In the past decade, AIDS has helped drive a global revolution in thinking about the delivery of complex and expensive lifelong therapy in resource-limited settings.

When thousands of delegates gathered at the XI International Conference on AIDS in 1996, results of studies in high-income countries confirmed the effectiveness of combination antiretroviral regimens in preventing AIDS-related illness and death. Most delegates left the conference with the fear that the new therapies would remain beyond the reach of people living with HIV in low- and middle-income countries. True to these fears, while the number of AIDS-related deaths plummeted in the world’s richest countries in the years immediately following the conference, the human toll from the epidemic soared in low- and middle-income countries, erasing decades of public health gains in sub-Saharan Africa.

By 2000, however, a growing chorus of voices rejected the inevitability of uncontrolled death and despair in the world’s poorest countries. In their demands that the world recognize the universal human right to access treatment, people living with HIV were soon joined by leaders in government, religion, industry and civil society. The Declaration of Commitment on HIV/AIDS, unanimously endorsed by the UN General Assembly in 2001, embraced equitable access to care and treatment as a fundamental component of a comprehensive and effective global HIV response. In 2003, WHO called the treatment gap a global public health emergency and on World AIDS Day launched the “3 by 5” initiative, which committed all components of the UNAIDS family and a broad array of partners to a highly ambitious target. At the same time, levels of funding for treatment increased greatly as a result of initiatives such as the United States President’s Emergency Plan for AIDS Relief and the Global Fund to Fight AIDS, Tuberculosis and Malaria (see ‘Financing’ chapter).

Although the world fell short of the “3 by 5” target, the initiative galvanized unprecedented global action to expand access to treatment and forever altered approaches to treatment and care. The “3 by 5” initiative, the President’s Emergency Plan for AIDS Relief and the Global Fund definitively demonstrated the feasibility of delivering HIV treatment...
in even the most resource-limited settings and confirmed that the extraordinary declines in AIDS-related illness and death seen in high-income countries can be achieved in low- and middle-income countries as well. Experience has identified the key elements of success, shed light on the obstacles to rapid scaling up of treatment access and aided in the identification of best practices to overcome these obstacles. Treatment access has helped mobilize communities in the response to HIV, preserved the health and viability of households vulnerable to HIV, and strengthened HIV prevention efforts in many parts of the world. For the first time, a comprehensive AIDS response now encompasses HIV prevention, care and treatment.

Building on momentum generated by the “3 by 5” initiative, the Global Fund and the President’s Emergency Plan for AIDS Relief, the Group of Eight leading industrialized countries, meeting in Scotland in the summer of 2005, called on the world to move as close as possible towards universal access to antiretroviral drugs by 2010. This goal was subsequently endorsed by all UN Member States at the High Level Plenary Meeting of the 60th Session of the UN General Assembly in September 2005 (see ‘Financing’ chapter).

Expanding access to antiretroviral drugs

To expand delivery of antiretroviral drugs in resource-limited settings, WHO has outlined a public health approach to therapy, simplifying and standardizing treatment regimens. A key to this approach is national consensus on one or more WHO-recommended first-line treatment regimens, along with second-line therapy for those whose first-line treatment fails (WHO, 2004). In a recent survey, 36 out of 49 of the “3 by 5” focus countries had developed national antiretroviral therapy guidelines with at least one WHO-recommended first-line treatment regimen (Beck et al., 2006).

Between 2001 and 2005, the number of people on antiretroviral therapy in low- and middle-income countries increased more than fivefold—from 240,000 to approximately 1.3 million (Figure 7.1). As of June 2005, 21 countries were providing antiretrovirals to at least 50% of those in clinical need (WHO and UNAIDS, 2005).

In Africa, the number of people on antiretroviral therapy more than doubled in 2005 alone, with roughly one in six people who needed treatment receiving antiretrovirals by December 2005. Nearly 200 sites in Kenya were providing antiretrovirals by December 2005. In South Africa—the country with the largest population of people living with HIV—the number of people receiving antiretrovirals grew from fewer than 5000 at the beginning of 2004 to roughly
190,000 by the end of 2005 (WHO/UNAIDS, 2006). Figure 7.2 shows the rapid rise in coverage in sub-Saharan Africa during the past two years, while also indicating that there have been significant differences in progress between countries. Coverage levels of 50% or greater have been achieved in countries such as Botswana and Uganda, while in others levels remained at less than 10%.

Progress was also made in other regions. With strong support from the national government to increase access to treatment, Cambodia was delivering antiretrovirals to more than 12,000 people by the end of 2005. In early 2006, more than 20,000 individuals were receiving antiretrovirals in 28 provinces in China (Ministry of Health, People’s Republic of China, 2006). The Latin America and Caribbean region currently has the highest coverage for antiretroviral therapies (68%), with the number of people on treatment increasing from 275,000 at the end of 2004 to 315,000 at the end of 2005.

Major strides in expanding access to treatment are being achieved in countries that are struggling against extraordinary challenges. Still recovering from the genocide that claimed hundreds of thousands of lives in the 1990s, Rwanda was delivering antiretroviral drugs to more than 18,000 individuals by the end of 2005, with substantial further expansion in treatment access anticipated. It had also established 76 antiretroviral therapy sites by September 2005, compared with 16 sites at the end of 2003. However, humanitarian agencies report that only a very limited

![Figure 7.1: Number of people on antiretroviral therapy in low- and middle-income countries, 2002 to 2005](image-url)
number of refugees in 26 countries in Africa and Asia are currently receiving antiretroviral therapy (UNHCR, 2006).

Worldwide, it is estimated that between 250 000 and 350 000 deaths were averted in 2005 as a result of increased treatment access (WHO/UNAIDS, 2005).

Although a variety of technical and logistic issues have slowed the roll-out of paediatric HIV treatment and care, progress has been made in some countries. As of July 2005 in Malawi, 19 out of 61 sites providing antiretroviral therapy to adults were treating children as well.

FINANCING AND DELIVERING EXPANSION OF TREATMENT ACCESS
Expanding access to treatment is truly a global endeavour, as a broad range of international donors and multilateral agencies have joined together to work with governments to purchase and deliver antiretrovirals. More than 50 countries and numerous foundations and corporations have contributed financially to the Global Fund, which as of December 2005 was supporting programmes providing antiretrovirals to 384 000 people. The number of people receiving antiretrovirals through Global Fund-supported projects nearly tripled between December 2004 and December 2005. Through the
SAVING LIVES, EXPLODING MYTHS

Expanding treatment access is exploding the once-widespread belief that antiretroviral therapy programmes could not succeed in resource-limited settings or among high-risk populations. Available evidence reveals that adherence to antiretroviral regimens in low- and middle-income countries is at least equal to, and often greater than, rates of adherence reported in high-income countries (Nemes et al., 2004). In Haiti, 87% of adults and 98% of children were alive one year after initiating antiretroviral therapy, with the typical adult experiencing an increase of 163 in the CD4+ T-cell count (Severe et al., 2005). Likewise, programmes in Argentina, Brazil, China, Hong Kong Special Administrative Region and elsewhere are effectively delivering antiretrovirals to HIV-infected injecting drug users, achieving high rates of treatment adherence and dispelling the notion that such individuals cannot reliably participate in, and benefit from, AIDS treatment initiatives (Open Society Institute, 2004).

