

6. HEALTH SYSTEMS

Key findings

- Evidence on the interaction between HIV investments and health systems strengthening shows many positive impacts, but also some evidence of missed opportunities for overall system strengthening.
- Countries are adopting strategies to address critical health worker shortages, including task-shifting approaches which have been shown to result in improvements in access and quality of health services at comparable or lower costs than traditional delivery models. More efforts are needed to improve working conditions and access to health care for health workers themselves, as well as to ensure continued learning opportunities, quality assurance and measures to counter stigma and discrimination against people living with HIV in the health care setting.
- Collaboration between national and international partners has helped to strengthen HIV drug procurement and supply management systems in many countries, with some evidence of broader beneficial effects on overall systems. Yet, 34% of reporting low- and middle-income countries had experienced at least one stock-out during 2008, increasing the risk of treatment interruptions, failure or drug resistance.
- More data are becoming available to assess coverage and impacts of expanding HIV programmes. In 2008, 139 of 149 low- and middle-income countries worldwide responded to the joint WHO, UNICEF and UNAIDS questionnaire to monitor progress towards universal access, with higher reporting rates for many indicators as compared with 2007. However data quality and completeness remain uneven. Continued investment in strategic information is necessary to improve programmes and ensure accountability and sustained funding.

Achieving universal access to HIV prevention, treatment and care as well as the broader Millennium Development Goals rests on the capacity of health systems to deliver these services while respecting the principles of universal coverage, equity, participation and multisectoral action as enshrined in the landmark Declaration of Alma-Ata (7).

There has been much debate in recent years on whether the expansion of disease-specific global health initiatives, such as the global response to HIV, has strengthened or weakened health systems in countries with high disease burdens. The evidence shows that HIV investment has had many positive effects on health systems, but some evidence also indicates negative effects or missed opportunities for strengthening the overall system. More significantly, with its attention to the values of universal coverage, client-centred service delivery, community participation and multisectoral action, the international response to HIV has highlighted weaknesses in health systems in many areas and driven action towards improving human resource capacity, infrastructure, supply chains, health financing and information systems. A renewed international emphasis on expanding access to primary health care increases the importance of ensuring that investment in HIV programmes can be leveraged to create positive synergy between the HIV response and the development of health systems, and to draw on and use the lessons learned.

6.1. Health systems, primary health care and the HIV response

Numerous studies have examined the evidence base regarding the interaction between disease-specific global health initiatives and strengthening health systems (2–8). They concur in their assessment that, although data are limited, the available evidence demonstrates mostly positive and some negative effects. Importantly, these studies have also found that scaling up responses to HIV, TB and malaria has not resulted in decreased coverage of interventions for maternal and child health.

A multi-country evaluation by the Global Fund to Fight AIDS, Tuberculosis and Malaria also assessed financial flows and found that the total external funding directed towards HIV increased substantially between 2003 and 2006 but not at the expense of funding for maternal, neonatal and child health – which also grew, although not by as much. A comprehensive assessment of development assistance for health between 1990 and 2007 also documented a substantial increase in resources for global health, not just for the response to HIV (9). Clearly, continued commitment by international and national partners is needed to increase funding for health as a whole, and efforts are needed to maximize positive synergy with global health initiatives.

At the country level, analysing the interaction between disease-specific programmes, health systems and the additionality of resources is more complex due to weaknesses in data quality and availability and the interchangeable nature of earmarked international and domestic funding. Nevertheless, positive associations or benefits are visible in different contexts. Data from Rwanda show an important positive relationship between HIV interventions and improved antenatal care and family planning services (10). This may be partly explained by the fact that HIV-specific funds were used to build health facilities, train human resources and improve laboratories. Similarly, the results from a programme developed and implemented by Partners in Health in Haiti show a positive association between integrated prevention and care for HIV and vaccination, family planning and TB detection and treatment (11).

Global health initiatives have been rapidly adapting their approaches to foster synergy with efforts to strengthen health systems. The Global Fund, for example, has created financing windows for strengthening health and community systems, with countries being able to request funding for strengthening health systems as part of disease-specific proposals (12,13). The Fund reports that, so far, more than one third of its committed funding of US\$ 4.2 billion has been allocated to strengthening health systems, including strengthening infrastructure (such as laboratories), increasing human resources, improving skills and competencies of health workers and developing and supporting health information systems (14). The United States President's Emergency Plan for AIDS Relief reported spending a similar proportion of its funding for strengthening health systems and has introduced a specific target of training at least 140 000 new health care workers in its second phase of implementation. UNITAID, which supports the scaling up of access to treatment for HIV, TB and malaria by leveraging price reductions for high-quality diagnostics and medicines, is also contributing to broader strengthening of health systems and sustainability through innovative financing mechanisms for essential drugs.

These actions are closely intertwined with recent efforts to renew primary health care. At the 62nd World Health Assembly in 2009, Member States affirmed the interdependence of strengthening health systems, primary health care and disease-specific programmes, noting that they are mutually reinforcing and contribute to achieving the health-related Millennium Development Goals. Resolution WHA62.12 (15) calls on countries and partners to ensure that disease-specific programmes are developed, integrated and implemented in the context of integrated primary health care.

