9 The Way Forward: Prevention, Treatment and Human Rights

"AIDS is no longer just a disease, it is a human rights issue."
Nelson Mandela, at the first 46664 concert held at Greenpoint Stadium, Cape Town (29 November 2003).

There now is a considerable body of evidence to support the view that an effective HIV/AIDS strategy integrates prevention, treatment and human rights. In this chapter, we emphasize the importance of each of these aspects and draw upon the conclusions reached in previous chapters to map out the future of HIV/AIDS. While medicine and science have a crucial role to play in addressing pandemics, whether slow-moving (like HIV/AIDS) or fast-moving (like influenza), the social, legal, political, financial and economic ramifications of pandemics can not be ignored. Well-considered social, legal, political and financial strategies are essential in order to address any pandemic effectively.

9.1 The Importance of HIV/AIDS Prevention

Global access to antiretroviral therapy for people living with HIV/AIDS has been scaled up significantly in recent years, from 8% in 2003 to 28% in 2006 (Global HIV Prevention Working Group 2007). Many developing countries now have universal access to treatment, including low-income countries, such as Rwanda (Perry 2007), and middle-income countries, such as Thailand and Brazil (see Chap. 2). However, prevention needs to be scaled up considerably in order to make universal access to treatment an affordable goal on a global scale. Without adequate prevention, new infections will rise and millions more people will need treatment.

The importance of prevention is illustrated dramatically in Fig. 9.1. Two middle-income countries started out at the same point in 1990 with respect to HIV/AIDS: Thailand and South Africa. However, the course of the epidemic in each has diverged to an extraordinary degree since then.

Low- and middle-income countries are not alone in needing a significant increase in HIV prevention. As Table 9.1 shows, HIV infections have increased in several high-income countries in recent years. In New York City, between 2001 and 2006 the annual number of new HIV infections in men under 30 who have sex with men increased by 32%. The significant factors behind the increase in new infections appear to be higher rates of drug use, optimism that AIDS is treatable and increasing stigma about HIV (Kershaw 2008).

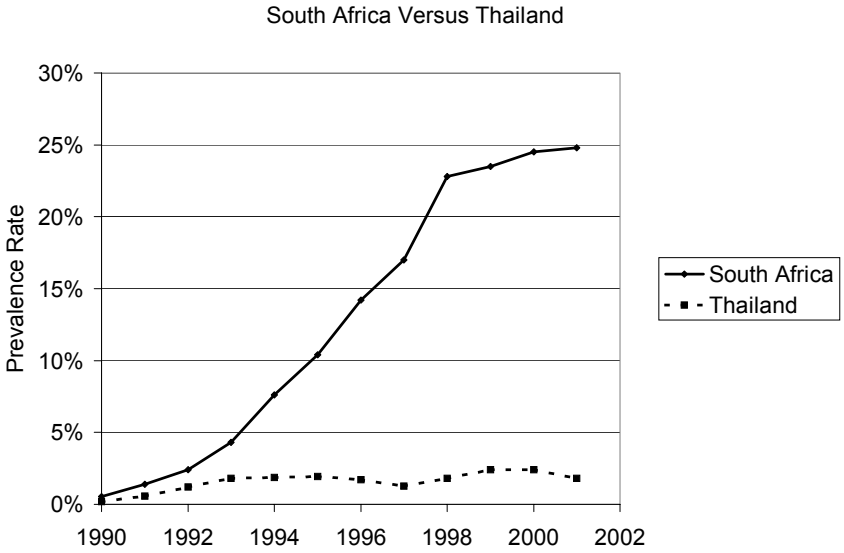

Fig. 9.1 Tale of two countries: South Africa and Thailand. *Source*: UNAIDS

Table 9.1 Rising HIV infection rates in high-income countries

Country	Period	Increase in new HIV infections (%)
Australia	2000–2005	41
Canada	2000–2005	20
United Kingdom	1998–2004	150

Source: Global HIV Prevention Working Group (2007)

In Chap. 2, we discussed how integrated prevention-treatment-human rights strategies aimed at high-risk groups have proved effective in countries like Brazil. In Chap. 7, we explained that limited resources need to focus on high-risk groups and locations to achieve the best possible results. However, as we showed in the example of Ghana, even though almost 80% of people living with HIV/AIDS are sex workers, who are the source of almost 80% of HIV infections, a negligible amount of funding for HIV/AIDS is targeted at this group. The mismatch between the most affected group and the allocation of funding in Ghana highlights the importance of matching funding to prevailing prevalence and transmission patterns in a given country or region. As we saw in Chap. 2, an HIV prevalence rate above 1% is a key threshold for an HIV epidemic to run out of control unless funding for prevention efforts is targeted at high-risk groups, such as commercial sex workers, men who have sex with men, injection drug users and prisoners. However, in Chap. 8 we saw that PEPFAR – the largest bilateral donor of funding for HIV/AIDS programs in developing countries – prohibits the use of funding for programs for commercial sex workers and needle exchange programs.

In Chap. 3, we saw that African-Americans make up 54% of HIV/AIDS patients, even though African-Americans account for less than 15% of the US population. Moreover, black men who have sex with men (MSM) have the highest rates of unrecognized HIV infection, HIV prevalence and incidence rates and AIDS mortality rates among MSM in the United States. In five US cities, 46% of African-American MSM are infected with HIV. HIV and AIDS prevalence rates have affected black MSM disproportionately since the beginning of the epidemic. Black MSM are the only group in the United States with HIV prevalence and incidence rates that are comparable to those in the most affected developing countries. However, the vast majority of HIV prevention intervention for African-Americans does not target homosexual men and for homosexual men does not target black MSM (Millett and Peterson 2007). Thus, the need to focus prevention efforts on the most vulnerable groups remains an issue not just in developing countries.

While prevention strategies need to be tailored to the sources of HIV infections in specific contexts, there are several proven prevention strategies that need to be scaled up. The resources for prevention need to be focused according to the specific nature of the epidemic in different settings, as we showed in Chap. 2. Figure 9.2 shows the source of new HIV infections by region. Table 9.2 summarizes the coverage levels of several essential prevention strategies and Fig. 9.3 shows their deployment by region. It is important to emphasize that prevention and treatment are mutually supportive and need to be addressed simultaneously. Access to treatment supports prevention by reducing risky behaviors, increasing disclosure of HIV status, reducing stigma and reducing infectiousness (Global HIV Prevention Working Group 2007). Prevention supports access to treatment by reducing the number of people that require treatment, thus making universal access to treatment more affordable. HIV treatment and prevention should be integrated, in order to enhance the effectiveness of both.

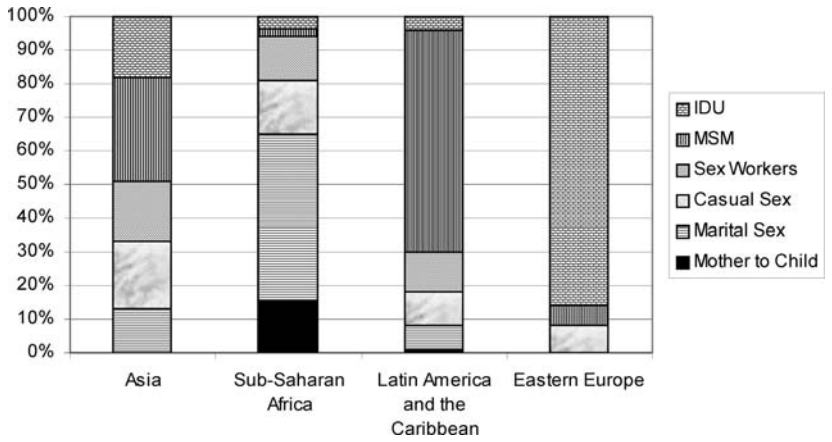

Fig. 9.2 Sources of new HIV infections by region. *Source*: Global HIV Prevention Working Group (2007)

Table 9.2 Estimated coverage levels for essential prevention strategies

Strategy	Coverage
Global condom use in risky sex	9%
Knowledge of HIV status in sub-Saharan Africa	Men 12%/Women 10%
Global treatment for sexually transmitted infections	<20%
Prevention of mother-to-child transmission in developing countries	11%
Global prevention services for men who have sex with men	9%
Global prevention services for injection drug users	8%
Global prevention services for sex workers	<20%
Annual transfusions of unscreened blood in developing countries	6 million units
Unsafe injections in health care settings	40%

Source: Global HIV Prevention Working Group (2007)

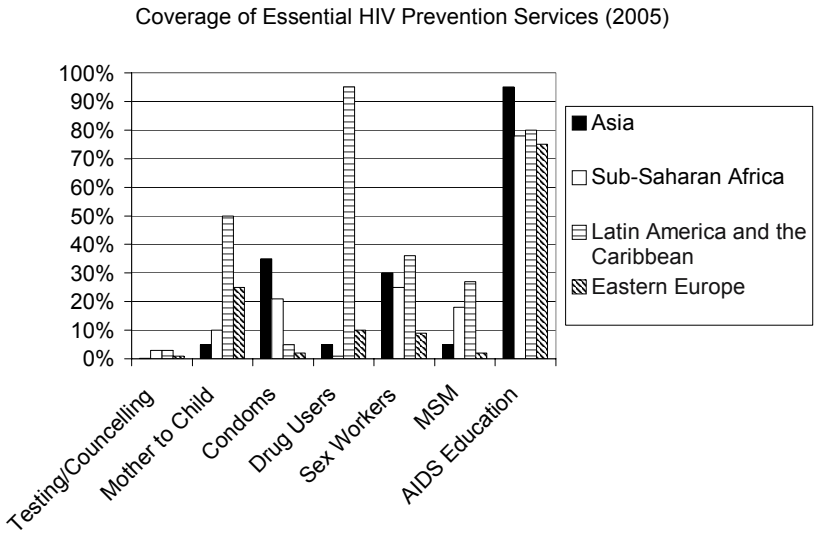

Fig. 9.3 Regional coverage of HIV prevention Services. *Source*: Global HIV Prevention Working Group (2007)

9.1.1 HIV/AIDS Prevention Strategies

HIV prevention strategies fall into four general categories: (1) prevention of sexual transmission; (2) prevention of blood-borne transmission: (3) prevention of mother-to-child transmission; and (4) social strategies.

9.1.1.1 Preventing Sexual Transmission

The strategies for preventing sexual transmission are: (1) behavioral change programs (to increase condom use, to delay the initiation of sexual behavior in young people and to reduce the number of sexual partners); (2) condom promotion; (3) HIV testing (knowledge of HIV status decreases risky behavior); (4) diagnosis and treatment of sexually transmitted infections (which significantly increase the risk of HIV acquisition and transmission, particularly in the case of genital herpes); and (5) adult male circumcision (which reduces the risk of female-to-male transmission by about 60%) (Global HIV Prevention Working Group 2007).

The effectiveness of these strategies varies. The promotion of condoms has been largely successful with respect to commercial sex and casual sex, but condom use remains low within marriage. As we noted in Chap. 4, increasing life expectancy, in areas where it is low due to diseases like malaria, is a cost effective strategy for enhancing behavioral change to lower the risk of HIV infection. A survey by the WHO, on behalf of the Global Fund, reviewed anti-malaria operations in Ethiopia, Ghana, Rwanda and Zambia. In Ethiopia, childhood malaria declined by 60% and the death rate was cut in half within 2 years of the beginning of the mass distribution of mosquito nets. Within a single year, both cases and deaths dropped by two-thirds, in Rwanda, and one-third in Zambia. In Ghana cases fell by an eighth and deaths by a third. In many cases, the distribution of free nets was accompanied by free drugs based on artemisinin, a substance to which the malarial parasite has yet to develop widespread resistance, and spraying DDT inside people's houses. Based on these results, the WHO believes that a 5-year campaign that distributes free nets and malaria drugs would bring malaria under control in most of Africa at a cost of USD 10 billion (Economist 2008). These promising results also bode well for HIV prevention.

Some studies suggest that treating sexually transmitted infections may not reduce HIV transmission significantly (Halperin 2007). However, there is a strong association between the risk of infection with HIV and other sexually transmitted diseases. Moreover, as we noted in Chap. 4, Oster (2005) argues that the explanation for the substantial difference in the transmission rates between the United States and sub-Saharan Africa is due to other untreated sexually transmitted infections, which leave open sores from chlamydia, syphilis and gonorrhea that facilitate HIV transmission. Thus, treating bacterial sexually transmitted infections could prevent as many as 24% of new infections over a decade

There is significant evidence that male circumcision significantly reduces HIV transmission. Box 9.1 discusses the relationship between circumcision and HIV/AIDS.

A similar picture is seen in South and South-East Asia, where overall HIV prevalence is much lower, but the countries with highest HIV prevalence have little

male circumcision (Papua New Guinea, Cambodia and Thailand). Conversely, HIV prevalence is extremely low in those countries where most men are circumcised (Pakistan, Bangladesh, Indonesia and Philippines).

Box 9.1 Circumcision and HIV/AIDS

There is ecological evidence that prevalence of circumcision is negatively correlated with prevalence of HIV/AIDS. Specifically, there is a strong inverse correlation between the prevalence of circumcision in countries and the prevalence of HIV in those countries. All the highest HIV prevalence countries are those where circumcision is little practiced. In fact, no country with nearly universal circumcision coverage has ever had an adult HIV prevalence higher than 8%, including countries such as Cameroon, where a 1997 survey found sexual behavior to be higher risk than that in countries with prevalence of around 25%. This fact is illustrated in Fig. 9.4.

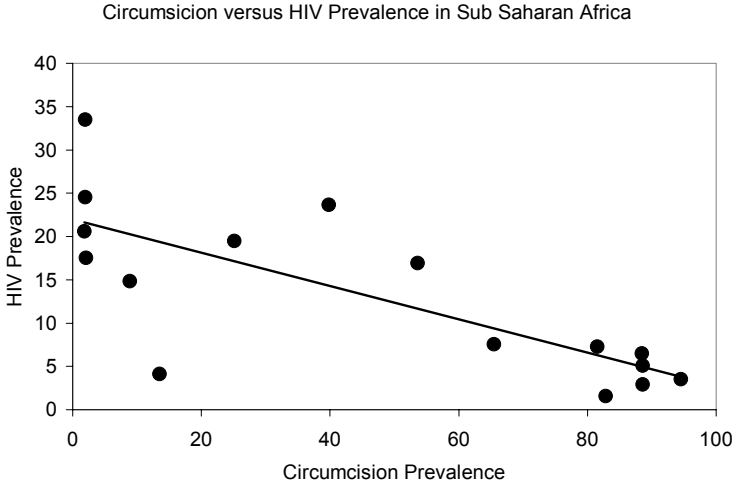

Fig. 9.4 Ecological relationship between circumcision and HIV prevalence. *Source*: Bailey (2007)

A large, randomized controlled trial in 3,274 men between the ages of 18 and 24 years showed that circumcision resulted in a significant 60% reduction in HIV infection (Auvert et al., 2005). These results were confirmed by two other trials.

