Moving Toward a Unified Global HIV/AIDS Agenda: Communities of Color in Crisis

Bisola Ojikutu and Jamal Harris

Introduction

At the conclusion of 2007, UNAIDS and the World Health Organization (WHO) estimated that there were 33.2 million people living with HIV (PLWHA) worldwide.[1] Since the first cases were identified more than 25 years ago, HIV infection has been reported in every region of the world. However, the most dire consequences of this disease have been manifested in resource-poor settings where health care infrastructure is suboptimal, access to education is minimal, and poverty is rampant. Over the course of the last 5 years, efforts have been initiated to mitigate the disparate impact that HIV has in these settings. Though universal access to treatment is an unmet and distant goal, antiretroviral therapy is now more widely available. In addition, there has been a decrease in the number of new HIV infections, primarily due to strides made in both prevention and access to effective care and treatment.[1]

This chapter will focus on the HIV epidemic in three of the most resource-limited regions of the world: sub-Saharan Africa, the Caribbean, and Latin America. Each of these regions has been impacted by varying degrees by HIV/AIDS. Each faces ongoing challenges while combating the spread of infection and struggling to treat those who are already infected. However, progress has been made. Lessons that can be derived from the development of successful prevention interventions and from scale-up of treatment programs in these regions will be highlighted.

Equally important is the recognition that this epidemic is borderless. Immigration from the three selected regions to other parts of the world, including the U.S., is constant. Providers in the U.S. are caring for and treating culturally diverse populations, including immigrants from all corners of the globe, particularly in minority communities. Therefore, it is important for health care providers to have an understanding of the international HIV epidemic. Moreover, some of the lessons learned from

B. Ojikutu (✉)
Massachusetts General Hospital, Office of International Programs, Division of AIDS, Harvard Medical School, Boston, MA
E-mail: bojikutu@partners.org

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experiences internationally may be extrapolated to vulnerable, relatively resource-constrained populations here in the U.S. Suggestions for the potential integration of international and domestic strategies will be discussed.

Sub-Saharan Africa

Though the HIV epidemic has adversely affected inhabitants of every corner of the globe, sub-Saharan Africa has suffered the most widespread and catastrophic blow from this disease. Home to only 10% of the world's population, this region shoulders the burden of approximately 75% of all HIV cases. Nearly 7 out of 10 HIV-infected adults and 9 out of 10 HIV-infected children live in sub-Saharan Africa.[1] Furthermore, biological factors, economic inequality, violence against women, and cultural practices, including early marriage, have led to gender-based disparities in HIV prevalence.[2–6] Today, 61% of those living with HIV in the region are women and adolescent females. Because of the high prevalence of infection, poor health care infrastructure, and limited access to care and treatment, HIV-related mortality has been devastating. In 2006, 76% of AIDS deaths worldwide occurred in sub-Saharan Africa.[1]

Sub-Saharan Africa's 47 countries can be divided into southern, eastern, western, and central regions. Each is distinct in its geography, its history, and the characteristics of its HIV epidemic. The southernmost nations have the highest rate of HIV infection on the continent. Eight countries in southern Africa reported an HIV prevalence greater than 15% in 2007 (Table 1). With 5.5 million PLWHA, South Africa has the largest population of HIV-infected adults and children in the world. Kwa Zulu Natal, one of South Africa's nine provinces, has the highest HIV prevalence rate based on seroprevalence surveys of antenatal clinic attendees (39.1%) in the country. Nationwide, 29% of pregnant woman were estimated to be HIV-positive in 2006. However, there is new evidence that the rate of new infections throughout the country has leveled off.[7]

Though rates of HIV throughout southern Africa are exceptionally high, Zimbabwe has noted a recent decline in prevalence. Rates dropped from 22.1% in 2003 to 20.1% in 2005.[8] Amongst Zimbabwean women, a considerable decline in HIV prevalence has been observed. For example, in the capital city of Harare, HIV prevalence in women attending antenatal or postnatal clinics fell from 35% in 1999 to 21% in 2004.[9] Similarly, Botswana has noted a decline in HIV prevalence rates among young, pregnant women, from 39 to 29% in 20–24-year-old antenatal clinic attendees nationwide. However, nationwide prevalence estimates in that country remain high, approximately 24% in 2005.[1,8]

