Key findings

- Investing in the HIV response can strengthen health systems as a whole and catalyse more effective and responsive health care delivery systems.

- Many countries are adopting strategies such as task-shifting to address health worker shortages, which involves moving specific tasks from highly specialized health workers to less specialized workers.

- Globally, 18% of all reporting treatment sites experienced at least one stock-out of antiretroviral drugs in 2007, with stock-outs highest in Africa and Latin America.

- Programme managers and health care workers need better strategic health information to guide service delivery and improve the impact of interventions in resource-limited settings.
6.1 Strengthening health systems

Strengthening health systems to support the unprecedented scale-up of HIV prevention, treatment and care interventions requires careful stewardship and integrating HIV programmes with other areas of the health system. All health systems have to carry out some basic functions to meet their goals, regardless of how they are organized. WHO identifies six building blocks for a strong health system: service delivery; health workforce; health information; medical products, vaccines and technologies; and leadership and governance (1). Each of these functions is essential to improving health outcomes and ensuring the greatest possible efficiency in health investment.

Health workforce

The health workforce continues to represent one of the most significant challenges in scaling up priority HIV interventions in low- and middle-income countries. The world health report 2006 (2) indicated a worldwide shortage of 4.3 million doctors, nurses and midwives, with sub-Saharan Africa alone experiencing a shortage of 1 million health care workers. Additional challenges related to the health workforce include migration, lack of skills and poor working environments (3).

HIV and other diseases have had an enormous effect on human resources in many countries in sub-Saharan Africa, where morbidity, mortality and absenteeism have undermined an already overstretched health workforce (4). Some studies have estimated that up to 20% of the health workforce may be lost due to HIV and related illnesses (3). A recent anonymous survey of 595 health care workers in South Africa (5) found that the HIV prevalence among health workers was 15.9%, comparable to the national average HIV prevalence of 15.5% among adults. Such results are unlikely to be markedly different in other high-burden countries.

These and other studies have emphasized the need to give priority to providing HIV interventions, including antiretroviral therapy, to health workers. A recent survey on the effect of scaling up treatment on human resources in Malawi, for example, estimated that, for 1024 health care workers accessing antiretroviral therapy as of June 2006, an estimated 250 lives were saved one year after treatment initiation, which accounts for a gain of 1000 health worker-days per week at the national level. This is equivalent to the total estimated number of health worker-days per week required for providing antiretroviral therapy services at the national level (6).

In 2007, WHO worked with several international partners and Member States to develop a plan to address the health workforce crisis with a focus on three interventions (7):

- treat: provide a comprehensive package of HIV interventions to health care workers;
- train: including task-shifting to less specialized types of workers; and
- retain: including occupational health and safety, financial and non-financial incentives to remain in the health workforce and measures to address the migration of health care workers to the private sector or to higher-income countries.

One of the key elements of the train component is task-shifting, which entails moving specific tasks, where appropriate, from highly qualified health workers to other health workers. Task-shifting was used successfully in resource-limited settings before the HIV epidemic emerged to address shortages of physicians in resource-limited settings, and several studies have demonstrated that this strategy is not only cost-effective but that auxiliary staff perform some tasks better than fully trained health care workers do (8).

In 2007, 28 of 73 low- and middle-income countries reported having a policy on task-shifting to allow reorganization of tasks among health care workers and hiring non-professional workers. WHO, together with the United States President’s Emergency Plan for AIDS Relief and UNAIDS, recently developed global recommendations and guidelines on task-shifting, and launched them at the first-ever International Conference on Task Shifting held in January 2008 (9). The recommendations provide overall guidance to countries that are considering adopting or further expanding a task-shifting approach to strengthening the health workforce.

Uptake of task-shifting in the delivery of HIV services has demonstrated beneficial results. A recent study in South Africa (10) found that, after six months of follow-up, outcomes such as viral suppression, adherence and retention of patients at sites without doctors were similar to those at sites with doctors. Favourable outcomes of the task-shifting approach have also been documented in Haiti and Rwanda, where Partners in Health, a nongovernmental organization, delivers HIV treatment and care services using a model that shifts tasks towards nurses and community health workers. In Partners in Health sites in Haiti, where doctors exclusively perform only 2% of all tasks, the 12-month survival of the people ever started on antiretroviral therapy was comparable to antiretroviral therapy was comparable to survival outcomes in other resource-limited settings. The drop-out rates were less than 5% in Partners in Health sites in both countries, which has been attributed to the support of community health workers who accompany people through their treatment with daily supervision and monitoring. Nurses and doctors accepted task-shifting as an approach, and

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1 Data reported to WHO in response to the annual questionnaire for monitoring the health sector response to HIV/AIDS, 2007.
community health workers were well respected. At all levels of the health care system, staff reported that they felt capable of taking on new or more complicated tasks with adequate training, materials and remuneration (11). Similar results have also been reported in Uganda (12).