President’s Emergency Plan for AIDS Relief, the United States’ Government is providing intensive assistance to 15 countries in Africa, Asia and the Caribbean, and support to 100 additional countries. The President’s Emergency Plan aims to deliver antiretrovirals to two million people by 2007. As of October 2005, the President’s Emergency Plan was supporting antiretroviral therapy for about 471,000 people living with HIV, approximately 60% of whom are women and 7% are children. For its part, the World Bank launched a US$ 60 million Treatment Acceleration Project, with initial grants for scaling up treatment access provided to Burkina Faso, Ghana and Mozambique in 2004 and 2005.

Bolstered by such increases in funding, a wide variety of civil society organizations are leading efforts to expand access to antiretroviral drugs and to promote “treatment literacy” (see ‘Civil society’ chapter). In Burundi, for example, the 125 member organizations of the nationwide Alliance Burundaise contre le SIDA are deeply involved in delivering 14 of the 16 component programmes of the National Action Plan, including antiretroviral therapy, treatment of opportunistic infections and psychosocial support. The national association representing HIV-positive people, the Association Nationale des Séropositifs et Sidéens du Burundi, now provides care to over 3000 people, of whom 1357 are receiving antiretroviral therapy. The Kenya Coalition on Access to Essential Medicines—which includes networks of people living with HIV, the Kenya Medical Association, international nongovernmental organizations and a broad range of civil society groups—promotes coordinated action to enhance scaling up treatment access. Civil society advocacy remains an important factor in expanding access. For example, the Indian Network of People Living with HIV/AIDS played an important role in influencing the decision by the Government of India to provide free antiretroviral drugs in six heavily affected states.

At the same time, growing numbers of employers are providing antiretrovirals and other medical services to their workers living with HIV (UNAIDS, 2005a). By mid-2005, the private sector in South Africa was providing antiretroviral drugs to between 70,000 and 80,000 people,
while in several other African countries, public sector employers such as ministries of education and health are beginning to offer antiretroviral drugs as part of their employee health activities (see ‘Reducing the impact’ chapter).

**DAUNTING OBSTACLES**

Despite these many achievements, as of December 2005 at least 80% of those in clinical need of antiretroviral drugs were not receiving them. In India alone, where an estimated 770,000 individuals needed antiretroviral drugs in 2005, only about 40,000 were believed to be receiving the drugs in August 2005, with the public sector accounting for fewer than one-third of those on therapy (ITPC, 2005).

Although dramatic price declines for leading antiretroviral drugs have helped make expansion of treatment access possible in low- and middle-income countries, not all countries have taken full advantage of optimal pricing options. In the Russian Federation, for example, generic antiretroviral drugs have yet to be registered nor have clear steps been taken by the country’s considerable pharmaceutical industry towards local manufacture of antiretrovirals (International Treatment Preparedness Coalition, 2005). As many second-line antiretroviral drugs remain too costly for widespread use in many countries, further price declines are likely to be needed to sustain and expand treatment access initiatives.

Even with the growing provision of drugs by public health systems, treatment often involves considerable out-of-pocket costs, including fees charged to patients for the use of public services. In Nigeria, out-of-pocket costs for individuals who receive antiretroviral therapies at public clinics reportedly average US$ 300 annually (International Treatment Preparedness Coalition, 2005), a significant sum for the 91% of households in the country that live on less than US$ 2 a day (UNDP, 2005). The nongovernmental organization Médecins Sans Frontières reported in December 2005 that 44% of Nigerian patients on antiretroviral therapy surveyed experienced one or more treatment interruptions or took insufficient doses because of inability to cover fees required by public antiretroviral therapy clinics (Deutsche Presse-Agentur, 2005). Zambia—a country in which one in six adults are HIV-positive—aims to avoid the deterrent effect of out-of-pocket costs.
GUIDANCE AND TECHNICAL SUPPORT FOR EXPANSION OF TREATMENT ACCESS

WHO provides a wide range of technical support to help countries scale up treatment access based on a public health approach. It recommends that national plans for scaling up treatment use a chronic care model with standardized first- and second-line antiretroviral regimens, integrated service delivery, training of new cadres of health-care workers based on WHO’s Integrated Management of Adolescent and Adult Illness (see below), strengthened procurement and supply management of medicines, diagnostics and commodities, and other actions to enable the widest possible access to life-preserving medications (WHO, 2004).

WHO prequalifies antiretroviral drugs as suitable for inclusion in national programmes. Prequalified drugs can include biogeneric compounds that are determined by WHO to be bioequivalent to patented products produced by the major pharmaceutical companies. WHO’s prequalification programme not only provides guidance to national policy-makers but also helps ensure that drugs used to treat AIDS are of acceptable quality. The WHO-convened AIDS Medicines and Diagnostic Service provides countries with crucial information on pricing and availability of prequalified AIDS medicines. It includes over 20 partner agencies, including UN organizations (such as UNDP, UNICEF and the World Bank), procurement agencies (such as Crown Agents and the International Development Association), donors (such as the United States Agency for International Development, The Global Fund and the Clinton Foundation), and technical support agencies (such as the Ensemble pour une Solidarité Thérapeutique Hospitalière En Réseau).

WHO also works with other UNAIDS Cosponsors on a variety of treatment projects, and has provided technical assistance to scores of countries in developing successful Global Fund proposals.

by providing antiretroviral drugs free of charge in public clinics. In 2005, the number of people on antiretroviral drugs was increasing by 1000 each month, with approximately 30 000 people on treatment by June 2005 (WHO/UNAIDS, 2005). In some cases, countries that have reduced or eliminated out-of-pocket fees for antiretroviral drugs have not extended such policies to treatment for opportunistic infections.

Although funding has increased rapidly, a variety of obstacles remain to scaling up treatment access at the same rate. Large numbers of HIV-positive people live in rural areas, yet treatment is largely confined to urban areas, requiring rural residents either to go without treatment or to travel long distances to obtain essential care. Thus, treatment often entails an overnight stay, which may be too expensive or made impossible by childcare and other household responsibilities. It can sometimes be difficult for patients who start antiretroviral therapy in the private sector, where a wide range of antiretrovirals may be available, to receive the same regimens under the standardized approach recommended for the public sector.

