

3 Investing in strategic information

Background

Strategic information is information and knowledge that guides health policy, planning, resource allocation, programme management, service delivery and accountability. It is essential for action at all levels of the health system. As countries scale up their HIV responses towards universal access, there is an increasing recognition of the need to invest in strategic information to guide programme planning and sustain national and international commitment and accountability.

This chapter presents the key elements in strengthening health information systems, one of the six building blocks of a health system. It then addresses the three main activities related to strategic information for the HIV response:

- surveillance of HIV and sexually transmitted infections;
- monitoring and evaluation (including patient monitoring, prevention and assessment of HIV drug resistance, and pharmacovigilance);
- research.

The chapter concludes by discussing the effective use of data for improving programmes, including for setting targets and conducting situation analyses.

3.1 Strengthening health information systems

A well-functioning health information system is one that generates reliable and timely strategic health information on which to base decisions at different levels of the health system. Information systems for HIV programmes must be strengthened within the context of more robust, integrated and harmonized overall health information systems.

Efforts to strengthen information systems to support the HIV response must consider three key dimensions:

1. **Content:** *What information is needed? What are the sources of information?* HIV programmes require a wide range of strategic information on the epidemic and the response. HIV surveillance provides data to monitor the determinants and trends of the epidemic, develop interventions and measure impact. Monitoring and evaluation is required to plan and implement programmes and document outcomes. Drug resistance monitoring and pharmacovigilance are needed to support treatment programmes. Research provides evidence to improve interventions. Both population-based and health facility-based data sources generate strategic information in these areas. Information needs and sources vary in relation to the type of epidemic and country context.
2. **Processes:** *How is information collected, managed and used?* Effective generation and use of strategic information requires optimal processes for data collection, sharing, management and feedback among the different levels of the health system. This involves: the definition of norms and standards, including ethical standards, for collecting and disseminating data; procedures for using data to conduct situation analyses, set targets, guide planning and implementation, and support advocacy efforts; and investment in data quality. The UNAIDS 'Three Ones' principles for coordinating national HIV responses emphasize the importance of national ownership and coordination among stakeholders, including international partners, around one agreed framework for national monitoring and evaluation.
3. **Resources:** *What resources are needed to support strategic information activities?* A fully functional health information system requires the infrastructure and tools for data collection, storage and management, including data recording tools, data reporting forms, databases, and electronic systems for data-sharing and analysis. It requires investment in building human resource capacity (including epidemiologists, surveillance and monitoring and evaluation officers, and information technology and management information system specialists) at all levels of the health system through training, mentoring and supervision. As programmes are scaled up, there is also need to protect the security and confidentiality of patient data. Infrastructure (e.g. laboratories) is needed to scale up research. Strengthening information systems also requires an appropriate policy, management and financial environment.

Key resource:

202. Guidelines on protecting the confidentiality and security of HIV information: Proceedings from a workshop, May 2006. Interim guidelines
http://data.unaids.org/pub/manual/2007/confidentiality_security_interim_guidelines_15may2007_en.pdf

3.2 Surveillance of HIV/AIDS and sexually transmitted infections

HIV surveillance provides essential data to understand the magnitude and determinants of the epidemic in a country, assess the burden of disease, monitor trends over time, develop interventions and evaluate their impact. In addition, second generation HIV and STI surveillance systems measure trends in risk behaviours.

HIV surveillance systems should be capable of being adapted and modified to meet the specific needs of each epidemic. For example, surveillance methods and activities in a country with a predominantly generalized heterosexual epidemic should differ greatly from those in countries where HIV infection is mostly concentrated among populations at high risk of infection, such as sex workers, men who have sex with men, and injecting drug users, as well as the sexual partners of these groups.

In addition to collecting data from HIV surveillance, countries also use statistical modelling to better understand their specific HIV epidemics, including trends in HIV prevalence in the general population and most-at-risk populations, and estimates of the numbers of people who need particular interventions, such as antiretroviral therapy and antiretrovirals for preventing mother-to-child transmission. Based on the recommendations of the UNAIDS Reference Group on Estimates, Modelling and Projections, WHO and UNAIDS provide technical assistance and training to country teams to generate country estimates.

Summary of recommendations:

The health sector plays the lead role in comprehensive HIV surveillance. National HIV/AIDS programmes should build surveillance systems that provide data in a routine, standard manner with consistency of methods, tools and populations surveyed. Vital elements of a comprehensive HIV surveillance system include:

- HIV infection and AIDS case reporting;
- HIV sentinel surveillance among clients attending antenatal clinics;
- integrated biological and behavioural data among most-at-risk populations;
- periodic national population-based surveys (e.g. Demographic and Health Surveys) with HIV testing;
- data from HIV surveillance among TB patients.