The world health report 2008. Primary health care – Now more than ever (16) articulated four key areas of reform to address

inequity in health between countries and populations and the changing nature of health problems in an evolving global context. The four areas of reform articulate different facets of health systems.

❶ **Universal coverage.** Ensuring that health systems contribute to health equity, social justice and the end of exclusion, by moving towards universal access and social health protection.

❷ **Service delivery.** Reorganizing health services around people's needs and expectations to render them more socially relevant and more responsive to the changing world while producing better outcomes.

❸ **Public policy.** Securing healthier communities by integrating public health actions with primary care and by pursuing healthy public policies across sectors.

❹ **Leadership.** Replacing disproportionate reliance on command and control on the one hand and laissez-faire disengagement of the state on the other with the inclusive and participatory leadership required by the complexity of contemporary health systems.

The international response to HIV has upheld and promoted reform in each of these areas. The political and financial commitment to achieving universal access to HIV prevention, treatment and care, implemented through a public health approach and carefully considering the needs of vulnerable population groups, has fostered inclusiveness and equity in the response to HIV. Service delivery approaches have been developed with attention to human rights and have been implemented through partnerships with affected communities, including people living with HIV. The HIV response has equally forced debate on major policy issues such as access to HIV treatment free of user charges and the balance between intellectual property rights and access to medicines, and has resulted in the condemnation of discriminatory laws that stigmatize people engaged in high-risk behaviour. Action against HIV has been truly multisectoral in its leadership, bringing together professionals from various sectors, including civil society groups. Continued commitment to such approaches is necessary to ensure that scaling up services for HIV positively affects the delivery of primary health care services through strong, equitable and efficient health systems (Box 6.1).

Box 6.1. Providing HIV services within an integrated approach to strengthening health systems and renewing primary health care

WHO's integrated management tools and training materials for health service delivery – Integrated Management of Adolescent and Adult Illness (IMAI), Integrated Management of Childhood Illness (IMCI) and Integrated Management of Pregnancy and Childbirth (IMPAC) – support a strategy for delivering health services that can efficiently strengthen district-level health care in resource-limited settings. The tools allow for decentralized scale-up of health services with optimal use of human resources and support the strengthening of health systems at three levels: by building clinical teams at the decentralized level and strengthening the community delivery of services; by supporting strong programme management and logistics; and by empowering patient self-management and community involvement.

Based on normative guidelines from WHO, these service delivery tools are implemented through training modules for health workers, clinical mentoring and quality management tools. The tools also include guidance on interlinked longitudinal patient monitoring systems for HIV care and antiretroviral therapy, prevention of mother-to-child transmission integrated within maternal and child health services; and TB/HIV.

By placing emphasis on strengthening district-level health systems to provide integrated primary care, the tools result in improved patient referral, case management and communication between levels of the health system. Strong involvement of people living with HIV as expert patients during training and their participation in clinical teams and as community health workers supports effective chronic care. The decentralization of services to the community level provides services close to home, supports family-based care and empowers patient self-management. Such community-based approaches to health service delivery not only help to overcome geographical distances but also address social distances by ensuring that health services are responsive to the needs of the community.

Country-level demand for these approaches is growing. IMCI has been adapted for use in more than 100 countries and IMAI has been adapted and implemented in 36 countries, most with a high HIV burden.

6.2. Human resources for health

One of the most critical challenges in scaling up access to HIV prevention, treatment and care in the health sector remains the shortage of adequately prepared human resources (2). WHO estimates that the global shortage of trained health workers exceeds 4 million; and the Global Health Workforce Alliance estimates that an additional 1.5 million trained workers are needed to address the current shortfall in health systems in Africa (2). Not only does the scarcity of human resources impede the effective delivery of HIV services, but the HIV epidemic has further depleted the health workforce in many countries with a high HIV burden. The World Bank has estimated that a country with 15% adult HIV prevalence can expect to lose up to 3.3% of its health care providers from HIV-related illness annually (17).

In 2006, WHO, the International Labour Organization and the International Organization for Migration outlined a strategy to address the health workforce crisis with a focus on three key interventions: comprehensive HIV treatment, prevention, care and support services for health workers (“treat”); measures to empower health workers to deliver universal access to HIV services (“train”); and strategies to retain health workers in the public health system, including financial and other incentives and improved working conditions (“retain”) (18). These priority actions are important in supporting the scale-up of HIV services towards universal access but also to strengthen the overall capacity of human resources in countries affected by the HIV epidemic.