Efforts to expand access to treatment have also inadequately addressed the needs of certain populations especially
vulnerable to HIV. These include sex workers, men who have sex with men, injecting drug users and prisoners (see ‘At risk’ chapter), as well as refugees, internally displaced people and a range of mobile populations who cross borders for work or other reasons. As countries scale up treatment access, these populations must not be excluded. International financing mechanisms, such as the Global Fund, rely on proposals from the countries. However, many countries of asylum and countries with internally displaced people do not give priority to refugees or internally displaced people, populations who are commonly discriminated against.

National treatment guidelines provide an important vehicle to accelerate scaling up access to treatment, promote equity and demonstrate national ownership of the treatment agenda. Many countries have developed their own rules for managing national roll-out of antiretroviral therapy, typically using the framework of WHO’s treatment guidelines. First produced as recommendations in 2001, the revised 2003 guidelines have now evolved at countries’ request into separate guidelines for infants and children (WHO, 2006a) and adults, and are fully harmonized with revised guidelines for prevention of mother-to-child transmission of HIV (both due for publication in mid-2006 by WHO).

In forging national guidelines, countries must inevitably deal with the tensions between the public health approach of mass therapy and the high variability of individual patient needs. WHO advocates that countries arrange for the provision of specialty care in tertiary referral centres, which can mentor and supervise treatment sites in nearby areas. In Senegal, this approach has enabled a relatively small number of centres to support district hospitals and treatment centres throughout the country. Physician-mentors are on call to answer urgent inquiries from nurses in the field, an innovation that helped Senegal meet its “3 by 5” target of placing 4200 people on antiretrovirals by the end of 2005.

**Building towards universal access to treatment**

Building on the strong momentum from the “3 by 5” initiative, the world has embarked on an unprecedented quest to
move towards universal access to HIV care and treatment. To reach this goal, workable strategies will be needed to overcome a host of obstacles that have thus far slowed the pace of scaling up access to treatment. Fortunately, as the number of countries with experience in introducing antiretrovirals increases, successful strategies for overcoming impediments to implementation are beginning to emerge.

INCREASING KNOWLEDGE OF HIV SEROSTATUS
HIV cannot be effectively treated unless it is diagnosed. In numerous countries, expansion of treatment access has been accompanied by a sharp increase in use of voluntary HIV counselling and testing services (Global HIV Prevention Working Group, 2004). For example, Cambodia increased the number of voluntary counselling and testing sites by nearly 20% in early 2005, with further expansion planned. On an international level, UNHCR and its partners now offer voluntary HIV counselling and testing in over 30 refugee camps in 11 countries.

Overall, however, use of testing services remains far too low to support the worldwide scaling up of access to antiretroviral drugs. Even in the United States, where antiretrovirals have been widely available for a decade, an estimated one in four people living with HIV are unaware that they are infected.

A variety of efforts are being made to increase use of testing services. For example, a 2005 study in the United Republic of Tanzania indicates that waiving fees for testing increases both the number of people tested and the cost-effectiveness of the intervention (Thielman et al., 2006). Making the process simpler and more convenient also helps, as is being done in Lesotho, which in 2005 began offering rapid testing free of charge to all citizens, using health workers to make door-to-door visits to villagers. The country has embarked upon an ambitious ‘Know your status’ programme, in which all citizens are encouraged to be HIV tested. HIV testing procedures in hospitals and clinics also need to evolve, particularly when life-saving treatment can be initiated for a sick person. This has been recognized by Botswana, which recently launched a new policy to routinely offer an HIV test in all health-care settings. The move towards a routine offer of HIV testing (sometimes called provider-initiated testing) has great potential if adopted in tuberculosis clinics, antenatal services, re-feeding wards, clinics for sexually transmitted infections and for all hospitalized adults and children in countries with high HIV prevalence.

REDUCING STIGMA-BASED OBSTACLES TO SCALING UP TREATMENT
Known to be a frequent obstacle to HIV prevention programming, stigma associated with HIV (see ‘The impact’ chapter) also hinders scaling up treatment access. Informants surveyed in Kenya cited stigma and discrimination as the most significant impediments to expansion of treatment access (International Treatment Preparedness Coalition, 2005). Similarly, companies in South Africa that provide antiretrovirals through employment-based medical coverage schemes believe that stigma may be contributing to workers’ underuse of AIDS treatment services (UNAIDS, 2005a).

Efforts to reduce stigma and discrimination among health providers as well as among the general public (see ‘Reducing the impact’ chapter) will be important in
scaling up both access to and use of anti-retroviral therapy in many countries. At the same time, it is expected that increased access to care will serve to reduce stigma and discrimination, as AIDS loses its association with death and becomes redefined as a treatable chronic disease that—most importantly—can also be prevented.

BUILDING HUMAN CAPACITY TO SUSTAIN HIV TREATMENT

Efforts to scale up access to treatment programmes must overcome the human resource crisis in low- and middle-income countries, which is especially pronounced in the health sector (see Chapter 8). For this reason, many international donors and nongovernmental organizations are building training components into their treatment programmes. In India, for example, the Clinton Foundation is working with the national government to train medical providers in the administration of antiretrovirals and to upgrade needed laboratories. In Botswana, more than 1300 health-care providers have received in-service training from senior HIV experts from international medical institutions who spend between six and 24 months serving in the Clinical Preceptorship Programme of the African Comprehensive HIV/AIDS Partnerships, a public–private initiative of the national government, the Bill & Melinda Gates Foundation and the Merck Company Foundation/Merck & Co., Inc. Developed in 2005, WHO’s training tools for the Integrated Management of Adolescent and Adult Illness and the Integrated Management of Childhood Illness have enabled more than 15 000 providers of AIDS-related services to be trained in an integrated approach to antiretroviral therapy, care and prevention (WHO, 2006a, 2006b). In the same year, the first of a series of UNAIDS–supported regional technical facilities around the world became operational in southern Africa.

Traditional training initiatives, although critically important to scaling up treatment access, are not enough to remedy the acute global shortage and maldistribution of health-care workers (Narasimhan et al., 2004). In addition to providing training programmes, it is important for governments, donors and other partners to explore innovative solutions (UNDP, 2005). For example, at the Third International AIDS Society Conference on HIV
Pathogenesis and Treatment in Rio de Janeiro, Brazil, in July 2005, experts studied examples of private companies that have successfully extended AIDS treatment beyond the workplace to surrounding communities in several countries (Beckmann et al., 2005).

In the absence of sufficient numbers of trained health-care providers, countries should maximize use of existing community health workers, medical assistants and other community-based resources to facilitate scaling up treatment access. Cooperation between low- and middle-income countries—such as in the form of medical brigades to support and train mid-level workers—can help stretch health-care resources further, especially when combined with careful examination of optimal roles and responsibilities of physicians, nurses and other staff (UNDP, 2005). Such task shifting is promoted by WHO in the Integrated Management of Adolescent and Adult Illness approach (WHO, 2006b).