Sentinel surveillance among antenatal clinic attendees and population-based surveys with HIV testing are relevant for generalized HIV epidemics. Integrated biological and behavioural surveillance among high risk groups may be relevant for all epidemic levels, and are a priority for concentrated and low-level epidemics.

Developing reliable estimates of the size of populations at high risk for HIV is another important aspect of surveillance, to inform assessment of needs and development of appropriate policies and programmes. Estimates of the population size of high risk groups should be calculated using standard methods in conjunction with data from integrated biological and behavioural surveillance and service data.

Surveillance of new cases of HIV infection (HIV incidence) is challenging; it cannot be done through case reporting because early HIV infection has no distinct clinical features that bring newly-infected people to medical attention. Current laboratory-based tests for recent infection are not useful for individual determinations; however they may be employed with suitable caution at the population level to produce incidence estimates. In countries or sites with linked testing, dynamic cohorts may be used to measure recent infections. STI surveillance is strongly recommended both in its own right and as a useful early warning system for expansion of an HIV epidemic.

Key resources:

203. Guidelines for measuring national HIV prevalence in population-based surveys
<http://www.who.int/hiv/pub/surveillance/guidelinesmeasuringpopulation.pdf>

204. The pre-surveillance assessment: Guidelines for planning serosurveillance of HIV, prevalence of sexually transmitted infections and the behavioural components of second generation surveillance of HIV
<http://www.who.int/hiv/pub/surveillance/psaguidelines.pdf>
205. Guidelines for HIV surveillance among tuberculosis patients. Second edition
 English: http://whqlibdoc.who.int/hq/2004/WHO_HTM_TB_2004.339.pdf
 French: http://whqlibdoc.who.int/hq/2005/WHO_HTM_TB_2004.339_fre.pdf
 Spanish: http://whqlibdoc.who.int/hq/2004/OMS_HTM_TUB_2004.339_spa.pdf
 Russian: http://whqlibdoc.who.int/hq/2004/WHO_HTM_TB_2004.339_rus.pdf
206. Guidelines for effective use of data from HIV surveillance systems
 English: <http://www.who.int/hiv/strategic/surveillance/en/useofdata.pdf>
 Spanish: http://www.who.int/hiv/pub/surveillance/useofdata_sp.pdf
207. Guidelines for conducting HIV sentinel serosurveys among pregnant women and other groups
 English: <http://www.who.int/hiv/pub/surveillance/en/ancguidelines.pdf>
 French: http://www.who.int/hiv/pub/epidemiology/en/guidelinesforconduction_fr.pdf
208. Estimating the size of populations at risk for HIV: Issues and methods
<http://www.who.int/hiv/pub/surveillance/en/EstimatingSizePop.pdf>
209. Guidelines for using HIV testing technologies in surveillance: selection, evaluation and implementation
http://www.who.int/hiv/pub/surveillance/en/guidelinesforUsingHIVTestingTechs_E.pdf
210. HIV surveillance training modules, WHO Regional Office for South-East Asia
 Module 1: Overview of the HIV epidemic with an introduction to public health surveillance
http://www.searo.who.int/LinkFiles/Publications_Module-1.pdf
 Module 2: HIV clinical staging and case reporting
http://www.searo.who.int/LinkFiles/Publications_Module-2.pdf
 Module 3: HIV Serosurveillance
http://www.searo.who.int/LinkFiles/Publications_Module-3.pdf
 Module 4: Surveillance for sexually transmitted infections
http://www.searo.who.int/LinkFiles/Publications_Module-4.pdf
 Module 5: Surveillance of HIV risk behaviours
http://www.searo.who.int/LinkFiles/Publications_Module-5.pdf
 Module 6: Surveillance of populations at high risk for HIV transmission
http://www.searo.who.int/LinkFiles/Publications_Module-6.pdf
 Facilitator training guide for HIV surveillance
http://www.searo.who.int/LinkFiles/Publications_facilitator.pdf

3.3 Monitoring and evaluation of the health sector response

A comprehensive health-sector response to HIV requires sound strategies to monitor and evaluate progress. ‘Monitoring’ refers to the routine tracking of essential data related to the implementation of a programme and its inputs, processes, outputs, outcomes and impacts. ‘Evaluation’ is a collection of activities designed to assess the effectiveness of a programme. Regular monitoring and evaluation are essential to guide programme planning and implementation, measure progress, and sustain commitment and accountability.

