the issues relevant to surveillance. It is essential that the national context and the development activities of the National AIDS Programme be understood, and that responsibilities for specific surveillance activities be clearly identified.

Box 3. Main components to be reviewed in the assessment process

- HIV/AIDS/STI surveillance framework
- AIDS/HIV infection case reporting
- Sentinel surveillance for HIV
- Surveillance for STI
- Laboratory practices and quality assessment
- Behavioural studies
- Other relevant HIV/AIDS studies or sources of information in the country
- Management of the system, including information
- Resources
- Analysis, dissemination and use of information

How to review and present the results from an assessment

One possible way to review, present and summarize the assessment results is through an analysis that focuses on the strengths, weaknesses, opportunities and threats (SWOT). The SWOT analysis provides a good framework for identifying the strengths and limitations of the surveillance system. An example is presented in Table 1. In order to improve the quality of information and performance of the system, the opportunities identified in the country will need to overcome any constraints on the system. Gaps and weaknesses in the system need to be identified so that they can be resolved.

This type of analysis should be carried out for each component (HIV/AIDS, STI, sexual behaviour studies). The analysis of each component will be included in a final SWOT analysis to provide an overall picture.

Other rapid assessment methodologies can be used as well. But the basic principle is that the appropriate methods and tools are kept simple in order to achieve quick results and collect the key information. Another way to present the results is to name and enumerate the limitations and constraints of the surveillance system according to the different levels of the system, its functions and responsibilities. Although sometimes the roles and responsibilities are not well defined for each level, the assessment team needs to obtain a clear idea of what these are (Table 2).

Table 1. Example of a SWOT analysis for a national HIV surveillance system

Strengths	Weaknesses	Opportunities	Threats
<ul style="list-style-type: none"> - System in place since 1993 - Protocol developed in 1993 and updated in 1998 - Personnel trained - Regular supply of reagents - Good national coverage 	<ul style="list-style-type: none"> - Lack of evaluation - Inconsistency of sites - Data are available mostly from urban centres, with a lack of information in rural or periurban areas - Under-reporting of HIV and AIDS cases - Lack of supervision - Difficulties reaching the sample size - Difficulties due to transport and supervision in some sites - Problems with equipment in some laboratories - Limited use and analysis of different variables (e.g. socio-demographic), other than HIV, collected at the sentinel sites - Incomplete analysis of data 	<ul style="list-style-type: none"> - A national strategic plan incorporates new concepts for HIV surveillance - New partners involved in M&E activities - More resources available 	<ul style="list-style-type: none"> - High turnover of personnel - Change of government and political leadership - Highly dependent on foreign donors

Table 2. Limitations and constraints of the HIV surveillance system

System level	System limitations	Constraints
- Central management	<ul style="list-style-type: none"> - Lack of national surveillance plan - Inappropriate dissemination of the information 	<ul style="list-style-type: none"> - Lack of personnel (e.g. working in behaviour at national level) - Limited economic resources - Work overload
- Epidemiology unit	<ul style="list-style-type: none"> - HIV protocols not updated - Lack of adequate supervision 	
- Populations surveyed	<ul style="list-style-type: none"> - No high-risk populations surveyed for last 5 years 	<ul style="list-style-type: none"> - No resources available
- Laboratory, central and peripheral levels	<ul style="list-style-type: none"> - Lack of reagents - Personnel not trained - Equipment broken - No quality-assurance programme 	<ul style="list-style-type: none"> - Limited funds for surveillance, reagents used for blood safety
- Sites	<ul style="list-style-type: none"> - No supervisory visits - Insufficient material - Limited to urban sites 	<ul style="list-style-type: none"> - Difficulties in accessing rural areas - Lack of transport
- Analysis at central level and use of information at all levels	<ul style="list-style-type: none"> - Limited analysis of all variables collected (e.g. socio-demographic) - No use of other sources of information, such as blood donors - Reports delayed and distribution limited 	<ul style="list-style-type: none"> - National blood bank does not provide data - Lack of planning for use of information

The rapid assessment process encourages a participatory approach at these different levels and the findings are immediately discussed in small groups or meetings in which self-critiquing is encouraged in order to initiate changes.