IMPROVING SUPPLY MANAGEMENT
Once a person begins antiretroviral therapy, the drugs must be taken regularly for the rest of her or his life. Yet in many places, delays in procurement and disbursement of antiretroviral drugs frequently lead to interruptions of therapy and waiting lists for HIV treatment. National AIDS programmes and individual treatment centres need the capacity to gauge future demand for antiretroviral drugs and to implement reliable procurement, delivery and supply systems to avert stock shortages.

The Dominican Republic, for example, has occasionally experienced acute shortages of first-line medications, reportedly prompting some physicians to smuggle antiretrovirals into the country to avoid potentially serious treatment interruptions. Treatment centres in Nigeria in 2005 similarly reported antiretrovirals being out of stock for up to two months. Slow disbursement of funds was one of the factors cited by the Global Fund in its finding of non-performance on the country’s Round 1 grant for expanding treatment access.

The need to increase countries’ ability to manage supplies of medications and effective health service delivery is an important focus of the “Three Ones” principles (see ‘Building national capacity’ chapter) and one that is supported increasingly by donors, multilateral agencies and international nongovernmental organizations. Many different approaches are being tried, responding to the specific conditions in each country. Following an assessment of the country’s procurement supply management system by WHO and UNICEF, Cambodia is in the process of replacing its fragmented process for purchasing and managing treatment supplies with a unified national system that includes a national drug inventory database. Burkina Faso is attempting to overcome bureaucratic delays by setting up a stand-alone, not-for-profit agency to ensure a steady supply of affordable drugs and diagnostics as it scales up treatment access. At an international level, the World Bank’s Implementation Acceleration Team works with governments to improve activities such as planning, financial management and expenditure tracking (World Bank, 2005).

PROMOTING TREATMENT ADHERENCE
Sustaining effectiveness of antiretroviral therapies over time requires minimizing the risk of the virus becoming resistant to the drugs used to treat the infection.
Resistant strains of HIV can be transmitted to others, potentially foreclosing or impeding the effectiveness of future treatment options for individuals who are newly infected. Efforts to control tuberculosis, malaria and respiratory infections have each been impeded by the growth over time of resistance to first-line therapies, underscoring the potential long-term danger of drug resistance to the global HIV response (Norrby et al., 2005; Okere et al., 2005; Bates et al., 2004).

To prevent or significantly delay the emergence of drug resistance, it is critical that patients follow antiretroviral regimens exactly as prescribed. Adherence of 90% or greater is required to suppress viral activity and minimize drug resistance over time (Paterson et al., 2000). Discontinuation or interruption of therapy is even more dangerous than periodic non-adherence (Lucas, 2005).

Although rates of adherence to antiretroviral therapy recorded to date are at least as high in resource-limited settings as in high-income countries, studies nevertheless indicate that rates of adherence may be insufficient to prevent the emergence of drug resistance. Among patients surveyed over 12 months in a public clinic in Belo Horizonte, Brazil, nearly 40% were non-adherent (Bonolo et al., 2005). One factor affecting adherence is the complexity of the medication regimen: patients are less likely to take their medications consistently when the medication regimen is complicated, e.g. with a large number of pills to be taken at different times of the day (Osterberg and Balsche, 2005). WHO has always promoted fixed-dose combinations and urged manufacturers to produce such products. Several fixed dose-combinations of antiretrovirals based on WHO’s simple five-drug, first-line formulary are available, either from the research and development or generics industry, and either have regulatory approval or have been prequalified by WHO.

As a component of the “3 by 5” initiative, WHO and a large number of partners have created a network called HIVResNet dedicated to standardized global surveillance and monitoring of HIV drug resistance, and is assembling a global network of laboratories to perform surveillance using a standardized protocol. A country-specific package to monitor HIV drug resistance in patients will be...
Experience all over the world shows that family members and social or work peers are often the most effective in supporting adherence. In ground-breaking antiretroviral therapy projects in Haiti and South Africa, the use of peer support has been cited as an important factor in the strong rates of patient adherence and treatment success. With more and more workplace-based treatment programmes emerging, HIV-positive peer educators are becoming ever more important as positive role models and examples of successful treatment. To promote treatment adherence in its company-sponsored antiretroviral programme in South Africa, the mining company Anglo American recruits treatment supporters from among its workers who are HIV-positive, supporting their fellow workers who are taking antiretrovirals (UNAIDS, 2005a).

used to adjust treatment guidelines and programming.

INTEGRATING HIV CARE WITH OTHER HEALTH SERVICES
By integrating HIV care with systems designed to address other health problems, countries can increase uptake of antiretroviral therapy and deliver more comprehensive, higher-quality care. In many countries, for example, HIV and tuberculosis are managed by two separate vertical care systems that interact little with each other. Moreover, HIV clinicians often have little experience or expertise in treating tuberculosis, and vice versa. Without close care coordination for both HIV and tuberculosis, clinicians may fail to intervene to avert or address potential drug interactions, side-effects of medications, and infections sometimes associated with reconstitution of the immune system (Karim et al., 2004).

As an example of what can be done, Malawi has worked with national, bilateral, international and nongovernmental organization partners to link its HIV and tuberculosis care systems in the country’s National Antiretroviral Treatment Scale-up Plan. The Global Fund represents an ideal vehicle to promote integration of HIV and tuberculosis care and treatment.

Programmes to prevent mother-to-child transmission of HIV and reproductive and sexual health services also provide opportunities for integration or improved coordination. In Latin America and the Caribbean, for example, the International Planned Parenthood Federation supports HIV testing and referral services in reproductive health settings in Barbados, Brazil, Colombia, El Salvador, Guatemala and Nicaragua. The International HIV/AIDS Alliance and other organizations are supporting country-level programmes to enhance the integration of HIV programming in sexual and reproductive health services, and the Global Coalition on Women and AIDS is advocating for such integration to be a core component of national AIDS programmes.

PATIENT MONITORING
Over the next few years, most patients in low- and medium-income countries will continue to be monitored clinically because of limited access to immunological (CD4+ T-cell count) monitoring and laboratory facilities. To support health
TREATMENT IN CONFLICT SETTINGS

Conflict often results in broad-based population displacement, disrupting health-care services and exposing individuals to severe health risks. However, each situation is context specific and must be examined individually (Spiegel and Qassim, 2003; Spiegel and Haroff-Tavel, 2005). Although special challenges arise to ensure proper adherence to therapy in such conditions, more and more evidence shows that people affected by conflict are able to receive and adhere to antiretroviral therapy (Ellman et al., 2005).

The Inter-Agency Standing Committee Task Force on HIV/AIDS in Emergency Settings—a broad-based alliance of UN agencies, nongovernmental agencies and other stakeholders committed to swift, effective and coordinated action to address the needs of people affected by conflicts and other emergencies—has developed Guidelines for HIV/AIDS Interventions in Emergency Settings (IASC 2004). These guidelines, which are now used by various partners in different emergency contexts, provide a common practical reference framework for use in emergency situations (UNHCR, 2006). Timely provision of care and treatment is a core priority of the guidelines—an emphasis that is also reflected in UNHCR’s HIV/AIDS strategy for 2005–2007, which calls for efforts to ensure the access of refugees and other displaced individuals to antiretrovirals when such therapies are available in the surrounding population (UNHCR, 2005).