3.3.1 Monitoring health sector HIV programmes

A key step in strengthening monitoring and evaluation (M&E) systems is to determine what data should be collected, at which levels of the system, and by whom. Decisions should be made on what data need to be reported upwards and for what purpose. The main purpose is generally to measure inputs, outputs, outcomes and impacts against a limited number of key indicators limited so as to avoid overburdening the system.

Summary of recommendations

National HIV/AIDS programmes, ministries of health and other stakeholders should collaborate on the design, implementation and strengthening of national M&E systems. A national strategy for M&E of health-sector HIV/AIDS programmes should include tools and processes to generate a wide range of data, plus analysis and reporting on HIV prevention, treatment and care interventions at the national, sub-national and facility levels.

The data should include input indicators (e.g. budgets, human resources, supplies), process indicators (e.g. training, interventions to review and update procedures, availability and adequacy of national policies and guidelines); output indicators (e.g. newly trained health workers, improved procedures, geographical coverage of interventions); outcome indicators (e.g. increased uptake of services, increased knowledge of HIV, behavioural change); and impact indicators (e.g. longer survival of people living with HIV). As national programmes expand, it is also increasingly important to monitor the quality of services and to measure impacts on the health system.

Data for monitoring the health-sector response to HIV come from several sources. These include routine medical and other records that are part of the broader health information management system; mapping available services in health facilities and other health settings; health facility surveys; population-based surveys; cohort studies of people living with HIV; monitoring procurement and supply of HIV medicines and diagnostics; and impact assessment. Other sources include surveillance data (e.g. behavioural and biological surveys) and mortality records and reports. Special studies should be considered when routine data collection and analysis is inappropriate or not feasible. Data from organizations providing community-based HIV services are also essential.

M&E activities should use ongoing data collection systems as far as possible to minimize burden of data collection and optimize use of resources. It is important that indicators are defined and measured in a consistent and standard way in order to assess trends and measure progress towards programme goals. It is also important that M&E systems are able to capture data disaggregated by age, sex, population groups (including most-at-risk population groups, such as sex workers, men who have sex with men and injecting drug users; patients with TB and hepatitis B and C coinfection) and by geographical regions or socioeconomic groups as appropriate.

Key resources:

211. National guide to monitoring and evaluating programmes for the prevention of HIV in infants and young children
<http://whqlibdoc.who.int/publications/2004/9241591846.pdf>
212. National AIDS programmes: A guide to indicators for monitoring and evaluating national HIV/AIDS prevention programmes for young people
English: <http://www.who.int/hiv/pub/epidemiology/nayoungpeople.pdf>
French: http://www.who.int/hiv/pub/me/nayoungpeople_fr.pdf
Spanish: http://www.who.int/hiv/pub/me/nayoungpeople_sp.pdf
Russian: http://www.who.int/hiv/pub/me/nayoungpeople_ru.pdf
213. National AIDS programmes: A guide to indicators for monitoring national antiretroviral programmes
English: <http://www.who.int/hiv/pub/me/naparv.pdf>
French: <http://www.who.int/hiv/strategic/me/naparvfr.pdf>
Spanish: http://www.who.int/hiv/pub/me/napart_sp.pdf
214. A guide to monitoring and evaluation for collaborative TB/HIV activities: Field test version
English: http://whqlibdoc.who.int/hq/2004/WHO_HTM_TB_2004.342.pdf
Russian: http://whqlibdoc.who.int/hq/2004/WHO_HTM_TB_2004.342_rus.pdf
215. Core indicators for national AIDS programmes: Guidance and specifications for additional recommended indicators
Forthcoming in 2009

Note that updated guidelines on monitoring and evaluation for PMTCT, male circumcision, and testing and counselling programmes will be available in 2009.

3.3.2 Global monitoring and reporting

At the international level, demonstrating the impact of investments in HIV programmes is critical to sustaining commitment and ensuring accountability. Since the World Health Assembly in 2006, WHO is mandated to monitor and report annually on global progress in the health-sector response to HIV/AIDS, with a view to achieving universal access by 2010. Data from national programmes are also necessary to monitor progress towards meeting other international commitments such as the Millennium Development Goals and the UN General Assembly's Declaration of Commitment on HIV/AIDS.

Summary of recommendations

To facilitate global monitoring and reporting, WHO has developed a core framework of recommended national level indicators on the health-sector response to HIV/AIDS. The framework includes indicators to measure the availability and coverage of interventions, as well as their outcomes and impact in terms of survival and improvements in quality of life. The selection of indicators has been guided by the principle of maximum alignment with existing international processes. National programmes are requested to report data on an annual basis, and data from national programmes are aggregated and analysed to produce an annual global progress report.