Throughout much of eastern Africa, HIV prevalence has remained lower than that noted in its neighbors to the south. Over time, the difference between the two regions has widened as several countries in eastern Africa have reported remarkable declines in HIV prevalence. The most notable are Uganda and Kenya where the proportion of adults living with HIV dropped from 15% and 14% in the early 1990s

Table 1 Adult[15–49] HIV prevalence in selected Sub-Saharan Africa, Caribbean, and Latin American countries, 2005

Sub-Saharan Africa	(%)
Swaziland	33.4
Botswana	24.1
Lesotho	23.2
Zimbabwe	20.1
Namibia	19.6
South Africa	18.8
Zambia	17.0
Mozambique	16.1
Cote d'lvoire	7.1
Uganda	6.7
Kenya	6.1
Cameroon	5.4
Nigeria	3.9
Chad	3.5
The Caribbean	
Haiti	3.8
Trinidad and Tobago	2.6
Jamaica	1.5
Dominican Republic	1.1
Cuba	0.1
Latin America	
Belize	2.5
Guyana	2.4
Honduras	1.5
Brazil	0.5
Mexico	0.3

to 6% and 5.1%, respectively, by the end of 2006.[1] HIV prevalence in the remaining east African nations has either decreased or remained relatively stable (Table 1).

Significantly lower HIV infection rates have been observed in western and central Africa. The majority of the countries in these two regions have a national prevalence less than 2% (Table 1). HIV infection rates are somewhat higher in the central nation of Cameroon and the western nations of Chad, Cote d'Ivoire, and Nigeria (Table 1). Though Nigeria's HIV prevalence is currently estimated to be less than 4%, more than three million HIV-infected individuals live in this heavily populated nation. Wide variations in HIV prevalence have been noted across the country, from 1.6% in the western states to 12% further east.[10]

A combination of several factors helps explain the pervasive discrepancy in HIV epidemiology between the regions in sub-Saharan Africa. Male circumcision has been identified as a significant factor mediating HIV transmission in Africa. Circumcised males have a 50–60% decreased risk of contracting HIV from their female partners.[11–13] The prevalence of male circumcision differs widely across the continent. Higher rates have been noted in western Africa, particularly amongst Muslim populations where HIV prevalence is low. Male circumcision is much less common

in southern Africa where HIV prevalence is significantly higher. The WHO estimates the prevalence of circumcision in Botswana and Zimbabwe, both with raging HIV epidemics, to be less than 20% countrywide.[14]

But low circumcision rates alone do not explain the enormously high HIV prevalence rates in southern Africa. A second contributing factor is genital herpes simplex virus infection-2 (HSV). Numerous epidemiologic studies have identified HSV-2 as a biological cofactor in transmission and acquisition of HIV infection in both males and females.[15–17] HSV-2 seroprevalence in sub-Saharan Africa ranges from less than 10% amongst males in the western African country of Benin, which has an HIV prevalence of 2%, to over 50% amongst males in Zimbabwe, which has an HIV prevalence of 27%.[18] Recent studies have explored the use of antivirals, such as acyclovir, to reduce HSV-2 replication, and therefore inhibit HIV transmission and acquisition. Though epidemiologic data validate this intervention as a reasonable approach to HIV prevention, two recent large-scale trials employing this strategy have failed to show any efficacy of HSV-2 suppressive therapy. Studies are underway to determine why no effect was noted.[19,20]

