

**Public Health Aspects of HIV/AIDS in Developing Countries: Epidemiology,
Prevention and Care**

Epidemiology, Prevention and Care of HIV in Peru

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Introduction

The first case of acquired immunodeficiency syndrome (AIDS) in Peru was diagnosed in 1983; the patient was a gay man who had lived in the United States (U.S.) for several years, returning to Peru in 1982. Although the physicians at the public hospital where the patient was admitted had not yet seen this illness, they knew about AIDS in the U.S. and realized that AIDS and their patient's illness were one and the same. Although in hindsight the inevitability of additional cases is clear, at that point many believed that the epidemic was a problem isolated to the U.S. that would not affect Peru on a large scale.

Since then, the HIV/AIDS epidemic has not only become apparent, it has gone through various stages. The initial AIDS case did portend the direction of the epidemic and since 1983 HIV/AIDS in Peru has been concentrated among men who have sex with men (MSM). Although other vulnerable groups exist, such as commercial female sex workers and prisoners, the main burden of the epidemic remains among MSM.

HIV/AIDS has spread throughout the country, although the coastal and Amazonia regions are more affected than the highlands and this remains a primarily urban epidemic.

The government's response to the HIV/AIDS epidemic has also gone through various stages ranging from denial to action, while passing through periods of uncertainty and disorganization. Efforts have included peer education among both sex workers and MSM and the initiation of serologic and behavioral surveillance programs. As in other parts of the world, the action of non-governmental organizations (NGOs) and private voluntary organizations have been of immeasurable importance both for their direct work in prevention and care of people living with HIV/AIDS (PLWHA), as well as their

advocacy efforts which have positively influenced the government's response to HIV/AIDS.

In this chapter we will present information on the epidemiology of HIV/AIDS, discuss the history of the epidemic and the response both of the government and NGOs, the successes and failures of these efforts, and the current realities of the epidemic in Peru.

1. Epidemiology of HIV in Peru

HIV and AIDS are both reported to the Ministry of Health (MoH) in Peru, a procedure that has been mandatory since 1989. The Peruvian General Directorate of Epidemiology collects data on the reported cases and as of November 2006 there were 19,399 AIDS cases and 27,738 cases of HIV reported to the government (OGE., 2006b). The vast majority of these cases are sexually transmitted and most are found in the capital, Lima. The trajectory of the epidemic is described in greater detail below.

1.1 Concentrated HIV Epidemic

The World Health Organization (WHO) in their 2004 report entitled, "Second generation surveillance for HIV: The next decade" defined a concentrated HIV epidemic as one in which high risk groups have an HIV prevalence of 5% or more and the general population has an HIV prevalence of less than 1% (UNAIDS/WHO, 2004). This is the situation in Peru, as it is in much of Latin America. In Peru, the highest risk group for HIV remains MSM.

HIV transmission in Peru is predominantly sexual, with 96% of cases reported to the MoH stemming from sex, with approximately 36% of these infections being due to sex between men (MoH, 2006). The proportion of infections associated with homosexual or

bisexual sex among men has dropped in the last ten years, with more infections being associated with heterosexual transmission (MoH, 2006), and there has been a consequent reduction in the male to female ratio of HIV infection. Approximately 3% of infections are due to vertical transmission and 1% due to parenteral transmission (MoH, 2006). The significant lack of parenteral transmission is primarily due to the lack of injection drug use, which is not the case in other areas of Latin America, notably the southern cone of South America (UNAIDS, 2006b).

1.1.1.1. HIV among Men who have Sex with Men (MSM)

Since the onset of the HIV epidemic in Peru, the primary risk group has been MSM. The prevalence of HIV among MSM is generally found to be between 5 and 15% (UNAIDS, 2006a). The lower rate of 5% is found in MSM populations in urban settings other than the capital, Lima, while the higher rates are encountered in Lima.

Additionally, there are differences in prevalence among distinct groups of MSM as defined by their sexual identification. The group with the highest risk are men who identify as transvestites, many of whom are sex workers, have an HIV prevalence of 30%, followed by men who identify as homosexual or gay who had an HIV prevalence rate of 18% and finally, men who identify as bisexual who had a 15% prevalence of HIV infection (Tabet, Sanchez, Lama et al., 2002).

Given the concentration of the epidemic in the MSM population, the vast majority of research is also focused on MSM. As shown by the results of the Tabet *et al.* study, this research has identified the dangers of grouping all MSM into one collapsed category (Tabet et al., 2002; Caceres, Konda, Pecheny et al., 2006b). Although the term ‘men who have sex with men’, based on a behavioral definition, was created to avoid the

consequences of stigma, it artificially brings together groups that are considerably diverse in many aspects, including sexual identity (Caceres et al., 2006b). This lack of nuance in categorization has marred prevention efforts by trying to treat all MSM alike and ignoring issues of sexuality. Prevention programs often only reach MSM who self-identify as gay, homosexual or transgender, while bisexual men who do not identify as such are more likely to be missed.