Programmatic interventions designed to meet the treatment needs of children and women should be specifically examined and incorporated into national responses, along with those of vulnerable populations such as refugees, displaced people and populations at highest risk.

systems in this regard, WHO has recently revised its clinical and immunological staging guidelines for adults and for children (WHO, 2006a). The new adult and paediatric treatment guidelines, and the revised guidelines for preventing mother-to-child transmission of HIV, both promote much wider roll-out and availability of technologies for testing CD4+ T-cell counts. However, they also recognize that clinical decisions can still be made without access to CD4+ T-cell counts regarding when to start treatment, when to substitute antiretroviral drugs as a result of toxicity and...
As the AIDS epidemic’s burden on women and girls increases, there is a growing need to ensure that women benefit from equitable access to antiretroviral drugs and other HIV-related treatments.

when to switch regimens because of treatment failure.

Many donors and international agencies are now prioritizing initiatives to expand access to critical laboratory services and equipment. In 2004, the Clinton Foundation brokered an agreement with five companies to sharply lower prices for tests for CD4+ T-cell counts and viral load in low- and middle-income countries. In the Caribbean region, the World Bank is providing financial assistance to the Pan Caribbean Partnership Against HIV/AIDS to enhance regional laboratory capacity to support scaling up treatment access. A US$59 million World Bank loan to Nigeria is supporting development of national diagnostic capacity. However, obtaining servicing and spare parts for diagnostic equipment remains a problem in many resource-limited settings, which will require considerable effort to overcome.

Ensuring equity as access to treatment expands

In most countries, the most vulnerable and least well-off populations (frequently one and the same) have less access to HIV-related treatment than those that are wealthier or live in wealthier communities. To ensure equitable access to treatment as scaling up proceeds, WHO and the UNAIDS Secretariat recommend that countries take action in several areas. These include establishing a broadly representative ethics advisory body (in line with the structures set up under the “Three Ones” principles), carry out a public dialogue on equitable access to HIV treatment and care, and develop and enforce policies and evaluation systems specifically designed to promote equity (WHO/UNAIDS, 2004). In addition, programmatic interventions designed to meet the treatment needs of children and women should be specifically examined and incorporated into national responses, along with those of vulnerable populations such as refugees, displaced people and populations at highest risk (see ‘At risk’ chapter).

THE TREATMENT NEEDS OF CHILDREN

With over 600 000 children contracting HIV infection each year, mostly through mother-to-child transmission, access to affordable HIV diagnostics and treatment represents an urgent global health priority. In 2005, UNAIDS and UNICEF issued a global call to action
The cost of medications has always been an issue in the response to HIV. Many of the drugs used in antiretroviral therapy are covered by patents and intellectual property laws that can limit their use or maintain their price at levels too high for widespread use in low-income countries. The development of generic antiretroviral drugs, as well as the willingness of the international pharmaceutical industry to reduce prices in low-income countries, have been key advances in increasing access to treatment.

Over the past two years, the global community has taken new steps to increase access to affordable antiretroviral therapies. In December 2005, the WTO amended its intellectual property rules to make permanent a temporary waiver permitting countries that lack a strong pharmaceutical industry to import generic medications for HIV and other high-priority communicable diseases. In 2004–2005, UNDP and other partners assisted 36 African countries to make best use of the flexibilities and safeguards available for accessing essential medications under the WTO’s agreement on Trade-Related Aspects of Intellectual Property Rights.

Uncertainty about the continued viability of existing sources of generic medications nevertheless clouds future prospects for sustainable access to needed antiretrovirals. In particular, it is unclear whether countries will have secure access to affordable second-line therapies, in line with WHO recommendations for long-term treatment efficacy. Treatment options after second-line therapy are not yet identified and it remains uncertain how many countries will seek to provide such therapy through the public health systems.

In 2005, India revised its patent laws to comply with WTO’s rules, potentially preventing the country’s generic pharmaceutical industry from manufacturing generic equivalents for drugs patented after 1996. Historically, India has served as a pivotal source of generic antiretrovirals, which have contributed to the price reductions that have made treatment access feasible in resource-limited settings. While national treatment programmes may continue to have access to affordably priced zidovudine and other first-generation antiretrovirals—in part because the patents for such medications will soon begin to expire—the revised laws may prevent countries from looking to India for affordable generic equivalents of second-line antiretrovirals (Havlir and Hammer, 2005).

that challenges the world to ensure that antiretroviral therapy and prophylaxis with the antibiotic cotrimoxazole (see below) reach 80% of children in need by 2010 (UNICEF and UNAIDS, 2005).

Accurate diagnosis of HIV infection in children can be difficult in resource-limited settings. Because of the persistence of maternal antibodies up to 18 months after birth, highly sensitive tests such as polymerase chain reaction or viral load testing are typically needed to render a definitive diagnosis in infants. While such tests have long been regarded as not feasible in low-resource settings because of their high cost and the difficulty of
collecting blood from newborn infants, more recent technical developments using dried blood spots show promise, enabling earlier diagnosis and avoiding the need to take blood from a vein.

Formulations of antiretrovirals suitable for use in children remain rare and tend to be more expensive than adult regimens. Most paediatric antiretroviral formulations are syrups that taste unpleasant to many children, potentially complicating adherence. Some must be diluted with drinking water or refrigerated, which may be unpractical in certain settings. In many places, dosages of adult medications are simply reduced for children, risking undertreatment (which can lead to drug resistance) or overtreatment (which can produce side-effects because of the drugs’ toxicity). Recently, some manufacturers have piloted the production of mini-pills, which are particularly suitable for young children. However, all new products need to be properly tested, prequalified and licensed for use, and this takes time.

Access to cotrimoxazole is critical, especially in settings where antiretrovirals are not yet accessible. The antibiotic, which provides protection against life-threatening opportunistic infections and can delay the need to initiate antiretroviral therapy, has been shown to reduce the risk of death in children living with HIV by more than 40% (Chintu et al., 2004). However, even though cotrimoxazole costs as little as US$ 0.03 a day, an estimated four million children who need the drug are currently unable to obtain it (WHO and UNAIDS, 2005).

Side-effects associated with antiretroviral therapy can sometimes be more severe in children than in adults (McComsey and Leonard, 2004). It can also be difficult to distinguish in children between the complications of HIV disease itself and toxicities or side-effects associated with the drugs used to manage HIV. Many HIV-infected children also suffer from tuberculosis or malnutrition, further complicating medical management (WHO, 2006a).

Because HIV-positive children are vulnerable to severe infections, timely and proper immunization is especially important. Routine vaccines are generally safe to administer to HIV-infected children, but additional research is needed to find ways to ensure the effectiveness of routine immunization in children living with HIV and to enable clinicians to make more informed treatment decisions (Obaro et al., 2004).