Behavioral factors also help explain variation in HIV prevalence across Africa. Though HIV transmission via intravenous drug use (IDU) and men having sex with men (MSM) have been reported in Africa (most notably in Kenya, Tanzania, South Africa, and Mauritius), heterosexual sex is the predominant mode of transmission across the continent. Numerous lifetime sexual partners, young age at sexual debut, and low condom use contribute to increased risk of HIV acquisition. But a key feature that may differentiate high-prevalence regions from those that have lower prevalence is the rate of multiple *concurrent* sexual partnerships. The per act risk of heterosexual transmission of HIV is low.[21] However, engaging in multiple concurrent partnerships over an extended period of time increases one's risk of HIV acquisition because of exposure to a higher number of cumulative sexual acts. A recent study revealed that 22% of men in Zambia and 55% of men in Lesotho (both high HIV prevalence countries) reported engaging in two or more concurrent sexual partnerships lasting at least a year within the previous year.[22] This pattern of concurrent partnerships is less common in western African nations where, as aforementioned, HIV prevalence is lower. Though polygamy, a type of concurrency, is common in north and western Africa, other factors, such as the higher prevalence of circumcision and the lower likelihood that women in polygamous relationships in those regions are also engaging in multiple partnerships, most likely diminish the risk of HIV transmission.

The Caribbean

Though the Caribbean is small in both land mass and population, its HIV prevalence is second only to that observed in sub-Saharan Africa. The first case in the region was noted in Jamaica in 1982.[23] By the end of 2007, a total of 230,000 people were living with HIV in the Caribbean Islands.[1] Approximately 50% of infections have

been noted in women. Most recent data indicate that HIV prevalence has ranged from a high of 3.8% in Haiti to a low of 0.1% in Cuba (Table 1). As in sub-Saharan Africa, the spread of the epidemic has been fueled by poor health care, poverty, and behavioral factors, such as young age at sexual debut. Commercial sex work has also significantly contributed to HIV spread in most of the Caribbean nations. More than 31% of female sex workers in Guyana have been noted to be HIV positive.[24] In addition, 12% of the HIV cases that were reported in 2007 were secondary to MSM. High levels of stigma and discrimination toward MSM have been documented; therefore, the percent attributed to this transmission mode may be underreported and thus deceptively low.[24] Injection drug use has rarely been reported as a risk factor for infection in this region.

Haiti, the poorest country in the Western Hemisphere and the country with the largest epidemic in the Caribbean, deserves special consideration. More than one-half of those living with HIV in the Caribbean (or 190,000 people) are Haitians. At the height of the epidemic in that country Haiti's HIV prevalence was estimated to be 6%. Among women aged 15–49, AIDS continues to be the leading cause of death.[1] Though HIV has impacted other countries throughout the region, several factors have made Haiti's epidemic particularly severe and in many ways similar to epidemics in sub-Saharan Africa. Throughout the epidemic, Haiti has been embroiled in political upheaval. The lack of an effective government has led to disruption of economic activity and limited development and upkeep of public services, including health care facilities. Therefore, most Haitians have had limited access to health care and accurate education regarding prevention strategies. In addition, most Haitians live on less than 1 U.S. $ per day; therefore, extreme poverty has contributed to severe deficits in health care access. Extensive internal (rural to urban) and external migration has also limited the ability to trace exposed individuals, establish accurate epidemiologic data, and treat known cases.[26] Immigration has led to a higher HIV prevalence rate in some areas of neighboring Dominican Republic, particularly in camps housing sugar cane plantation workers, many of whom are Haitians.[27]

In spite of severe economic and political strife throughout the 25 years of the AIDS epidemic, Haiti has made significant progress in addressing the epidemic. Though 6% of women tested in antenatal clinics were found to be HIV infected in 1996, 3.1% were HIV positive in 2004.[28]

National HIV prevalence is also relatively high in the Bahamas (3.3%). Trinidad and Tobago and Guyana are also combating significant epidemics; countrywide prevalence rates are 2.6% and 2.4%, respectively (Table 1).