Vulnerability to HIV varies considerably from one epidemic to the next, as do the issues facing vulnerable groups. For example, in a concentrated epidemic, such as in Asia and Latin America, HIV transmission occurs primarily among vulnerable groups and prevention programs targeted at vulnerable groups would reduce

overall infection. However, in a generalized epidemic, such as in several countries in Southern Africa, where HIV transmission occurs primarily outside vulnerable groups, Halperin (2007) argues that transmission would continue unabated despite prevention programs targeted at vulnerable groups. However, as we noted in Chap. 4, research regarding the relationship between trade routes, truckers, sex workers and HIV propagation contradicts this idea. In a generalized epidemic, where HIV is spread along trade routes, prevention programs targeted at truckers and sex workers would be effective in bringing down the growth rate of the spread of the disease.

Having multiple sex partners increases the risk of HIV infection in both concentrated and generalized epidemics, but the impact of this factor on HIV prevalence rates can vary considerably. For example, even though the United States and Uganda have similar rates of multiple sex partners, and the number of sexual partners that men and women had over a 10-year period were much higher in the United States than in Uganda, Uganda's HIV/AIDS prevalence rate was about 18 times higher than that of the United States (Halperin 2007). However, as we noted in Chap. 8, a recent study indicates that abstinence-only programs are as effective as providing no information at all when it comes to preventing pregnancies, unprotected sex and sexually transmitted diseases. Abstinence-plus interventions, which promote sexual abstinence as the best means of preventing HIV, but also encourage condom use and other safer-sex practices, are more effective than abstinence-only programs (Underhill et al., 2007).

9.1.1.2 Preventing Blood-borne Transmission

The proven strategies for preventing blood-borne transmission are: (1) to supply injection drug users with clean injection equipment; (2) methadone or other substitution therapy to reduce drug dependence; (3) blood safety programs, including screening of donated blood; and (4) infection control in health care settings, including injection safety and antiretroviral treatment following exposure to HIV.

As we noted in Chap. 8, the risk of AIDS infection through the use of blood products was recognized as early as 1982, but countries were slow to adopt measures to ensure the safety of the blood supply and the World Health Organization (WHO) passed a resolution on blood products that made no mention of AIDS as late as January 1987. In the 1990s, Chinese health authorities promoted blood-selling by poor farmers to commercial blood collection centers, despite warnings from the WHO, spreading HIV/AIDS through the blood fractionation and re-injection process. In 2007, new HIV infections through hospital blood transfusions continued to be reported in China, and illegal underground blood collection centers have continued to operate. Box 9.2 recounts the story of the Libyan scandal over blood-borne transmission to children.

Box 9.2 The Bulgarian Six

On December 14, 2007, Sixth Sense Productions, Inc., an independent Hollywood producer, announced plans to make a USD 40 million movie about five Bulgarian nurses (Kristiyana Vulcheva, Nasya Nenova, Valya Chervenyashka, Snezhana Dimitrova, Valentina Siropulo) and a Palestinian medical intern (Ashraf Ahmad Djum'a al-Hadjudj) who were jailed in Libya and faced the death penalty for allegedly infecting children with HIV.

This news item is a postscript to a long international drama that began to unfold in 1999 when the medics were arrested on charges of injecting 418 Libyan children with HIV-tainted blood while at a Benghazi hospital. Of them, over 50 had died by the end of 2007.

One important report was submitted by Luc Montagnier and Vittorio Colizzi – two leading experts on HIV/AIDS. Their report concluded that the infection at the hospital resulted from poor hygiene and reuse of syringes. They concluded that the infections began before the arrival of the nurses and doctor in 1998. Through hospital records, and the DNA sequences of the virus, they traced it to patient n.356 who was admitted 28 times between 1994 and 1997 in Ward B, ISO and Ward A. The first cross-contamination occurred during that patient's 1997 admission. Montagnier and Colizzi both testified in person at the trial of record for the defense. On 14 December 2006, *Nature* (446, 836–837) published a report that also concluded that the strain of virus was already present before the arrival of the six accused.

The accused were tried and retried. The Libyans had signed confessions from them – which the accused said were extracted under torture. The final verdict in 2006 sentenced them to death by firing squad. The Libyan President likened the event to the case of Abdel Basset Ali al-Megrahi, who is serving a life sentence in Scotland for the bombing of Pan Am Flight 103 over Lockerbie, Scotland, on 21 December 1988. Thus, it became clear that Libya was trying to extract economic and political favors in exchange for the release of the six.

In the end, Bulgaria, Qatar and a group of European countries funneled USD 460 million into the International Fund Benghazi to finance the treatment of the HIV-infected children and the improvement of the Libyan health care system. France played a pivotal role in the final release of the accused. In exchange for the release, France agreed to sell antitank missiles and nuclear technology to Libya. It was a win-win deal for France: they did multi-million dollar business with Libya and got publicity for helping the release of the accused.

When the nurses returned to Bulgaria, the government endorsed a 10,000 leva reimbursement for each of the nurses. A Bulgarian mobile telephony provider donated an apartment for each nurse.

9.1.1.3 Preventing Mother-to-Child Transmission

The proven strategies for preventing mother-to-child transmission are: (1) general HIV prevention for women of child-bearing age; (2) a brief course of antiretroviral treatment in advance of delivery (which can reduce transmission by 50%, but is only received by an estimated 11% of women in need); (3) prevention of undesired pregnancy in HIV-positive women; (4) breast-feeding alternatives; and (5) cesarean delivery where the mother has a high viral load (Global HIV Prevention Working Group 2007).

In developing countries, a small but growing number of children are dying of HIV/AIDS. As Fig. 9.5 shows, some 4% of children died of HIV/AIDS in 2005.

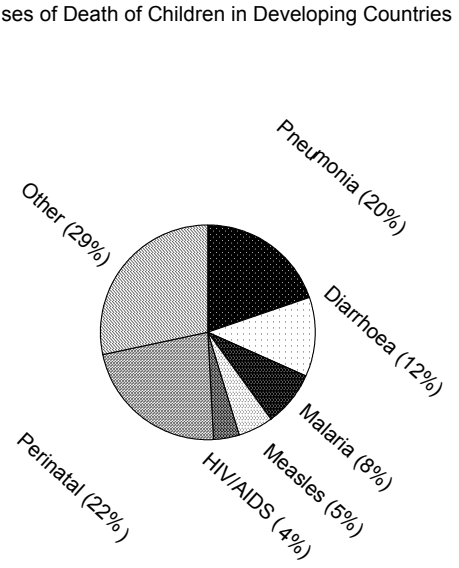

Fig. 9.5 Causes of death among children in developing countries. *Source*: World Health Organization

HIV infected mothers carry additional risks for the baby. In Table 9.3, we indicate some of the major risks. Some risks like stillbirth or high infant mortality have been found only in developing countries but not in developed countries.

For these additional risks, it has been suggested that one way of eliminating mother-to-child transmission is not to have the baby in the first place. This prevents mother-to-child transmission by 100%. Thus, family planning could also help to reduce mother-to-child transmission:

> Another often neglected aspect of HIV prevention – one prohibited from funding by the Bush administration's international AIDS program – involves expanding family planning services, including for HIV-positive women who do not want to conceive. Reducing unintended pregnancies could greatly decrease the number of infected infants as well as the number of children who eventually become orphans (Halperin 2007).

If an HIV-positive woman gives birth to a child, there is a risk of transmission of HIV itself, in addition to the other risks listed in Table 9.3. However, the transmission risk of HIV from mother to child is not 100%. It can be minimized through drug treatment of the mother and careful birthing. Figure 9.6 clearly demonstrates this fact, using the data from the United States. The introduction of *zidovudine* (for the mothers before childbirth) has dramatically reduced the risk of HIV infection of the baby.

Since 1998, most countries have applied a regimen of *zidovudine* from 28 weeks, with NVP administered during labor and to the baby, and the addition of a 7 day *zidovudine*/*lamivudine* postpartum regime. The result has been a dramatic reduction of infected newborns (see Fig. 9.7). Note that the reduction has been evident in Europe and the United States since 1994, when this regime was introduced. In Thailand, the regime was introduced in 1996 and in most parts of Africa 2 years later.

Table 9.3 Risks in pregnancies of HIV-positive women

Pregnancy outcome	Relationship to HIV infection
Spontaneous abortion	Limited data, but evidence of possible increased risk
Stillbirth	Evidence of increased risk in developing countries
Perinatal mortality	Evidence of increased risk in developing countries
Infant mortality	Evidence of increased risk in developing countries
Intrauterine Growth Restriction	Evidence of possible increased risk
Low birth weight (<2,500 g)	Evidence of possible increased risk
Pre-term delivery	Evidence of possible increased risk, especially with more advanced disease
Pre-eclampsia	No data
Gestational diabetes	No data
Chorioamnionitis	Limited data; more recent studies do not suggest an increased risk
Oligohydramnios	Minimal data
Fetal malformation	No evidence of increased risk

Source: French and Brocklehurst (1998)

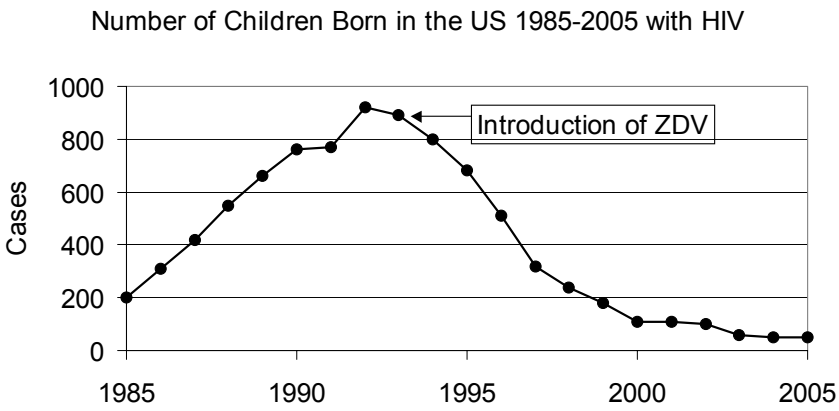

Fig. 9.6 Number of children born with HIV/AIDS in the United States 1985–2005. *Source*: Data collated from CDC database (www.cdc.gov)

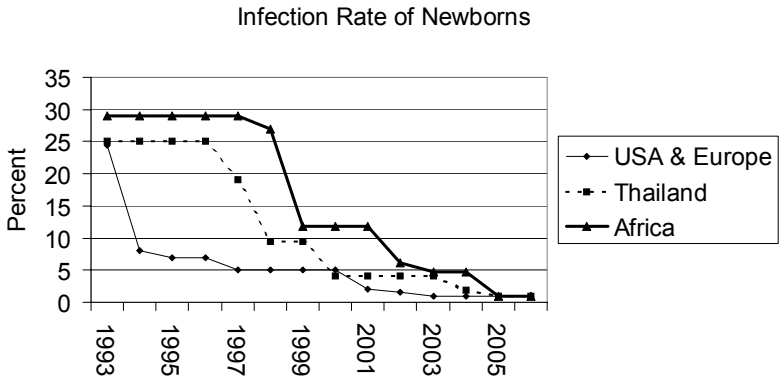

Fig. 9.7 Falling infection rate of newborns 1993–2006. *Source*: Data from Dr. Siripon Kanshana. Ministry of Public Health Thailand

Once a child is born, the question is whether the infected mother should breast-feed the child. On the one hand, UNAIDS estimated that globally there are 300,000 babies infected through breastfeeding. On the other hand, the UNICEF estimates that 1,500,000 children die every year from lack of breastfeeding by the mothers. Thus, it is not clear whether the mothers with HIV should or should not breastfeed the baby.

9.1.1.4 Social Strategies to Reduce Vulnerability to HIV/AIDS

Key factors that increase vulnerability to HIV include: (1) gender inequality (which reduces women's access to information and services, reduces power to negotiate safe sex with partners, increases the risk of sexual violence and may create the need to depend on sex for economic survival); (2) institutionalized discrimination against vulnerable groups (such as criminalizing drug use and needle possession, commercial sex work and sex between men); (3) poverty (which reduces access to information and services and access to prevention tools, such as condoms); (4) HIV stigma (which discourages individuals from seeking testing, disclosing their status, seeking HIV-related services or using alternatives to breast-feeding); and (5) conflict and humanitarian emergencies (which reduce access to services, information and social support by displacing populations and increase the risk of sexual violence) (Global HIV Prevention Working Group 2007).

As we noted in Chap. 4, there is no clear evidence that reducing poverty and income inequality will necessarily reduce HIV/AIDS prevalence. Moreover, poverty reduction is too broad a goal to constitute what might be considered a concrete HIV/AIDS prevention strategy. Thus, if poverty reduces access to information and services and access to prevention tools, such as condoms, a concrete policy response would be to find innovative ways to improve access to information, provide funding to enhance access to services and provide free access to prevention tools, such as condoms and circumcision.

Vulnerable groups are not compartmentalized. People infected through injection drug use can infect their sexual partners. A significant percentage of men who have sex with men also have sex with women (for example, 20% in Asia) and a significant percentage of men who have sex with men are HIV-infected in many parts of the world (28% in Bangkok; 15% in Phnom Penh; 21.5% in urban Senegal; and 46% of African-American men in five US cities). Sex workers can infect their clients, who in turn may infect their spouses or other sexual partners. In many areas, sex workers have very high rates of HIV infection (50% in South Africa; 27% in Guyana; 33% in St. Petersburg, Russia; and 73% in urban Ethiopia) (Global HIV Prevention Working Group 2007). Figure 9.8 shows the linkages between vulnerable groups and the general population in Bangladesh. The linkages between vulnerable groups, and between vulnerable groups and the general population, make effective prevention strategies for vulnerable groups essential.