Procurement and supply management
In addition to the human resources crisis, many health systems continue to face weak procurement and supply management systems that result in frequent stock-outs of antiretroviral drugs and other essential commodities (13). Among 66 low- and middle-income countries reporting data on stock-outs of antiretroviral drugs, 41 countries had not experienced any stock-out of antiretroviral drugs in 2007. The remaining 25 countries reported having experienced one or more episode of stock-out of antiretroviral drugs. Globally, 18% of all reporting treatment sites had experienced at least one stock-out of antiretroviral drugs in 2007. However, countries in Africa and Latin America reported higher proportions of treatment sites experiencing stock-outs of antiretroviral drugs than other regions.3

To help countries to strengthen their procurement and supply management systems, the United States President’s Emergency Plan for AIDS Relief funded the Supply Chain Management System, which brings together multiple stakeholders to procure essential medicines and other supplies at affordable prices, to build and strengthen reliable supply chain systems, and to foster coordination in this area among partners (Box 6.1).

**Box 6.1. Strengthening supply chain management in Guyana and Zimbabwe**

**Guyana**
AIDS is the leading cause of death for people between the ages of 25 and 44 in Guyana, and the government has given priority to timely access to treatment and care for people living with HIV. Guyana’s supply chain is largely centralized, with a unit within the Ministry of Health to manage the procurement and distribution of all public-sector health commodities.

To increase warehousing capacity, the Ministry of Health, with the support of the Supply Chain Management System, opened a new model storage facility for HIV medicines and supplies in November 2007. The new facility provides a secure, temperature-controlled environment for storing antiretroviral drugs and other commodities used in HIV testing, care and treatment. A warehouse management system was also launched, incorporating hand-held and radio frequency technology into the new warehouse. Previous warehouse inventory systems were prone to inaccuracy, resulting in inefficiency and expired products. The new system has already greatly improved inventory management.

In 2007, the Supply Chain Management System also worked with other partner organizations to develop a national forecast of antiretroviral drugs, other essential medicines and test kits needed over the coming year and trained technical staff from the Ministry of Health and partner organizations in forecasting techniques. This will help to further strengthen the inventory systems and ensure that potential shortages of essential health commodities are averted.

**Zimbabwe**
In Zimbabwe, coordination among key stakeholders has been key to success in scaling up antiretroviral therapy programmes in the current unstable economic environment. To strengthen procurement and supply management systems, the Supply Chain Management System has provided support to the National Antiretroviral Treatment Partnership Forum, a programme of the Ministry of Health and Child Welfare that coordinates the activities of government agencies with donor organizations.

Zimbabwe is reducing stock-outs of key HIV commodities through an innovative programme first developed for its family planning programmes. In partnership with the Supply Chain Management System and the United States Agency for International Development, the Ministry of Health and Child Welfare and the Zimbabwe National Family Planning Council piloted a project to add HIV rapid test kits and nevirapine for preventing mother-to-child transmission of HIV to an existing distribution system that delivers condoms and contraceptive to health facilities in two provinces. Delivery team leaders carry commonly used commodities in large trucks — or “moving warehouses” — to health facilities, checking remaining supplies and leaving behind what is needed to replenish stocks. According to an evaluation conducted in January 2008, stock-out rates fell by 19% for rapid test kits and by 37% for nevirapine in one province alone. As a result, this programme was approved for nationwide rollout. The Supply Chain Management System is training local staff in the necessary skills and tools to do their own quantification and national supply management.