As mentioned previously, Cuba has maintained an extremely low HIV prevalence throughout the epidemic (0.1% in 2005). More than 80% of cases are amongst MSM. Several factors have contributed to this country's low infection rate. Cuba established its National Programme on HIV/AIDS in 1983 soon after the first cases of HIV were noted in the region. This program has been simultaneously lauded and critiqued for its proactive and aggressive approach. Integral to the program was mandatory confinement of known HIV-positive individuals in sanatoriums until 1994, after which confinement became voluntary. Confinement limited sexual

contacts and allowed for close follow-up of patients. Though controversial, this practice helped contain the epidemic. In addition, Cuba implemented an HIV testing policy, which included partner tracing and notification, testing of pregnant women, and extensive follow-up of HIV-positive persons.[29] Antiretroviral therapy became available through Cuban drug manufacturers in 2000, prior to availability of treatment in other countries within the region. According to the Cuban government, all patients who qualify receive treatment free of charge.[30] Regarding prevention, the Cuban government recently announced a national prevention initiative that will specifically target the largest population affected by the epidemic, MSM.[31]

Unlike other countries in the Caribbean, Puerto Rico's HIV epidemic has been driven by IDU. Although national HIV prevalence is estimated to be less than 1% (Table 1), HIV prevalence amongst IDU(s) ranges from 42.4 to 55.2%.[32] According to the Puerto Rican Department of Public Health, 50% of AIDS cases in the country are amongst heterosexual IDU(s) and another 7% are in intravenous drug using MSM. Intravenous heroin and cocaine use has been difficult to combat because Puerto Rico serves as an efficient drug trafficking route from South America to the U.S. and Canada. Further compounding the problem is the lack of methadone and needle exchange programs on the island.[33]

Latin America

HIV prevalence in Central and South America ranges from 0.1% in Bolivia to 2.5% in Belize (Table 1). Throughout Latin America, HIV has remained concentrated in high-risk groups: IDU(s), MSM, and commercial sex workers and their clients. However, several nations are experiencing generalized epidemics.[1]

Brazil, the most populous country in South America, has the largest number of PLWHA in South America and accounts for approximately one-third of the HIV cases in the region. As is the case in most Western nations, HIV was first noted in Brazil among MSM in the mid-1980s. By the early 1990s, cases had been reported in heterosexual men, women, and IDU(s). Though a rise in cases has been observed over time, AIDS experts and advocates praise Brazil for limiting an epidemic predicted to spread much farther than the estimated 620,000 infected adults.[34,35] HIV prevalence within the country has remained stable at 0.5% (Table 1). This is largely due to an early, aggressive HIV program, which included simultaneous prevention programming and universal access to antiretroviral treatment.[36]

In most South American countries MSM is the most commonly reported risk factor for HIV.[1] The exceptions are Argentina and Uruguay, where heterosexual transmission has caused the majority of new cases in recent years. Transmission due to IDU is significant in many South American countries as well as in Mexico.[37]

In Central America, migrant life styles and the frequenting of commercial sex workers has driven the spread of HIV. As mentioned, Belize has the highest rate in the region. Factors contributing to Belize's high HIV-prevalence rate include multiple sexual partners, young age at sexual debut, and low condom usage. In addition,

high HIV prevalence has been noted amongst commercial sex workers. Significant epidemics also exist in Honduras, Guatemala, El Salvador, Costa Rica, Nicaragua, and Panama.[1]

Mexico has maintained an HIV infection prevalence of 0.3%, lower than the 0.6% in the U.S. to its north and lower than the HIV prevalence rates of its Central American neighbors (Table 1). There continues to be significant HIV rates among MSM. Unprotected sex between MSM contributes to more than half of new infections per year.[1] Because of migration, HIV infection rates have also increased in border communities, including rural areas around the southern and northern borders of the country.[38,39]