Using either the SWOT analysis or other approaches, the results should provide summarized information to National AIDS Programme managers or donors who may then use them to make decisions regarding surveillance activities and any gaps or limitations that need to be overcome.

Review of behavioural surveillance

Behavioural surveillance is a core component of second generation surveillance. This review can be undertaken in addition to the previous rapid assessment described, or can take place concurrently.

It is useful when assessing the surveillance system to review all behavioural surveillance that has been carried out and the number of studies conducted in

the country in the past four or five years. The review aims to:

- 1) draw up an inventory of studies carried out to date;
- 2) understand behavioural trends among the general population and vulnerable groups, based on the behavioural indicators used and populations studied;
- 3) identify gaps both in the data on these populations and in the indicators used;
- 4) identify the pool of expertise (institutions and individuals in the country).

The following information (Box 4) needs to be collected in order to review the state of the art of behavioural studies:

Box 4. Review of behavioural studies

- Author's name
- Title
- Date
- Type of study and location
- Group(s) studied and ages
- Sample size
- Indicators used and main findings
- Strengths
- Limitations

This behavioural review can be done by an in-country consultant (see Terms of Reference in Appendix I) as a data-collection exercise. It should take one-to-two weeks. One week should be sufficient to analyse the data and to obtain basic information on behavioural

studies. Suggested categories for the analyses (in the form of a table) are: vulnerable groups; title, authors, date, reference; institution(s) in charge of study design, data collection, analysis; methodology (type of study, sample size); and main findings by determinants/factors.

In the event that a behavioural surveillance system exists, the team may review how the protocols were implemented in light of the standards set, e.g., in the *Behavioral Surveillance Surveys: Guidelines for Repeated Behavioral Surveys in Populations at Risk of HIV* (FHI et al. 2000).

Whatever tools or approaches are used to assess the HIV surveillance system, the main objective of the process is to identify what does and does not work in the system. Identifying strengths, weaknesses, opportunities and threats is one way to facilitate the planning process. The findings of the review of the HIV, STI and behavioural surveillance systems are specific to each country.

It is useful for the programme managers and partners to understand and consolidate the positive aspects of their country's surveillance system and, in parallel, to identify the main gaps that need to be addressed. These steps, in turn, allow those involved to build on existing strengths, and to map out the opportunities for moving into a second generation HIV surveillance system. Ideally, the exercise is carried out by all parties in a positive spirit of constructive criticism.

Building consensus

Rationale

In the 21st century, epidemiology and information systems will be of increasing importance and will serve as the main driving forces behind programmes. Results of epidemiological studies are used to inform health professionals, the public and policy-makers about the need for new or different health policies. This process is the translation of epidemiological research into public health action. But sometimes translation does not take place, due to a variety of factors, such as poor communication, the lack of advocacy efforts by epidemiologists or a manager's lack of information. Second generation surveillance information systems should drive policies and translate information into action.

Following the review and assessment of the HIV surveillance systems, the NAP and all key stakeholders, including bilateral donors, NGOs and research institutions, need to agree on gaps and shortcomings and on methods for improving the surveillance system. They must also set priorities and identify who contributes to what, and when. This phase lays the foundation for the National Second Generation Surveillance Plan and facilitates the coordination process with all the partners involved in surveillance activities. Consequently, the different partners can identify how they can contribute financially or technically to the systems, thereby increasing the system's sustainability.

All key partners involved in surveillance are invited to a national consensus-building workshop aimed at developing a common vision of how to improve surveillance in the country. The outcome of this workshop will vary according to the particular situation in each country. For example, a country may need only to review its protocol and update it with new recommendations. But other countries may need to outline a national surveillance plan to raise resources or shift HIV surveillance to other groups.