1.1.2. HIV among Female Sex Workers

Female sex workers are another high risk group, although the HIV prevalence among female sex workers is generally estimated at between 1 and 2% (McCarthy, Wignall, Sanchez et al., 1996; Campos, Chiappe, Cárcamo et al., 2003). This low prevalence may, however, be deceptive as sex workers who test HIV positive often stop coming to government-promoted monthly health check-ups and become street-based sex workers, no longer participating in surveillance programs. Women, who were initially counted in official HIV/AIDS statistics then, would not be included in subsequent sentinel surveillance studies. While female sex work is legal in Peru, it is legal only for brothel-based sex workers who seek and receive monthly medical exams. The rates of HIV infection found among other sex workers, notably street-based sex workers, are likely to be higher. The rate of HIV infection among street-based sex workers was found to be 9% between 1985 and 1990 (McCarthy et al., 1996), although in subsequent studies this figure was 1%, mirroring rates found among brothel-based sex workers (Sanchez & Gotuzzo, 1994; Cáceres & Mendoza, 2004b).

1.1.3. HIV among Prisoners

Prisoners comprise another high risk population, although very little research has been done among this population. An epidemiological surveillance study in 1999 found that the prison population had an HIV prevalence of 1.1% (Carcamo, Blitchein-Winicki, Valverde et al., 2003). Another study conducted by Doctors without Borders in 2004 yielded an estimated prevalence rate of 2.0%, more than double that found in the general population of Peru (MSF, 2005). The MoH mentions the need for continued surveillance among the population of prisoners (MoH, 2006); however, because of funding constraints they have not been included in surveillance efforts to date. The Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund) provided funding to conduct a surveillance study within the prisons in 2004, however, the results have not yet been released (DGE, 2006). The vulnerability of this population is acute and for the prisoners for whom conjugal visits are allowed, the risk to their female partners must also be addressed. Doctors without Borders has been working in Peruvian prisons since 1998 to combat HIV infection and to address the myriad health problems experienced by this population. .

1.1.4. HIV in the General Population

In the general population the prevalence of HIV is estimated through the testing of pregnant women. The prevalence is estimated to be approximately 0.3% (MoH, 2006) and this rate has not changed substantially in the past 10 years. Despite the low prevalence of HIV in the general population, approximately 50% of HIV/AIDS cases in the country are found within the general population. The MSM population, while a relatively small segment of the overall population, contributes the majority of the other 50% of cases.

Table 1.1. HIV prevalence among the general population between 1986 and 2003,

Peru

Population	General Population (1987-2003)			Authors
	Year(s)	Sample Size	HIV prevalence	
Visa Applicants, Lima and Provinces	1987-1992	21,562	0.3%	(McCarthy <i>et al.</i> , 1996)
Military Recruits, Lima	1995	480	0.2%	(Cáceres <i>et al.</i> 1997)
Blood donors, Lima	1996	18,373	0.4%	(MoH, 2006)
ANC 15-24 year olds, Lima	1996	3,566	0.3%	"
ANC 15-24 year olds, Lima	1997	3,450	0.6%	"
ANC 15-24 year olds, Lima	1996-1997	12,752	0.5%	(Hierholzer <i>et al.</i> , 2002)
Men 18-30, Chiclayo	1997	437	0.5%	(Cáceres <i>et al.</i> 1999)
Men 18-30, Iquitos	1997	432	0.2%	"
Men 18-30, Cusco	1997	405	0.0%	"
ANC 15-24 year olds, Lima	1998	3,990	0.2%	(MoH, 2006)
ANC 15-24 year olds, Lima	1999	3,622	0.3%	"
ANC 15-24 year olds, Lima	2000	9,583	0.2%	"
ANC 15-24 year olds, Provinces	2002	9,978	0.2%	"
Pregnant women, Lima	2003	12,438	0.5%	(Alarcon <i>et al.</i> , 2003)

Table 1.2. HIV prevalence among vulnerable groups between 1986 and 2002, Peru

Population	Vulnerable Groups (1986-2002)			Authors
	Year(s)	Sample Size	HIV prevalence	
MSM, Lima	1986-1990	4,300	26.2%	(McCarthy <i>et al.</i> , 1996)
MSM, Lima	1998	1,328	16.0%	(MoH, 2006)
MSM, Lima	1998-2000	7,041	13.9%	(Hierholzer <i>et al.</i> , 2002)
MSM, other	1998-2000	4,514	5.3%	"
MSM, Lima	2002	451	18.5%	(Tabet <i>et al.</i> , 2002)
MSM, Lima	2002	1,360	22.3%	(MoH, 2006)
MSM	2002	1,923	8.0%	"
MSM	2002	3,280	13.9%	(Lama <i>et al.</i> , 2006)
Registered FSW, Lima	1986-1990	5,973	0.6%	(McCarthy <i>et al.</i> , 1996)
Clandestine FSW, Lima	1986-1990	146	9.6%	"
Registered FSW, Lima	1992	400	0.6%	(Sanchez, <i>et al.</i> 1996)
Registered FSW, Lima	1994	801	0.8%	"
Registered FSW, Lima	1998	1,402	1.6%	(MoH, 2006)
Registered FSW, Lima	1998-2000	3,375	1.2%	(Hierholzer <i>et al.</i> , 2002)
Registered FSW, Provinces	1998-2000	4,936	0.6%	"
Registered FSW, Provinces	2002	4,418	1.1%	(MoH, 2006)
Clients of Registered FSW, Other	2002	4,373	0.5%	"
Prisoners	1999	6,963	1.1%	(Carcamo <i>et al.</i> , 2003)