Social strategies that address the factors that increase vulnerability to HIV include: (1) HIV awareness campaigns, including in the mass media; (2) anti-stigma measures; (3) gender equity initiatives to empower women; (3) involving communities and HIV-positive individuals in HIV/AIDS programs; (4) visible political leadership; (5) engaging a broad range of sectors in HIV awareness and prevention programs; and (6) legal reforms to support HIV prevention strategies, such as laws decriminalizing needle possession and anti-discrimination laws (Global HIV Prevention Working Group 2007). Human rights are the core of most social strategies to

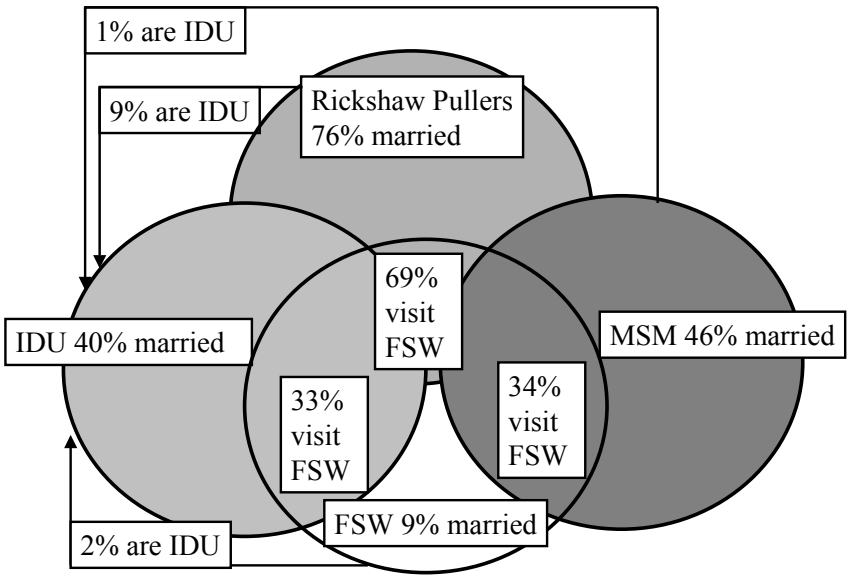

Fig. 9.8 Dynamics of transmission of HIV/AIDS across groups in Bangladesh. *Source*: Evaristo Marowa, UNAIDS Country Coordinator, Bangladesh, Presentation on HIV/AIDS in Bangladesh, 24 April 2005

prevent the spread of HIV/AIDS. We address the various aspects of HIV/AIDS and human rights in greater detail below.

Awareness of HIV status has a significant impact on rates of HIV transmission. When unaware of HIV seropositivity, the transmission rate is estimated at 8.8–10.8 % (as a percentage of PLWH/A), whereas awareness of HIV seropositivity reduces the transmission rate to an estimated 1.7–2.4% (Holtgrave 2005). However, increasing access to HIV testing and counseling also raises human rights issues. In order to balance the need for more testing with the need to respect human rights, it has been recommended that health care providers offer and recommend HIV testing, in conjunction with counseling (the opt-in approach), rather than rely on the client to initiate this process. However, mandatory HIV tests and routine HIV testing unless the client opts out risk violating individuals' rights to informed consent and confidentiality (Jürgens 2007).

9.1.2 Barriers to Increasing HIV Prevention

The major barriers to increasing HIV prevention are: (1) inadequate financing; (2) failure to target limited funding where it will have the greatest impact, due to lack of information on the nature of the epidemic or ideological, non-scientific restrictions on the use of donor funding; (3) limited capacity to administer large

increases in funding; (4) failure to integrate HIV prevention in schools, workplaces and other health care programs, such as TB and reproductive health; and (5) stigma and discrimination against HIV-positive people and vulnerable groups, which deter people from seeking testing and prevention services and discourage political leadership (Global HIV Prevention Working Group 2007). We analyze the problems and solutions regarding stigma and discrimination against HIV-positive people and vulnerable groups later in this chapter.

We analyzed the issues of inadequate financing, targeted financing and donor coordination in Chap. 7. As we noted in Chap. 7, a lack of donor coordination is an obstacle to expanding treatment and prevention programs, due to the administrative burden that it imposes on recipients.

As we noted in Chap. 8, the US government's foreign AIDS program, PEPFAR, devotes only 20% of funding to prevention and requires that two-thirds of that amount be spent on abstinence-only programs that do not promote condom use, despite evidence that this approach to prevention is not effective and undermines best practices. PEPFAR guidelines also undermine HIV/AIDS prevention by further stigmatizing sex workers and prohibiting funding of needle exchange programs, despite evidence that such harm reduction programs are effective. The PEPFAR approach assumes that vulnerable groups do not interact with the rest of society. PEPFAR is perhaps the best example of ideological, non-scientific restrictions on the use of donor funding, although it also serves as an example of two of the other significant barriers to HIV prevention, due to its promotion of stigma and discrimination against vulnerable groups and the percentage of funding that it allocates to prevention. However, it is important to emphasize that PEPFAR has done more than any other bilateral funding program to address the need for adequate financing. The key point is that the money that has been made available through PEPFAR could be better spent.

On 26 December 2007, US President Bush signed legislation that lifted a 1999 ban that had made Washington, DC the only US city barred by federal law from using municipal money for needle exchange programs. Officials of the District of Columbia Health Department planned to allocate USD 1 million for such programs in 2008 (Urbina 2007). Extending this change in policy to PEPFAR would enhance the effectiveness of prevention programs in the countries that receive PEPFAR funding.

9.2 The Future of HIV Treatment

In Chap. 3, we provided an overview of the history of drug developments to treat HIV/AIDS and saw the dramatic impact on survival of triple combination therapy. Without this treatment, the chance of surviving 10 years was about 50%. With this treatment, patients have a 50% chance of living another 35 years. In the early 1980s in the United States, the leading causes of death among 25–44 old year men

by rank were accidents, cancer and homicide. By 1994, deaths from AIDS had become the leading cause of death in this group. Following the introduction of universal access to triple combination therapy, deaths from AIDS fell to fourth place, behind accidents, cancer and homicide. As a result, whereas 68% of Americans considered HIV/AIDS to be the most urgent health problem facing the United States in 1987, by 2006 only 6% held this view. However, as we saw in the case of Mexico, the introduction of triple combination therapy led to a dramatic rise in the cost of treatment per patient. Thus, with the advent of triple combination therapy, the focus has shifted from the effectiveness of treatments for HIV/AIDS to the cost of making effective treatments accessible. This is why the issue of drug patents became so important, as we saw in Chaps. 5 and 6. This is also why access to health insurance also has become an important issue, which we analyzed in Chap. 3.

There are five classes of anti-HIV drugs, which are known as antiretroviral drugs. (1) Nucleoside/Nucleotide Reverse Transcriptase Inhibitors (NRTIs) were the first type of drug used to treat HIV infection in 1987. NRTIs interfere with reverse transcriptase, an HIV protein that the virus needs to makes copies of itself. (2) Protease Inhibitors, the first of which was approved in 1995, inhibit protease, another protein involved in the HIV replication process. (3) Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTIs), which began to be approved for use in 1997, stop HIV from replicating within cells by inhibiting the reverse transcriptase protein. (4) Fusion or Entry Inhibitors prevent HIV from entering human immune cells and have been available since 2003. (5) Integrase Inhibitors, of which one drug was approved in 2007, inhibit the integrase enzyme, which HIV needs to insert its genetic material into human cells (http://www.avert.org/introtrt.htm).

HIV-positive people are prescribed antiretroviral therapy once the number of CD4 cells falls below a certain threshold or when they develop clinical AIDS symptoms. The CD4 cell count guidelines of the World Health Organization, which depend on the stage of the disease and the particular circumstances of the patient, indicate that antiretroviral treatment should begin when the CD4 cell count falls to the 200–350 mm range (World Health Organization 2003). In 2006, an international panel of experts continued to recommend these guidelines (Hammer et al., 2006). Patients start on what is referred to as "first-line treatment". They then change to "second-line treatment" if the first set of drugs is too toxic for a particular patient to tolerate or if the virus develops resistance to the first set of drugs. The likelihood of drug resistance increases the more doses a patients skips, making daily adherence to treatment extremely important (Hammer et al., 2006).

As of the end of 2006, about 2 million people were receiving of ARV treatment in low- and middle-income countries, which represents 28% of those in need (WHO/UNAIDS Progress Report on Universal Access to Treatment). The "3 by 5" initiative, between December 2003 and December 2005, aimed to have 3 million people on ARV therapy by the end of 2005. During this period, the number of people in low- and middle-income countries receiving ARV treatment increased from 400,000 to 1.3 million (WHO 2006).

9.2.1 Obstacles to Increasing the Number of People Receiving Treatment

One obstacle to increasing the number of people receiving treatment is the capacity constraints of treatment providers, which include limited health infrastructure and human resources, management capacity and the ability to identify new patients through testing and counseling (CHAI 2007). In Chap. 7, we examined multilateral funding programs that address these capacity constraints in developing countries. It is important to note that the estimates of the number of people requiring treatment are just that – estimates. As we have noted, UNAIDS HIV/AIDS estimates were revised in 2007, due to the use of better methodologies. Estimates of the number of people with HIV/AIDS do not necessarily reflect the number of patients that have been identified as requiring treatment.

The reluctance of the United States to allow PEPFAR funding to be spent on WHO-approved drugs has also been criticized as an obstacle to expanding treatment (see Chap. 8 for a discussion of PEPFAR). Indian generic drug manufacturer, Cipla, created a triple-combination drug in a single pill (Triomune) that could be taken twice daily, which it offered to sell for about USD 300 per patient per year in 2001. Cipla's Triomune offer made the 3 by 5 initiative a realizable goal and Cipla has the production capacity to produce four million doses of Triomune per day. The WHO approved Triomune in December 2003 as a first-line treatment for HIV/AIDS (Hamied 2005). The PEPFAR restriction on the use of WHO-approved drugs had the effect of preventing the use of PEPFAR funding to buy Triomune. Moreover, the majority of PEPFAR funds have been used to purchase patented versions of HIV/AIDS drugs, rather than generic versions (see Chap. 8). Figure 9.9 shows how generic competition has lowered the cost of triple combination antiretroviral therapy. Between 2001 and 2007, the price of the generic drugs has brought down the price of the originator substantially – from over USD 10,000 to under USD 350. At the same time, the generic prices have stayed in the 25–30% range of the originator price.

PEPFAR funds can be used to purchase other low-cost generic equivalents of several patented HIV/AIDS drugs, including some produced by Cipla. PEPFAR requires that generic drugs be approved by the US FDA, Canada, Japan or Western Europe to be eligible for funding (see Chap. 8). If US FDA approval is sought for fixed dose combinations of previously approved antiretrovirals for the treatment of HIV, if one or more of the approved drug components are covered by a patent, the FDA cannot approve an application until the patent expires. However, the application can receive tentative approval (which recognizes that at the time the tentative approval action is taken, the application meets the technical and scientific requirements for approval, but final approval is blocked by patent or exclusivity). Products that receive tentative approval are eligible for procurement under the

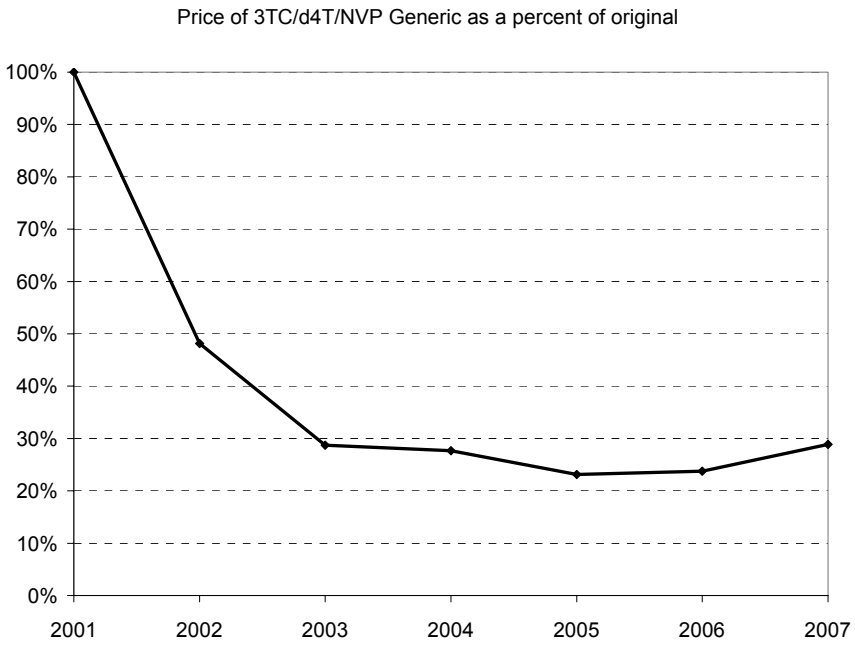

Fig. 9.9 Generic competition has lowered the cost of ARVs. *Source*: MSF

PEPFAR program (US Food and Drug Administration 2006). Table 9.4. lists the generic versions of HIV/AIDS drugs that have been approved by the FDA for purchase with PEPFAR funds, along with the generic companies that own the patents for the specific generic formulations and the country of manufacture.

The fact that the patents for HIV/AIDS drugs are owned by different companies has delayed combining different HIV/AIDS drugs in a single pill in markets protected by patents. One such pill, Atripla, was created through a joint venture between Merck and Bristol-Myers Squibb with Gilead Sciences and combines *efavirenz* (Bristol-Myers Squibb, Merck) with *emtricitabine* and *tenofovir* (Gilead Sciences) (IB Times 2007). Atripla was approved for sale in the United States in 2006, several years after the Indian generic manufacturer, Cipla, had started manufacturing a triple-combination pill and 3 years after Cipla's pill was approved by the WHO. Approval to market Atripla in the European Union was sought in December 2007. Gilead Sciences and Merck have formed a joint venture to market Atripla in developing countries (IB Times 2007). Table 9.5 shows the US patents, patent owners and patent expiry dates for selected HIV/AIDS drugs.