A situation analysis of health workers’ access to HIV and TB services in Ethiopia, Kenya, Malawi, Mozambique and Zimbabwe reported a high proportion of deaths among health workers due to HIV and TB and identified gaps in the implementation of policies on health worker entitlements (19). Access to antiretroviral therapy for health workers living with HIV was reported as being widespread but lacking in measures to protect confidentiality and privacy. Further, only 28% of health workers reported any recent training on injection safety or the use of post-exposure prophylaxis, and 68% reported that their facilities lacked essential supplies such as gloves, sharps bins and water. As many as 62% of health workers surveyed were exposed to people with suspected or confirmed TB on a daily basis. Another subsequent study including countries from other regions found similar results (20). Such findings draw attention to the need to establish or extend existing occupational health services with HIV prevention, treatment and care for all health workers, especially in countries with a high burden of disease.

One human resource strategy to tackle the health workforce crisis and maximize capacity to provide HIV prevention,

treatment and care services is task-shifting, which entails delegating specific tasks, where appropriate, from highly qualified health workers to other health workers. In 2008, 49 of 93 reporting countries (53%) indicated that they had developed policies to address human resource shortages through task-shifting strategies. In sub-Saharan Africa, the corresponding percentage among reporting countries was 63% (Box 6.2).¹

Evidence is growing on the experience and results of scaling up task-shifting approaches. A recent article (21) reviewed current evidence and concluded that task-shifting can improve access to, coverage of and quality of health services at comparable or lower costs than traditional delivery models. However, such approaches require political and financial commitment and careful attention to health service organization. Another article describing the experience of Médecins sans Frontières in using task-shifting in efforts to scale up antiretroviral therapy in Lesotho, Malawi and South Africa (22) noted that the strategy had enabled increased access to life-saving treatment, improved the workforce skills mix, increased the efficiency of health systems, enhanced the role of communities, saved costs and reduced attrition and international brain drain. However, it also drew attention to the ongoing challenges of maintaining quality and safety, addressing professional and institutional resistance and sustaining motivation and performance.

Concurrently, evidence is emerging that lessons learned from task-shifting in HIV are being applied in other settings. For example, given the enormous shortage of surgeons and anaesthesiologists in Africa, efforts have been made to shift tasks on surgical services.

In addition to task-shifting strategies, countries with high HIV burdens and health worker shortages also need longer-term investment to expand the number and capacity of health workers, such as providing preservice training in HIV to doctors and nurses, and opportunities for continued learning. Attention also needs to be paid to the attitudes of health workers towards people living with HIV and people at high risk of HIV infection. A recent study by the Asia Pacific Network of People Living with HIV/AIDS (24) surveyed the experience of more than 3000 people living with HIV in accessing HIV-related health services in 2008. About 37% of women and 13% of men who have sex with men and transgender people participating in the survey reported that they had been tested for HIV without informed consent, and 12% of men who have sex with men and transgender people had their HIV status disclosed to others without their knowledge. Both injecting drug users and men who have sex with men reported experiences of denial of services and

¹ Data reported by countries to WHO, UNICEF and UNAIDS in response to the annual reporting form for monitoring the health sector response to HIV/AIDS, 2009.

physical assault by health care workers. Similar studies in other regions (25–27) have also revealed evidence of stigma and discrimination in health services against people living with HIV, ranging from breaches of patient confidentiality to delays or refusal to provide care. Although factors such as increasing awareness of HIV and the expansion

of antiretroviral therapy may help to reduce HIV-related discrimination in health care settings in some countries, other factors such as homophobia continue to pose barriers for people most at risk of HIV infection to seek testing or treatment in health services.

Box 6.2. Country experiences in implementing task-shifting approaches for HIV service delivery

Introducing task-shifting in national antiretroviral therapy policies in Malawi

Since HIV treatment started to be scaled up 5 years ago, Malawi has expanded to 223 fixed and 96 outreach clinics that have initiated more than 215 000 people on antiretroviral therapy and documented their treatment outcomes.

According to the first national antiretroviral therapy guidelines in 2003, doctors and clinical officers were the only personnel who could initiate and prescribe antiretroviral therapy, while nurses and medical assistants with appropriate training could follow up the people receiving antiretroviral therapy. In the first 2 years, 60 treatment clinics were set up, mainly in hospitals, and about 40 000 people started antiretroviral therapy. However, as the number of people being treated increased, it became apparent that nurses were de facto running the clinics. It was also apparent that data recording and reporting crucially depended on clerks and that better access and follow-up necessitated decentralization to peripheral health centres where clinical officers were often not present.

The new antiretroviral therapy scale-up plan (2006–2010) specified a target of 250 000 people to start treatment by 2010, to be achieved by decentralizing follow-up, initiating antiretroviral therapy at health centres and task-shifting. The new national treatment guidelines stipulated that doctors, clinical officers and medical assistants could initiate antiretroviral therapy from 2006 and nurses from 2008. In 2008 alone, 76 000 people initiated antiretroviral therapy and, of the 170 sites in the public sector, almost half were health centres.

Each quarter, data are collected to estimate the number of full-time equivalent clinicians, nurses and clerks needed to deliver antiretroviral therapy nationwide in the public sector. From 2006 to 2008, the workforce needed to deliver antiretroviral therapy to an increasing number of people has had to double. If Malawi continues to enrol 75 000 people per year, by 2015 the country might expect 750 000 people to start antiretroviral therapy, which will require 500 full-time equivalent clinicians and 500 full-time equivalent nurses just to staff the antiretroviral therapy clinics. This will considerably burden the existing health work force. Strategies to address this increasing burden include implementing simplified standard protocols, improving service delivery through operational research, increasing the recruitment of data clerks and considering shifting tasks to lower levels of health workers such as health surveillance assistants.