Treatment

Though highly active antiretroviral drug therapy (HAART) for HIV was widely available in high-income nations by the mid-1990s, treatment was largely unavailable in most low- to middle-income countries until recently. Drug prices, concern that poverty-stricken patients in resource-poor settings would not be able to manage complicated drug regimens, and the lack of trained human resources to provide the drugs inhibited widespread access. In response to this glaring inequity and increasing AIDS-related mortality, several critical funding initiatives were implemented, which have improved the availability of HIV treatment and prevention around the world. In 2001, the Global Fund to Fight AIDS, Malaria, and Tuberculosis, a multilateral partnership of governments, civil society, the private sector, and affected communities was created to collect and disburse financing for international health projects. Securing and distributing funds for HIV treatment integrated with prevention services is a major function of this organization. During its first two rounds of grant making, the Global Fund committed U.S. $1.5 billion in funding to support 154 programs in 93 countries worldwide.[40]

In 2003, the WHO and the United Nations Program on HIV/AIDS launched the 3×5 initiative with the goal of having three million people living with HIV/AIDS in low- to middle-income countries on HAART by the end of 2005. By the end of 2005, 1.3 million people were receiving HAART, tripling the total number of people on these lifesaving medicines in a 2-year period.[41] The estimated number of people on treatment jumped to nearly three million by the end of 2007.[42] A significant amount of money to support treatment has come from the U.S. through the President's Emergency Plan for AIDS Relief (PEPFAR), which committed 15 billion U.S. $ to support HIV care, treatment, and prevention initiatives in 15 focus countries in Africa, the Caribbean, and Asia. This unparalleled funding initiative supported treatment for more than 1.6 million HIV-infected adults and children by March 2008.[43] National governments of some of the most highly impacted countries in the developing world have also contributed resources. Further contributing to the ability to increase access to treatment is the drop in the yearly cost of annual antiretroviral treatment. The prices of antiretroviral drugs in the developing world

Table 2 Estimated number of people needing and receiving antiretroviral therapy in Sub-Saharan Africa, the Caribbean, and Latin America, 2007

Region	Number needing ART	Number receiving ART	Coverage (%)
Sub-Saharan Africa	7,000,000	2,120,000	30
Eastern and Southern	5,300,000	1,690,000	32
Western and Central	1,700,000	430,000	25
Latin America	630,000	390,000	62
Caribbean	70,000	30,000	43

declined from $10,000–$15,000 per patient per year to as little as $140 per patient per year for a first-line WHO combination antiretroviral treatment regimen largely due to advocacy efforts.[44,45]

The influx of new funding changed the landscape of HIV treatment throughout the developing world. In 2003, approximately 100,000 people were receiving antiretroviral therapy in sub-Saharan Africa. By the end of 2007, over two million people were on therapy. Unfortunately, this is only 30% of those who require treatment in the region (Table 2). In addition, wide disparity in access has been evident between countries. Botswana reported that 79% of those who qualified were receiving treatment by the end of 2007, while other countries, such as Ghana, struggled to provide access to a mere 15% of patients.[42] With 5.5 million people infected countrywide, South Africa has the greatest need, yet scale-up has been criticized for its slow pace.[46] By the end of 2007, approximately 300,000 people had initiated treatment.[42]

The scale-up of antiretroviral therapy in both Latin America and the Caribbean has occurred more quickly than in Africa with an estimated 64% and 43% of those needing treatment receiving it by December 2007 (Table 2). Within the region there is also great variation in coverage. Countries such as Brazil, Argentina, Cuba, Costa Rica, and Chile have covered more than 70% of those needing treatment, while in the Dominican Republic and Haiti the coverage is much less widespread.[42]

The challenges facing those working to expand effective treatment programs for both adults and children in resource-poor settings have been substantial. Skilled human resources, including doctors, nurses, pharmacists, and laboratory technicians are severely lacking in most developing countries because of early death due to HIV and brain drain. With 1 doctor for every 60,000 patients, Malawi, a country with an HIV prevalence of 14%, is facing a grave plight.[47] In addition to human resources, general health care infrastructure is sorely lacking. Combating coinfection with tuberculosis (TB) is also a major concern. In many developing countries, the TB case rate has increased fivefold to tenfold since the identification of HIV, and the prevalence of HIV infection among individuals with newly diagnosed TB exceeds 80%.[48] Furthermore, even though drug prices continue to decline, medication stock-outs (both of antiretrovirals and drugs for the prophylaxis and treatment of opportunistic infections such as TB) continue to occur. These deficits place patients at risk for antiretroviral therapy resistance due to nonadherence to first-line

regimens. Currently, second-line treatment, which usually includes a protease inhibitor, is costly and less available at treatment sites.