Zidovudine was the first drug to be approved for treatment of HIV infection. As Table 9.5 shows, the patent for *zidovudine* expired in 2005 and the patent for *lamivudine* expires in 2009. However, Glaxo extended the life of these patents to 2016 by combining the two drugs into one pill (called Combivir). While the new

Table 9.4 Generic HIV/AIDS drugs approved by FDA for PEPFAR

Generic drug	Generic manufacturer	Country
Lamivudine/zidovudine (fixed-dose combination)	Aurobindo Pharma	India
Stavudine tablets and oral solution	Aurobindo Pharma	India
Nevirapine tablets and oral solution	Aurobindo Pharma	India
Efavirenz	Aurobindo Pharma	India
Lamivudine tablets and oral solution	Aurobindo Pharma	India
Zidovudine tablets, capsules, and oral solution	Aurobindo Pharma	India
Abacavir tablets	Aurobindo Pharma	India
Lamivudine/nevirapine/zidovudine (fixed-dose combination)	Aurobindo Pharma	India
Didanosine tablets and pediatric powder	Aurobindo Pharma	India
Abacavir copackaged with lamivudine/ zidovudine (fixed-dose combination)	Aurobindo Pharma	India
Nevirapine copackaged with lamivudine/ zidovudine (fixed-dose combination)	Aspen Pharmacare	South Africa
Didanosine	Barr Laboratories	US
Lamivudine oral solution	Cipla	India
Lamivudine/nevirapine/stavudine (fixed-dose combination for pediatric use)	Cipla	India
Lamivudine/zidovudine (fixed-dose combination)	Cipla	India
Abacavir	Cipla	India
Lamivudine/zidovudine (fixed-dose combination)	Emcure Pharmaceuticals	India
Nevirapine tablets	Hetero Drugs Ltd.	India
Lamivudine/nevirapine/zidovudine (fixed-dose combination)	Pharmacare	South Africa
Nevirapine	Ranbaxy	India
Lamivudine	Ranbaxy	India
Zidovudine	Ranbaxy	India
Nevirapine	Strides Arcolab Ltd.	India
Stavudine	Strides Arcolab Ltd.	India
Nevirapine	Zhejiang Huahai Pharmaceutical	China

Source: http://hivinsite.ucsf.edu/InSite?page=pr-rr-10#S1.7X, July 2007

combination reduces the number of pills that a patient needs to take, it did not involve the invention of any new chemical entities. The patent history of *zidovudine* has been cited as a classic case of "evergreening" – the use of the patent system to extend drug monopolies far beyond the term of the original patent (Hamied 2005). Box 9.3 discussed evergreening.

Table 9.5 US patents, owners and expiry dates for selected HIV/AIDS drugs

Drug	US patent number	Patent owner	Patent expiry date
Zidovudine (AZT)	4724232	Glaxo	September 2005
Didanosine (ddI)	4861759/5616566	US National Institutes of Health, licensed to Bristol-Myers Squibb	October 2006
Stavudine (d4T)	4978655	Yale University, licensed to Bristol-Myers Squibb	June 2008
Lamivudine (3TC)	5047407	IAF Biochem International SA (Canada), licensed to Glaxo	February 2009
Nevirapine	5366972	Boehringer Ingelheim	November 2011
Efavirenz (EFV)	5811423	Merck & Co., Bristol-Myers Squibb	August 2012
Zidovudine + Lamivudine (AZT + 3TC)	5905082	Glaxo	May 2016
Tenofovir (TDF)	5922695	Gilead Sciences	July 2017

Sources: http://drugpatentexpiry.blogspot.com/2006/05/tenofovir-disoproxil-fumarate-patent.html; http://www.answers.com/topic/emtricitabine; Pérez-Casas et al. (2000)

Zidovudine was originally synthesized in 1964, as a potential cancer treatment. Research in 1984 showed that it was effective against HIV/AIDS, which formed the basis for Glaxo's 1984 patent application. Following clinical trials, the US FDA approved *zidovudine* in March 1987 for advanced HIV disease in adults and the patent for *zidovudine* as a treatment for HIV/AIDS was granted in February 1988 (Cochrane 2000). While *zidovudine* alone only extended life by a matter of months, once it was combined with two other classes of HIV/AIDS drugs, it extended life for years. The FDA expanded *zidovudine* approval in 1990 to include less-advanced stages of HIV disease (Coffey and Peiperl, 2006).

Box 9.3 Evergreening patents

Evergreening is a mechanism by which pharmaceutical and other companies can keep extending patents on drugs after the initial patents expire.

The role of patents is to give exclusive rights to manufacture the patented product over a fixed period of time. The intention of providing a monopoly is to provide an incentive to innovate. Granting a patent requires three elements: (1) novelty of the product; (2) non-obviousness of the new product; and (3) demonstrated utility of the product.

To understand evergreening in the United States, we need to examine the Drug Price Competition and Patent Term Restoration Act, informally known as the "Hatch-Waxman Act" [Public Law 98-417]. It is a 1984 United States federal law which established the modern system for generic drug approval. Hatch-Waxman amended the Federal Food, Drug, and Cosmetic Act. Section 505(j) sets forth the process by which would-be marketers of generic drugs can file Abbreviated Abbreviated New Drug Applications (ANDAs) to seek FDA approval of the generic. Section 505(j)(5)(B)(iv), the so-called Paragraph IV, allows 180-day exclusivity to companies that are the "first-to-file" an ANDA against holders of patents for branded counterparts. The Hatch-Waxman Act encouraged the growth of generic industry, whose market share rose from 19% in 1984 to 49% in 2002 (by volume).

For pharmaceutical companies, the Hatch-Waxman Act has created a perverse incentive. It has given them more incentive to try to extend the life of existing drugs by making marginal changes than to try the risky strategy of inventing completely new chemicals. Thus, the two decades following its passage, the Hatch-Waxman Act has resulted in more me-too drugs than drugs with new chemical compounds. The most famous documented case of evergreening occurred in the case of Prilosec – the so-called "Purple Pill" of AstraZeneca (USD 6 billion/year global blockbuster drug), the patent for which expired in 2001 only to be reincarnated as a new patented drug Nexium.

However, on 30 April 2007 the Supreme Court of the United States issued a ruling in KSR International Co v. Teleflex et al., which raises the bar for patent holders to prove that their invention is not obvious, and therefore patentable. This ruling will make many existing patents more vulnerable, make it harder to gain approval for new patents and make evergreening more difficult in the future. If the patent claim extends to what is obvious, it is invalid. For example, a patent's subject matter can be proved obvious if there existed at the time of invention a known problem for which there was an obvious solution encompassed by the patent's claims. The Supreme Court noted that, "granting patent protection to advances that would occur in the ordinary course without real innovation retards progress and may, in the case of patents combining previously known elements, deprive prior inventions of their value or utility." It is worth quoting in full the Court's description of the reason that patents are only granted for non-obvious innovations:

"We build and create by bringing to the tangible and palpable reality around us new works based on instinct, simple logic, ordinary inferences, extraordinary ideas, and sometimes even genius. These advances, once part of our shared knowledge, define a new threshold from which innovation starts once more. And as progress beginning from higher levels of achievement is expected in the normal course, the results of ordinary innovation are not the subject of exclusive rights under the patent laws. Were it otherwise patents might stifle, rather than promote, the progress of useful arts."

WHO guidelines for ARV treatment regimens provide a basis for a range of treatment protocols in individual countries. In individual countries, factors such as prices, drug efficacy and side effects are also taken into account. *Stavudine* (d4T) has been widely used as part of first-line treatment. However, in 2006 the WHO recommended that d4T no longer be used, due to toxicity. Instead, countries should switch to *tenofovir* (TDF) or *zidovudine* (AZT). Of these two, TDF is preferable, because of its efficacy and safety and because it can be taken only once a day.

TDF can be combined with *efavirenz* (EFV), together with *lamiduvine* (3TC) or *emtricitabine* (FTC), in one, triple-combination pill that can be taken once a day. Patients are more likely to adhere to this once-a-day regimen, thereby reducing drug resistance and improving treatment outcomes. However, the higher cost of AZT and TDF, compared to d4T, has delayed the shift to the new regimen in many developing countries (CHAI 2007). In partnership with UNITAID (discussed below), the Clinton Foundation HIV/AIDS Initiative (CHAI) has negotiated price reductions for several HIV/AIDS drugs for use in 27 low- and middle-income countries (see Table 9.6). The Clinton Foundation is discussed in Chap. 7. As of May 2007, 750,000 people were benefiting from medicines purchased under CHAI agreements in 50 countries (CHAI 2007).

Table 9.6 Prices of ARVs per patient per year of May 2007

Product	Strength (mg)	(1)	(2)	(3)	(4)	(5)	(6)
3TC	150	36	55	48	69	96	69
AZT	300	96	147	103	212	216	212
NVP	200	45	72	52	432	130	432
EFV	600	164	243	207	237	300	657
ABC	300	331	773	456	636	816	636
TDF	300	149	211	194	207	287	360
ddI EC	250	156	227	103	248	929	772
ddI EC	400	248	311	132	320	1,096	1,219
LPV/r	200+50	695	536	1,338	500	2,476	1,000
3TC+AZT	150+300	129	180	134	237	301	237
TDF+FTC	300+200	225	689	300	319	328	552
3TC+AZT+NVP	150+300+200	174	217	231	N/A	331	N/A
TDF+FTC+EFV	300+200+600	385	N/A	527	613	N/A	1,033

Source: Clinton Foundation. *Notes*: Each column numbered (1)–(6) refers to price per patient per year in US dollars. (1) Clinton Foundation HIV/AIDS Initiative (CHAI) Ceiling Price. (2) WHO Global Price Reporting Mechanism for the Low Income Countries Average Price. (3) MSF Lowest Price for Generic Drugs for the Low Income Countries. (4) Originator Access Price for the Low Income Countries. (5) WHO Global Price Reporting Mechanism Upper Middle Income Countries Average Price. (6) Originator Lowest Published "Second Tier" Access Program Price (when available)

There are several notable features in Table 9.6. First, the prices are generally higher for middle-income countries than for low-income countries. Thus, the pharmaceutical companies are pursuing a price discrimination strategy across different markets, selling drugs at a price that the markets can bear. Therefore, there is clear room for generic products in these markets, especially for the low-income countries. Compulsory licensing is a distinct possibility (see, however, our discussion in Chap. 6 about the difficulties many developing countries faced importing drugs under compulsory license from Canada). Some companies have used the World Bank's country income index or the Human Development Index as their criteria for setting prices. In Chap. 6, we developed a much more comprehensive index that takes into account not just the level of development of the country but also level of prevalence of HIV/AIDS explicitly. Second, the price of HIV/AIDS drugs in many cases in many developing countries is not necessarily lower than in developed countries. For example, in Guatemala, between 2000 and 2003, prices of most HIV/AIDS drugs were consistently higher than in the United States (Hellerstein 2003).

9.2.2 Second-Line Treatment

According to CHAI, in 2006, 80,000 (4%) of those receiving ARV treatment in low- and middle-income countries were taking second-line treatment. The reason that relatively few are on second-line treatment is that most only began treatment within the last 4 years. As a result, relatively few have experienced treatment failure, which is defined as (1) virologic failure (a viral load of more than 400 copies per milliliter), (2) immunologic failure (a declining CD4 cell count in spite of treatment) or (3) clinical failure (progression to AIDS evidenced by weight loss or the appearance of opportunistic infections). Another reason is that poor diagnostic and laboratory capacity in many countries has made treatment failure difficult to diagnose.

By 2010, CHAI estimates that close to 500,000 people will require second-line treatment in low- and middle-income countries (CHAI 2007). The higher cost of second-line treatment means that access requires further funding. However, patents are not expected to be an obstacle to acquiring affordable second-line treatments in the most affected low-income countries, due to the delay of TRIPS patent rules on pharmaceuticals to 2016, although patent rules may affect affordability in middle-income countries (CHAI 2007). In Chap. 6 we analyzed TRIPS rules on patents for pharmaceuticals in developing countries. However, as we noted in Chap. 5, the problem of regulatory capture in free trade agreements can undermine TRIPS rules so that patents create obstacles to affordable treatment in some low-income countries and political pressure on low- and middle-income countries can discourage the use of TRIPS flexibilities to increase access to treatment.

UNITAID is a global health initiative for HIV/AIDS, tuberculosis and malaria that is funded by several national governments. With respect to HIV/AIDS, UNITAID funding is focused on pediatric and second-line treatment and the prevention of mother-to-child transmission. UNITAID will finance a free supply of second-line HIV/AIDS treatment in 27 countries for 18 months, after which the reduced prices achieved by CHAI will enable other funding sources, such as the Global Fund (discussed in Chap. 7) and PEPFAR (discussed in Chap. 8), to fund the purchase of second-line treatments at lower prices (CHAI 2007).

While high-income countries and middle-income countries with low prevalence rates are in a position to pay for HIV/AIDS treatment, middle-income countries with high prevalence rates and most low-income countries are not. Low-income countries with high prevalence rates in particular will have to depend on external funding sources, such as PEPFAR and the Global Fund, to expand access to treatment and then to maintain treatment. Medical care for people with HIV/AIDS in developing countries costs about USD 1,000 a year, in drugs and support facilities. The Economist estimated that it would cost USD 6–7 billion a year to provide treatment for the 6–7 million people with HIV/AIDS in low-income countries that were in need of treatment in 2006. However, expanding treatment means that fewer people will die. Moreover, millions more will become infected, and even more so if prevention efforts are not improved. Thus, universal treatment in low-income countries could cost USD 40 billion by the end of the next decade. This highlights the need to ensure that external funding is both increased and sustained and the importance of prevention in making universal access to treatment affordable (Economist 2006).

9.2.3 Vaccines for HIV/AIDS

Scientists have been trying to develop an HIV vaccine for more than 20 years, although some have suggested that an effective AIDS vaccine may be a biological impossibility (Epstein 2007). In 2007, about 50 experimental HIV vaccines were being tested in clinical trials.

Most viral vaccines work by generating antibodies that neutralize or inactivate the invading virus. However, unlike other viruses, HIV-1 evades the antibody response, which, together with the large genetic variety found in HIV-1 strains, has made the development of an HIV-1 vaccine difficult. To date, antibody-based HIV-1 vaccines have only succeeded in neutralizing a minority of the copies of the virus that are found in a given patient. HIV-1 antibodies target the mechanism that HIV-1 uses to bind itself to the host immune cells in order to prevent HIV-1 from entering the cell. However, HIV-1 uses shielding mechanisms to prevent the antibodies from recognizing the virus, including a dense coating. Current HIV-1 vaccine research therefore seeks to find vulnerabilities in these shielding

mechanisms, but this requires research for multiple genetic subtypes of HIV-1 (Montefiori et al., 2007). For example, one recent study identified a place on the outside of the human immunodeficiency virus that could be vulnerable to antibodies that could block it from infecting human cells, which might be targeted with a vaccine aimed at preventing initial infection (Dunham 2007).