Box 5. Programme areas for monitoring and evaluation

1. HIV/STI and syphilis surveillance
2. Monitoring of sexual behaviour
3. STI care and prevention
4. Voluntary counselling and testing services
5. Blood safety
6. Monitoring of condom availability and accessibility

Source: Ministry of Tanzania, *Guidelines for Monitoring and Evaluation during Mid-Term Plan III 2000–2002*, October 2000

Ideally, workshop participants aim to develop the draft of a national surveillance plan that encompasses HIV, STI and behavioural components. Countries may also choose to draft a broader monitoring and evaluation plan that encompasses various essential HIV-related programmes, in addition to all the surveillance components, as illustrated for the United Republic of Tanzania in Box 5. Taking the example of Tanzania, the national surveillance plan was included in the broader M&E plan. Such plans crystallize the consensus reached by all parties.

What is expected

The consensus-building workshop for second generation surveillance aims to reach broad agreement among the main partners on the key issues and information needed with regard to HIV surveillance. It is important to have a clear idea of the outcome expected from such an exercise. For that, it is essential that the objectives and process required for achieving such results be clearly outlined in the planning document.

The expected outcomes of a national consensus-building workshop can be summarized as follows:

- identify the M&E indicators and surveillance strategy to measure the objectives of the National Strategic Plan;
- identify the main populations, methods and indicators to be used in second generation surveillance;
- consolidate a draft outline of an action plan for implementing second generation surveillance, including that of HIV, AIDS, STI and behaviour among different populations; and
- review the surveillance tools.

Who should participate

The participants in the consensus-building process should be the individuals, organizations and institutions that are involved in HIV surveillance activities. Participants may vary in different situations, but the main groups involved are: government, multilateral and bilateral organizations, NGOs, universities and research institutions, and epidemiologists and social scientists who are usually directly involved in collecting information. Relevant donors and stakeholders should also participate to determine the information needs.

To ensure success, the objectives should be agreed upon by all participants.

How to proceed

The implementation experience in different countries has shown that the consensus-building workshop agenda varies considerably from one country to another, based on the various countries' status and priorities. The agenda therefore needs to be tailored to each country, and may even be modified during the workshop. The workshop is comprised of working groups in which participants discuss the best strategy for improving the system. Consensus is then reached in plenary sessions with national and international partners on how to move ahead on second generation surveillance.

The essential steps for reaching consensus become increasingly complex as the workshop progresses. At a minimum, during the consensus-building workshop, the participants need to agree on the following aspects, highlighted by the SWOT analysis described earlier:

- 1) review the principles and rationale for the second generation surveillance, and for subsystems;
- 2) review the findings and recommendations from the assessment and reach a common vision of the second generation surveillance system;
- 3) describe the experiences and limitations of the present surveillance system;
- 4) identify the populations to be surveyed;
- 5) identify the sites or locations for each type of population;
- 6) select the indicators to be used for each population;
- 7) present the existing multisectoral national HIV/AIDS/STI plans, or equivalent;
- 8) if an M&E plan is developed, select indicators for the main activities for each component of the M&E plan including a national HIV plan;
- 9) identify the methods and/or sources to be used to collect the indicators for each surveillance subsystem (HIV/AIDS, STI and behavioural components);
- 10) identify the partners to be involved from the different sectors (ministries, NGOs, universities or research institutions, others);
- 11) discuss draft protocols of surveillance (if they exist);
- 12) agree on an implementation timetable and follow-up activities by partners, including financial contributions needed, with an estimated budget for two-to-three years; and
- 13) agree on monitoring and evaluations of surveillance.

Developing a national surveillance plan

Rationale

Having a national surveillance plan is beneficial for several reasons. Over time, the plan will allow all stakeholders to develop a comprehensive and thorough understanding of the strategy of the NAP or the Ministry of Health. This will allow stakeholders to identify how they can best contribute—technically and financially—to these efforts, and to complement each other, instead of duplicating efforts. The national surveillance plan also helps to legitimize surveillance as a worthwhile programme among many competing programmes, and allows for the findings to be entered into the National Strategic Plan.