Figure 7.3 provides data from three regions of the world, showing children as a percentage of the total number of people receiving antiretroviral therapy. In sub-Saharan Africa about 7% of all people being treated are children. In Latin America and the Caribbean, the median value of nine countries is 8%, while in Asia it is about 4%.

**MONITORING WOMEN’S ACCESS TO TREATMENT**

As the AIDS epidemic’s burden on women and girls increases (see ‘Overview’ chapter), there is a growing need to ensure that women benefit from equitable access to antiretroviral drugs and other HIV-related treatments. To that end, treatment programmes should be designed to address the many obstacles that women and girls face in accessing health care, and include efforts to reduce violence against women, lower the costs of treatment, shorten waiting times, provide appropriate
Inequalities are well documented in some areas of AIDS care. In Kenya, for example, HIV-positive men in 2002–2004 were twice as likely to be admitted to hospital as women living with HIV, and women paid 65% more per visit than men (UNAIDS Global Resource Tracking Consortium, 2004).

Fortunately, as access to antiretroviral therapies has expanded in recent years, it appears that the world has thus far avoided significant gender inequities in the use of antiretroviral drugs. In June 2005, UNAIDS and WHO reported that data from low- and middle-income countries on the use of antiretroviral drugs failed to detect notable gender inequities (WHO and UNAIDS, 2005). Moreover, the continued expansion of programmes to prevent mother-to-child transmission of HIV—particularly the Prevention of Mother-to-Child Transmission-Plus approach, which includes comprehensive care for the mother—has provided another avenue for an increasing number of women to be tested and start receiving (or be referred for) antiretroviral therapy. However, entry points for non-pregnant appointment schedules and sufficient female health workers, address stigma and discrimination, and guarantee privacy and confidentiality.

women and girls to HIV testing, counseling and treatment need to be more readily accessible.

Figure 7.4 provides data from 30 countries, showing women as the percentage of adults receiving antiretroviral therapy, compared with their expected percentage. The expected percentage varies according to the type of epidemic: more women would be expected to receive treatment in a generalized epidemic than in one concentrated among injecting drug users (who are more likely to be male). Data from Ethiopia and Ghana, which both have generalized epidemics, show a possible male bias, with the percentage of women on antiretroviral therapy being far less than 50%. In Burundi, Cambodia, China, Panama and South Africa, the reverse is seen, with women
figuring as a higher than expected proportion of adults on treatment. There are currently few data available to explain exactly why such differences between countries occur.

**Using expanded treatment access to strengthen HIV prevention**

Expanded access to treatment will inevitably have an important impact on HIV prevention efforts. Most notably, providing antiretroviral drugs to pregnant women for their own health needs substantially reduces the risk of transmission during birth or as a result of breastfeeding. Because the risk of sexual transmission is closely associated with viral load (Quinn et al., 2000), reducing a person’s viral load through antiretroviral therapy could reduce the likelihood that he or she will transmit the virus to someone else. A recent study in Uganda calculated that the risk of sexual HIV transmission in HIV serodiscordant couples fell by 98% when the HIV-infected partner was receiving antiretroviral therapy (Bunnell et al., 2006).

It is widely hoped that enhanced treatment access will buttress HIV prevention efforts by increasing incentives for voluntary testing, reducing HIV-related stigma, and providing clinicians with new opportunities for service delivery and reinforcing prevention messages in clinical settings (Global HIV Prevention Working Group, 2004). However, there are also concerns that broader access to treatment could potentially complicate prevention efforts by lengthening the period of infectiousness, contributing to drug resistance and increasing risk behaviours by making HIV infection appear less threatening (Over et al., 2004). Surveys of HIV-infected men who have sex with men in Sao Paulo, Brazil, found that those who were most optimistic about HIV treatments were more likely to have had unprotected anal intercourse with regular or casual partners in the previous six months (da Silva et al., 2005). This apparent dynamic tension between sexual risk behaviour and increased treatment access may require new prevention strategies to be devised (Gayle and Lange, 2004).

To capitalize on treatment’s beneficial effects on HIV prevention and to avert an increase in sexual risk behaviour, the Global HIV Prevention Working Group urges a simultaneous scaling up of treatment access and prevention programmes. Efforts to model the future course of the AIDS epidemic consistently demonstrate that a response that combines expanding...
Adequate nutrition is also necessary to ensure optimal benefits from the use of antiretroviral therapy, which is essential to prolong the lives of HIV-infected people and prevent transmission of HIV from mother to child.

prevention and treatment access will have a far greater impact on the epidemic than a response that prioritizes one over the other (Salomon et al., 2005; Over et al., 2004).

Making care and treatment comprehensive

With the understandable excitement about the benefits of antiretroviral therapy, it is sometimes forgotten that antiretroviral therapy is only one component of comprehensive treatment and care for people living with HIV. Even when on antiretrovirals, people have a host of other needs, such as proper food and nutrition, prevention and treatment of opportunistic infections, and psychosocial support. For this reason, efforts to scale up care and treatment access must aim to be comprehensive. If properly planned and funded, for example, provision of comprehensive care and treatment will also reinforce efforts to diagnose and treat other conditions relevant to AIDS, such as tuberculosis and malaria. This will not only improve patient outcomes but accelerate progress against a broad range of public health threats.

FOOD AND NUTRITION

Adequate nutrition cannot cure HIV infection but is essential to maintain a person’s immune system, to sustain healthy levels of physical activity and for optimal quality of life (WHO, 2005). Adequate nutrition is also necessary to ensure optimal benefits from the use of antiretroviral therapy, which is essential to prolong the lives of HIV-infected people and prevent transmission of HIV from mother to child. The WFP provides food as part of a comprehensive antiretroviral therapy package in 17 countries in Africa.

WHO’s resolution on Nutrition and HIV/AIDS, which was adopted at the 117th session of the Executive Board in January 2006, urges Member States to make nutrition an integral part of their response to HIV by identifying nutrition interventions for immediate integration into HIV and AIDS programming. This includes strengthening political commitment to nutrition and HIV as part of countries’ health agenda and reinforcing
nutrition components in HIV and AIDS policies and programmes, and incorporating HIV and AIDS issues in national nutrition policies and programmes.

To date, however, nutrition interventions have not been widely integrated into national treatment plans. At the Harriet Shezi Clinic of Chris Hani Baragwanath Hospital in South Africa, for example, only 6% of children on antiretroviral drugs have access to nutritional support, such as fortified maize meal and milk formula, and there are insufficient staff to advise patients on nutritional issues. UNAIDS Cosponsors such as UNICEF, WFP and WHO work closely to ensure the integration of food and nutrition in expansion of treatment

**FOOD AND TREATMENT FOR THE VERY POOR**

The WFP has been a strong advocate for greater attention to the role of food and nutrition in HIV treatment and care, working closely with WHO in the “3 by 5” initiative. In 2005, WFP provided food and nutrition through a variety of programmes to nine million HIV-positive individuals and others affected by HIV and AIDS in Africa, Asia and Latin America.