1.2 Urban/Rural Divide

The majority of HIV infection remains in the cities and urban areas of Peru where approximately 60% of Peru's population lives. Approximately 77% of all HIV/AIDS cases are in the capital, Lima, where roughly one third of the countries' population resides (MoH, 2006). Peru is divided into 24 regions and a time delay map would show AIDS case reporting first only in Lima (1983-1987), followed by regions with large cities including Arequipa and Chiclayo (1987-1992), and by 1992 there was at least one case of AIDS reported in every region. As of 2006, the diffusion of HIV/AIDS in Peru continues, although concentration in Lima and other large cities remains the trend. Additionally, the majority of cases continue to be reported on the coast and in the Amazonian regions of the country. The highlands continue to report very few cases, with most of the regions in this area of the country reporting less than 10 cases a year (OGE., 2006a). There have been isolated reports of HIV clusters in rural communities; although these are the exception and not the rule (Zavaleta, Fernandez, Konda et al., 2007).

1.3. Male to Female Ratio

While at the onset of the HIV epidemic, the male to female ratio was 18:1, this ratio decreased substantially over the first ten years of the epidemic, and since the mid-1990s it appears to have stabilized at around 3:1 (MoH, 2006). This decrease in the male to female ratio appears to have resulted from the transition in the epidemic from one primarily affecting MSM to one also affecting men who had sex with both men and women, in a country where male bisexual behavior is rather common (Paris, Gotuzzo, Goyzueta et al., 2001; Konda, Klausner, Lescano et al., 2005; Caceres et al., 2006b). However, such a shift did not necessarily imply the heterosexualization of the epidemic

since most women affected were monogamous (Alarcon, Johnson, Courtois et al., 2003; Johnson, Alarcon, Watts et al., 2003; Goodreau, Goicochea & Sanchez, 2005). The lack of generalization is evidenced in the HIV prevalence among pregnant women, which has stayed at approximately 0.3% over the past decade.

1.4. Surveillance Efforts

The MoH began HIV surveillance efforts in 1996, following WHO guidelines for surveillance in concentrated epidemic settings. These efforts have primarily focused on MSM, female sex workers, and 15 to 24 year old pregnant women. Biennial surveillance efforts took place with MSM and female sex workers between 1996 and 2002 using sentinel surveillance locations, primarily STI clinics (MoH, 2006).

Sentinel surveillance efforts with high-risk populations have used snowballing techniques and peer outreach workers to recruit eligible participants. These studies grew with each iteration, incorporating more participants and recruitment locations. Recruitment efforts attempt to recruit regardless of HIV status, however, as previously stated some individuals may avoid surveillance studies once they have tested HIV positive, leading to an artificially lower prevalence estimate. Partly due to limited funding, new surveillance surveys did not take place again until late 2006.

Sentinel surveillance among women attending antenatal clinics (ANC) only occurs in MoH hospitals and health centers, which serve approximately 75% of the country's pregnant women (MoH, 2006). Those women who attend private clinics, EsSalud (Social Security clinics, serving people with semi-public work-related insurance), and clinics of the military and police are not included in the MoH's surveillance. Although the rates among the private clinics would most likely be lower than those of the

government clinics, the effect of the exclusion of EsSalud and the military and police health centers is less well understood.

1.5. Estimation of the Number of People Living with HIV/AIDS (PLWHA)

Estimates of the number of people living with HIV/AIDS (PLWHA) range from 24,000 to 93,000. The upper limit is based on the median of the MoH's estimate (MoH, 2006). Estimating the number of PLWHA involves: (1) partitioning the total population into segments based on demographic attributes, e.g. age groups, gender, urban-rural residence and sexual orientation; (2) using appropriate estimates of segment size; and (3) using plausible estimates of HIV prevalence for each segment. The sum of these estimates of PLWHA per segment then would yield the national estimate. All existing national estimates share the same logic, although they vary in terms of the: (1) segments defined; and (2) estimates of population size and HIV prevalence per segment. One such estimate took into account age group, gender, the percentage of MSM, and further subdivided the MSM into those at lower and higher risk of HIV infection, as well as the urban/rural divide of HIV prevalence. This resulted in an estimate of approximately 45,249 PLWHA (Caceres, Mendoza, Konda et al., 2006c).