Although these challenges exist, availability of antiretroviral therapy for the prevention of mother-to-child transmission has increased. From 2004 to 2007, access to PMTCT increased from 10 to 33% in all low- and middle-income countries. Undoubtedly, room for improvement in access remains; 420,000 children were newly infected in 2007.[42] Once infected, outcomes are often poor for children. The lack of clinical and laboratory facilities for diagnosing HIV infection, lack of human resource capacity skilled in treating children, and lack of appropriate liquid drug formulations have contributed to a severe deficit in access. Moreover, some have sited lack of political and social will to treat children for HIV as a major barrier that must be overcome if progress is to be made.[49]

Outcomes in Resource-Limited Settings

For those patients in resource-poor settings who have been able to access treatment for HIV, HAART has proven to be very effective. Mortality and morbidity for HIV-infected patients in resource-limited settings have declined markedly with increased access to combination antiretroviral therapy. Short-term follow-up studies from numerous low-income countries in sub-Saharan Africa, the Caribbean, and Latin America have observed sustained immunologic benefit and virologic suppression.[50–52]

Although outcomes have been positive, studies have noted increased mortality secondary to late presentation and lost to follow-up. Braitstein et al. compared outcomes from 18 treatment programs through out Africa, Latin America, and Asia to results from the U.S. and Europe. Immunologic and virologic response to therapy was similar after 6 months in both settings. However, mortality in the lower income countries was higher secondary to more severe disease at the initiation of treatment.[53] Dalal et al. observed high rates of lost to follow-up in South Africa. Nearly 1 in 6 patients were lost to follow-up in a 15-month period.[54]

Success Stories

Antiretroviral Therapy Adherence

Prior to the more widespread availability of antiretroviral therapy in the developing world many questioned the ability of HIV-positive patients in resource-limited settings to adhere to complicated drug regimens. In actuality, higher rates of adherence to HAART have been noted in sub-Sahara Africa than in North America. Millis et al. compared data from 31 adherence studies in North America and 27 studies

from Africa. In the North American studies 55% of patients demonstrated adequate adherence compared with 77% of the African participants.[55] High rates of adherence in both adults and children at individual sites throughout the developing world have also been widely reported.[56–58] Several reasons for this finding have been proposed: intense, mandatory adherence training and patient education prior to HAART start, compulsory adherence tools and monitoring, treatment supporters, and the sense of overall emergency in regard to the epidemic. Models of adherence that emphasize communal relationships and social capital have also been employed and may be another factor for the high adherence rates.[59] Though adherence is high, Hardon et al. noted that transportation costs, excessive waiting times at health care facilities, and hunger may threaten long-term adherence to first-line regimens in low-income settings.[60]

National Prevention Strategy

Few countries have experienced a decline in HIV prevalence as significant as that noted in Uganda. The first African nation to successfully reverse the course of its HIV epidemic, Uganda was noted to have a nationwide adult prevalence of 15% in the early 1990s, which fell to approximately 4% by 2003.[1] Evidence of a decline in HIV incidence has also been documented.[61] Some debate has surrounded the reasons for this large-scale decline. However, several facts are incontrovertible. Uganda's National AIDS Control Program began very early in the epidemic and included strong political leadership as well as a significant amount of funding. The centerpiece of Uganda's campaign was health education and widespread communication of messages like "zero grazing," which promotes monogamy as opposed to abstinence. Incorporation of recognized church leadership and PLWHA was also critical to Uganda's multisectoral response. In addition, early efforts to secure the blood supply and develop a comprehensive countrywide surveillance system were key. Efforts also focused on empowering girls and women and targeted young people. Interestingly, the promotion of condom usage was not a program element until the late 1990s.[62,63]