A new class of HIV vaccines was designed to trigger cell-mediated immunity to create an extended immune defense. However, in 2007, Merck reported that its HIV vaccine, V520, had failed. V520 was being tested by Merck and the US National Institutes of Health in a clinical trial involving 3,000 people in high-risk groups in Australia, Brazil, Canada, the Dominican Republic, Haiti, Jamaica, Peru, Puerto Rico and the United States (Associated Press 2007). V520 used the common cold virus (the adenovirus) to transport three synthetic HIV genes into the body's cells (Park 2007). Merck halted the trials after 24 of 741 volunteers who got the V520 vaccine later became infected with HIV, while only 21 of 762 participants that received a placebo also became infected (Associated Press 2007). The V520 vaccine was one of only two AIDS vaccine candidates in advanced human trials, the other being tested by Sanofi-Aventis SA (Dunham 2007).

Other approaches are also being explored. David Ho (the inventor of triple combination therapy) and his team at the Aaron Diamond AIDS Research Center are researching the use of different vectors, or not using vectors at all, to produce stronger immune responses. Scientists at the International AIDS Vaccine Initiative are studying the use of crippled, live strains of HIV and ways to stimulate a special class of antibodies that appear to be able to defuse HIV. The Global HIV Vaccine Enterprise, which is funded by the Gates Foundation (discussed in Chap. 7), Wellcome Trust, the US National Institutes of Health and the European Union, is seeking to accelerate research on HIV vaccines by linking together independent organizations so that researchers can learn from each other, rather than work in isolation (Park 2007).

As we noted in Chap. 5, there are many subtypes of HIV-1 (the most commonly occurring HIV infection in humans). The major HIV-1 subtypes accounting for most infections in Africa are subtype C in southern Africa, subtypes A and D in eastern Africa, and circulating recombinant form 02_AG (CRF02_AG) in west-central Africa (Peeters and Sharp 2000). The most commonly occurring form of HIV-1 in North America and in Europe is subtype B. The first HIV/AIDS vaccine ever to reach Phase III trial was for subtype B. The gp120 vaccine was not effective. However, what vaccine trials have indicated thus far is that, in the case of HIV/AIDS, there is pattern of development of potential vaccines not in the subtypes where the needs are the greatest but in the area where the biggest monetary rewards are expected. The economics of HIV/AIDS vaccines suggest that funding for vaccines for the worst-effected countries are unlikely to come from the private sector (see Box 9.4).

Box 9.4 Why is there no AIDS vaccine?

HIV/AIDS affects hundreds of millions and kills several million people every year. The disease was identified several decades ago. Two Nobel prizes have been awarded in the past two decades for identifying the cause and the transmission mechanism of HIV/AIDS. Yet we still do not have a vaccine for HIV/AIDS. Kremer and Snyder (2004) have developed an argument as to why the private sector is very unlikely to develop a vaccine for AIDS. Here, we illustrate the argument with one example.

Imagine there are 100 people in the world. There are 90 people (type L) who have a small chance of 10% of contracting HIV/AIDS. There are another ten people (type H) who would develop HIV/AIDS with a 100% chance. Let us suppose that the harm from HIV/AIDS is USD 100 for each person. Let us also assume that for each USD 1 decrease in harm, a consumer is willing to pay USD 1 (technically, each consumer is risk neutral). Suppose the drug is perfectly effective, has no side effects and is costless to produce.

How much revenue will a pharmaceutical company generate in each of the following scenarios? (1) It develops a drug D that cures HIV/AIDS (forever). (2) It develops a vaccine V that prevents HIV/AIDS from developing. We show that under the assumption that the pharmaceutical company cannot distinguish between type H and type L, it is more profitable for the drug companies to produce the drug rather than the vaccine.

If the pharmaceutical company develops the drug D, it will be able to sell it to all the people who get HIV/AIDS. By assumption, all the type H people will develop HIV/AIDS. Thus, there will be ten people from type H who will get HIV/AIDS. In addition, nine people of type L will also develop HIV/AIDS. In total, there will be 19 people with HIV/AIDS, including both types. By assumption, each person contracting HIV/AIDS will be willing to pay USD 100 to reduce the effects of HIV/AIDS by 100%. Therefore, the pharmaceutical company will be able to earn USD 1,900 in revenue from the entire population. Given our assumption of zero cost of production, USD 1,900 will also be the profits of the pharmaceutical company.

The vaccine has to be sold before HIV/AIDS strikes. For type L, there is a 10% chance of HIV/AIDS. Thus, they will be willing to pay the average loss of $100 \times (1/10) =$ USD 10 for the vaccine. If the pharmaceutical company cannot distinguish between type L and type H, it can only charge USD 10 to all. In that case, it will generate USD $10 \times 100 =$ USD 1,000 profits by selling the vaccine to all 100 people. The other possibility is the following. The company sets a price of USD 100 for the vaccine. In that case, no person of type L will buy the vaccine ex-ante (as their expected benefit before HIV/AIDS strikes is USD 10 but the cost is USD 100). The only people who will buy the vaccine will be of type H. Since there are ten of type H, the profits will be USD $100 \times 10 =$ USD 1,000. Thus, in either price strategy, the profits of the company will be USD 1,000.

Therefore, the profits of the company are bigger in the case of the development of drug D instead of the vaccine V. This argument is extremely general as long as the probability of the type L does not get close to the probability of type H getting the disease and the company cannot distinguish between the types.

9.3 Public Health and Human Rights

At the beginning of this book, we highlighted the need to integrate three interrelated issues into any comprehensive AIDS strategy – prevention, treatment and human rights protection. As we showed in Chap. 2, each of these issues must be considered in the context of specific countries or regions, in order to take into account variations in cultural values, affected groups, infection rates, legal systems, economic resources and human resources. In this chapter, we have analyzed prevention and treatment issues in greater detail. The preceding discussion shows that great progress has been made on these two fronts and that greater progress is possible. Our analysis of prevention issues in particular has shown the need to integrate prevention, treatment and human rights strategies. The primary reason that human rights need to be addressed is because discrimination keeps people away from both prevention and treatment programs (Gruskin et al., 2007).

Changing social attitudes in order to overcome stigma and discrimination is not an easy task, particularly given deep-seated fears and prejudices surrounding sex, blood, disease and death and the wide-spread perception that HIV/AIDS is closely tied to deviant or immoral behavior (Jürgens and Cohen, 2007). In this regard, the United Nations International Guidelines on HIV/AIDS and Human Rights recommend that States, in collaboration with and through the community, promote a supportive and enabling environment for women, children and other vulnerable groups by addressing underlying prejudices and inequalities through community dialogue, specially designed social and health services and support to community groups. The Guidelines also recommend that States promote the wide and ongoing distribution of creative education, training and media programs explicitly designed to change attitudes of discrimination and stigmatization associated with HIV/AIDS to understanding and acceptance (United Nations 2007).

Variations in cultural values and legal systems make HIV/AIDS-related human rights particularly difficult to tackle on a global basis. However, HIV/AIDS-related human rights are the area where the least progress has been made and need to become a central focus in the global fight against HIV/AIDS (Jürgens and Cohen 2007). In this section, we focus on three categories of laws: (1) laws that discriminate against vulnerable groups; (2) laws that discriminate against HIV-positive people, such as those that criminalize HIV transmission; and (3) laws that prohibit discrimination against vulnerable groups, including HIV-positive people. We review the United Nations International Guidelines on HIV/AIDS and Human Rights and provide examples in each category.

The law plays different roles with respect to infectious diseases. Some health risks, such as poor access to sterile injection equipment, can be directly attributed to law, and laws have been used to change unhealthy behaviors, such as smoking and drunk driving. Both international and national laws are used in disease control. In addition to the law's role as a source of disease control authority for government, the law has a countervailing role as a source of protection against excessive and unnecessary regulations (Burris 1999).

The United Nations International Guidelines on HIV/AIDS and Human Rights acknowledge the inherent limitations in using law reform to enhance human rights. The effectiveness human rights laws depend on the strength of the legal system in a given society and on the access of its citizens to the system, both of which vary considerably from one country to the next. Moreover, the law cannot serve as the only means of educating, changing attitudes, achieving behavioral change or protecting people's rights. Nevertheless, since laws regulate conduct between the State and the individual and between individuals, they can either support or undermine the observance of human rights, including HIV-related human rights (United Nations 2007). For these reasons, we first consider laws that have a negative impact on HIV-related human rights and then consider laws that support human rights.

9.3.1 Laws that Discriminate Against Vulnerable Groups

While social attitudes may take time to change, an important first step is to reform laws, policies and practices that institutionalize discrimination against the groups of people who are most vulnerable to HIV/AIDS: women and girls; men who have sex with men; commercial sex workers; and injection drug users. The United Nations International Guidelines on HIV/AIDS and Human Rights recommend that States reform criminal laws and correctional systems to ensure that they are consistent with international human rights obligations and are not targeted against vulnerable groups (United Nations 2007). Laws in this category include those that prohibit sexual acts between consenting adults in private, laws prohibiting sex work that involves no victimization and laws prohibiting measures such as needle exchange that can reduce the harm associated with illicit drug use (Elliot 2002).

9.3.1.1 Women and Girls

The United Nations International Guidelines on HIV/AIDS and Human Rights recommend the enactment of anti-discrimination and protective laws to reduce human rights violations against women and children in the context of HIV, to reduce the vulnerability of women and children to HIV infection and to the impact of HIV/AIDS. With respect to women, the Guidelines recommend law reforms to ensure the equality of women regarding property and marital relations and access

to employment and economic opportunity, such as equal rights to own and inherit property, to enter into contracts and marriage, to obtain credit and finance, to initiate separation or divorce, to equitably share assets upon divorce or separation and to retain custody of children. In addition, laws should ensure women's reproductive and sexual rights, including the right of independent access to reproductive and sexual health information and services and contraception, the right to demand safer sex practices and the right to legal protection from sexual violence. With respect to children, laws should provide for children's access to HIV-related information, education and means of prevention, govern children's access to voluntary testing with consent, should protect children against mandatory testing, particularly if orphaned by AIDS, and provide for other forms of protection in the context of orphans, including inheritance and/or support. Laws should also protect children against sexual abuse and provide for their rehabilitation if abused and ensure that they are not subject to penalties themselves. Protection under disability laws should also be ensured for children (United Nations 2007).

In sub-Saharan Africa, laws of particular concern include marital rape, property laws, inheritance laws, and child custody laws. In many African countries marital rape does not exist as a legal concept, leaving women with no recourse against sexual abuse by their husbands. When the husband is HIV-positive or engages in unsafe sex or drug use, this increases the risk of infection for women. Child custody laws, customary practice and traditions that favor paternal custody of children make it difficult for women to leave abusive relationships. While statutes allow property ownership regardless of sex, in practice women only have user rights under customary laws, not ownership. Under inheritance laws, property remains in the man's family after he dies. Thus, if a woman wants to leave an abusive husband or her husband dies, she cannot take any property with her, leaving women economically dependant upon their husbands or, as widows, their families. New laws have created inheritance rights for dependants, but are ignored by the man's family and not enforced. As a result, women and children widowed and orphaned by AIDS are left without adequate resources for medical treatment, and women must either rely on their in-laws for support or become commercial sex workers (Kelly 2004). Laws and cultural traditions thus increase women's vulnerability to HIV/AIDS, either within marriage or by forcing them to support themselves and their children as sex workers.

9.3.1.2 Men Who Have Sex with Men

The United Nations International Guidelines on HIV/AIDS and Human Rights recommend the enactment of anti-discrimination and protective laws to reduce human rights violations against men having sex with men, including in the context of HIV, including penalties for vilification of people who engage in same-sex relationships, legal recognition of same-sex marriages or relationships and non-discriminatory property, divorce and inheritance laws for same-sex relationships.

One key purpose of such anti-discrimination laws is to reduce the vulnerability of men who have sex with men to infection by HIV and to the impact of HIV/AIDS. The Guidelines also recommend that the age of consent to sex and marriage be consistent for heterosexual and homosexual relationships and that laws and police practices relating to assaults against men who have sex with men ensure adequate legal protection (United Nations 2007).

In a 2006 internet-based survey of 759 sexually active MSM in New York City, 11% reported being HIV-positive and 74% reported being HIV-negative. The majority were white, college-educated and in their 30s. The race of the respondents was white (77%), latino (13%), black (4%) and other (6%). In the previous 12 months, 45% had more than ten male sex partners, 53% had engaged in unprotected anal sex and 37% had used non-injection drugs. Fifty percent of the HIV-positive men had unprotected anal sex in the previous 12 months and 71% of the HIV-negative men had unprotected anal sex in the previous 12 months (NYC Health 2007).

In a 2006 survey of 614 Black MSM in New York City, 67% were HIV-positive. The median age of the respondents was 42 years, 22% had less than a high school education, 67% were unemployed and 57% had an annual income of less than USD 10,000. Fifty-six percent identified themselves as homosexual, 32% as bisexual, 6% as heterosexual and 6% as other. Sixty-five percent had previously been diagnosed with a sexually transmitted infection and 30% had been raped (80% before they were 18 years old). Eighty-four percent knew that they were HIV-positive. Of the 16% that were unaware that they were HIV-positive, 53% reported having been tested for HIV previously. Of those who had never been tested for HIV, the reasons they gave were: (1) being afraid to learn that they had HIV (48%); (2) being worried that others might treat them differently (26%); (3) the perception of not being at risk because they practiced safe sex (16%); and (4) being afraid that results will be reported to the government (16%). Fifty percent reported unprotected anal sex with a man in the previous 3 months and 31% had exchanged sex for drugs, money or a place to stay in the same period. Among those who had unprotected anal sex with a man in their last sexual encounter, 84% of the HIV-positive men had an HIV-positive sex partner and 89% of the HIV-negative men had an HIV-negative sex partner (NYC Health 2007).

9.3.1.3 Sex Workers

According to the UNAIDS Guidance Note on HIV and Sex Work, despite high HIV prevalence among sex workers, only one in three receive adequate HIV prevention services and even fewer receive adequate treatment and health care (UNAIDS 2007). The UNAIDS Guidance Note focuses on the reduction of HIV vulnerability among sex workers, who are defined as adults over the age of 18 years in order to take into account that sexual exploitation of children under 18 years of age is prohibited under international law. The key factors that lead people into sex work include poverty, gender inequality, indebtedness, migration, criminal

coercion, humanitarian emergencies, drug use and dysfunctional families. Laws, policies and practices that drive sex work underground make HIV/AIDS prevention and treatment for sex workers and their clients more difficult. Discrimination against sex workers among the police, health care services and other social services impede access to prevention and treatment. The UNAIDS Guidance Note organizes its recommendations into three categories: (1) reducing vulnerabilities and addressing structural issues; (2) reducing risk of HIV infection; and (3) building supportive environments and expanding choices.