With growing recognition of the importance of food and nutritional support as part of comprehensive care for people living with HIV, the WFP now provides food support alongside antiretroviral therapy in 17 African countries. In many cases, activities are still in the pilot stages, and have typically been implemented for less than two years. It is hoped that testing different approaches to the provision of food and nutritional support to those in treatment, along with rigorous evaluation, will lead to the development of a model that can be scaled up. To date, WFP’s pilot programmes have led to some innovative approaches.

In Malawi, WFP works with the international nongovernmental organization Action Against Hunger to provide severely malnourished patients with a daily ration of a high-protein, high-energy peanut paste, developed in France in the late 1990s. The ready-to-use paste is highly effective for rehabilitation of severely malnourished children. For patients with less severe forms of malnutrition, an individual food basket of corn soya blend and vegetable oil is provided. Body mass index and HIV staging are used to determine eligibility for food assistance. Outcomes such as weight gain and recovery time are closely monitored in order to document results.

While the approach being piloted in Malawi is focused on individualized care, many countries have found that a significant proportion of those seeking antiretroviral therapy are affected by food insecurity at the household level, often the result of prolonged sickness of the household’s main wage earner. Such vulnerability presents a real challenge for service providers. Lack of both income and food security makes it difficult for families to prioritize seeking care over seeking food, which means that food provided for the sick individual is likely to be shared with family members, diluting the intended benefits. To help address this problem, many countries provide a protection ration in addition to an individual ration, to minimize dilution at the household level. Health workers in Mozambique and Zambia have also developed food security checklists, which are used by health-care providers or community household workers to help identify households that are most likely to benefit from food assistance.
HIV-related immune suppression increases vulnerability to a host of potentially life-threatening opportunistic illnesses, including respiratory ailments, certain bacterial and fungal infections and neurological disorders.

access, both as a treatment intervention and as a means of mitigating AIDS effects on individuals and communities (see ‘Reducing the impact’ chapter). Organizations providing services to refugees and displaced people have found that food and nutrition programmes can also be vehicles for providing HIV prevention education. UNHCR and WFP have together developed 20 programme strategies which integrate HIV-related activities with food and nutrition support in refugee settings. These have been implemented in refugee camps in Uganda and Zambia (UNHCR/WFP, 2004).

TUBERCULOSIS

As tuberculosis is a leading cause of AIDS-related death, accurate diagnosis, prevention and treatment of tuberculosis are of overriding importance (see ‘The impact of AIDS’ chapter). There are a number of barriers to timely diagnosis and treatment of tuberculosis that must be overcome. For example, since rapid diagnostic tests routinely used in high-income countries are often unavailable in low- and middle-income countries, a substantial percentage of people with tuberculosis have to wait for several weeks before being diagnosed with the disease, threatening their own health and those living around them.

Patients who are HIV-positive and diagnosed with latent tuberculosis infection need preventive therapy to prevent development of potentially life-threatening active tuberculosis. It is important, however, to exclude active tuberculosis when isoniazid is to be used to prevent tuberculosis and this presents significant operational challenges. Preventive therapy coverage is very poor, with only 1% of HIV-infected adults covered worldwide, with virtually no coverage in sub-Saharan Africa (USAID et al., 2003).

There is also an urgent need for simpler, better drug regimens for the treatment of tuberculosis. Growing resistance to available tuberculosis drugs increases the cost and complexity of tuberculosis control and underscores the need for new drugs. In Botswana, the prevalence of resistance to at least one tuberculosis drug among individuals undergoing anonymous HIV testing increased from 3.7% in 1995 to 10.4% in 2002 (Nelson et al., 2005). Simpler, shorter regimens of tuberculosis drugs would increase treatment completion rates and reduce the emergence of
resistance. Leading global efforts to generate new drugs to treat tuberculosis, the Global Alliance for TB Drug Development is a public–private alliance that has built the most comprehensive pipeline of investigational tuberculosis drugs since the 1960s, with the aim of ensuring development of at least one new drug in the next decade.

OPPORTUNISTIC INFECTIONS
HIV-related immune suppression increases vulnerability to a host of potentially life-threatening opportunistic illnesses, including respiratory ailments, certain bacterial and fungal infections and neurological disorders (Felkin et al., 2004). HIV infection can also raise the risk of certain cancers, especially among individuals who are coinfected with human papilloma virus (Sobhani et al., 2004). Up to half of people living with HIV experience oral disease, often early in the course of the HIV infection (Petersen et al., 2005). Antiretroviral therapy significantly reduces the incidence of disabling and potentially life-threatening opportunistic infections.

In the era of antiretroviral drugs, preventing and treating HIV-related opportunistic infections remains a cornerstone of the global response to AIDS. Even in high-income countries where antiretroviral therapy is universally available, opportunistic infections remain a major cause of death in people living with HIV (Bonnett et al., 2005). A substantial portion of patients fail on antiretroviral therapy, typically because they are not fully adherent to prescribed regimens or had pre-existing resistance to one or more antiretroviral medications. For such individuals—and for the majority of the world’s HIV-positive people who currently lack access to antiretroviral therapy—medications for opportunistic infections can mean the difference between life and death.

Because many opportunistic infections such as tuberculosis, malaria, bacterial pneumonia, bacterial enteritis or diarhoea are caused by infectious agents that have long been common in the community, treatments for such conditions should be readily available. Others, such as the protozoal disease Pneumocystis carinii pneumonia, can be prevented and treated with widely available antibiotics, such as cotrimoxazole. However, some opportunistic diseases—such as cryptococcal infections, disseminated herpes simplex infections and infections caused by cytomegalovirus and hepatitis C virus, toxoplasmosis and Kaposi sarcoma—require complex and expensive medications that are not available or affordable in many settings.

In fact, only a small fraction of people living with HIV have reliable access to proven prophylaxis or treatments for opportunistic infections. Globally, only 4% of HIV-infected adults and 1% of children living with HIV were able to obtain cotrimoxazole, an inexpensive medication that prevents Pneumocystis carinii pneumonia and other bacterial infections. Several studies have shown the benefits of this antibiotic in different settings and situations, but unfortunately very few centres or programmes globally are promoting this simple pre-antiretroviral therapy intervention with much enthusiasm. The low level of coverage is especially worrying for infants who are born to HIV-positive mothers and identified as HIV-exposed by programmes for the prevention of mother-to-child HIV transmission. Newly revised WHO guidelines emphasize the need to implement this simple
HIV COINFECTION WITH HEPATITIS B AND C

Because unscreened blood transfusions and injecting drug use are principal modes of transmission for both HIV and hepatitis B or C virus, many HIV-positive people are coinfected with hepatitis B and hepatitis C viruses. In the United States and Europe, an estimated 30% of HIV-infected individuals are also infected with hepatitis C virus (Kontorinis, Agarwal and Dieterich, 2005), including as many as 90% of people who contracted HIV as a result of injecting drug use (CDC, 2003). Even in Kenya, where injecting drug use is much less prevalent than in some other parts of the world, nearly one in 25 patients surveyed at a major AIDS clinic were coinfected with hepatitis C (Karuru et al., 2005). HIV infection may accelerate the progression of hepatitis C, increasing the risk of life-threatening liver disease (Bonacini et al., 2004).