How to proceed

The drafting of the national surveillance plan is the responsibility of the NAP, and should take place shortly after the consensus-building workshop. This would be followed by specific activities related to the implementation of the surveillance, i.e. protocol development (as detailed below). Surveillance indicators are part of the broader country monitoring-and-evaluation plans and, if integrated into an M&E plan, are better accepted, sustained and used by the NAP.

The key to successfully establishing a good surveillance system is consistency and systematization of the process to develop the plan. Surveillance systems, both for HIV prevalence rates and behaviours, monitor trends in a cost-effective way. Therefore, the systems should monitor the same populations over time, in similar geographical locations, using the same tools to collect the information. This method contrasts with large population-based sample studies, which cannot be repeated too often because of their high costs.

The main elements of a national surveillance plan need to contain at least the following components, listed in Box 6.

Box 6. Main elements of a national surveillance plan

- Identification of the structure of surveillance unit, coordination, resource mobilization and dissemination
- Priority areas of the National Strategic Plan, including the link between surveillance plan and strategic plan
- General strategy for HIV surveillance
- Main objectives
- Expected results
- Activities
- Identification of populations, locations and time frames
- Surveillance among programme areas: HIV and syphilis, sexual behaviour, STI information
- Schedule of activities
- Resources needed
- Monitoring and evaluation of the surveillance system

At the same time, the system should be flexible enough if the results obtained are not relevant or do not provide good information. For example, in the case of a Latin American country, HIV surveillance had been carried out among pregnant women for the previous eight years. The surveillance systems showed a prevalence rate of less than 0.4% among antenatal attendees. On the other hand, reported AIDS cases in the country showed that more than 60% of cases were related to MSM, indicating that the surveillance system needs to strengthen reporting among this group. The HIV surveillance system was therefore not very effective and its focus was shifted accordingly to include the MSM group.

Surveillance protocols

Rationale

Once the national surveillance plan has been developed, a final step in the implementation of second generation HIV surveillance systems is preparing specific surveillance protocols that contain the main elements of the system. Protocols ensure that the surveillance system is consistent over time, regardless of changes in personnel. These documents help to clarify the aims of the system and how it is integrated into the National Strategic Plan. Protocols are key elements in the coordination of surveillance activities among the various players. They serve as a history of the surveillance system's evolution for future use (helping to generate consistency over time). And, finally, they serve as a quality-assurance mechanism; taking into account the high turnover of some NAP personnel, sound protocols guarantee consistency in the survey procedures. There should be specific protocols for each component of the system—HIV prevalence, sexual behaviour, HIV/AIDS cases and STIs.

How to proceed

A good protocol will ensure standard procedures for the collection of information, either on behaviour or HIV infection, across different sites and populations. Surveillance protocols should contain clear objectives regarding the information sought and should have well-defined indicators. This will allow for comparisons over time of some populations followed in similar locations. It is advisable to have separate protocols for each component of the system: HIV seroprevalence among antenatal clinic attendees; HIV/AIDS cases; STIs; and sexual behaviour among the populations around the sentinel sites or among other at-risk populations.

Whether a specific country has a low-level, concentrated or generalized epidemic, a surveillance protocol for each activity should include the following basic common components in order to be systematic and consistent:

- *Definition of objectives.* What are the primary and specific objectives of the surveillance activity? Is the activity integrated into the more general context of the NAP and, if so, how? Is it integrated into the M&E plan and the National Strategic Plan?
- *Definition of indicators.* What are the essential indicators that have been identified and will be monitored over time?
- *Development and validation of tools and instruments.* What tools and instruments are needed for collecting information? Have the tools and instruments already been validated, or will they be? Do they have internal and external validation for the country? Have they been adapted to suit the local culture?