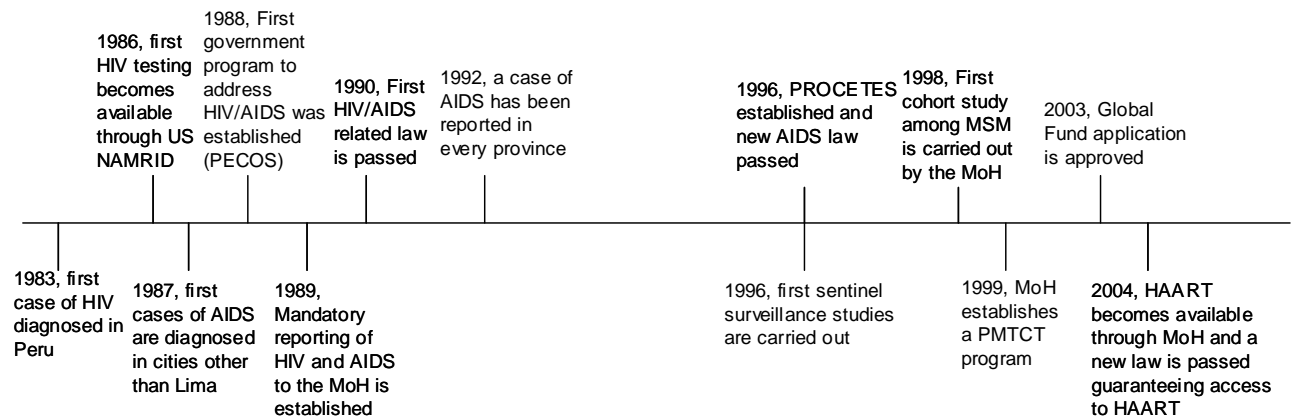
Another estimate, operationalized through UNAIDS Spectrum modeling, yielded the MoH 2005 estimate of 93,000 (with 56,000 to 150,000 as the lower and upper ranges)(MoH, 2006). The main discrepancy between the two estimates is the size of the MSM population to which a high HIV prevalence is attributed. Given the high prevalence observed in sentinel surveillance among MSM, the combination of sub-segments and specific prevalence used may largely impact the total estimate (Caceres et al., 2006b).

1.6. Estimation of the Incidence of HIV

Data on HIV incidence provide additional information on the HIV epidemic. Three studies have estimated the incidence of HIV infection in MSM. The first was calculated from a cohort of high-risk MSM studied from 1998 to 2000 by the MoH. The results of this study yielded an HIV incidence estimate of 3.5/100 person-years (MoH, 2006). The second study published in 2007, retested samples from sentinel surveillance in 1996, 1998, 2000, and 2002 again using sensitive/less sensitive EIA. The results of this study yielded estimates of 11.3%, 4.8%, 12.4% and 8.3% incidence per year (Sanchez, Lama, Kusunoki et al., 2007).

A model of HIV incidence based on the total number of HIV cases reported to the MoH has also been constructed. This model calculated the incidence rate ratio (IRR) for the 1983 to 1995 and the 1996 to 2005 periods. The IRR for 1983 to 1995 was 2.07 per year (95% CI 1.97 – 2.19) and 1.09 (95% CI 1.09 – 1.10) for 1996 to 2005 (Caceres et al., 2006c). This drop in incidence may be interpreted as a sign of stabilization in the epidemic. These estimates are based on the HIV case reporting databases of the MoH, which include reporting biases and surveillance biases, but take into account cases among non-MSM.

Figure 1.1: Timeline of important events in Peru's HIV epidemic (1983-2006)



2. HIV Prevention in Peru: Community and Political response to the Epidemic

The history of the response to the HIV epidemic in Peru is varied and the level of response and importance given to the epidemic has changed drastically over the years. The history of this response has been described in various publications and from a variety of view points, including those internal and external to the government (Cueto, 2001; Caceres, 2006; Caceres, Cueto & Palomino, 2006a; MoH, 2006). These responses can be divided into several periods: 1983 to 1987, 1988 to 1996, 1996 to 2001, 2001 to 2003, and 2003 to the present. The government's role in HIV prevention has been intricately linked to the political will of the MoH and the programs have changed over time direction and scope in accordance with this will.

The first period of the response to the HIV/AIDS epidemic, 1983 to 1987, was somewhat lethargic. The first case of AIDS in Peru was diagnosed in an individual whose infection appeared to have occurred while he lived in the United States. Given this, there was the sense that AIDS had not really reached Peru. The next several cases were similar in that all were gay or bisexual men who had either lived abroad or had sex with foreigners, and all were gay or bisexual men. This cluster of cases encouraged a narrow definition of the AIDS risk group and perpetuated the idea that HIV transmission native to Peru was not occurring. Even though doctors working with AIDS patients understood that transmission was most likely occurring in the country; the government and the public, informed primarily through an ill-informed and sensationalistic media, were convinced that this was a problem solely of the U.S. and gay men with U.S. sex partners. This attitude appears to have added to the complacency of the government's

response (Cueto, 2001; Caceres, 2006). It should also be noted that the political and economic environment was in chaos in the mid and late 1980s under the dual strains of economic collapse and terrorist insurgencies (Cueto, 2001).

Despite the government's lack of response, other actors and organizations began to work to address the burgeoning epidemic. There was a response from civil society, stemming primarily from within the most affected communities, and NGOs began working during this time. Additionally, the presence of a U.S. Naval Medical Research Institute Detachment (NAMRID) helped to establish the first rounds of HIV testing and surveillance in 1986. The studies organized by NAMRID became the *de facto* surveillance mechanism and helped provide evidence of the growth of the epidemic (McCarthy et al., 1996; Cueto, 2001).