Key resources:

216. Global framework for monitoring and reporting on the health sector's response towards universal access to HIV/AIDS treatment, prevention, care and support
http://www.who.int/hiv/universalaccess2010/UAframework_Final%20Nov.pdf
217. Monitoring the declaration of commitment on HIV/AIDS: Guidelines on construction of core indicators
http://data.unaids.org/pub/Manual/2007/20070411_ungass_core_indicators_manual_en.pdf

3.3.3 Patient monitoring systems

Patient monitoring systems are essential to support individual management of patients in long-term HIV care, as well as for clinical teams to monitor outcomes of groups of patients enrolled in HIV care, and to maintain a high quality of services. Patient monitoring systems also contribute to programme monitoring and evaluation at the health centre, sub-national and national levels, since they generate essential information on the outcome and impact of programmes (e.g. survival of patients on ART) to report 'up' to the national level.

The WHO HIV care/ART patient monitoring system lays out an internationally agreed minimum data set and definitions, and includes an illustrative system to collect these data. This system includes summary HIV care/ART patient cards, pre-ART and ART registers, and cross-sectional and cohort reports. The ART register organizes patients into monthly treatment cohorts, which allows group cohort analysis, and is useful for monitoring and comparing programme performance over time and across sites. The tools should be adapted for use at country level.

WHO has also developed (and made available for free) an OpenMRS Express electronic medical record that uses the same data elements as the paper forms and produces the same reports. It can be readily customized to meet local requirements, and can be used to collect all elements on the patient card or only the register elements. The standard data set is available and can be implemented in other software.

In collaboration with multiple partners, WHO has developed three interlinked patient monitoring systems to track longitudinal information on patients in HIV care/ART, TB-HIV management, and maternal and child health/PMTCT monitoring. The latter integrates monitoring the care of pregnant women and infants with monitoring of PMTCT interventions and malaria prevention (cotrimoxazole, or intermittent preventative therapy for malaria with sulfadoxine-pyrimethamine). Countries are beginning to adapt these three interlinked systems, particularly as decentralization of services becomes more widespread.

Many patient monitoring systems are paper-based at the health facility level, and then require that paper-based data be entered again into electronic systems for transmission, aggregation and analysis. Higher volume facilities may use electronic medical records with entry of patient-level data; or data may be entered from patient cards into an electronic register; or entry may happen at the district or national levels, where data are aggregated and analysed on a spreadsheet or other software (such as the HealthMapper extension for ART data).

Depending on the context, each way of doing things has its strengths and weaknesses. Simple and practical paper forms should provide the foundation of any patient monitoring system. In high-volume sites (>1500 patients), however, aggregating data manually to produce monthly or quarterly reports will be a great burden on the clinical team, and requires a data clerk. Electronic systems facilitate generating such reports easily, and sometimes automatically, but electronic systems require attention to security and confidentiality, space, equipment, human resources and training. In any case, there will be a continuum of paper to electronic data entry, depending on the needs and resources of each health facility.

Summary of recommendations

In keeping with the 'Three Ones' principles, WHO recommends developing and implementing one national patient monitoring system that supports a minimum standard data set and standardized forms and reports. Electronic forms should mirror paper forms in order to ensure that the same information is collected and reported, regardless of whether this is done through paper or electronically, and so that patients can transfer between facilities without loss of information.

WHO recommends nationally standardized and interlinked patient monitoring systems that track delivery of integrated HIV care/ART, maternal and child health with integrated PMTCT and malaria prevention interventions, and TB/HIV services. This can facilitate patient and programme management during scale-up.

Key resources:

218. Patient monitoring guidelines for HIV care and antiretroviral therapy
<http://www.who.int/hiv/pub/ptmonguidelines.pdf>
Note that new guidelines are currently in draft form at the following web link:
http://www.who.int/hiv/pub/imai/pmg_form_13aug.pdf
Training materials: <http://www.who.int/hiv/capacity/IMA/sharepoint/en>

215. Core indicators for national AIDS programmes: Guidance and specifications for additional recommended indicators
Forthcoming in 2009
216. Global framework for monitoring and reporting on the health sector's response towards universal access to HIV/AIDS treatment, prevention, care and support
http://www.who.int/hiv/universalaccess2010/UAframework_Final%20Nov.pdf
217. Monitoring the declaration of commitment on HIV/AIDS: Guidelines on construction of core indicators
http://data.unaids.org/pub/Manual/2007/20070411_ungass_core_indicators_manual_en.pdf

3.3.4 Prevention and assessment of HIV drug resistance

Given the high replication and mutation rates of HIV and the necessity of lifelong antiretroviral treatment, the emergence of some level of HIV drug resistance (HIVDR) is inevitable. However, the risk of HIVDR can be reduced with appropriate action.