- *Implementation procedures.* How is the information going to be collected? Who is going to be responsible for collecting the information? Who does what, where and when?
- *Data analysis and interpretation.* Who is responsible for analysing the data and interpreting the results?
- *Development of mechanisms to disseminate information.* Who is going to disseminate the information and how will this be done at local and national levels? When will it be done, and what are the target audiences?
- *Budget.* Who will pay for what.
- *Timeline.* When specific steps will be carried out.

The main components of a standard protocol for HIV surveillance are presented in Box 7.

Box 7. Elements of a standard protocol

- Justification
- Objectives
- Population, geographical area
- Description of methods:
 - sampling methods
 - information sources
 - ethical aspects
 - laboratory procedures
 - collection of socio-demographic data
 - quality control
- Monitoring and supervision
- Data management and analysis
- Dissemination and use

Protocols may need to be changed or revised over time in accordance with the results of the evaluation of the second generation surveillance systems.

Other second generation guideline modules have been, or are being, developed, dealing in greater detail with such issues as the selection of populations, sampling methods, laboratory procedures, analysis and use of data.

Linking HIV prevalence and behavioural studies

One of the main goals of second generation surveillance is to try to link data on behaviour to HIV seroprevalence data. This link will allow us to address the questions of whether any changes in HIV prevalence among young people can be attributed to changes in sexual behaviour, and whether any changes in sexual behaviour may be attributed to interventions. However, the parallel observations of a decline in

prevalence and change in behaviour may be insufficient to explain direct causal effects. In order to do this and better explain changes in prevalence, other possible factors, such as increasing mortality, migration and change of populations, may also need to be investigated.

Socio-demographic data needs and methods

In order to link needs and methods, two separate data sets are usually collected from different individuals who represent the same source population. Having a sampling frame for the behavioural survey, in the catchment area where the sentinel sites for the serosurveys in antenatal clinics are located, will help in collecting data from similar populations. Specifically, basic socio-demographic data, or indicators, need to be collected from both groups (serosurveys and behavioural surveys).

For the general population, these indicators, to be collected both in HIV seroprevalence surveys in

sentinel sites and behavioural surveillance surveys in population-based studies, are likely to include:

- age and gender;
- socioeconomic status;
- educational status;
- residency (in a non-identifying fashion) or migration status, including urban sites and residential areas vs rural setting;
- parity (for antenatal clinics and survey populations); and
- marital status.

The collection of demographic and other descriptive information will make it possible to determine whether both populations are similar. It will also mean that HIV seroprevalence and behaviours can be linked in sub-groups of both survey populations, e.g. urban 15–24-year-old women.

Monitoring the implementation of surveillance activities

Rationale

Monitoring is defined as the continuous management assessment of surveillance system implementation in relation to agreed protocol. Monitoring contributes to effective reporting and it focuses on the somewhat delicate process of supervision of protocol implementation or data collection. The most important part of monitoring is assessing whether the elements of the surveillance system are performing according to plan. Monitoring is a continuous process and it should be conducted at all levels of the system.

If there are clear and precise protocols for HIV surveillance, monitoring the HIV information system is relatively simple. As mentioned in the previous section, HIV surveillance protocols should clearly outline the steps required for collecting information on HIV, STIs or behaviours.

Stakeholders are involved in the various stages of the country-driven process to develop and implement HIV/AIDS activities. Experience shows that it is worth taking the time to go through the process of achieving consensus fully and systematically rather than omitting some steps. For example, in some countries, implementation of surveys may occur more than a year after the initial assessment of the surveillance system. Nevertheless, ownership is achieved.

The implementation of surveillance activities is greatly facilitated by the common vision established by national and local programme managers, and partners involved in surveillance. There is a common feeling and understanding of what needs to be accomplished and how.

The consensus-building workshops and transparency of the whole process will encourage the involvement of national institutions and strengthening of their capacities—for example, regional or national centres working on HIV issues, such as those in Thailand, have been involved in training for data collection of behavioural data. Countries have become conscious of the importance of encompassing behavioural surveillance within their systems, and have taken the necessary steps to implement these protocols.