*Source: Where we work: country highlights (web site) (14)*

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2 Data reported to WHO in response to the annual questionnaire for monitoring the health sector response to HIV/AIDS, 2007.
3 Data reported to WHO in response to the annual questionnaire for monitoring the health sector response to HIV/AIDS, 2007.
HIV response and strengthening health systems
There has been significant debate in recent years about vertical (disease-specific) programming versus horizontal (health systems) investments. Some concern has been raised that funding for vertical programmes, such as those directed at providing HIV prevention, treatment and care services, distort the health system by diverting scarce resources in low- and middle-income countries away from other areas of the health system and complicating budgeting and planning processes for recipient countries (15–17). In response, several stakeholders have noted the false dichotomy of vertical HIV programmes versus horizontal investment in health systems as if they were mutually exclusive. They suggest that, although concerns about distorting health systems are valid, effective design of disease-specific programmes and integration with other components of the health system can leverage disease-focused investment to strengthen other areas of underresourced health systems (18,19).

The debate has stimulated significant discussion and evaluation on how HIV programme delivery affects the health systems of low- and middle-income countries. Several recent analyses of HIV programme implementation have provided new information on this, suggesting that investment in priority HIV interventions has effects throughout the health system, such as upgrading laboratory and clinical infrastructure (20). Additional analyses provide the conceptual framework for how HIV programme delivery can catalyse more effective and responsive health care delivery systems (Box 6.2) (21).

Box 6.2. Strengthening Cambodia’s health system with HIV investment

In 2003, Cambodia released a plan to scale up the provision of a continuum of care package for providing integrated care and treatment to people living with HIV. The services provided through this plan include:
- voluntary testing and counselling;
- community-based services, including home-based care and support groups for people living with HIV;
- health facility-based care, including treatment for opportunistic infections, antiretroviral therapy for adults and children and laboratory and pharmacy services; and
- supportive networks of people living with HIV or Mond Mith Chouy Mith (centres for friends help friends activities).

Cambodia’s National Center for HIV/AIDS, Dermatology and Sexually Transmitted Infections is leading the rollout of the plan from a single operational district in 2003 to an anticipated 40 of 68 operational districts by 2010.

One of the critical components of Cambodia’s plan was coordinating the activities of government, nongovernmental organizations and international partners in delivering HIV services. This was particularly challenging given the number of different nongovernmental organizations that had been providing HIV services before any government services existed.

Another important component of the plan was providing additional training and incentives to health workers to address the increased workload involved in treating people living with HIV.

A case study was submitted in 2007 to provide a snapshot of the continuum of care in mid-scale-up, paying particular attention to the potential for HIV interventions to contribute to strengthening the health system. Evidence for broader strengthening of the health system included:
- improved management techniques developed for the national HIV plan and picked up by other parts of the health care system;
- increased technical abilities of clinicians to treat people who do not have HIV infection;
- increased utilization of other hospital services as a result of positive feedback within the community regarding the standard of care; and
- improved general laboratory and pharmacy operations.

Evidence for these effects in strengthening the health system was most evident in the operational district that first began implementing the plan, where training, equipment and renovations built general system capacity as much as HIV-specific care.

In addition, staff and resources from paediatric HIV services are also providing services to all children in need of care, leading to an improved quality of general paediatric care at these 22 hospitals. The National Center for HIV/AIDS, Dermatology and Sexually Transmitted Infections has initiated an integrated laboratory initiative to pool staff and laboratory equipment from the various vertical programmes to optimize laboratory output at the district hospital level.

Sources: The continuum of care for people living with HIV/AIDS in Cambodia: linkages and strengthening in the public health system – a case study (22) and the WHO Country Office for Cambodia.
6.2 Integrating HIV services with primary health care

Several studies have indicated that HIV services need to be integrated with other health services to maximize the impact of investment in HIV interventions (23).

WHO has developed integrated tools and training materials health workers can use in delivering health services to people living with HIV. The Integrated Management of Adolescent and Adult Illness (IMAI) approach was built on the model of the Integrated Management of Childhood Illness (IMCI), which has been successfully implemented in countries since 1999. Rather than separate tools from different disease programmes, the IMAI and IMCI tools provide health workers with an integrated case management approach to managing multiple health problems while delivering priority prevention interventions.

Both approaches support a decentralized model of scaling up of health services that optimizes the use of human resources and fosters networks of health care provision at the district level. These district networks link communities, health centres and hospitals through systems of referral, consultation and mentoring and facilitate patient self-management. Such approaches also enable laboratory and clinical infrastructure and supply management to be strengthened and have the potential to strengthen the broader health system (Box 6.3).

Box 6.3. Integrated service provision in the United Republic of Tanzania

The United Republic of Tanzania has extensively implemented the IMCI strategy for several years. A large intervention study demonstrated that the integrated approach to delivering priority treatment and prevention interventions for children through IMCI resulted in a 13% greater reduction in child mortality than with using the same per capita resources for children’s health delivered in a disintegrated fashion with disease-specific interventions (24).