The major effect of these efforts was the alteration of cultural and sexual behavioral norms.[63] Delay in sexual debut, decreased frequency of multiple sexual partners, and narrowing in the age gap between women and men have been documented in numerous studies. Increases in condom usage and voluntary counseling and testing also occurred in the mid to late 1990s.[64,65]

In recent years, there is evidence of stabilization and possibly a slight increase in the prevalence of HIV in Uganda. This trend coincides with a dramatic increase in the availability of HAART and further uptake of condoms and voluntary counseling and testing. Evidence suggests that more young people are having sex with multiple partners, although the age of sexual initiation continues to rise.[62] Understanding the interplay of these factors and developing interventions that will be effective in reversing this rise in HIV prevalence is Uganda's new challenge.

Evidence for population level decline in adult HIV prevalence has also been noted in Kenya and Zimbabwe. In both cases, similar alterations in sexual behavior with decreases in multiple partnerships and delayed age at sexual debut have been cited as causal factors.[66,67]

Circumcision

As mentioned previously, studies have determined that male circumcision decreases HIV transmission from female to male upward of 60%. Though these studies did not demonstrate a direct benefit to the female partners of circumcised men, this discovery has been heralded as the most significant finding since the development of HAART or triple drug regimens.[68] Modeling estimates indicate that male circumcision could avert two million new HIV infections and 0.3 million deaths in sub-Saharan Africa in the next 10 years.[69] However, challenges to widespread dissemination of this intervention remain. Safety in settings where health care infrastructure is suboptimal is a concern.[70] In addition, there is evidence to suggest that transmission risk is increased during the healing period postprocedure.[71] Attention must also be directed toward the implications for not only the patient, but toward his sexual partner(s). Though these challenges exist, the benefit of this procedure outweighs current known risks. Therefore, the WHO recommends rapid establishment of circumcision services to optimize HIV prevention in countries with the highest prevalence.

Condom Use and HIV Prevention

According to estimates made by UNAIDS, the HIV epidemic in Brazil appears to be stabilizing.[1] The simultaneous institution of early treatment access and a vigorous prevention campaign have contributed significantly to this stabilization. Condom use has been central to Brazil's national prevention campaign. The country's aggressive promotion of condoms amongst the general population and within high-risk groups has successfully contributed to sustained control of the epidemic. While in other countries condom ads, if broadcast, have been shaded in nuance, Brazil's media campaign has been glaringly overt. For example, a new line of condoms depicting the logos of the most popular Brazilian soccer teams was promoted using nationwide television ads featuring supporters wearing condom-shaped caps in their team's colors. The condoms broke sales records. Contrary to findings from other countries, the acceptability of the female condom has been high in some studies; therefore, both male and female condoms have been promoted and distributed widely.[72]

Opt-Out Testing

The WHO currently recommends opt-out HIV testing and counseling for all individuals attending healthcare facilities, irrespective of the presence of symptoms or the patient's reasons for accessing healthcare. In the developing world, Botswana was a forerunner in the implementation of opt-out testing in medical settings. Prior to 2003, HIV testing was performed after individuals were counseled with patients actively choosing whether or not they agreed to be tested. Though antiretroviral therapy was available for PMTCT since 2001, very few women who received care at antenatal clinics opted to be tested for HIV. To increase the percentage of women who benefited from HIV testing and subsequent PMTCT, Botswana initiated a nationwide opt-out testing program in 2004. Testing remained confidential and noncompulsory.[73] Creek et al. assessed the efficacy of Botswana's approach and found that the percentage of women receiving PMTCT interventions increased from 29 to 56%.[74] According to the 2007 UNAIDS report, 77% of all pregnant women were tested for HIV in 2007 and more than 95% received antiretroviral therapy for PMTCT. Kenya, Malawi, Uganda, and Zambia have implemented similar programs.[1]

Applying Lessons Learned Internationally to the U.S.