A good surveillance study protocol is a necessary element for building a good information system but it is not enough in itself. If a good protocol is not well implemented, the information produced may be of poor quality. The sound implementation of protocols is essential in order to produce good information. For

this, it is necessary to have good instruments and, above all, a very good supervisory system. In order to minimize potential biases, avoid mistakes in interpretation, human error, logistical constraints or any other unforeseen problem, there is a need to closely monitor the process of data collection. The best way to ensure that the protocol is respected and the information collected as planned is through supervision of the whole process.

Another advantage of monitoring the implementation of protocols is that it ensures the credibility of the information collected. Sometimes the information provided by a surveillance system may be questioned by some donors and authorities—even health ministers. If the quality of the system is ensured by close supervision, potential problems and misunderstandings can be avoided or confronted.

How to proceed

It is important that a full-time surveillance team be assigned to oversee the implementation and coordination of surveillance protocols, given the numerous partners and components involved in surveillance activities.

The collection sites must be visited to ensure that information is collected adequately. For this, the supervisors need to be very familiar with the surveillance protocol and need to know the exact steps to be taken when collecting the information. Monitoring focuses more on process indicators to show that activities are carried out in accordance with the protocol. But it also identifies problems so that immediate corrective action can be taken. The key point is that the final indicators produced by the information system are more robust if the system has performed as planned than if the quality was poor. Instruments for collecting this information should be developed. Monitoring, as a continuous process, refers to the regular collection, analysis and use of information. It focuses more on the inputs, performance and progress of the information system.

For example, a checklist for a supervisory visit can be prepared. This checklist should include general information about the sites, the number of samples collected versus the number expected, materials required, the supply of materials, etc. In brief, the checklist should include all the main elements of the established protocol.

Information is valuable in HIV planning and the monitoring of responses as long as it is of a high standard. One of the main tasks of national surveillance teams

is to ensure that activities for surveillance are implemented according to the various protocols established to monitor the different determinants.

The ongoing process of monitoring the system during protocol implementation is vital to ensuring the overall accuracy of the study results. The study protocols should establish the various responsibilities for monitoring and supervision at the different levels. The quality of the results is therefore the responsibility of all levels of staff involved with the implementation of surveillance activities. The national coordinator or the national committee (the main parties responsible for surveillance activities) is primarily responsible for monitoring the compliance of methods outlined in the study protocols. Second generation surveillance promotes greater geographical and population coverage. Regional or provincial and on-site coordinators should identify the gaps, constraints and problems in implementing the surveillance protocols and also play an active role in ensuring that the data are collected according to the defined protocols.

For example, regular monitoring of the field operations should verify that the inclusion and exclusion criteria are fully respected. It should also ensure that sample sizes

established for each population are completed in the stipulated time and that the principles of confidentiality and sound ethics are respected. Measures should also be taken to monitor the accuracy of data being collected and entered into the data management system.

If blood samples are taken, the recently published *Guidelines for using HIV testing technologies in surveillance* (WHO/CDS/CSR/EDC2001.16 UNAIDS/01.22E) can be consulted for more detailed and useful information on how to proceed with HIV testing. For data management, it is important that appropriate training be carried out for those responsible for completing the forms or questionnaires and entering the data on computer. Feedback to all staff involved in the implementation of HIV surveillance activities at the different levels is also essential and may be done through a publication or a one-day workshop.

A multidisciplinary technical working/reference group for HIV/AIDS and STI surveillance has been found to be very useful in some countries, enhancing the overall acceptability and credibility of surveillance results at national and international level. This group should include international as well as local partners involved in surveillance activities.

Evaluation of second generation surveillance systems

Rationale

The main aim of monitoring and evaluation (M&E) is to provide continuous feedback on programme implementation. The process is also applied to surveillance systems and needs to be planned in the early steps of initiating second generation surveillance. Monitoring of the information system will help to identify potential problems and resolve them.

Despite the fact that the guidelines focus on the initiation of surveillance systems, evaluation needs to be considered early on in the overall process and is therefore briefly addressed in this section.