Building on the IMCI approach, the United Republic of Tanzania adapted the IMAI acute care, chronic HIV care and palliative care tools to use as the national curricula to train health care workers and support the decentralization of HIV services to the health centre level. Until mid-2006, antiretroviral therapy was delivered predominantly through care and treatment centres in 200 hospitals. In 2007, the Ministry of Health and Social Welfare trained care and treatment teams from 500 primary health facilities using the IMAI tools adapted to the United Republic of Tanzania to expand the delivery of antiretroviral therapy. The number of people receiving antiretroviral therapy increased from 46 124 people in October 2006 to 135 696 by December 2007. There are plans to train teams from an additional 500 primary health care facilities in 2008.

The Ministry of Health and Social Welfare has also reallocated the work of its implementing partners to strengthen the capacity of regional and district teams to manage HIV services. This policy of regionalization, combined with support for standardized national guidelines and curricula for the hospital and health centre level and active decentralization, are key to the further expansion of HIV services within a strengthened health system.
6.3 Investing in health information

Strategic information about the HIV epidemic at the local and national levels is essential for countries to guide planning, decision-making, implementation and accountability of their health sector response to HIV.

Surveillance

Knowing the HIV epidemic in a country is a prerequisite to designing an appropriate response. In 2000, UNAIDS and WHO launched the second-generation HIV surveillance method to improve HIV surveillance (25). This strategy promotes the adaptation of information systems to the country-specific characteristics of the HIV epidemic and links various sources of information, including HIV prevalence in different population groups, information on sexual risk behaviour, reporting of AIDS cases and other sources of data. Most countries have adopted this approach to strengthen HIV surveillance, although the quality of surveillance and trends has varied over time.

A recent evaluation of the frequency and timeliness of data collection, the appropriateness of systems used and consistency of surveillance sites provided useful insights into the quality of HIV surveillance practice. Globally, among 137 low- and middle-income countries, 56 countries had fully implemented surveillance systems, 32 had partly implemented them and the remaining 49 countries had poor performing systems. This represents a slight increase in the quality of surveillance systems globally over the past few years, especially in countries with generalized epidemics (26).

Since new HIV testing technologies – such as rapid tests and dried blood spot sampling – have become available, many countries have conducted nationally representative surveys to estimate HIV prevalence. National population surveys can provide more accurate and better-quality information on the levels of HIV infection in both urban and rural settings than estimates derived from sentinel surveillance. They also provide data on the age and sex distribution of the people living with HIV. During the past five years, about 30 national population-based surveys have been carried out, mostly in sub-Saharan Africa. Data from population-based surveys enable greater accuracy in generating global and regional estimates of the HIV epidemic.

Knowledge of the HIV epidemic in a country must include understanding the expected numbers and sources of new infections. WHO and UNAIDS are working with countries in eastern, western and southern Africa to generate better estimates of HIV incidence and inform programme planning. The study, which uses a modelling technique called modes of transmission, estimates the expected number of people newly infected per year based on the current distribution of infection and patterns of risk within a population (27).

Monitoring and evaluation

Countries have made significant efforts and progress in strengthening monitoring and evaluation of their HIV programmes in recent years, as a result of increasing investment in the HIV response as well as pressure from multilateral and bilateral donors for greater accountability. Countries are better prepared to collect, use and analyse data to monitor and improve programme performance. Key stakeholders have also made efforts to improve coordination for monitoring and evaluation activities in accordance with the “three ones” principles (28).

More and more countries recognize the need to strengthen systems to monitor the health-sector response to HIV/AIDS. As of December 2007, 67 low- and middle-income countries have developed or are developing a national monitoring and evaluation plan for the HIV response in the health sector. Most low- and middle-income countries (143 of 149 reporting countries) provided data for monitoring progress in the health sector towards universal access in 2007. An increasing number of countries are also able to monitor access to priority HIV interventions. For example, 131 low- and middle-income countries reported data on the number of people receiving antiretroviral therapy in 2007. However, the availability of detailed data, such as data disaggregated by sex and by age, is more limited. In 2007, only 101 countries were able to provide data on antiretroviral therapy disaggregated by sex and/or by age. Limited data are available from high-income countries. Nine of 44 high-income countries reported data on the number of people receiving antiretroviral therapy in 2007.