In 1988, the Peruvian government established the first AIDS-related program, the Special Program for the Control of AIDS (PECOS, by its Spanish acronym) (MoH, 2006). This signified the beginning of the second period of the government's response to the epidemic, 1988 to 1996. However, even after the establishment of PECOS, the government's response was not overly energetic. The actions of PECOS were more tentative and exploratory than an organized governmental response to the epidemic, the result, in part, of the limited funding provided PECOS. In 1990, the first law related to HIV/AIDS was passed in the Peruvian Congress. The law included a call for monitoring at risk groups defined as homosexuals (Cueto, 2001; Caceres, 2006; Caceres et al., 2006a). Although this law was never implemented, the focus on narrowly defined risk groups speaks to the atmosphere in the country at the time, which considered HIV and

AIDS to be solely linked to homosexual behavior and led to a context of blaming MSM for HIV in Peru.

Several of the NGOs working throughout this period received international funding to aid their work both for HIV prevention and for the care of PLWHA. At this point, funding was mainly provided by the Dutch organization HIVOS, United States Agency for International Development (USAID), and private Peruvian donors. These organizations were also instrumental in lobbying the government to mount an adequate and effective response to the epidemic as well as advocating for the rights of PLWHA. PLWHA were often mistreated or even refused care by health professionals, out of fear based on poor knowledge of transmission as well as prejudice resulting from assumptions about lifestyles (Cueto, 2001).

In 1996, a doctor and founding member of one of the most influential NGOs working on HIV, Via Libre, was appointed to head a new government program to respond to the epidemic. This appointment resulted from Via Libre's pressure on the government to improve their response to HIV/AIDS (Cueto, 2001). The establishment of the Program for the Control of Sexually Transmitted Diseases and AIDS (PROCETSS, by its Spanish acronym) marked a substantial shift in the government's response to HIV/AIDS. This shift took place within the administration of Alberto Fujimori. PROCETSS received funding from the government to establish a coordinated response to HIV and STIs by initiating peer staffed outreach programs for both MSM and female sex workers. They also established 33 PROCETSS offices outside of Lima; this was the first organized effort to respond to HIV/AIDS outside of the capital. Additionally, PROCETSS

established the first surveillance program and made HIV and AIDS case notification mandatory.

There were several criticisms of PROCETSS, the first being that the high level of importance and funding given to PROCETSS was not commensurate with the actual problem of HIV/AIDS in Peru. Even with the Peruvian MoH's overly high estimate that there were 50 to 100 thousand PLWHA in Peru in 1996, Peru suffered from many other diseases which also presented a real threat. Unlike the developed world where HIV represented the unexpected re-emergence of infectious disease, Peru has high rates of other infectious diseases such as tuberculosis (TB) and malaria that continued to cause more morbidity and mortality than HIV/AIDS. Despite this, PROCETSS became the second highest funded public health program in the country, second only to the childhood vaccination program (Cueto, 2001). Another criticism was that PROCETSS mirrored the dictatorial rule of the Fujimori government and did not do enough to work with scientists or the large NGO community that had emerged in response to HIV/AIDS (Cueto, 2001; Caceres, 2006).

In 1996, new HIV/AIDS legislation was passed in the Congress, resulting from the lobbying efforts of Via Libre and PROCETSS. This law adopted non-discriminatory language and established several protections for PLWHA including the right to medical care and the illegality of refusing to treat a PLWHA or refusing employment due to an HIV diagnosis. Additionally, the law established the right to confidentiality of HIV positive individuals and the need for pre and post-test counseling for HIV testing. While this law was not implemented for some time, as the customary implementing regulation

had not been released, its existence speaks to the changing attitude of the government toward HIV/AIDS (Cueto, 2001; Caceres, 2006).

An additional problem in this time period was the lack of action on the part of PROCETSS and the government to secure treatment for HIV/AIDS patients. Highly active antiretroviral therapy (HAART) became available in 1996, however in contrast to the developed world and some developing countries like Brazil, these drugs remained inaccessible to most PLWHA in Peru. Although in 1997 to 1998 the drugs became available for purchase in Peru, their cost per month was prohibitive for the vast majority of PLWHA.

In mid 2001, with the election of Alejandro Toledo, the MoH was given over to Dr. Luis Solari, a conservative Catholic who was not supportive of HIV prevention work nor of activities with vulnerable populations such as MSM and female sex workers. He also openly opposed what he described as an over-emphasis on condoms and tried to undermine them as unsafe and ineffective in preventing disease transmission. In 2002, another conservative Catholic, Dr. Fernando Carbone, was appointed as MoH, a post he would hold until 2003. These two years of conservative control of the MoH were characterized by a lack of action in the area of HIV/AIDS and a reduction in HIV/AIDS related funding, especially for prevention (Cueto, 2001; Caceres, 2006). They did however support the acquisition of funding for treatment, including an application to the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund).

Since 2004, the government's response to HIV/AIDS has been highly influenced by support from the Global Fund. This support has influenced recent HIV/AIDS policy, including a law passed in 2004 which guaranteed HAART for PLWHA who required it.