The U.S. has suffered from a concentrated epidemic since the first cases were noted in the early 1980s. MSM, minority populations, particularly African Americans and Latinos, and injection drug users have been disproportionately affected. As of 2007, 1.2 million people were estimated to be living with HIV nationally. Annual incidence is down from its peak in the 1980s. However, a potential rise in new cases amongst the most highly impacted populations has been noted.[75] In Washington, DC, the nation's capitol, HIV prevalence within certain populations has been found to be similar to that noted in resource-limited regions of the world.[76]

As scale-up of international treatment programs has progressed, expertise from the U.S. and other western nations where HAART has been available since the mid-1990s has been instrumental. Can any lessons learned through rapid scale-up in the developing world be utilized in the U.S.? As discussed earlier, one of the primary reasons that several countries have noted for a decline in HIV prevalence is the presence of a national strategic plan that incorporates both comprehensive prevention programming and universal access to treatment. Some progress has been made in the development of a national strategy that will specifically target the most vulnerable, disproportionately impacted populations in the U.S. In June 2008, the U.S. House of Representatives Financial Services Appropriations Subcommittee approved a bill that includes $1.4 million to the White House Office of National AIDS Policy for the development of a National AIDS Strategy.

Opt-out testing has a proven benefit in increasing the acceptability of HIV testing and in normalizing the process of obtaining an HIV test. Opt-out testing has

been implemented successfully in resource-limited settings. In the U.S. one in four people who are estimated to be HIV positive are unaware of their status. Those who are unaware of their status are more likely to engage in risky behaviors and therefore have a higher likelihood of transmitting HIV. In 2006, the Centers for Disease Control and Prevention (CDC) recommended that opt-out HIV screening be a part of routine clinical care in all health-care settings for patients of age 13–64.[77] Though opt-out testing has been recommended, few programs have been implemented. Many challenges exist for widespread opt-out testing strategies to be successfully implemented. These include limits on funding for treatment, human resource shortages, and time constraints.[78] However, most agree that opt-out testing is an appropriate and long overdue intervention that must be undertaken in order to reach those who are unaware of infection and ultimately lower the rate of new HIV infections.

Lastly, although studies have shown that adherence to HAART is higher in many resource-limited settings than it is in settings such as the U.S., little is known about whether or not models that promote adherence in the developing world can be transferred to domestic health care settings. As mentioned, many national treatment plans in the developing world have mandated adherence training prior to starting HAART. Intensive adherence training is not standard in health care settings where HIV-infected patients are treated in the U.S. In addition, treatment supporters who assist patients to remain adherent to HAART are a frequent component of programs in resource-limited settings. This model has been implemented in a few locations in the U.S. with some success.[79] Further research should be undertaken to identify the factors that promote adherence in the developing world and to determine their applicability to the U.S. setting.

Remaining Challenges and Conclusions

Over the last few years significant strides have been made that have decreased morbidity and mortality secondary to HIV/AIDS. However, many challenges remain if the rate of new infections is to be further slowed and the goal of universal access to care and treatment is to be reached worldwide. There have been notable failures in critical areas. For example, minimal progress has been made in vaccine development. The most recent vaccine trial sponsored by Merck Pharmaceuticals yielded negative trial results and in post hoc analysis actually increased the risk of HIV transmission.[80] In addition, though studies are ongoing, researchers have thus far been unable to identify an effective microbicide that would decrease the vaginal or rectal transmission of HIV.[81] Both of these factors have led to a reaffirmation of the need to emphasize known prevention strategies and treatment.

Although these and other challenges that have been discussed do exist, efforts to end this epidemic must intensify. Continued focus must be directed toward those populations who are most highly impacted by this disease both domestically and

internationally. Failure to do so will lead to increased inequality within populations already suffering from extreme health care disparities.

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