More progress is needed to ensure the availability of high-quality information and to make the best use of this information in developing national programmes, monitoring the impact of interventions and ensuring accountability. Regularly collecting and making available high-quality data on the impact and outcomes of key interventions is a pressing challenge for the future.

Although evidence is growing of the positive impact of scaling up antiretroviral therapy for individuals and communities, the high rates of loss to follow-up and early mortality among people initiating treatment raise concerns. Countries need the capacity to conduct cohort analyses and require appropriate tools, including electronic systems, to collect, compile and analyse data to monitor the outcome and impact of interventions and to take decisions for preventing undesirable results (Box 6.4).

At the global level, a high level of commitment from countries and donors will be sustainable only if evidence indicates that the large investments in the HIV response are mitigating morbidity and mortality and preventing new infections.
Box 6.4. Investing in a patient monitoring system for Ethiopia

Ethiopia developed its first National Monitoring and Evaluation Framework on HIV/AIDS in 2003. The national patient monitoring system for antiretroviral therapy was adopted in 2005 with its own package of data collection and reporting instruments. The patient monitoring system for antiretroviral therapy is used in all the 329 health facilities (119 hospitals and 210 health centres) currently delivering antiretroviral therapy. All health providers who provide antiretroviral therapy services are trained to use the national monitoring system for antiretroviral therapy, and the training is incorporated into the IMAI training modules.

To roll out the implementation of the patient monitoring system, Ethiopia trained and deployed data clerks to all health facilities providing antiretroviral therapy services. Data are collected using a paper-based system at the health facility level and compiled in an electronic database at the regional and national levels. Regional health information desks have data managers and monitoring and evaluation officers, with a central department responsible for coordinating monitoring and evaluation activities.

The national monitoring and evaluation system requires that all sites providing antiretroviral therapy services report patient information to their next administrative level on a monthly basis, with data disaggregated by age, sex and treatment regimen. Treatment outcome indicators begin to be reported six months after antiretroviral therapy is initiated and continue to be reported as patients reach 12 months, followed by each successive year on treatment. A total of 1129 testing and counselling sites and 502 sites providing interventions to prevent mother-to-child transmission follow the same procedures but report on a quarterly basis to the next administrative level.

National- and regional-level information on antiretroviral therapy is compiled, validated and disseminated monthly, and voluntary counselling and testing services and services to prevent mother-to-child transmission report nationally on a quarterly basis. National reports with aggregate data are disseminated electronically to key stakeholders and partners. The patient monitoring system has also provided the Ministry of Health and its partners with a rich source of research data to evaluate its national programme, for example, to evaluate how antiretroviral therapy affects morbidity and mortality in Ethiopia.

As the country’s antiretroviral therapy programme is scaled up, the current paper-based information system will become an increasing challenge. It is labour-intensive and takes up a large amount of space. It is subject to errors, which could compromise the quality of data. There are also concerns about ensuring the privacy and confidentiality of individual records. The heavy workload of both health care workers and data entry clerks creates difficulty in ensuring timely follow-up of patients who miss appointments or other events that could signal treatment interruption. Increased capacity is needed to sustain the monitoring of patients, especially at the woreda level, the lowest programme management level in the Ethiopian health care system.

Research

Comprehensive strategic health information includes operational research to guide the implementation and scale-up of HIV prevention, care and treatment programmes. Key stakeholders have acknowledged the importance of operational research to fill gaps in knowledge and to ensure evidence-based implementation of health-sector interventions. The Sydney Declaration launched at the 4th International AIDS Society Conference on HIV Pathogenesis, Treatment and Prevention in July 2007 calls for 10% of HIV/AIDS funding to be allocated for research (29).

In March 2008, WHO and partners organized an international consultation to define priority areas of research to guide implementation of the public health approach to delivering care and treatment in resource-limited settings. The consultation considered four main areas of research: laboratory services, antiretroviral therapy, non-antiretroviral therapy care and health systems. The recommendations from the consultation will be published during 2008.
References


19. Farmer P, Garrett L. From ‘marvellous momentum’ to health care for all: success is possible with the right programs. Foreign Affairs, 2006, July/August.

20. Wyss K, Weiss S. Contributions of ART scaling-up to the strengthening of health systems in the framework of support provided by GFATM: the case of Tanzania, Chad and Burkina Faso. Basle, Swiss Centre for International Health, 2005.