Task-shifting and community mobilization to optimize HIV treatment in primary health care in Lesotho

Lesotho faces a severe shortage of health care workers, with only 5 doctors and 62 nurses per 100 000 inhabitants. Eighty per cent of doctors are from other countries, primarily from other countries in Africa, and many are awaiting certification to practice medicine in South Africa.

In early 2006, antiretroviral therapy was available only at the hospital level and provided almost exclusively by doctors. Recognizing the health care worker shortage as a major challenge to expanding HIV treatment, the Government of Lesotho developed an emergency human resources plan in late 2007, recruiting 200 nurses from both within and outside Lesotho to reinforce the capacity to manage antiretroviral therapy at the health centre level and providing rural and other allowances to retain health workers. The Ministry of Health and Social Welfare also formally adopted task-shifting at the national level (especially nurse-based HIV care in primary health care) and the use of lay community and facility-based health workers for nonclinical support tasks drawing on the experience from SELIBENG SA TŠEPO (Wellspring of Hope), a joint pilot programme launched in 2006 with Médecins sans Frontières which provides HIV care and treatment, including antiretroviral therapy, in primary health care in a rural health zone with a population of 200 000, of whom an estimated 30 000 are living with HIV (23).

As of February 2009, SELIBENG SA TŠEPO had trained over 150 nurses in delivering antiretroviral therapy and managing opportunistic infections. Given the high turnover of nursing staff, training is repeated regularly through one week of comprehensive training in HIV treatment and care conducted at least three times a year, combined with an intensive, two-month clinical mentorship from the Médecins sans Frontières mobile team and from more experienced clinical nurses. Targeted on-the-job training is also provided on issues identified during supervision visits. The programme also recruited HIV/TB lay counsellors, usually people living with HIV, village health workers or peer educators from within the community, who were trained by Médecins sans Frontières and were supervised directly by nurses in charge of clinics. These lay counsellors are facility-based, receive structured training, have clear task descriptions and are paid for their services. They manage HIV testing and counselling services, provide treatment adherence support and carry out general clinic support tasks.

6.3. Procurement and supply management

Achieving universal access to HIV prevention, treatment and care services requires collaborative efforts among national authorities, pharmaceutical companies and international agencies to ensure an uninterrupted and affordable supply of a wide variety of HIV-related commodities including antiretroviral drugs and HIV diagnostics. In 2008, the United Nations Secretary-General held a meeting with 17 research-based and generic pharmaceutical and diagnostics companies to review and strengthen collective efforts to expand access to HIV-related drugs in low- and middle-income countries (28). The pharmaceutical companies committed to continuing research and development of new HIV-related drugs adapted to resource-limited settings in accordance with WHO guidance. They also committed to developing reliable and affordable technologies to diagnose HIV and TB among people living with HIV, including infant diagnosis, and to invest further in research and development of new biomedical HIV prevention technologies such as vaccines, microbicides and pre- and post-exposure prophylaxis regimens.

At the country level, sound policies and efficient systems for procurement and supply management are required

to ensure that supplies of essential commodities such as antiretroviral drugs are maintained. Stock-outs of antiretroviral drugs may lead to interrupted treatment, increasing the risk of treatment failure or the emergence of drug-resistant HIV variants. In 2008, among 97 reporting countries, 85 (88%) had national policies or guidelines for procurement and supply management of antiretroviral drugs and other essential commodities, including test kits.¹ Drug stock-outs continue to be an issue of concern in low- and middle-income countries. Of the 90 countries that provided information on the experience of stock-outs of required antiretroviral drugs in 2008, 31 (34%) reported that their health facilities dispensing antiretroviral drugs had experienced at least one stock-out during the year, similar to 2007, when 25 (38%) of 66 reporting countries had experienced at least one episode of stock-out of antiretroviral drugs. A higher proportion of countries in sub-Saharan Africa and the Americas experienced stock-out in 2008 compared with other regions. WHO and partners will develop an early warning system to prevent drug stock-out and its serious effects on treatment interruption and the emergence of drug resistance.

¹ Data reported by countries to WHO, UNICEF and UNAIDS in response to the annual reporting form for monitoring the health sector response to HIV/AIDS, 2009.

Box 6.3. Strengthening procurement and supply management systems for antiretroviral drugs in Ethiopia

Ethiopia began to scale up access to antiretroviral therapy in 2006. At that time, there were no reliable logistics systems for antiretroviral drugs and other commodities, and coordination among partners was weak.