The Global Fund provided partial funding for treatment for the first two years of the HAART program in Peru, while the government agreed to supply the remaining funds and to continue funding treatment after Global Fund support was no longer available. The specifics of this program are described in more detail later in this chapter. It remains to be seen, however, if the government will be capable of sustaining this level of support for all of those in need.

2.1. Government and Ministry of Health Response to HIV Prevention

The role of the government in the prevention of HIV/AIDS in Peru has had a rocky history, beginning with a disorganized and anemic response, which evolved into a response that although well funded and well organized none the less has failed to provide a sustained effort to increase safer sex and prevention outside of narrowly defined risk groups. However, the efforts of NGOs, researchers, doctors, as well as those affected by the epidemic in pressuring for effective government action have been substantial and have led to a response that has improved markedly over the years.

2.1.1. Peer education and Periodic Medical Check-ups for MSM and Female Sex Workers

In 1996, PROCETSS initiated a peer-education program which included referral to sexually transmitted infection (STI) reference centers where medical check-ups were performed for both MSM and female sex workers. These periodic medical check-ups include HIV testing for MSM and HIV testing for a nominal fee for female sex workers. This fee is levied so that testing can remain voluntary for sex workers, although HIV testing is required to get a certificate of health from the MoH. These services comprise the only VCT services for non-pregnant women in Peru. Under this program, peer

educators from among both MSM and female sex workers were recruited and paid a small stipend to distribute condoms and pamphlets to their peers and for encouraging other MSM and female sex workers to attend STI reference centers for testing and treatment. This innovative strategy which was the first official effort to reach MSM, particularly poor, less educated, high risk men, ultimately encouraged a new wave of sexual minority organizing in inner cities of Peru. Indeed, the program's training engendered a cadre of informed and empowered MSM who went on to organize other MSM in their communities. Several female sex worker led organizations were also formed subsequent to these interventions.

Over time, a lack of monitoring and evaluation has resulted in a decrease in the quality of the program and the decreasing effectiveness of prevention messages. The use of a stipend system for peer outreach workers that valued recruitment quotas over actual need or effectiveness of interventions has also lessened the impact of the program. The lack of information on program evaluation or the number of people it has reached has also been a barrier to maximizing its impact. Sentinel surveillance among MSM indicates an increase in condom use throughout this period (Sanchez et al., 2007), and while this evidence is ecological, it is important nonetheless. This program is still in place in 2007, with little change from its initial approach ten years ago. In the absence of program evaluation, it is difficult to judge the impact that this intervention has had.

2.1.2. HIV Testing of Pregnant Women and the Prevention of Mother to Child Transmission

In 1996, the MoH established a program to prevent mother-to-child transmission (PMTCT) through the provision of Zidovudine (AZT) to HIV-positive mothers and their

children. In 1999, free screening for all pregnant women was established. In 2004, a law was passed requiring HIV testing for pregnant women. Despite both the program and the law, only around 50% of pregnant women were screened for HIV infection in 2004 (Garcia, Velasquez, Segura et al., 2000; MoH, 2006). Barriers to higher rates of testing included ineffective screening activities in obstetric wards and national health centers as well as problems with regular supplies of test kits. Tests are given along with counseling and are free to all pregnant women. At present, under Global Fund support, a program to prevent vertical transmission is in place, which promotes testing among pregnant women, ensures rapid testing at delivery for women who have not been tested, and ensures ARV prophylaxis to prevent infection during pregnancy, delivery and post-partum (Peru AIDS Project supported by GFATM, 2004-2008). New projects funded by the Global Fund will complement this program.

The MoH estimates that 450 children are infected with HIV via vertical transmission per year. This is based on the prevalence rate of 0.2-0.3% among pregnant women, the number of live births per year, and an approximate 30% transmission rate of HIV to an infant via vertical transmission either during the pregnancy, delivery, or post partum (MoH, 2006). Newborns are only followed up for HIV testing if their mother is known to be HIV-positive and given that approximately 50% of pregnant women are not tested for HIV during the course of pre-natal care; their children are also not tested for HIV. This leads to an under registration of vertical transmission and a missed opportunity to incorporate HIV-positive children with into the health system, where they could receive care. These figures may be changing now, given the implementation since 2005 of a

project supported by the Global Fund, aimed at reaching 100% screening coverage of pregnant women, and providing prophylactic regimes to those women testing positive.

2.1.3. HIV/AIDS Prevention in the General Population

It is often noted that although specific strategies for high-risk groups have been implemented, few prevention efforts among the general population have been initiated (Cueto, 2001; Gotuzzo, 2004). This lack is compounded by the stigma surrounding HIV/AIDS, which influences how people outside of the targeted high-risk groups view their risk. This lack of risk perception undermines the adoption of preventive behaviors, such as condom use. Apart from heterosexual men and women, this also affects the risk perception of non-gay or homosexually identified MSM, as HIV risk is linked to a sexual identity instead of sexual risk behavior.