Summary of recommendations

To maintain the effectiveness of first- and second-line antiretroviral regimens, WHO recommends that countries develop a national strategy for HIVDR prevention and assessment. Surveys of HIV drug resistance emergence and prevention during ART, and of transmitted drug resistance, can be used to inform optimal selection of ARV regimens on a population basis.

Interventions for preventing the emergence of resistance are required at all levels of the health system. The recommended prevention and assessment strategy was developed in consultation with WHO HIVResNet, a global network of institutions, specialists and participating countries. Technical assistance is available from the WHO HIV Drug Resistance Team and from other members of the network.

Key interventions for preventing and managing HIV drug resistance include:

- promoting use of standard ART regimens;
- supporting use of standardized individual treatment records;
- active monitoring of adherence;
- removing barriers to continuous adherence;
- providing quality assurance/control for drugs, and an adequate and continuous drug supply;
- preventing HIV transmission by persons receiving ART;
- monitoring programmes for 'early warning' of HIVDR;
- doing surveillance for HIVDR transmission, and monitoring HIVDR emergence in treated populations;
- taking appropriate actions based on the results of monitoring and surveillance.

Key resource:

219. HIV drug resistance (WHO webpage)
<http://www.who.int/hiv/drugresistance/>

3.3.5 Pharmacovigilance

The objectives of pharmacovigilance are to enhance patient care and patient safety in relation to the use of medicines; to improve public health and safety in relation to the use of medicines; and to contribute to assessing the risk-benefit profile of medicines.

As HIV/AIDS treatment programmes are scaled up in low- and middle-income countries, there is a risk that their effectiveness may be compromised as a result of adverse events related to using antiretrovirals. These include problems of toxicity, intolerance, drug-drug interactions, and adverse events linked with co-morbidities such as hepatitis. Pharmacovigilance is critically important for clinicians as they seek to optimize patient adherence to treatment and treatment outcomes, and to ensure their safety. Assessing the likelihood of adverse events in a given population is also important for policy-makers and programme managers as it informs the initial selection, forecasting, procurement and distribution of antiretroviral drugs.

Summary of recommendations

WHO recommends the development of national pharmacovigilance programmes for ARV drugs, with passive and active surveillance of adverse events that are potentially linked to these medicines. The

main focus of these programmes should be on treatment monitoring and post-monitoring surveillance that covers detection, assessment, and the understanding and prevention of adverse effects or other ARV drug-related problems. Pharmacovigilance programmes should also include communication of information about benefits, harms and risks of drugs to practitioners, patients and the public.

Using standardized methods to collect reports of suspected adverse drug reactions through spontaneous reporting should be a core activity of national pharmacovigilance centres. In the context of antiretroviral therapy, pharmacovigilance activities are also important for programmatic decision-making. Active surveillance of adverse reactions to antiretrovirals through cohort event monitoring and special studies is critical for supporting regular updates of national and global treatment, care and prevention guidelines; improving patient and public care and safety; and standardizing management of toxicity and drug-drug interactions based on local data on adverse drug reactions, as well as international recommendations.

To optimize monitoring and managing adverse events associated with antiretroviral drugs, national pharmacovigilance programmes should:

- enable clinicians to identify, report and manage adverse events and toxicity related to ARV use;
- stimulate improved reporting and analysis of ARV adverse events and toxicity;
- integrate active surveillance and cohort event monitoring in national pharmacovigilance programmes;
- carry out focused in-depth studies aimed at improving ARV use and safety;
- pool and analyse data on adverse events as a basis for developing national and global antiretroviral therapy policies, and draft or improve treatment guidelines;
- promote information sharing on issues relating to ARV adverse events, including management of toxicity, intolerance and drug–drug interactions.

Key resources:

220. [Pharmacovigilance for antiretrovirals in resource-poor countries
http://www.who.int/medicines/areas/quality_safety/safety_efficacy/PhV_for_antiretrovirals.pdf](http://www.who.int/medicines/areas/quality_safety/safety_efficacy/PhV_for_antiretrovirals.pdf)

3.3.6 Evaluation

Evaluation is an essential, but often neglected, component of a comprehensive M&E system. It assesses the value or impact of a programme or intervention through a detailed analysis of inputs and outcomes. There are three sequential phases of evaluation—process, outcomes and impact evaluation.