Since 2006, the Supply Chain Management System of the United States President's Emergency Plan for AIDS Relief and the Ethiopian Federal HIV/AIDS Prevention and Control Office have undertaken a number of measures to build a strong network of systems and partners to support the scale-up of the treatment programme (29). These measures have included mobilizing resources, quantifying needs and regular management of supply plans in coordination with partners. Ethiopia has also revised the logistics system for antiretroviral drugs to allow health facilities to place orders in relation to their need and established a new logistics system for laboratory items to ensure their uninterrupted supply.

These efforts have enabled an increased and sustained supply of antiretroviral drugs, rapid test kits, laboratory commodities and drugs for opportunistic infections to support the national programme. They have also resulted in the virtual elimination of stock-outs of antiretroviral drugs at the national level. In 2008, none of the 420 health facilities dispensing antiretroviral drugs in Ethiopia reported having experienced a stock-out of a required antiretroviral drug.¹ A national coordination mechanism brings together donors and programme implementers to jointly respond to growing programme demands, and regional coordination mechanisms are being established.

In addition, efforts to strengthen procurement and supply management for antiretroviral drugs have brought wider benefits to the overall system. Access to other essential medicines, such as those to treat opportunistic infections, has improved with support from the Global Fund to Fight AIDS, Tuberculosis and Malaria, and national training on methods to quantify the need for antiretroviral drugs has been useful to conduct similar assessments for other drugs. The lessons learned from strengthening procurement and supply management systems for antiretroviral drugs are being applied to establish a national Pharmaceutical Fund and Supply Agency for all pharmaceutical drugs and commodities.

¹ Data reported by countries to WHO, UNICEF and UNAIDS in response to the annual reporting form for monitoring the health sector response to HIV/AIDS.

Additional information on procurement and supply management systems is available from specific country-level studies. During 2007 and 2008, through close collaboration with international partners, 15 countries in sub-Saharan Africa¹ undertook literature reviews and country surveys to evaluate their national procurement and supply management systems. The studies revealed complex structures for procurement and supply management of medicines, with inadequate coordination among national authorities and partners and a lack of adequately trained human resources. Following these evaluation studies, nine countries are participating in a regional project to establish harmonized procedures for procurement and supply management in collaboration with partners and to provide technical assistance to strengthen national procurement and supply management systems. Some countries are also taking measures to improve the coordination of national partners involved in procurement and supply management at the country level (Box 6.3).

6.4. Laboratories

A cornerstone of the public health approach to scaling up access to antiretroviral therapy has been the effective use of WHO's clinical staging system for initiating antiretroviral therapy in the absence of adequate laboratory capacity to measure CD4 cell counts. Clinical follow-up has also been successfully undertaken in resource-limited environments to monitor toxicity and thus substitute antiretroviral drugs when necessary, and to identify treatment failure, critical for initiating second-line regimens.

Nevertheless, as the number of people receiving antiretroviral therapy increases substantially, efforts to strengthen laboratory capacity must continue alongside to enable health services to diagnose HIV infection, assess the immune status of people living with HIV, formulate treatment plans and monitor treatment outcomes such as adverse events and treatment failure. Unfortunately, laboratory services are often underfunded, lack quality assurance and frequently operate without satisfactory strategic coordination between the local and national levels of a country's tiered laboratory network (an integrated system of laboratories organized in alignment with the public health delivery network in a country). Weak infrastructure and an inadequate number of skilled technical staff create additional hurdles for wider system development.

¹ These countries include Benin, Burkina Faso, Burundi, Cameroon, Central African Republic, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Ghana, Mali, Nigeria, Rwanda, Senegal, United Republic of Tanzania and Zambia.

A recent assessment of human resource needs to support essential laboratory services for HIV, TB and malaria in Côte d'Ivoire and the United Republic of Tanzania revealed many gaps in laboratory capacity (30,31). The size of the national laboratory workforce was about half the size recommended by national guidelines in both countries. Further, facilities and technicians to provide essential diagnostic services at the peripheral levels were severely lacking, as were appropriate training curricula, teaching materials and supervision. To address these gaps, Côte d'Ivoire is developing the country's first national laboratory policy and national laboratory strategic plan. The United Republic of Tanzania is also taking measures to strengthen its laboratory capacity. The assessment recommended several additional priority actions, including increasing investment in laboratory staff as an essential component of the health workforce, establishing incentives for staff to work in rural and remote settings and providing appropriate supervision and on-site training.

In 2008, countries in sub-Saharan Africa adopted the Maputo Declaration on Strengthening of Laboratory Systems for HIV, TB and malaria, agreeing to develop national laboratory policies and implement national laboratory strategic plans that reflect an integrated public health approach to disease control (32). Several countries are already taking steps to reinforce their laboratory networks. Standardized laboratory equipment and related items have been adopted in several countries, including Botswana, Kenya, the United Republic of Tanzania and Zambia (Box 6.4). Such measures bring significant financial and operational benefits, including substantially reducing costs due to bulk procurement and economies of scale; greater efficiency in supply chain management with reduced stock-outs and expiry of reagents; simpler service maintenance; improved planning and quantification of needs; and standardized staff training requirements.