Two antiretrovirals effective against HIV are also effective against hepatitis B virus, and antiretroviral therapy may provide indirect benefits for patients with chronic hepatitis B infection. Although effective treatments exist for both newly acquired and chronic hepatitis C infection, the regimen is costly (an average of US$ 25 000 for a 48-week regimen) and often unavailable in low- and middle-income countries. The timing of therapy for hepatitis C infection may also be affected by the presence of HIV infection, as clinicians advise that immune restoration following antiretroviral therapy for HIV should precede initiation of antiviral treatment for hepatitis C infection (Cooper, 2005). To ensure that injecting drug users fully benefit from antiretroviral therapies, national guidelines should provide clear guidance on antiretrovirals for individuals who are coinfected with HIV and hepatitis B or C virus.

intervention much more widely, and also consider at what stage to discontinue cotrimoxazole administration for children or adults who have started antiretroviral therapy (WHO, 2006b).

Some of the leading treatments for opportunistic infections are currently unaffordable for many national public health systems. In the Dominican Republic, for example, some of more expensive medications used to treat common opportunistic infections—such as fluconazole, amphotericin B, aciclovir and ganciclovir—are available only for direct purchase through private pharmacies, an option that is economically untenable for most people living with HIV (International Treatment Preparedness Coalition, 2005). However, progress has been made on a number of fronts. For example, Pfizer has made fluconazole available free of charge or highly discounted through its corporate donation programme, while in South Africa, lobbying by activists persuaded Bristol-Myers Squibb, maker of amphotericin B, to sharply reduce the drug’s price in 2005 (Bicanic et al., 2005).

MITIGATING AND MANAGING SIDE-EFFECTS

While antiretroviral drugs are highly effective in slowing HIV disease progression, they can cause important side-effects in some individuals, some of which can be life-threatening. Side-effects include severe skin reactions, hepatitis, anaemia and cardiovascular disease. Some chronic side-effects can be debilitating (e.g. chronic gastrointestinal intolerance) or
cause long-term changes in body appearance (e.g., lipodystrophy and lipoatrophy). The range and severity of side-effects may vary according to the nutritional status or other characteristics of different patient populations. Medical management of patients on antiretrovirals must also take account of potential drug–drug interactions—most notably between tuberculosis medications (especially rifampicin) and several classes of antiretrovirals, and also with long-term hepatitis C therapy. As access to treatment continues to expand, experience gained is shedding light on patient safety issues in resource-limited settings, providing information useful to WHO’s regular review of treatment guidelines and recommendations for optimal first- and second-line treatment regimens.

PSYCHOSOCIAL SUPPORT
Most countries allocate less than 1% of national health budgets to mental health, and there are proportionally very few mental health professionals in low- and middle-income countries, compared with industrialized countries. This is an obstacle to comprehensive care and treatment, as HIV infection can result in mental and neurological impairment, and a substantial number of people living with HIV have underlying cognitive and substance abuse disorders (McArthur et al., 2005). Untreated mental illness not only reduces the quality of life for HIV-affected individuals and households, but poor mental health is strongly associated with non-adherence to treatment regimens (Singh et al., 1999; Gordillo et al., 1999). To date, planning for HIV care and treatment has often failed to take into account the need to integrate strong mental health and psychosocial support interventions (Baingana et al., 2004).

Antiretroviral therapy is probably the single most effective intervention for HIV-related mental disorders, reducing the incidence of dementia and improving cognitive and behavioural functions. However, it may not address underlying depression and other mental health problems that are not associated with HIV infection itself (Siegel et al., 2004). Initiatives to expand antiretroviral access should be accompanied by enhanced capacity to recognize mental illness, integration of psychosocial services in treatment programmes and increased access to psychotropic medications (Baingana et al., 2004).

Typically, the intensive and diverse needs of individuals living with HIV outstrip the capacity of community-based support resources, and the stigma associated with HIV and AIDS discourages affected households from accessing palliative services that might be available.
PALLIATIVE CARE

Even with the best of treatments for HIV, palliative care for symptom management, control of pain and end-of-life care remain an important component of a comprehensive care package for people living with HIV. WHO has produced Integrated Management of Adolescent and Adult Illness guidelines for palliative care (WHO, 2006b), but there are few other manuals, protocols and systems for controlling pain and managing terminal care in resource-limited settings.

Recently, an analytical review of 26 palliative-care service organizations in sub-Saharan Africa found that hospital-based palliative care is virtually non-existent in the region because of its high costs and the low priority it is accorded in health systems. Although home care has long been proven to be an excellent source of palliative support for people living with HIV, access to such care is low, especially in rural areas. Typically, the intensive and diverse needs of individuals living with HIV outstrip the capacity of community-based support resources, and the stigma associated with HIV and AIDS discourages affected households from accessing palliative services that might be available. Greater commitment is urgently needed to integrate palliative care into comprehensive patient management and to develop simplified protocols for delivery of palliative care by clinical and lay staff (Harding and Higginson, 2005).

Research is vital

A key pillar of the “3 by 5” initiative was the identification and rapid application of new knowledge. The initiative placed particular emphasis on learning by doing, according high priority to continuing evaluation and analysis of programme performance and focused operational research.

Working with the UNAIDS Secretariat and other partners, WHO has developed patient monitoring guidelines for HIV care and antiretroviral therapy to assist primary health-care facilities to collect follow-up data on adults and children. Patient records and facility registers generate data that can be useful for evaluation efforts. WHO has supported four countries in the development of operational research agendas linked with scaling up access to treatment and bilateral donors are also investing significant resources in targeted programme evaluations.

There is currently notable variation in guidelines regarding initiation of antiretroviral therapy, with no randomized trial having been undertaken to date to clarify the optimal timing for such therapy (Wood et al., 2005). Unanswered questions include the long-term clinical benefit, if any, of antiretroviral therapy during primary infection. Additional research is needed to provide clinicians and patients with a stronger basis on which to make important treatment decisions.

Further research is also needed on the prevention and treatment of opportunistic infections. For example, while antiretroviral therapy moderates the incidence and severity of HIV-related dementia, the prevalence of neurological disease among people living with HIV in areas with long-standing access to antiretrovirals has actually increased. This underscores the need for new therapeutic strategies that act directly on the central nervous system (Perry et al., 2005).