The strategies in the first category are to: (1) address poverty and gender inequality by providing alternatives to sex work through micro-finance programs and reforms to property rights; (2) address the demand for paid sex by seeking to changes men's behavior; (3) expand access to education for girls and women; (4) provide alternative job opportunities through employment growth and vocational training; and (5) provide employment and education opportunities and access to social services for refugees, internally displaced persons and economic migrants.

The strategies in the second category are to: (1) involve sex workers in HIV prevention and treatment programs; (2) make male and female condoms available for free or at low cost; (3) increase access to antiretroviral treatment; (4) address the specific needs of sex workers in sexual and reproductive health programs, taking into account the different needs of female, male and transgender sex workers; (5) make HIV prevention information and condoms readily available to clients; (6) seek to eliminate violence against sex workers by clients, managers, police and other government officials; (7) seek to change attitudes towards sex workers to reduce stigma and discrimination; (8) promote initiatives to enable sex workers to negotiate safe sex practices; and (9) promote access to drug addiction treatment programs and harm reduction programs, such as needle exchange.

The strategies in the third category are to: (1) address sex work stigma and discrimination to reduce economic, cultural and social marginalization in families and communities; (2) improve access to health care, education and training, microfinance and credit, social services, housing support and legal services; and (3) promote community organizations that work with sex workers.

The UNAIDS Guidance Note on HIV and Sex Work has been criticized for emphasizing alternative livelihoods without offering concrete examples, rather than emphasizing the right to engage in sex work and workplace safety and national laws that undermine sex workers' rights, particularly criminal prohibition of sex work and related activities. The Guidance Note's strategy of reducing demand for sex work has been criticized as implicitly supporting the criminalization or repression of sex work, which can increase the risk of HIV infection by driving sex work underground, limit sex workers' choices regarding working conditions and clients and increase stigmatization. The Guidance Note was further criticized for not advocating enhanced human rights protection for those engaged in sex work – as women, men, transgender persons and workers. The process used for preparing the document was criticized for not meaningfully engaging sex workers. UNAIDS' response to criticism of this document – to withdraw it as a public document

and restrict it to internal use – was also criticized (Canadian HIV/AIDS Legal Network 2007b)

The United Nations International Guidelines on HIV/AIDS and Human Rights recommend that criminal law prohibiting sexual acts (including adultery, sodomy, fornication and commercial sexual encounters) between consenting adults in private should not be allowed to impede provision of HIV prevention and care services and should be repealed. With regard to adult sex work that involves no victimization, the International Guidelines on HIV/AIDS and Human Rights recommend de-criminalizing and legally regulating occupational health and safety conditions to protect sex workers and their clients, including support for safe sex during sex work. More generally, criminal law should not impede provision of HIV prevention and care services to sex workers and their clients and should ensure that children and adult sex workers who have been coerced into sex work are not prosecuted for such participation but rather are removed from sex work and provided with medical and psycho-social support services, including those related to HIV (United Nations 2007).

9.3.1.4 Injection Drug Users

In Eastern Europe and Central Asia, UNAIDS (2006) estimates that the use of contaminated injection equipment accounts for more than 80% of HIV/AID cases and accounts for about 30% of new infections outside sub-Saharan Africa. The United Nations International Guidelines on HIV/AIDS and Human Rights recommend that criminal law not be an impediment to measures taken by States to reduce the risk of HIV transmission among injecting drug users and to provide them with HIV-related care and treatment. They further recommend that criminal law be reviewed to consider: (1) the authorization or legalization and promotion of needle and syringe exchange programs; and (2) the repeal of laws criminalizing the possession, distribution and dispensing of needles and syringes (United Nations 2007).

In Saint Petersburg, Russia, a 2002 study found that 48% of injection drug users had shared needles in the 30 days prior to their first use of a needle exchange program. In early 2004, there were four syringe exchange facilities in Saint Petersburg – one mobile service (a bus) and three fixed facilities. However, the most important source of sterile syringes for injection drug users was drug stores. Human Rights Watch found that state-supported impediments to access to both needle exchange points and drug stores were important barriers to HIV prevention, including: (1) police patrols of drug stores, which deterred injection drug users from purchasing syringes; (2) police patrols of needle exchange bus stops; and (3) arrests, fines or bribes for possession of syringes, even though carrying syringes is not illegal in the Russian Federation. However, while police interference with the syringe exchange bus was a problem in the late 1990s, it lessened in the early 2000s. Humanitarian Action, an NGO that delivers syringe exchange services in

Saint Petersburg, visited with police chiefs to talk about the importance of syringe exchange for HIV prevention and organized a training session in 2003 for police officers that included the participation of former drug users and people living with HIV/AIDS. However, due to past incidents, the fear of apprehension by the police kept some drug users from using fixed as well as mobile syringe exchange facilities (Human Rights Watch 2004). Table 9.7 shows the dramatic increase in HIV prevalence among injection drug users in Saint Petersburg from 1998 to 2001.

Table 9.7 HIV prevalence among drug users in Saint Petersburg, Russia

Year	Prevalence rate (%)
1998	4
1999	12
2000	19
2001	36

Source: Dr. Tatjana Smolskaya, Pasteur Institute of Saint Petersburg

A 2005 survey of 500 injection drug users (IDUs) in New York City found that 65% had obtained a syringe from an exchange program in the previous year, 49% at a pharmacy, 10% from a medical provider, 53% from a friend or sexual partner and 25% from a drug dealer. The self-reported HIV prevalence rate in the group was 21%. IDUs who obtained syringes from sterile sources (exchange, pharmacy or provider) were less likely to share syringes than those who obtained them from non-sterile sources (friends, relatives or the street). Those who obtained syringes from exchange programs were significantly less likely to share syringes. Nevertheless, 19% of IDUs had shared a syringe at least once in the previous 12 months and 53% had engaged in unprotected sex. IDUs that had shared a syringe were 2.5 times more likely to engage in unprotected sex (NYC Health 2007).

9.3.2 Laws that Discriminate Against HIV-Positive People

Another category of laws discriminates directly against people with HIV/AIDS, such as laws that criminalize HIV transmission and travel restrictions based on HIV status.

9.3.2.1 Criminalization of HIV Transmission

There is a concern that the criminalization of HIV transmission will discourage people from seeking testing (Tarantola and Gruskin 2007). There is evidence that knowledge of HIV status results in behavioral changes that reduce transmission. In

addition, where knowledge of HIV status leads to antiretroviral treatment, treatment also reduces transmission by reducing the amount of virus in the body. Thus, the criminalization of HIV transmission may have the effect of increasing, rather than reducing, HIV transmission. One possible response is mandatory HIV testing in health care settings (that is, testing without the informed consent of the patient). However, this policy, too, may be self-defeating if it discourages people from seeking health care. Moreover, mandatory HIV testing runs counter to the United Nations International Guidelines on HIV/AIDS and Human Rights recommendation that public health legislation ensure that HIV testing of individuals should only be performed with their specific informed consent (United Nations 2007).

Several studies have concluded that the criminalization of HIV transmission is unlikely to serve the goals of public health policy or the goals of criminal law, and thus may do more harm than good. In a UNAIDS policy paper, Elliot (2002) recommended that governments and the judiciary take into account the following principles in determining policy regarding the use of criminal sanctions under public health law: (1) use the best available scientific evidence regarding the modes and risk of HIV transmission to rationally determine when and if conduct should attract criminal liability; (2) the primary objective should be to prevent HIV transmission; (3) legal and policy responses to HIV/AIDS should pursue public health and conform to international human rights norms, particularly nondiscrimination and due process; and (4) policy makers should assess the impact of law or policy on human rights and prefer the least-intrusive measures possible to achieve a demonstrably justified objective of preventing disease transmission.

With respect to the four functions of criminal law (harm prevention through imprisonment; prevention of future harm through rehabilitation; punishment/retribution; and deterrence), Elliot (2002) concluded that criminal law is an ineffective response to the epidemic: (1) imprisoning an HIV-positive individual does not prevent transmission through conjugal visits or high-risk behavior with other prisoners; (2) criminal penalties are unlikely to change sexual activity and drug use, due to the complexity of these human behaviors; (3) punishment/retribution do not achieve the goal of HIV prevention and risk reinforcing prejudice and discrimination against already stigmatized HIV-positive people; and (4) criminal sanctions are unlikely to act as a deterrent, given that drug use and sexual activity persist even with the risk of criminal prosecution and are more likely to be driven underground when prosecuted, hindering HIV prevention. Moreover, overly broad use of criminal laws risks spreading misinformation regarding how HIV is transmitted.

In an empirical study conducted in the United States, Burris et al. (2007) found that laws prohibiting unsafe sex or requiring disclosure of infection do not influence people's normative beliefs about risky sex and did not significantly influence sexual behavior. The study concluded that criminal law is not a clearly useful intervention for promoting disclosure by HIV-positive people to their sex partners. Moreover, given concerns about possible negative effects of criminal law, such as stigmatization or reluctance to cooperate with health authorities, criminal law should be used with caution as a behavioral change mechanism for HIV-positive people.

There have been numerous cases in which criminal laws have been applied to HIV transmission in common law countries. In some cases, courts have applied existing criminal laws to cases involving HIV, where the laws themselves do not refer specifically to HIV. In this context, law reforms could come from the legislature, through amendments that clarify the application of relevant criminal laws to cases involving HIV, or through the evolution of precedents in the courts. The United Nations International Guidelines on HIV/AIDS and Human Rights recommend the reform of criminal laws and correctional systems to ensure that they are consistent with international human rights obligations and are not misused in the context of HIV/AIDS (United Nations 2007). They also recommend the sensitization of the judiciary, in ways consistent with judicial independence, on the legal, ethical and human rights issues relative to HIV, including through judicial education and the development of judicial materials (United Nations 2007). Criminal laws should not include specific offences against the intentional transmission of HIV but rather should apply general criminal offences to these exceptional cases. Such application should ensure that the elements of foreseeability, intent, causality and consent are clearly and legally established to support a guilty verdict and/or harsher penalties (United Nations 2007).

In the United States, a series of cases involving spitting have gone in different directions. In Ohio v. Bird (1998), an HIV-positive man was convicted of felonious assault, which requires the knowing attempt to harm by use of a weapon capable of inflicting death, after spitting in a police officer's face, even though all medical and scientific evidence demonstrated that saliva does not transmit HIV. In State v. Jones (2000), another case of an HIV-positive individual accused of spitting on an officer, the New Mexico court of appeals ruled that criminal liability for battery could not be based upon the victims' subjective and unsubstantiated fears that they could develop a disease, and reversed the lower court on this issue. In Weeks v. State (1992), the Texas Court of Appeal sustained the attempted murder conviction of an HIV-positive inmate who spat in a guard's face. The spitting cases show how the application of criminal laws to HIV-positive individuals – when based on HIV status, stigma and discrimination rather than on medical or scientific evidence – can undermine genuine efforts to reduce HIV transmission by spreading misinformation and increasing stigma and discrimination.

In cases involving behavior that does carry a risk of HIV transmission, such as unprotected sexual intercourse or sharing drug injection equipment, the central issue is consent. In R v. Cuerrier (1998) the Supreme Court of Canada established that there is a duty to disclose one's HIV status before engaging in any activity that poses a "significant risk" of HIV transmission. Failure to do so legally invalidates a sexual partner's consent to sexual intercourse. The lack of consent to have intercourse with a partner that is HIV-positive converts the sexual intercourse into a criminal assault. In that case, the complainants did not become infected with HIV as a result of the unprotected sex. However, if the complainants believe that their partner is HIV-free and the accused puts the complainants at significant risk to their health, failure to disclose HIV status vitiates consent to sexual intercourse.

This decision suggests that there might not be a duty to disclose HIV status prior to engaging in activities that do not pose a significant risk of transmission, such as kissing and oral sex, or where an HIV-positive individual uses a condom. In R v. Edwards, a lower court judge ruled that there is no duty to disclose HIV status prior to engaging in unprotected oral sex because it is a low risk activity (Canadian AIDS Society 2004).

In R v. Williams (2003), the defendant began a sexual relationship with the complainant in June 1991, in which they had unprotected sex on numerous occasions. On 15 November 1991, the defendant learned that he was HIV-positive, but did not reveal his status to the complainant and continued to have unprotected sex with her. The Supreme Court of Canada ruled that the defendant was not guilty of aggravated assault under section 268(1) of the Canadian Criminal Code, which requires that the assault "wounds, maims, disfigures or endangers the life of the complainant". What distinguishes aggravated assault from mere assault is not the act itself, but rather the consequences of the act. Because it was likely that the defendant had infected the complainant before he learned of his HIV status, it could not be proved beyond a reasonable doubt that he had endangered the life of the complainant. However, the defendant was guilty of attempted aggravated assault for continuing to have unprotected sex with the complainant after having learned of his HIV status. The court ruled that there is sufficient criminal intent for a conviction on a sexual assault charge if a person acts "recklessly". In Canadian law, a person acts "recklessly" if they know that their conduct risks committing a crime but they commit the act nevertheless. In this case, the Supreme Court ruled that criminal recklessness is established once an individual becomes aware of a risk that he or she has contracted HIV, but continues to have unprotected sex without disclosure of HIV status, thereby creating a risk of further HIV transmission. In this case there was no evidence before the court regarding the defendant's awareness of the risk that he might be HIV-positive, prior to 15 November 1991, other than the fact that he had been asked to take an HIV test. This aspect of the ruling raised the issue of whether there is a duty to disclose the mere awareness of a risk that one might be HIV-positive before having unprotected sex. The court also suggested that an HIV-positive person might be held criminally liable for failure to disclose HIV status before having unprotected sex with another HIV-positive individual, where this results in the transmission of a different strain of HIV or a drug-resistant strain of HIV.

The Supreme Court of Canada cases have been criticized, on the one hand, for discouraging people from seeking testing in order to avoid the possibility of a criminal conviction based on knowledge of HIV status and, on the other hand, for risking undesirable invasions of privacy if courts are required to determine whether an individual was aware that their past activities put them at risk of HIV infection (Canadian HIV/AIDS Legal Network 2003). However, in R v. Williams, the fact that the defendant had been asked to take an HIV test, because he was on a list of former partners provided by an individual who had tested HIV-positive, was not sufficient to establish that he was aware that his past activities had put him at risk

of HIV infection. Nevertheless, the decision has been criticized for extending the criminal law beyond cases where individuals know that they are HIV-positive, without defining the nature of the awareness that might be required. More generally, the use of criminal law to prevent HIV transmission has been criticized for stigmatizing all HIV-positive people because of the conduct of a few individuals, for discouraging those most at risk from seeking testing and for being unlikely to stop people from having risky sex or sharing needles and syringes. Moreover, all of the HIV-related criminal prosecutions in Canada have occurred in the context of heterosexual intercourse, rather than homosexual intercourse or injection drug use, creating a perception of discriminatory application (or non-application) of the laws (Betteridge 2007).