Evaluation involves the periodic assessment of the HIV surveillance system's performance efficiency. It reveals which components of the system are strong and which need to be strengthened in order to improve the quality of the information. Involving indepth analysis of the HIV information system, evaluation is aimed at determining whether the goals of the surveillance system have been met.

Evaluation, in a nutshell, is the careful examination of an ongoing or completed project. It is a one-step process and takes into account not only the design of the surveillance system but also its implementation and results. It should be planned from the beginning of the activity.

An evaluation should address the following key issues:

- Are the goals and objectives of the HIV surveillance system clearly stated?
- Are there standard protocols for the mechanisms used to collect information?
- How effective were the various components of the system (data collection, laboratory facilities, questionnaires used, etc.)?
- What are the human and financial resources used, and the direct and indirect costs involved?
- Is the acquired information being used and adequately disseminated?

How to proceed

Sharing information is as important as collecting the data. If the data are not reliable or properly collected, the information provided by the surveillance system is of little use. A good HIV surveillance system should include the basic elements of M&E to reassure the

partners and authorities that the data collected are meaningful, since different decisions will be made according to the quality of data. It is always advisable to provide arguments that build trust in the HIV surveillance system so that any decisions made are known to have been based on reliable information.

Evaluation of second generation surveillance systems should be tailored to the country and its specific HIV situation. Scientific rigour must be combined with practical realities.

The frequency and scope of evaluation will depend on factors such as the level of satisfaction, performance of the system and resources available.

Evaluations are usually conducted on a periodic basis and can take one of the following forms:

- an internal, annual, rapid evaluation, by national experts
- an external biannual or tri-annual evaluation, by external experts
- a combination of external and internal expert evaluation.

This does not necessarily mean that an independent evaluation of the National Strategic Plan is required. The Plan can be developed jointly, if necessary.

An intermediate step towards improving HIV surveillance systems could take the form of an evaluation workshop. The results of HIV surveillance systems are then disseminated and shared with the appropriate audiences, including, ideally, the participants and technical staff involved in the survey. During this dissemination workshop, a participatory assessment could be carried out in cooperation with the technical staff and main partners involved. The problems and limitations of the surveillance system are exposed and solutions proposed. In this workshop, results are presented and reviewed and recommendations made to improve the next round of surveys.

This process of reviewing surveillance results, monitoring reports and obtaining feedback from participants at all levels enhances the quality of future surveillance surveys. It also helps to build technical capacity.

Following the performance evaluation, it will be clear how well the HIV surveillance met its goals and objectives. The evaluators—either internal or external—will then suggest modifications for enhancing its usefulness and improving the quality of its components.

Conclusions

These practical steps for implementing second generation HIV surveillance systems are partly based on the findings of a European Commission-funded project—Surveillance of HIV/AIDS—involving implementation of second generation surveillance systems in eight countries on three different subcontinents.

Based on these findings and other experience acquired by the WHO/UNAIDS Working Group on Global HIV/AIDS and STI Surveillance and its partners, there is a good understanding of the necessary steps involved in implementing second generation surveillance systems at the country level. These steps include: identifying the strengths and gaps of the system in order to determine the information needs of a particular country; agreeing upon methods and tools for data collection; analysing and interpreting the multiple data available with the second generation surveillance approach; and disseminating the results in order to make optimal use of the surveillance information.

There is no blueprint approach, however, to implementing second generation surveillance. Each country may place emphasis on particular aspects of the process, and take more or less time, depending on its priorities or policies relating to the programmes.

We feel confident that the steps described herein can be enhanced as other experiences in the implementation of second generation surveillance are documented by more countries around the world.