Strengthening evaluation is essential for programme managers and decision-makers since it enables them to assess how successfully programmes are meeting their goals. Evaluation is also critical for countries and their development partners since it demonstrates the effectiveness of aid and argues for sustaining or increasing it. The effective use of evaluation data will ensure that the HIV response is based on the best available evidence, and will guide continued programme improvement.

Ideally, sound monitoring provides much of the data required for evaluation, including baseline data. In practice however, additional data collection is often required because health information systems may be weak, and complete, high-quality data may not be readily available. Capacity for conducting evaluations may also be limited in many countries.

Summary of recommendations

The main steps in planning evaluation include:

- conducting a country readiness assessment that includes gauging the strengths of national strategic and M&E plans and the links between them and, also, assessing the availability of data and resources for an evaluation;
- creating a multidisciplinary national evaluation task force that brings together key stakeholders from government, civil society, the private sector, and technical and financial aid agencies;
- reviewing and cataloguing relevant materials and documents such as national plans, programme data, census data, data from behavioural and biological surveillance and other surveys, programme monitoring and evaluation reports, and research studies;

- developing an agenda for the evaluation, including prioritizing key questions and agreeing on an action plan and timelines.

This is followed by implementation of the evaluation agenda. Evaluations bring together data from multiple sources. In order to strengthen monitoring and evaluation, it is important that any additional necessary data collection be integrated into the existing health information system which, in turn, should be linked to the country review and strategic planning processes (see section 4.2). (In other words, the process of doing an evaluation should strengthen the monitoring and evaluation system and, thus, facilitate future evaluations.) The evaluation process should involve collaboration among policy-makers, project managers, international stakeholders and evaluation experts.

3.4 Research

An effective response to HIV/AIDS requires that interventions and approaches be continually improved over time. Over the past 25 years, sustained research efforts have produced new scientific evidence, and have enabled the evolution of HIV interventions, policies and programmes.

The importance of investing in research was acknowledged by the Sydney Declaration of the 4th International AIDS Society Conference on Pathogenesis, Treatment and Prevention held in Sydney, Australia in July 2007. The Declaration called on national governments and bilateral, multilateral and private donors to allocate 10% of all resources for HIV programming to research, which provides more and better evidence on which to base the response to HIV.

The HIV response can be strengthened through different types of research—clinical/epidemiologic; socio-behavioural; and health systems. In each of these areas, new evidence should be collected, assessed and then brought to bear on policies, strategies and programmes. Operational research builds on the different disciplines that are used for basic research to address questions related to programmes. Performing research alone is not enough; there must also be processes for bringing it quickly to bear on decisions, so they are informed by the most up-to-date evidence.

There are many examples of research that is urgently needed. These include research aimed at: discovering effective prevention technologies (vaccines, microbicides and cervical barriers, and pre-exposure prophylaxis) and of effective treatment and care interventions; expanding understanding of socio-behavioural factors that increase or decrease risk behaviour or hinder or facilitate access to interventions; and discovering the optimal models of service delivery within a variety of national and sub-national contexts.

To scale up research, countries need to invest in building research capacity. This means training human resources and developing research infrastructure, including laboratories. It also requires stronger health information systems to capture and use information generated through research. Greater collaboration between researchers and policy-makers is needed to ensure that the role of research is appreciated and the findings are translated into practice. Collaboration among national partners, donors and north/south research organizations and networks is also necessary to devise and conduct research that is relevant to country situations.

3.4.1 Operational research

Operational research covers all programme areas and is vital to improving programme operations and making the most effective use of available resources.

Operational research involves the use of systematic research techniques to solve programme problems. It is used to gather evidence to inform treatment and prevention programmes, and looks at such matters as different approaches to task-shifting for ART delivery, the factors that influence adherence to medical regimens, and the factors that influence uptake of testing and counselling. It uses a variety of qualitative and quantitative analytical techniques, favours multidisciplinary approaches, and should be 'owned' by country partners.

Summary of recommendations

A first step for implementing operational research is to conduct a rapid assessment of what is known about the selected topic in the country, and to formulate questions that can be addressed through such research. This is best done through consulting major stakeholders from the research community, the ministry of health, and NGOs. Once general priorities are established, it is important to identify individuals who can form the nucleus of the project, so that they can design an appropriate study, and

seek resources to support the project. Data collection methods can build on available tools that can be adapted, translated and tested in the country, in order to ensure that they fit with local realities. Data triangulation is recommended.