In the United Kingdom, there were eleven prosecutions for reckless transmission of HIV/AIDS between 2003 and 2007, in which eight accused pleaded guilty, two were convicted and one was acquitted (Klein 2007). A New Zealand court has ruled that people living with HIV/AIDS are not required to disclose their HIV status if they use condoms during vaginal sex (Klein 2007).

In particular, the use of criminal laws to prevent HIV transmission also has been criticized for not taking into account that HIV-positive individuals living in abusive relationships may fear the consequences of disclosing their status to partners and may not be able to use a condom or insist that their partner use a condom (Canadian AIDS Society 2004). In a literature review of HIV/AIDS and gender-based violence, the Harvard School of Public Health Program on International Health and Human Rights (2006) found that gender-based violence (which is not limited to violence against women) can interfere with safe sex practices and access to treatment. Not only is gender-based violence a risk factor for acquiring HIV/AIDS, but HIV/AIDS is also a risk factor for gender-based violence.

In summary, the use of criminal laws to prevent HIV transmission may undermine overall public health initiatives by: (1) reinforcing HIV/AIDS-related stigma; (2) spreading misinformation about HIV/AIDS; (3) creating a disincentive for HIV testing; (4) hindering access to counseling and support services; (5) creating a false expectation that criminal laws eliminate the danger of unprotected sex for people who believe that they are HIV-negative; (6) creating the risk of selective prosecution of marginalized groups; (7) criminalizing behavior that results from gender inequality, in the case of HIV-positive people living in abusive or economically dependent circumstances; and (8) invading privacy through the disclosure of medical records and HIV status in public court proceedings (Elliot 2002). However, the use of criminal laws may be warranted in some circumstances, where HIV status is an aggravating or otherwise relevant factor in cases involving physical assault that would constitute criminal behavior even in the absence of HIV, such as rape or the use of needles as weapons (Elliot 2002).

Finally, a distinction should be made between criminal laws and public health laws that are quasi-criminal in nature, particularly those regarding quarantine. While quarantine laws, such as isolation, detention or quarantine, may be suitable

for casually communicable and curable diseases, such laws run the same risk of misuse as do criminal laws (Elliot 2002). In this regard, the United Nations International Guidelines on HIV/AIDS and Human Rights recommend that public health law provisions applicable to casually transmitted diseases not be applied inappropriately to HIV/AIDS and that they be consistent with international human rights obligations (United Nations 2007).

9.3.2.2 Migration Laws that Discriminate Against HIV-Positive People

Some countries have restricted the entry of people living with HIV/AIDS, for short-term or long-term stays, through mandatory testing or a requirement to declare one's HIV status. As we saw in Chap. 8, the WHO International Health Regulations also contain provisions regarding health measures applied to travelers. These provisions encourage States to base their determinations upon scientific principles, available scientific evidence of a risk to human health and any available specific guidance or advice from the WHO. They also require States to treat travelers with respect for their dignity, human rights and fundamental freedoms and minimize any discomfort or distress associated with such measures.

Governments cite two main reasons for imposing travel restrictions on people living with HIV/AIDS – public health protection and reducing demand on health care and social services (UNAIDS/IOM 2004). In the United Kingdom, another source of demands for HIV screening of migrants has been a concern over "health tourism" – HIV infected migrants from developing countries that go to Europe to receive health care. However, research shows that access to treatment is rarely the reason for migration to Europe, since most migrants only learn of their HIV status after having arrived in the host country, and there is no uniform policy in European Union countries regarding screening of migrants for HIV (Carballo 2007).

HIV/AIDS is not considered to be a condition that poses a threat to public health in relation to travel because HIV/AIDS is already present in virtually every country in the world and HIV is not transmitted through casual contact. Unlike highly contagious diseases with short incubation periods, such as SARS, cholera and plague, HIV transmission can be prevented through safe sex and safe drug injection, which can be used by both the infected and the non-infected to prevent transmission. There is no evidence to support the assumption that both the infected and the non-infected will engage in unsafe practices. As a result, the presence of HIV-positive individuals, by itself, does not pose a risk to public health. In addition, travel restrictions are not effective in preventing the entry of HIV-positive individuals, since HIV tests do not detect the virus in newly infected people and nationals that are returning from travel abroad (who may have been infected while outside the country) are not subject to HIV/AIDS-related travel restrictions and are not prevented from entering their own country. Moreover, travel restrictions can undermine HIV/AIDS-related public health initiatives by increasing stigma and discrimination and mislead the public into thinking that HIV/AIDS can be

prevented through border measures, rather than through proven prevention strategies (UNAIDS/IOM 2004).

UNAIDS and the International Organization for Migration (IOM) recommend that exclusion on the basis of possible costs to health care and social services only occur on an individual basis, where the following considerations are shown: (1) the person requires the health care and social services and is likely to use them in the near future; (2) the person has no other means of meeting those costs (for example, through private or employment-based insurance or personal resources); and (3) these costs will not be exceeded by the benefits of the person's skills, talents, contribution to the labor force, payment of taxes, contribution to cultural diversity and capacity for revenue or job creation (UNAIDS/IOM 2004). They also recommend that countries treat similar conditions alike, rather than singling out HIV/AIDS. One study showed that the 10-year economic impact of admitting immigrants with asymptomatic HIV infection would be similar to admitting immigrants with asymptomatic coronary heart disease (Zowall et al., 1994).

The Canadian Immigration and Refugee Protection Act provides that foreign nationals can be deemed "medically inadmissible" based on a medical condition, and therefore denied a visa or entry at the border, if: (1) they are likely to be a danger to public health or public safety; or (2) they might reasonably be expected to cause excessive demand on health or social services. Since 1991, Canadian government policy has been that people living with HIV/AIDS do not represent a danger to public health or public safety by virtue of their HIV status. The issue of excessive demand on health or social services is mainly a consideration in cases of immigration or stays that exceed 6 months, is determined on a case-by-case basis and does not apply to refugees or close family members of Canadian citizens or permanent residents (spouses and children). Demand on health or social services is considered excessive if: (1) the anticipated costs would likely exceed the costs of health or social services for the average Canadian resident; or (2) the demand would add to existing waiting lists for those services and would increase the rate or mortality and morbidity in Canada by denying or delaying access to those services by Canadian citizens or permanent residents. The social or economic contributions the individual is expected to make to Canada are not taken into account. People entering Canada for less than 6 months are not required to disclose their HIV status or to be tested for HIV (Canadian HIV/AIDS Legal Network 2007a).

The United States has had a travel and immigration restriction in place for people living with HIV/AIDS since 1987 (Human Rights Watch 2006). Under the US Immigration and Nationality Act, applicants for a visa or for admission to the United States are inadmissible if they have "a communicable disease of public health significance", which includes HIV infection, although waivers are available on a case-by-case basis. For example, the US Attorney General named the 2006 High Level Meeting on AIDS a "designated event" for which an HIV waiver would be available. Visitors entering the United States on the Visa Waiver Program (which waives the requirement to apply for a visa prior to traveling to the United

States, for certain countries) must fill out an I-94W form, which asks, "Have you ever been afflicted with a communicable disease of public health significance." If the visitor answers yes to the question or the US border authorities suspect a visitor to be HIV-positive the person may be: (1) placed into secondary inspection; (2) questioned by an official of the US Department of Homeland Security; (3) placed into deferred inspection; (4) asked to withdraw the application for admission into the United States; (5) placed into the expedited removal process; or (6) placed into an US Department of Homeland Security Detention Center and detained until the case is heard by an immigration judge (GMHC 2006).

HIV-positive non-immigrants seeking to enter the US on a temporary basis for business, pleasure, or education are eligible for a waiver under which they can be allowed to enter the United States. In practice, a waiver is granted in most cases if: (1) they are not symptomatic; (2) it is a short visit; (3) they have insurance or other assets sufficient to pay medical expenses; and (4) they don't appear to be a public health risk. Permanent residency and immigration applicants can also apply for a waiver, but they are usually rejected. To receive a waiver as an immigrant, the person must be the spouse, unmarried son or adopted child of a United States citizen or permanent resident or have a United States citizen or lawful permanent resident as their son or daughter. In addition, an HIV-positive immigration applicant must prove that: (1) he will not be a danger to public health; (2) the possibility of spreading the disease is minimal; and (3) there will be no cost incurred by any level of government without its prior consent (Tarwater 2001).

The political history of the US HIV travel restrictions is an interesting story. In June 1987 the US Public Health Service added AIDS to the list of excludable conditions, noting that the exclusion was not based on any new scientific knowledge and that AIDS is not spread by casual contact, which is the usual public concept of contagious. In July 1987, Republican Senator Jesse Helms also added HIV infection to the exclusion list, through the US Congress, together with a prohibition on funding from the US Centers for Disease Control for AIDS programs that "promote, encourage or condone homosexual activities" (Koch 1987; AIDS Treatment News 1991). Senator Helms accompanied the introduction of his amendments with the following statement: "We have got to call a spade a spade, and a perverted human being a perverted human being" (Koch 1987). In July 1995, Senator Jesse Helms advocated spending less money on HIV/AIDS, because it resulted from "deliberate, disgusting, revolting conduct" and was "a disease transmitted by people deliberately engaging in unnatural acts" (Associated Press 1995). Ten years later, he had this to say: "It had been my feeling that AIDS was a disease largely spread by reckless and voluntary sexual and drug-abusing behavior, and that it would probably be confined to those in high-risk populations. I was wrong" (Hulse 2005).

In 1990, the US Centers for Disease Control (CDC) recommended that all diseases except active tuberculosis be removed from the list of excludable conditions. HIV was left on the list because it had been put on the list by Congress. In November

1990, the Immigration Reform Act of 1990 directed the CDC to establish a new list of excludable conditions, based solely on current epidemiological principles and medical standards. In January 1991, the CDC again proposed that only active tuberculosis remain on the list of excludable conditions. Religious leaders campaigned to maintain the ban and the US House of Representatives opposed removing the HIV ban (AIDS Treatment News 1991). In August 2007, Democratic Representatives Barbara Lee and Hilda Solis introduced the "HIV Nondiscrimination in Travel and Immigration Act". The proposed legislation would restore the authority of the Secretary of Health and Human Services to determine whether HIV status is a communicable disease of public health significance. The decision to maintain or remove the ban would then be based on public health analysis instead of a formal ban made by Congress (Latino Commission on AIDS 2007). In November 2007, the US Department of Homeland Security proposed a new rule that would allow short-term visas to be granted to HIV-positive people by US consulates in their home countries. However, applicants would have to agree to conditions, including ceding the right to apply for longer stays or permanent residency in the United States. Democratic members of the US House of Representatives objected that the changes would only shift decision-making authority to local consular officers, who may lack the appropriate medical expertise. Moreover, there would be no appeal process (Werner 2007).

The United States and Canada are similar societies, both culturally and economically, but have adopted very different approaches to HIV/AIDS travel restrictions. The HIV prevalence rate in the United States is higher than in Canada. This suggests that the US travel restriction has not been effective in preventing HIV transmission in the United States, and that the lack of such a restriction in Canada has not had the effect of increasing HIV prevalence.

Health care costs, measured as a percentage of GDP, are also higher in the United States than in Canada. While this difference is attributable to many factors, making it difficult to determine the impact of the different travel restriction policies on health care costs without further study, it is an indication that the Canadian approach has not led to a significant increase in health care costs compared to the American approach. In 2003, Americans spent USD 5,711 per capita on health care, compared with USD 2,998 in Canada. Americans spent 15.2% of GDP on health care compared with 9.9% of GDP in Canada. Interestingly, this gap was not always there. In 1970, both countries spent exactly 7.0% of their respective GDP on health care (OECD 2006).

Another factor that suggests that US travel restrictions are unlikely to prove successful is illegal immigration. There are several million illegal entries into the United States each year. They are obviously not screened. Thus, from a practical point of view, travel and immigration restrictions for HIV-positive individuals are unlikely to be effective in preventing the entry of many HIV-positive individuals and may provide additional incentives for some individuals to migrate illegally.

9.3.3 Laws that Prohibit Discrimination Against Vulnerable Groups

The United Nations International Guidelines on HIV/AIDS and Human Rights recommend that States enact or strengthen anti-discrimination laws that protect vulnerable groups, people living with HIV/AIDS and people with disabilities from discrimination in both the public and private sectors, and provide for speedy and effective administrative and civil remedies (United Nations 2007). Human rights laws in many jurisdictions prohibit discrimination against vulnerable groups or against people with HIV/AIDS, as well as providing other rights that are relevant to HIV/AIDS, such as the right to life and the right to health.

Human rights laws fall into two categories. The first category applies to governments, prohibiting governments from passing discriminatory laws or requiring governments to uphold certain human rights. The second category of human rights law prohibits discrimination on the part of private actors, for example with respect to employment practices or rental of housing. While it is not possible to eliminate individual or societal prejudices with legislation, human rights laws provide victims of discrimination with legal recourse against acts of discrimination and create economic disincentives through fines or other legal remedies, thereby contributing to social change.

Canada provides one example of the sources and functioning of human rights laws. Section 15 of the Canadian Charter of Rights and Freedoms, which is part of the Constitution of Canada, guarantees equality rights in the following terms:

> Every individual is equal before and under the law and has the right to the equal protection and equal benefit of the law without discrimination and, in particular, without discrimination based on race, national or ethnic origin, colour, religion, sex, age or mental or physical disability.

Canadian courts have interpreted the term "disability" to include HIV/AIDS, which means that people living with HIV/AIDS have constitutional protection against discrimination by the State. Section 15 is not limited to the grounds that are listed, but also covers analogous grounds, such as sexual orientation. Any law that is inconsistent with constitutional provisions may be struck down or interpreted by courts to make it consistent with the constitution. The Charter applies to all levels and branches of government, all government acts, government corporations and private persons or bodies that exercise authority granted by a statute or that implement government policies or programs.

However, the Charter does not otherwise apply to acts by private citizens. Instead, discrimination by an employer, a landlord or a private business is addressed under other federal and provincial human rights laws, such as the Canadian Human Rights Act, which apply to both the public and private sectors. By virtue of a 1996 policy of the Canadian Human Rights Commission and decisions of Canadian courts and tribunals, the prohibition against disability-based discrimination in the

Canadian Human Rights Act and its provincial counterparts cover discrimination based on HIV/AIDS status (Elliott and Gold 2005).