International partners such as WHO, UNICEF, the United States Centers for Disease Control and Prevention and other agencies are supporting countries in developing agile and effective laboratory systems through activities such as developing technical and operational recommendations to harmonize and standardize clinical laboratory testing; strengthening tiered, integrated laboratory networks in resource-limited settings; and endorsing a well-defined package of equipment and items required for each level of the laboratory network. UNICEF, WHO, UNITAID, the United States President's Emergency Plan for AIDS Relief and the Global Fund to Fight AIDS, Tuberculosis and Malaria have also made special efforts to improve laboratory capacity for early diagnosis of HIV among infants.

Box 6.4. Strengthening laboratory capacity in the United Republic of Tanzania and Zambia

The United Republic of Tanzania has a multi-tiered health laboratory system, with decreasing complexity in functions and expertise from the national level to the health centre and dispensary levels. There is 1 national reference laboratory and 4 zonal referral, 23 regional, 90 district and 6099 health centre (577) and dispensary (5522) laboratories. After a national plan to scale up antiretroviral therapy was established in 2002, the Ministry of Health and Social Welfare and partners assessed the readiness of the laboratory system to meet the increasing demand for services. This was followed by a broad review of the National Health Laboratory Standard Guidelines, which prescribe the institutional framework behind the national laboratory system, the organizational structure of laboratory services, minimum standards of physical infrastructure, the range of essential tests to be performed at each level of laboratory services and minimum personnel requirements for all levels. An Operational Plan for the National Laboratory System to Support HIV/AIDS Care and Treatment was further elaborated in 2005. Currently, 94% of the equipment in the public health laboratory system is standardized as outlined in the Operational Plan, with turn-around times for most laboratory tests of less than 24 hours.

In Zambia, the Ministry of Health developed a National Medical Laboratory Policy in 1997. The policy included a five-year implementation plan, one step of which was to standardize laboratory procedures and equipment. In about 1999, the Ministry of Health developed a list of essential equipment for different levels of the laboratory network. With the expansion of the antiretroviral therapy programme, the government recognized the need for strengthening its laboratory infrastructure to conduct essential diagnostic and monitoring tests. In May 2006, the Laboratory Technical Working Group, formed to develop a coordinated approach to improving laboratory services in the country, created the Operational Plan for the National Laboratory System (2006–2008) and developed a list of potential standard equipment by facility level.

Zambia currently has 216 active laboratories in the public sector. The process of standardization reduced the number of laboratory commodities by about 80%, thus reducing overall procurement costs through economies of scale. In addition, supply chain management has improved significantly. During 2007, an estimated 70% of the 185 priority laboratory commodities were out of stock at least once at the centralized warehouse. By the end of 2008, the stock-out rate had dropped to 2%.

6.5. Health financing

Achieving universal access requires that people be able to access affordable HIV prevention, treatment and care services. Since countries with limited resources have the greatest HIV burden, financing HIV services has been a major impediment to achieving universal access. The public sector often does not have enough resources to provide essential prevention and treatment services; and individuals and households often lack the means to pay for such services or may be unable to bear the indirect costs of seeking services, such as loss of productive time and transport costs.

Promoting affordable HIV prevention, treatment and care services must therefore be an essential part of a comprehensive strategy to achieve universal access. The evidence suggests that HIV services should ideally be provided free of charge at the point of delivery (33). Charging fees to recover costs from end-users is likely to inhibit prevention, discourage HIV testing, reduce uptake of antiretroviral therapy and decrease adherence among those already receiving it (34).

Many countries are implementing measures to provide HIV services free of charge in the public sector. The considerable increases in the availability of funding from international partners such as the Global Fund to Fight AIDS, Tuberculosis and Malaria and the United States President's

Emergency Plan for AIDS Relief in recent years has enabled countries to either reduce or eliminate user fees for essential services. Substantial funds are also being made available to strengthen the health systems that are critical to delivering these services. In 2008, 88% of reporting low- and middle-income countries had policies to provide antiretroviral therapy free of charge in the public sector.¹ Countries also reported that they had policies in place for free provision of co-trimoxazole (83%), laboratory monitoring (77%) and HIV testing (93%).

Given the global economic crisis that started in 2008, providing HIV services free of charge may not be sustainable in some countries. A staff perception survey conducted by the World Bank, WHO and UNAIDS in 71 countries in early 2009 (35) suggested that domestic and international funding for HIV is already being affected in 11% of the countries surveyed and that some impact is expected in 31% of the countries in 2009. International funding commitments are secure only through 2009 or 2010 in about 40% of the countries surveyed. Respondents also indicated concern about the possible negative effect on funding for prevention programmes, which are politically easier to reduce than treatment programmes.

¹ Data reported by countries to WHO, UNICEF and UNAIDS in response to the annual reporting form for monitoring the health sector response to HIV/AIDS, 2009.