Key resources:

221. Guide to operational research in programs supported by the Global Fund
http://www.who.int/hiv/pub/epidemiology/SIR_operational_research_brochure.pdf
222. Framework for operations and implementation research in health and disease control programmes
<http://www.theglobalfund.org/documents/me/FrameworkForOperationsResearch.pdf>
223. HIV testing, treatment, and prevention: generic tools for operational research
To be available in 2009 at the following web link:
<http://www.who.int/hiv/pub/vct/en/>

Note that publication of generic tools to assist data collection on key topics including adherence to ARVs; prevention of transmission by those under treatment; stigma; and testing for HIV, are anticipated in 2009.

3.5 Using data effectively for programme improvement

The main reason for generating strategic information is to provide evidence to inform the development and implementation of policies, strategies and programmes at all levels of the health system. This means strategic information activities should be linked to the needs for evidence and to the people who need it, and that the evidence must be packaged and disseminated in ways that make it easy for those people to digest and use. Plans for disseminating the evidence should keep different readers or audiences in mind, whether they be political decision-makers, programme planners and managers, health workers, people living with HIV or at-risk of infection, and so on. Feedback from readers or audiences at all levels of the health system should ensure that the information is presented in ways that meet their needs, and that it encourages a culture of data generation and application for programme improvement at all levels.

3.5.1 Situation analysis

In order to remain effective, planning and programming of the HIV response must be linked to regular review of the epidemiological situation and programme performance. National HIV/AIDS programmes need a clear understanding of the country situation in order to prioritize and tailor interventions.

For example, to interrupt HIV transmission, it is important to know the geographical areas and populations where the epidemic is spreading most rapidly, and to plan interventions accordingly. Similarly, organizing services for care, support and treatment requires an understanding of the location of people living with HIV. There may be considerable overlap in initiatives for HIV prevention, care and treatment in terms of geographic and population focus.

Summary of recommendations

HIV/AIDS programme managers need to regularly track, analyse and use data from multiple sources, including:

- biological and behavioural sentinel and periodic surveillance;
- HIV/AIDS case reporting from the health services;
- sexually transmitted infection (STI) clinics;
- patient monitoring from testing and counselling services, HIV care and ART services, TB and maternal and child health services;
- surveys to assess HIV drug resistance prevention, and site indicators for monitoring HIV drug resistance;
- situation assessments, mapping studies and rapid assessments among target populations;
- population surveys (demographic and health surveys, HIV indicator surveys, etc);
- national census reports;
- social, cultural and behavioural research;
- operational research;
- periodic AIDS, TB and maternal and child health programme reviews.

Rapid assessment and response (RAR) methods can be used to generate information in situations where data are needed extremely quickly, when time or cost constraints rule out using more conventional research techniques, and when current, relevant data are needed to develop, implement, monitor or evaluate programmes. RAR methods use existing information from multiple sources and are flexible and cost-effective. They can provide information on the country situation or context; target populations and settings; risk behaviours; and HIV infection and other HIV-related outcomes and responses. Both qualitative and quantitative methods and data should be considered. All RARs should include recommendations and plans of action. They should also encourage community participation.

An analytical approach known as 'triangulation' integrates multiple data sources to improve the understanding of a public-health problem. It is used to guide programmatic decision-making to address such problems.

Key resources:

224. A guide to rapid assessment of human resources for health
http://www.who.int/hrh/tools/en/Rapid_Assessment_guide.pdf
222. Framework for operations and implementation research in health and disease control programmes
<http://www.theglobalfund.org/documents/me/FrameworkForOperationsResearch.pdf>
36. SEX-RAR guide: The rapid assessment and response guide on psychoactive substance use and sexual risk behaviour
http://www.who.int/mental_health/media/en/686.pdf
52. Rapid assessment and response: Adaptation guide on HIV and men who have sex with men (MSM-RAR)
http://www.who.int/entity/hiv/pub/prev_care/en/msmrar.pdf
225. Rapid assessment and response: Adaptation guide for work with especially vulnerable young people (EVYP- RAR)
http://www.who.int/hiv/pub/prev_care/en/youngpeoplerrar.pdf

Note that publication of an HIV triangulation resource guide: Synthesis of results from multiple data sources for evaluation and decision-making, is anticipated in 2009

3.5.2 Setting targets

Setting targets is an integral part of national health-sector strategic planning and is necessary to monitor progress. Even the best interventions will have little public-health impact if they are implemented on a limited scale.

All countries strive towards the goal of universal access, but individual country targets will differ in a given year depending on the country context. For example, the Guidance for global scale-up of the prevention of mother-to-child transmission of HIV suggests the following coverage levels to guide setting country-level targets:

- at least 80% of all pregnant women attending antenatal care are tested for HIV, including those previously confirmed to be living with HIV.
- at least 80% of pregnant women living with HIV receive antiretroviral prophylaxis or antiretroviral therapy to reduce the risk of mother-to-child transmission.
- at least 80% of infants born to women living with HIV receive a virological HIV test within two months of birth.