The remainder of this section provides an overview of court cases in a variety of countries that have applied constitutional law, international law and other legislation to uphold the rights of people living with HIV/AIDS with respect to employment and access to HIV-related medical care and treatment.

9.3.3.1 Cases Involving HIV-Related Discrimination in Employment

In March 2007, Mexico's National Supreme Court of Justice ruled that a provision in article 226 of the Social Security Institute Law for the Armed Forces (ISSFAM) that required HIV-positive individuals to be discharged from the military was unconstitutional, because it was not based on an individual assessment of the person's ability to work, violated constitutional protections of non-discrimination and equality and was inconsistent with Mexico's international obligations regarding people living with HIV/AIDS. The Court ordered that three soldiers be reinstated until medical certificates were issued to determine whether they were fit for duty, which would include an obligation to reinstate their social security benefits (Pearshouse 2007; Medina and Reyes 2007; SCJN 2007a, b). In September 2007, Mexico's National Supreme Court of Justice ruled for a fifth time that this provision was unconstitutional, thereby creating jurisprudence that is binding on all federal judges in Mexico (Avilés Allende 2007). Table 9.8 summarizes several other cases involving HIV-related discrimination in employment from various jurisdictions around the world.

9.3.3.2 Cases Involving Access to HIV-Related Treatment

With respect to HIV/AIDS, laws in South Africa and Latin America that provide a right to health care have been used to induce governments to provide access to antiretroviral treatment (Gruskin et al., 2007). The South African constitution provides a right to health care that is binding on the government. The Treatment Action Campaign used this provision to challenge the government's program that limited the use of *nevirapine* to prevent mother-to-child HIV transmission to 18 test sites. The court ruled that the government's restriction on the use of *nevirapine* was unreasonable and that the policy should be reformed to meet the government's constitutional obligation (Singh et al., 2007; Elliot et al., 2006).

In Argentina, five court cases between 1996 and 2003 repeatedly ordered the Argentine Ministry of Health to supply antiretroviral treatment to people living with HIV/AIDS, in accordance with the right to health set out in international treaties, which had been incorporated into domestic law. The failure of the Ministry of Health to act in a timely fashion, which led to interruptions in the supply of antiretroviral drugs, ultimately led to a court order that would fine the Ministry of Health USD 1,000 per day (funds which would then be used to implement the national AIDS plan) until it complied with the courts' previous orders, and the threat

Table 9.8 HIV-related discrimination in employment

Case	Relevant legislation	Issues	Outcome
Canada v. Thwaites, Federal Court (1994)	Canadian Human Rights Act	Discharge from Armed Forces based on HIV status	CAD 160,000 paid for unlawful discrimination
XX v. Gun Club Corp., Colombian Constitutional Court (1996)	Constitution of Colombia	Dismissal from job based on HIV status; violation of privacy by doctor	Doctor reported to Medical Ethics Tribunal for violating patient's privacy; Compensation paid for unlawful discrimination; Entitlement to social security restored
MX v. ZY, Bombay High Court of Judicature (1997)	Constitution of India	Employment at public corporation denied based on HIV status	Discriminatory workplace policy unconstitutional; Worker ordered reinstated; Lost wages paid from date of illegal dismissal
JRB et al. v. Ministry of Defense, Supreme Court of Justice of Venezuela	Constitution of Venezuela; International treaties	Mandatory medical leave from Armed Forces based on HIV status; violation of privacy by superior officers	HIV found incompatible with military service; Armed Forces ordered to respect privacy and to provide medical treatment
Haindongo Nghidipohamba Nanditume v. Minister of Defence, Labour Court of Namibia (2000)	Labour Act	Denial of entry into Namibian Defence Force based on HIV status	Namibian Defence Force found guilty of unfair discrimination; Ordered to admit plaintiff, unless his CD4 count was below 200 and viral load above 100,000; Ordered medical exam to include also CD4 and viral load, not just HIV
Hoffmann v. South African Airways, Constitutional Court of South Africa (2000)	South African Constitution	Government airline's prohibition on employing HIV-positive people as cabin crew	Unfair discrimination; Airline ordered to hire plaintiff and pay legal costs
XX v. Ministry of National Defense, Colombian Constitutional Court (2003)	Constitution of Colombia; Universal Declaration of Human Rights	Expulsion of student from military school based on HIV status	Unconstitutional discrimination; School ordered to provide medical treatment, including ARVs, and appropriate activity to minimize risk to cadet's health
Diau v. Botswana Building Society	Employment Act; Constitution of Botswana	Employment terminated for refusal to take HIV test	Infringement of right not to be subject to inhuman and degrading treatment and right to liberty; Employer ordered to reinstate employee and pay compensation for lost wages

Source: Elliot et al. (2006) Courting Rights: Case Studies in Litigating the Human Rights of People Living with HIV, UNAIDS/Canadian HIV/AIDS Legal Network, http://www.aidslaw.ca/ publications/interfaces/downloadFile.php?ref=1013

Table 9.9 Cases involving access to HIV-related treatment

Case	Relevant legislation	Issues	Outcome
Alonso Muñoz Ceballos v. Instituto de Seguros Sociales, Constitutional Court of Colombia (2002)	Constitution of Colombia	Eligibility to receive public health care for HIV	Discontinuing access to treatment violated right to health and freedom from discrimination; Public social security obliged to cover patient's health care
Luis Guillermo Murillo Rodríguez et al. v. Caja Costarricense de Seguro Social, Supreme Court of Justice of Costa Rica (1997)	Constitution of Costa Rica; International Human Rights Conventions	Refusal to provide ARVs	Refusal violated right to life and health; Social Security system ordered to provide ARVs and pay court costs and damages; If cost of ARVs relevant, so are costs of withholding treatment
D v. United Kingdom, European Court of Human Rights (1997)	European Convention on Human Rights	Deportation of person with advanced AIDS, receiving treatment and palliative care	Deportation would amount to inhuman treatment, due to risk of dying in most distressing circumstances
N (FC) v. Secretary of State for the Home Department, House of on Human Rights Lords (2005)	European Convention	Deportation of person living with HIV, receiving ARV treatment	Deportation not inhuman treatment, because N was healthy
Cruz del Valle Bermudez el al. v. Ministry of Health and Social Action, Supreme Court of Venezuela (1999)	Constitution of Venezuela	HIV+ persons not covered by social security system through employment	Court ordered Ministry to provide coverage for ARVs and HIV-related treatment to all Venezuelans, even if not eligible for social security
Jorge Odir Miranda Cortez et al. v. El Salvador, Inter-American Commission on Human Rights (2001)	American Convention on Human Rights	Access to ARVs pend-pending delayed decision of Supreme Court	El Salvador ordered to provide ARVs and other HIV-related treatment pending decision of Supreme Court of El Salvador; Case rendered moot when Supreme Court ordered Salvadoran Social Security Institute to provide access to HIV treatment
Van Biljon and Others v. Minister of Correctional Services and Others, High Court, South Africa (1997)	South African Constitution	Access to ARVs for HIV+ prisoners	Government ordered to provide free ARVs to HIV + prisoners, even though not available outside prisons

Source: Elliot et al. (2006) Courting Rights: Case Studies in Litigating the Human Rights of People Living with HIV, UNAIDS/Canadian HIV/AIDS Legal Network, http://www.aidslaw.ca/publications/interfaces/downloadFile.php?ref=1013

of criminal charges for contempt of court (Elliot et al., 2006). An Argentine court also relied on the right to health set out in international treaties to order the government to produce and administer a vaccine within a set period of time, in order to protect people living in a region affected by Argentine haemorrhagic fever (Singh et al., 2007). The constitutional court of Ecuador relied on the right to health set out in international treaties to rule that the Ministry of Health had failed to meet its obligations when it suspended its HIV treatment program (Singh et al., 2007; Elliot et al., 2006). In Costa Rica, the Supreme Court ruled in 1997 that the Costa Rican Social Security Fund could not argue that financial constraints justified failure to comply with its very reason for its existence, which is to provide coverage for necessary medical care. Shortly after this ruling, the Supreme Court ordered the Social Security Fund to develop a plan to provide coverage to all persons living with HIV/AIDS that were in need of antiretroviral treatment. A few weeks later, Costa Rica became the first Central American country to include coverage for antiretroviral drugs in its national health insurance plan (Elliot et al., 2006).

In India, the courts have interpreted the right to life in the Indian constitution to include a right to health, and have obliged the Indian government to dedicate resources to uphold the right to health in a variety of cases (Singh et al., 2007).

Table 9.9 summarizes several other cases from various jurisdictions around the world where litigation has increased access to HIV-related medical treatment. These cases suggest that human rights laws can be instrumental in promoting health care reforms through litigation, provided that judicial authorities are independent and competent and governments respect the rule of law (Singh et al., 2007).

9.3.3.3 Institutional Policies and Practices

In addition to laws that institutionalize or prohibit discrimination, institutional policies and practices can represent an important force with respect to stigma, discrimination and access to health care. The United Nations International Guidelines on HIV/AIDS and Human Rights recommend that States ensure that government and the private sector develop codes of conduct regarding HIV/AIDS issues that translate human rights principles into codes of professional responsibility and practice, with accompanying mechanisms to implement and enforce those codes. In many jurisdictions, the courts have the power to order changes in policies and practices of both governmental and non-governmental institutions. However, litigation is an expensive and time-consuming process that creates additional stress for the people living with HIV/AIDS who choose to litigate. Thus, it is important to promote the voluntary adoption of appropriate policies and practices.

One example in this category is the policies and practices of health care institutions. For example, in the mid 1980s, in British Columbia, Canada, all hospitals refused to treat AIDS patients, with the exception of St. Paul's Hospital, which adopted appropriate policies based on the commitment of the founding Sisters of

Providence to care for all who were in need, regardless of financial or social standing (Gratham 2007). In 2006, the City of Philadelphia agreed to resolve a complaint regarding the refusal of emergency medical services personnel to touch or lift a patient because of his HIV status, by paying monetary compensation and agreeing to implement a mandatory paramedic/EMT training program on HIV and infectious diseases (John Gill Smith and United States v. City of Philadelphia 2006). Ironically, "Philadelphia" was the name and setting of the first high-profile Hollywood film to take AIDS seriously, in 1993.

Another example in this category is the policies and practices of employers. As we showed in Chap. 3, HIV/AIDS affects the productivity of workers substantially, making it cost effective for companies to have prevention programs and to provide treatment for employees, from a purely financial point of view. Business leaders have an economic incentive to invest resources in fighting the epidemic. Moreover, as we saw in Chap. 7, firms can have a tremendous impact in promoting prevention among employees and their families and providing access to treatment. However, it is important to have an overarching framework that ensures the adoption of best practices by individual firms and to minimize overlap between the private sector and the other players that are involved in addressing the pandemic. In this regard, the Global Business Coalition on HIV/AIDS has provided leadership, particularly in its efforts to identify ways to improve the global business community's response to HIV/AIDS, including through leadership to dispel myths and stigma, break down workplace barriers and influence community change. Given the economic and legal incentives, an effective HIV/AIDS response must be a core component of an overall business strategy.

9.3.4 Risk Management: The Tradeoff Between Human Rights and HIV Prevention

We can think of HIV/AIDS as a disaster from the point of view of a country as a whole. Unlike other disasters (such as an outbreak of an influenza pandemic), this disaster unfolds over many years. However, the standard operating procedure for disaster management also applies to managing HIV/AIDS risk. For managing any kind of risk, we need to measure the severity and the frequency of occurrence of that risk. Once we measure the risk, we need to find ways of managing the risk in a dynamic way. That means putting a risk management plan in place, monitoring the plan and modifying the plan as events unfold.

Most often, at the national level, HIV/AIDS is seen as a public health problem and is managed as such. Thus, various measures are taken to reduce the incidence of HIV/AIDS by taking steps against the main channels through which the disease strikes: (1) actions to reduce the contamination of the blood supply; (2) special steps to promote health care for key groups, such as sex workers; (3) needle exchange programs; (4) promoting safe sex through the use of condoms; and (5) minimizing HIV transmission from infected mothers to newborns.

Another approach to risk management is risk avoidance. At the country level, risk avoidance could imply two extreme actions: quarantining people who are already infected and preventing infected people from coming into the country. Neither of these policies is feasible for most countries, as they directly go against human rights. Thus, extreme forms of risk management and the respect for human rights pose a tradeoff for a country.

Cuba provides a striking example of how containment of HIV/AIDS can be conducted at a national level. Cuba started promoting public health messages against HIV/AIDS in 1983, 3 years before the first HIV case was reported in the country. Between 1986 and 1989, Cuba undertook a massive testing exercise, which tested more than 80% of the adult population. Those who were seropositive were quarantined indefinitely in sanitariums. Over the years, Cuba has relaxed the rule. Today, anybody found seropositive is required to attend an 8 week course. After that, they are free to leave. Nearly half the people choose to stay in the sanitariums, where they get free food and a place to stay, along with retraining if they choose to help with the logistics of the sanitariums.

Such a curtailment of freedom of movement without committing a crime is unprecedented anywhere in the world. It has been criticized by many. It did produce a result that is also unprecedented. Cuba has an HIV incidence rate of 0.05%. In the neighboring island of Haiti, the rate is 120 times as high, at 6.1%.

It should be noted that quarantine of individuals who have committed no crime is not unheard of. There was the case of Mary Mallon in the United States in 1908 – better known as the "Typhoid Mary" – who carried typhoid without every showing any symptoms. She was quarantined against her will for a number of years. Similarly, during the outbreak of influenza in the United States in 1918, many families were quarantined on public health grounds. Individuals with SARS were also quarantined in Toronto.

9.4 The Future of HIV/AIDS

The future of HIV/AIDS presents a mixed picture. While HIV/AIDS incidence has begun to level off in some high-prevalence countries, new infections have increased in many developed countries. While several science-based prevention strategies need to be scaled up significantly, the increase in mother-to-child prevention has dramatically reduced infections among newborns and male circumcision is a promising new prevention strategy. While millions still lack access to treatment, there has been a large increase in funding, drug prices have dropped dramatically, several key drug patents will expire in the near future and efforts to develop new treatments continue. While stigma and discrimination remain obstacles to effective prevention and treatment, human rights laws have proved to be an effective vehicle for addressing discrimination and increasing access to treatment around the world. Thus, while HIV/AIDS continues to pose a significant threat to public health, there are many signs that progress in fighting this pandemic can and will continue, as knowledge gradually replaces ignorance.

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