Striking the right balance between international and domestic funding is a challenge for sustainable financing for HIV programmes. In many countries, (such as Myanmar and Papua New Guinea), antiretroviral therapy is funded entirely or almost entirely by funds provided by international donors. Any reductions in funds received will affect the treatment programme, as national budgets will not be able to make up the difference. For example, Uzbekistan, which relies almost exclusively on the Global Fund for funding antiretroviral therapy programmes, has been unsuccessful in securing funding in subsequent rounds. In Cameroon, where the HIV prevalence is considerably higher, half the funding for treatment programmes comes from external sources. This funding is committed only through 2009, and no other funding sources have been identified. This will create difficulty in ensuring treatment continuity for those already receiving antiretroviral therapy or cover the new people who are becoming eligible for treatment, raising the risk of treatment interruption, HIV drug resistance and death.¹ As agreed at the Fifty-Eighth World Health Assembly in 2005, it is crucial for countries to manage and organize external funds in a way that contributes to the development of sustainable financing mechanisms for the country as a whole and to ensure that health financing systems provide protection against financial risk for individuals (36).

6.6. Strategic information

Strategic information on the HIV epidemic and response is essential to understand the disease burden and its determinants, develop policies and programmes and improve service delivery. The expansion in international funding for the HIV response from such agencies as the Global Fund and the United States President's Emergency Plan for AIDS Relief has been accompanied by an increased emphasis on performance-based programme management and implementation and attention to the cost-effectiveness of different strategies. The planning and scale-up of interventions is thus increasingly tied to monitoring and evaluation frameworks, with indicators to track progress in different implementation areas and to ensure accountability in relation to national and global goals.

¹ Information reported to WHO, UNAIDS and World Bank in response to a staff perception survey on the global economic crisis and the HIV response, 2009.

In 2008, 139 of the 149 low- and middle-income countries responded to the joint WHO, UNICEF and UNAIDS annual reporting form on the health sector's response to HIV/AIDS (data were also received from 19 high-income countries). Data were jointly validated at the country and regional levels with national authorities and partner agencies and reconciled at the global level. The yearly increase in the number of countries that provide national data to WHO, UNICEF and UNAIDS to monitor the global health sector response to HIV is testimony to their recognition of the importance of strategic information and their efforts to improve data collection, analysis and interpretation. Nevertheless, data quality is uneven across countries and intervention areas, such as data on access to services by populations at high risk of acquiring HIV. Further effort is needed to improve data collection and its use to inform programme improvement (Box 6.6).

HIV surveillance is the cornerstone of knowing an epidemic and designing a response. In 2008, WHO and UNAIDS continued to provide guidance and technical support to countries to strengthen their HIV surveillance systems. An increasing number of countries also conducted population-based demographic and health surveys with HIV testing, and five countries had conducted at least two such nationally representative surveys by 2008, enabling trends to be assessed over time. More data are expected from at least 10 additional country surveys to be completed during 2009 and 2010.

The increase in the numbers of people receiving antiretroviral therapy also draws attention to the importance of cohort analysis in collecting, compiling and analysing data to monitor the outcomes and impacts of expanding programmes. *Three interlinked patient monitoring systems for HIV care/ART, MCH/PMTCT (including malaria prevention during pregnancy), and TB/HIV* being developed jointly by WHO, UNICEF, UNAIDS, the United States Centres for Disease Control and Prevention and other partners, provides a standardized set of tools to support countries in improving patient monitoring and show evidence of results (Box 6.5) (37).

Box 6.5. Implementing a nationwide patient monitoring system for HIV care and antiretroviral therapy in India

India's free public-sector antiretroviral therapy programme began in 2004 in eight public hospitals. As of May 2009, 232 908 adults and children were receiving antiretroviral therapy in 217 public health facilities.¹ The roll-out of the treatment programme has been accompanied by a standard national patient monitoring system based on the global patient monitoring tools recommended by WHO (38). In the first year of the roll-out of antiretroviral therapy, WHO provided support for adapting these generic materials in the country and for developing training tools and capacity-building. This monitoring system consisted of a paper-based system using a combination of recording tools (including patient-held and facility-held patient cards, pre-antiretroviral therapy and antiretroviral therapy registers and drug-dispensing and stock inventory registers) and reporting tools (including a monthly report and a cohort analysis report) to assess patient outcomes and programme performance related to HIV care and antiretroviral therapy.

In 2009, WHO in collaboration with the national programme conducted a case study to document the implementation of the patient monitoring system in India, identify action at the country level that is necessary for sustainability and continued good performance and share the experience with other countries. India's experience successfully demonstrates how a standardized, nationwide patient monitoring system can be implemented in a vast and diverse country with many people receiving HIV treatment and care services. The National AIDS Control Organization (NACO) centrally coordinates the patient monitoring system, which covers all public and NACO-funded treatment sites (such as private hospitals or nongovernmental organizations linked to the NACO) in the country. The system has evolved under strong leadership by the NACO, with secure financial resources and investment in human resources and infrastructure. Each treatment site has at least one data manager, one pharmacist and two counsellors to support data management, all of whom receive training from the NACO. The clinicians and counsellors record data on paper-based cards and registers. Patient data are subsequently entered into patient monitoring software by data managers and analysed to derive statistics for monthly reports to the NACO.