2.2. HIV/AIDS Related Research

Peru has emerged as a center for HIV research over the past 10 to 15 years. There are several recognized contributing factors for this, including that key investigators in infectious diseases were trained in the U.S. in public health during the onset of the HIV/AIDS epidemic in that country and the high HIV incidence rate among MSM, which makes this a good setting for studies of HIV prevention in this population. Additionally, the presence of the U.S. Naval Medical Research Center, a medical research facility with a modern laboratory that opened in 1983, facilitated early HIV diagnostic testing that was not being done anywhere else in the region. There were also large research and training grants awarded to prominent Peruvian medical universities that established a cadre of researchers in infectious diseases who have maintained an interest in HIV/AIDS research.

This led to various Peruvian researchers gaining large grants for HIV research from the US National Institutes of Health and has established Peru as a leading hub for MSM-related HIV research.

There remains a need to increase locally relevant research and to more fully integrate the local community, particularly representatives of vulnerable populations, in the research process and to enhance social control of research. This interaction would increase the social value of research, enrich the research community perspectives in ongoing studies, and in the long run would protect research as a social practice.

2.3. NGOs and HIV prevention

Since the beginning of the HIV/AIDS epidemic in Peru, NGOs have played a large role in prevention efforts in response to HIV. These organizations have created and maintained peer support groups for PLWHA and their families, led education efforts in the general population and among health care providers to decrease stigma and increase awareness, and advocated for the care and human rights of PLWHA. Before 2003, USAID was the most important international funder of AIDS work, and they focused on prevention and research activities. In more recent years, NGOs have become key implementers of projects supported by the Global Fund.

However, despite their influential work, there is a lack of a shared understanding of the epidemic and its main trends (Caceres, 2006). In some ways these distinct perspectives of the epidemic sustain specific niches created by each NGO and lessen the impact that these organizations might have with a more unified effort. The lack of monitoring and evaluation has also prevented civil society organizations from

implementing adequate quality control of their work, due to a failure in viewing these activities as being a key part of successful interventions.

As of 2007, three separate HIV/AIDS projects funded by the Global Fund will be in place in Peru. The most recent is a third 5-year project, funded in the sixth round of the Global Fund in 2006 which joins projects funded in the Global Fund's second round in 2003, and fifth round in 2005, for a total of close to US\$ 80 million. Most of this funding is supposed to pay for prevention and training, while treatment is almost entirely funded by the Peruvian government. This drives Peru to a new and positive context where there is a need for careful evaluation of what has been done, serious implementation of effective interventions with comprehensive community involvement.

3. HIV Care in Peru

3.1. Care of PLWHA

While public healthcare in Peru is theoretically free to those who cannot afford private insurance, the reality is quite different given that the MoH does not have the funds to provide health care to all of those in need. Multiple co-infections, including TB and multidrug-resistant TB (MDR-TB), experienced by PLWHA in Peru cause substantial morbidity and often lead to out-of-pocket expenses that are detrimental and/or prohibitive to care. In addition to resource limitations, the effects of stigma continue to affect the care and treatment of PLWHA by health care personnel. PLWHA can feel that the prejudice with which they receive care is worse than the effects of the disease without care. Additionally, many PLWHA feel the need to hide their illness from family and friends resulting in limited social support.

3.2. The Implementation of HAART in Peru

A 2004 report commissioned by the MoH and the Global Fund reported that approximately 9,000 Peruvians were in need of HAART (Cáceres, Salazar, Rosasco et al., 2004a). Through MoH financing and a grant from the Global Fund, HAART became available through the MoH in May 2005. Although drugs had been available previously, these were only available for out of pocket purchase, which was not feasible for the vast majority of those in need of treatment. In 2004, the Peruvian government committed to providing the money for treatment and passed a law stating that the provision of HAART to those who needed it was mandatory.

HAART was made available through the several reference or referral hospitals of the MoH that have served HIV/ AIDS patients since the beginning of the epidemic; these are tertiary care centers with infectious disease specialists. These reference centers are primarily located in Lima, not only because this is the epicenter of the epidemic, but also because most of the advanced medical care in the country occurs in Lima.

Within 18 months of HAART rollout, approximately 60% of those in need were receiving HAART through the MoH, Social Security, and Armed Forces health care programs (Sebastián, 2005). This achievement should be recognized, as this indicates reaching 60% of those in need within the first year of the program. Sustained efforts are needed to not only reach the remaining 40% estimated to be in need of HAART, but also to continue to provide quality care to those already receiving HAART. This will include training additional health care personnel in the implementation of HAART, assuring the supply of medications, and implementing sufficient support services to assure adherence to the HAART regimens. While the MoH has tried to link social services to the provision

of HAART, the resources available are limited and case workers often do not have sufficient time to adequately serve their patient population. Additionally, even though the medications of HAART are free through the MoH, other medications needed for the treatment of HIV or diagnostic testing, may not be covered and must be paid for out of pocket.

The rollout of free HAART was initially concentrated in Lima, which has the highest prevalence of HIV and the greatest number of hospitals equipped to treat PLWHA. The coverage of treatment provision in other parts of the country is still below the levels in Lima, although even in Lima, medications are sometimes inaccessible. To achieve the levels of success in AIDS care accomplished in other areas of the world, Peru will need to work to assure the availability of the medications and adequately trained providers; without this the promise of HAART will not be realized.