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APPENDIX 1

Sample terms of reference for a consultant to review HIV/AIDS-related behavioural studies

PROJECT:	Second generation surveillance
POST TITLE:	National consultant
DURATION:	10 days
CONTRACT PERIOD:	Month (completed by [date])
DUTY STATION:	Home-based; no out-of-town travel is anticipated. If necessary, information can be collected and requested by phone from (<i>the capital city</i>) with materials to be sent to (<i>Ministry...</i>)
BACKGROUND:	The information on behavioural HIV/AIDS-related studies is piecemeal and has not yet been systematically compiled. Therefore, little is known about what has been accomplished over the past few years in the country. This information is much needed in the early stages of second generation surveillance in (<i>country</i>).
DUTIES:	<p>The consultant will review the behavioural studies in (<i>country</i>) accomplished between 1995 and (<i>year</i>) by the Ministry of Health, bilateral agencies (e.g. <i>specify</i>), NGOs (e.g. <i>specify</i>). If necessary, the consultant will visit these different partners to collect and review the information.</p> <p>He/she will produce a summary review of the studies, identifying the indicators based on the <i>National AIDS Programmes: A Guide to Monitoring and Evaluation</i> (UNAIDS, 2000, pp. 26–27). The behavioural indicators fall into the following major categories: knowledge, sexual negotiation and transmission, sexual behaviour, young people’s sexual behaviour, injecting drug use, STI care and prevention.</p> <p>In addition, a 2–3-page written report will summarize the framework with emphasis on the types of studies done, i.e. the general population or vulnerable groups (e.g. drug users, men who have sex with men, migrants, truck drivers, etc.), and on the indicators.</p> <p>Both documents are to be presented to, and discussed with, (<i>specify</i>) by (<i>date</i>) and handed over in the form of one hard and one electronic copy.</p>
QUALIFICATIONS:	Knowledgeable about the HIV epidemic and its behavioural aspects. Preferably a social science background with experience and interest in quantitative surveys. Familiar with the different partners involved. Excellent written English and analytical skills required.
LANGUAGE:	(<i>National to specify</i>) and English.

The Joint United Nations Programme on HIV/AIDS (UNAIDS) is the leading advocate for global action on HIV/AIDS. It brings together eight United Nations agencies in a common effort to fight the epidemic: the United Nations Children's Fund (UNICEF), the United Nations Development Programme (UNDP), the United Nations Population Fund (UNFPA), the United Nations International Drug Control Programme (UNDCP), the International Labour Organization (ILO), the United Nations Educational, Scientific and Cultural Organization (UNESCO), the World Health Organization (WHO) and the World Bank.

UNAIDS both mobilizes the responses to the epidemic of its eight cosponsoring organizations and supplements these efforts with special initiatives. Its purpose is to lead and assist an expansion of the international response to HIV/AIDS on all fronts: medical, public health, social, economic, cultural, political and human rights. UNAIDS works with a broad range of partners—governmental and NGO, business, scientific and lay—to share knowledge, skills and best practice across boundaries.

The current practical guidelines are partly based on the results of a HIV second generation surveillance project that took place in eight African, Asian and Latin American countries. The project—'Surveillance on HIV/AIDS'—is geared towards translating the conceptual framework of second generation surveillance principles into action.

These guidelines are aimed at programme managers, epidemiologists, social scientists and other experts working in or with national programmes to strengthen HIV surveillance systems at country level. Their main objective is to guide and enhance the process of second generation surveillance implementation in order to improve and expand the surveillance system and, consequently, provide a more comprehensive understanding of the HIV epidemic.

This document focuses on the methods used for the assessment of HIV, STI and behavioural surveillance systems, and how consensus can be reached to improve surveillance. Finally, it describes the main elements of a national surveillance plan and surveillance protocols, placing surveillance in the broader country context of strategic planning and the systematic monitoring and evaluation of programmes.



Joint United Nations Programme on HIV/AIDS

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Joint United Nations Programme on HIV/AIDS (UNAIDS)
20 avenue Appia, 1211 Geneva 27, Switzerland
Tel. (+41) 22 791 36 66 – Fax (+41) 22 791 41 87
E-mail: unaids@unaids.org – Internet: <http://www.unaids.org>