India has also succeeded in integrating patient monitoring and procurement and supply management at site level within the same system, with drug-dispensing and stock inventory registers maintained by pharmacists. As a result of these efforts, the extensive patient monitoring system is well organized and produces regular, timely and complete reports. Information generated through the system is being used to inform programme implementation, such as anticipating drug shortages by ensuring that at least three months of supplies are always in stock.

Nevertheless, sustaining an efficient and effective paper-based system in a large country is challenging. Given the growing monitoring-related workload with an increasing number of people accessing services and requiring follow-up, India is implementing a national electronic patient monitoring system initially piloted at selected sites which, since 2008, has been expanded nationally to all antiretroviral therapy centres with support from the William J. Clinton Foundation. When all functions for clinic and patient management have been built into the system, the software will greatly facilitate data management, generate monthly and cohort reports and provide a quality check for missing or incomplete data. India is also working towards strengthening cohort analysis from selected sites to enable programme evaluation over time and building capacity to use information not just for reporting but also for facilitating decision-making at all levels.

India's successful experience underscores the following core elements of a well-functioning patient monitoring system:

- ensuring national leadership and commitment to one strategy and one patient monitoring system;
- investing in human resources for data management functions to support clinical staff;
- ensuring an uninterrupted supply of user-friendly recording and reporting tools;
- international agencies providing technical support for patient monitoring;
- decentralizing responsibility and effective supervision and mentoring;
- using the information generated at all levels for decision-making; and
- securing financial resources.

¹ In addition, 5442 people were receiving antiretroviral therapy through the intersectoral health sector and centres supported by the Global Fund and nongovernmental organizations as well as an estimated more than 35 000 in the unorganized private sector – data reported to WHO, UNICEF and UNAIDS in response to the annual reporting form for monitoring the health sector response to HIV/AIDS and updated data from the National AIDS Control Organisation (NACO).

Operational research for learning by doing is an equally important component of strategic information, linking research to policies and practices and providing evidence to improve programmes. During the past few years, countries have become more interested in incorporating operational research into their efforts to scale up HIV testing, prevention, treatment and care. WHO and partners have sought to respond to this increasing demand for technical assistance, supported by the commitment of the Global Fund to fund

monitoring, evaluation and research activities. Tools to formulate and implement operational research projects have been developed and technical assistance is being provided, although more concerted efforts and resources are needed in this area.¹

¹ In 2009, WHO published a set of generic tools to facilitate the conduct of operational research in four priority areas – the utilization of HIV testing and counselling; disclosure, stigma and support; adherence to antiretroviral therapy; and HIV prevention in the context of scaled-up access to HIV treatment (39).

Box 6.6. Improvements in data availability and quality, but major gaps remain

The five-year evaluation funded by the Global Fund to Fight AIDS, Tuberculosis and Malaria in 18 countries (Box 2.6) showed that the scale-up of HIV programmes has led to a number of improvements in the availability and quality of data on programme outputs and health outcomes. Some areas of improvement include:

- Monitoring of HIV prevalence through the implementation of population-based surveys with HIV testing, better antenatal clinic-based HIV surveillance systems, and limited improvements in surveillance among populations at high risk of HIV infection;
- Information on risk behaviours and coverage of interventions through more frequent population-based surveys with HIV/AIDS-related questions;
- Data on HIV service provision through facility assessments sometimes carried out in combination with other health programmes;
- Clinic reporting systems for HIV, in some instances through electronic reporting of aggregate data and electronic health records;
- Regular compilation of data from multiple sectors supported by UNAIDS and co-sponsors for global reporting in relation to the goals established in the United Nations General Assembly Special Session (UNGASS) Declaration of Commitment, as well as commitments to achieve universal access to HIV prevention, treatment, care and support; and
- Availability of financial data through the implementation of national AIDS spending assessments, although the quality of these data is variable and out-of-pocket expenses are not taken into account.

There are, however, a number of persistent data weaknesses that hamper the ability to monitor, manage and evaluate programmes, which in turn affect the ability of WHO and partners to monitor progress. These data weaknesses include:

- Lack of data on AIDS mortality due to a failure to invest in civil registration systems with cause of death certification in hospitals or verbal autopsy for nonhospital deaths; as well as a long lag time between data collection and availability of results (e.g., 2-3 years for HIV surveillance) and lack of trend data related to populations at high risk of HIV infection;
- Limited data on antiretroviral treatment outcomes, including adherence and survival;
- In some countries, poor quality of data on the provision of interventions (including antiretroviral therapy, interventions for prevention of mother-to-child transmission, and HIV testing and counselling) emanating from health facility reports and poorly maintained national databases with insufficient quality control;
- Fragmentation in information flows as different partners and donors track information on their own activities and services with a lack of standardized, transparent and joint reporting systems;
- Incomplete and inaccurate data on community interventions (such as care and support, including for orphans) collected through administrative records involving large numbers of service delivery organizations. Such data are often used for performance-based disbursement but cannot be translated into population coverage estimates; and
- Lack of data quality-control mechanisms.

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