Similarly, the Global Plan to Stop TB 2006–2015 sets global targets. For example, by 2015, 85% of TB patients in DOTS programmes are to receive HIV testing and counselling, and 57% of TB patients in DOTS programmes (HIV-positive and eligible) are to be enrolled on antiretroviral therapy. National target-setting is necessary to translate international commitments into country action plans, and to monitor implementation.

Summary of recommendations

A number of factors need to be taken into consideration in order to set targets for scaling up priority health-sector interventions for HIV/AIDS (such as the proportion of people in need receiving antiretroviral therapy, or the proportion of HIV-positive pregnant women receiving antiretrovirals to prevent mother-to-child transmission). These include:

- considering the epidemiological context, geographical distribution and the size of populations in need;
- reviewing the programmatic context and health-service delivery infrastructure, including human and financial resources;

- assessing current coverage and the possible impact under different target scenarios;
- developing plans and time-bound targets for scaling up towards a standard or a benchmark.

Depending on the information available, targets can be set and coverage monitored in several ways: by geographical distribution, such as on the basis of administrative units (district, province, etc.); by population sub-groups (such as antiretroviral therapy targets for pregnant women, all adults, adolescents, children, or most-at-risk populations); or by combining methods for a more complete picture.

Target-setting must be integrated with programme planning and budgeting. It must be linked to related, ongoing efforts such as situation analyses and the collection of well-defined indicators and other monitoring and evaluation activities. Targets should be regularly evaluated and revised as necessary.

Key resources:

226. Technical guide for countries to set targets for universal access to HIV prevention, treatment and care for injecting drug users (IDUs) <http://www.who.int/hiv/idu/TechnicalGuideTargetSettingApril08.pdf>
227. Setting national targets for moving towards universal access: operational guidance http://data.unaids.org/pub/Guidelines/2006/20061006_report_universal_access_targets_guidelines_en.pdf
228. Considerations for countries to set their own national targets for HIV prevention, treatment and care http://data.unaids.org/pub/Report/2006/Considerations_for_target_setting_April2006.pdf
Addendum: http://data.unaids.org/pub/Guidelines/2006/20061006_report_universal_access_targets_guidelines_en.pdf
82. Guidance on global scale-up of the prevention of mother to child transmission of HIV: towards universal access for women, infants and young children and eliminating HIV and AIDS among children
English: http://whqlibdoc.who.int/publications/2007/9789241596015_eng.pdf
French: http://whqlibdoc.who.int/publications/2007/9789242596014_fre.pdf
Russian: http://whqlibdoc.who.int/publications/2007/9789280643114_rus.pdf

Note that publication of technical guidance on setting targets for ART, PMTCT and testing and counselling interventions is anticipated in 2009.

3.5.3 Data quality

A sound information system depends largely on the quality of data. This includes measures such as optimizing the amount of data to be collected, reducing the burden of data collection, using clear definitions, conducting local quality controls and checks, providing training, and providing feedback to data collectors and users to help to improve data quality.

Summary of recommendations

Data quality assessments should be carried out periodically to identify weaknesses in data collection and reporting systems, and to constantly improve data quality and accuracy.

The Health Metrics Network Assessment Tool for health information systems [web link <http://www.who.int/healthmetrics/tools/hisassessment/en/index.html>] lists the following criteria to assess the quality of health-related data and indicators:

- timeliness – the period between data collection and its availability to a higher level, or its publication;
- periodicity – the frequency with which an indicator is measured;
- consistency – the internal consistency of data within a dataset, as well as consistency between datasets and over time; and the extent to which revisions follow a regular, well-established and transparent schedule and process;
- representativeness – the extent to which data adequately represent the population and relevant subpopulations;
- disaggregation – the availability of statistics stratified by sex, age, socioeconomic status, major geographical or administrative region and ethnicity, as appropriate;
- confidentiality, data security and data accessibility – the extent to which practices are in accordance with guidelines and established standards for storage, backup, transport of information (especially over the Internet) and retrieval.

Key resource:

229. Routine data quality audit tool (RDQA): Guidelines for implementation GFATM, WHO and partners (Draft July 2008) <http://www.cpc.unc.edu/measure/tools/monitoring-evaluation-systems/data-quality-assurance-tools/RDQA%20Guidelines-Draft%207.30.08.pdf>