3.3. International Multi-Sectoral Response: Global Fund

Given its increasing gross domestic product, Peru, like much of Latin America, has not been a focus of international support for development. With international health aid in Peru also relatively minimal, support from the Global Fund has had an enormous impact on health related organizations at every level in Peru. The first application for Global Fund money was put together in 2001, but the proposal was rejected. This was due in part to the lack of a coordinating mechanism which was a funding requirement. In 2003, CONAMUSA, a country wide coordinating mechanism, was established; and a new application was submitted to the Global Fund. This application was approved, granting \$24 million to HIV/AIDS and \$26 million to tuberculosis. Of the \$24 million granted to the country for HIV/AIDS, part of the money was allocated to pay for the provision of

HAART during the first two years of the five year grant, while the remainder of the funding was to be used for prevention and surveillance activities (Caceres, 2006).

4. Successful Strategies Employed to Confront the HIV/AIDS Epidemic

The level of awareness of HIV and AIDS, especially among high-risk populations such as MSM and female sex workers, is high and this is most likely due in part to the educational and outreach activities of NGOs and in part the government's peer education program (Caceres et al., 2006c). Behavioral surveillance among high-risk groups and the general population show an increase in condom use, although this may be related to a parallel increase in casual sex (Cáceres et al., 2004b; Caceres et al., 2006c). Surveillance among MSM has also showed increased condom use at last sex, although only with regular partners (Sanchez et al., 2007).

Comprehensive program evaluation and periodic surveillance with timely sharing of the results remains essential for evaluating the success of different prevention strategies. The first comprehensive analysis of MSM surveillance data, covering the period between 1996 and 2002, was not published until 2007 (Sanchez et al., 2007) and there are no published reports on rates of infection among female sex workers or ANC populations. The Global Fund has recently supported several analyses of HIV surveillance data, and it is expected that these analyses will help to improve MoH programs.

Peru's exemplary implementation of its first Global Fund grant, allowed CONAMUSA to successfully apply for two additional projects in 2005 and 2006. This success was due to a highly satisfactory performance in the implementation of Global Fund-supported projects, as well as Peru's ability to move past the numerous bureaucratic

problems experienced by its neighbors. In Latin America, Peru is the second highest recipient of Global Fund AIDS funding after Haiti, a country with a generalized epidemic. The receipt of these funds represents many opportunities as well as many challenges.

5. Conclusions

5.1. Political Challenges in Meeting HIV/AIDS Prevention and Care

As HIV continues to be concentrated among MSM and other high risk and highly marginalized populations, efforts to provide adequate prevention and care are stymied by stigma. Even when technically adequate health services are available to vulnerable populations, their willingness to use these services is limited due to feelings of being poorly treated or blamed for their risk behaviors or illness. Although fear among health professionals that led to situations of refusal to care for HIV patients earlier in the epidemic have dissipated due to increased knowledge regarding transmission, the attitude that PLWHA ‘deserve’ their illness because of ‘inappropriate’ behavior still remains among many health professionals.

This attitude of blaming the victim has also influenced allocation of funding for HIV prevention programs. Since the onset of the epidemic, NGOs representing PLWHA and high risk populations worked not only to provide services to those in need, but also to advocate for a more organized governmental response to the epidemic. It has been argued that this response occurred in 1996 with the formation of PROCETSS (Cueto, 2001). However, the government’s response has not been consistent since that time. Between 2001 and 2003 when the MoH was under the direction of conservative

Catholics, funding for HIV/AIDS was reduced. Since 2003 funding levels for the current HIV/STI national strategy (the bureaucratic successor of PROCETSS) have been restored, although the reduction of the status of the HIV/STI authority in the MoH and the emergence of other actors (e.g. organization implementing Global Fund projects) may have limited the MoH's ability to provide guidance to national HIV/STI efforts. There are numerous and not necessarily concordant interests at play, making transparency and consensus building on the basis of technical analysis and principles of health and human rights critical.

5.2. Public Health Realities and HIV/AIDS in Peru

Despite the relatively low prevalence of HIV, the groups that are affected by the epidemic continue to be at high risk of infection and improved prevention and care efforts focused on their specific needs are needed. Although the leveling off of the male to female ratio of HIV infection does not indicate the generalization or heterosexualization of the epidemic, prevention and surveillance efforts are needed to continually monitor this situation to ensure that this does not occur. In addition, there are several highly marginalized risk groups that have been ignored by current prevention efforts, including clandestine sex workers and prisoners. The effort to provide prevention programs to these groups have not been adequately addressed by the government. NGOs have stepped in to provide prevention interventions not implemented by the government, although their efforts lack consistency and sustainability.

In Peru, as in other countries, the advent of treatment cannot be at the expense of prevention. The legacy of stigma and discrimination remain and although efforts for prevention and care have improved in the government, substantial work remains. Not

only are the issues of the mistreatment of PLWHA in health care facilities still in existence, there are additional insidious vulnerabilities which are revealed in this epidemic including the disempowerment of women, homophobia, and poverty. To neglect addressing these issues which make communities in Peru vulnerable to HIV infection, because of the advent of effective treatment, would be a huge mistake.

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