



Published in final edited form as:

Curr HIV/AIDS Rep. 2014 June ; 11(2): 146–157. doi:10.1007/s11904-014-0204-1.

The Changing Face of HIV in Latin America and the Caribbean

Patricia J García, MD, MPH, PhD^{1,2}, Angela Bayer, MPH, PhD^{1,3}, and César P Cárcamo, MD, MPH, PhD¹

¹Epidemiology, STD, and HIV Unit, School of Public Health and Administration, Universidad Peruana Cayetano Heredia, Lima, Peru

²Department of Global Health, University of Washington, Seattle, Washington, USA

³Division of Infectious Diseases, David Geffen School of Medicine, University of California, Los Angeles, CA, USA

Abstract

Latin America and the Caribbean (LAC) is a region with similarities and important disparities. In recent years LAC has witnessed achievements, with HIV prevalence rates relatively stable for LA and decreasing for the Caribbean. However average values hide differences. General population HIV prevalence in LAC is 0.4% in average. In the Caribbean there are fewer new HIV infections but HIV prevalence among adults exceeds 1% in several countries. It is estimated that 31% of adults living with HIV in LA and 52% of adults in the Caribbean are women. Unprotected sex is the main route of HIV transmission in LAC. Men who have sex with men and transgender women are the populations with the highest prevalence (10.6% and 17.7% respectively); however other key populations such as female sex workers (4.9%), drug users (range 1%-49.7% for intravenous drug users). Prisoners and indigenous populations are also important. LAC has the highest anti-retroviral treatment coverage of any low- and middle-income region in the world, but women and children are less likely than men to receive treatment. There is an important pending agenda to address the gaps in information, prevention and care for HIV in LAC.

Keywords

Latin America; the Caribbean; Latin America and the Caribbean (LAC); HIV; HIV/AIDS; HIV in LAC; MSM; global epidemic

Corresponding author: Patricia J. García, Address: Honorio Delgado 430. Ingeniería. Lima 31, Peru. patricia.garcia@upch.pe, Phone: (511) 319-0028.

Other authors:

Angela Bayer MHS PhD, Address: Honorio Delgado 430. Ingeniería. Lima 31, Peru. angela.bayer@upch.pe, Phone: (511) 319-0028
César P. Cárcamo MPH PhD, Address: Honorio Delgado 430. Ingeniería. Lima 31, Peru. cesar.carcamo@upch.pe, Phone: (511) 319-0028

Compliance with Ethics Guidelines: Conflict of Interest: Patricia J. García, Angela Bayer, and César P. Cárcamo declare that they have no conflict of interest

Human and Animal Rights and Informed Consent: This article does not contain any studies with human or animal subjects performed by any of the authors.

Introduction

Latin America and the Caribbean (LAC) represent 8.3% of the world's population. The region is heterogeneous and ethnically diverse but also shares similarities. Based on those similarities, LAC can be divided into (i) Central American countries: Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama; (ii) Spanish speaking or Latin Caribbean countries: Cuba and Dominican Republic; (iii) Non-Latin Caribbean countries: Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname and Trinidad and Tobago; (iv) South American Southern Cone countries: Argentina, Chile, Paraguay and Uruguay; and (v) South American Andean countries: Bolivia, Colombia, Ecuador, Peru and Venezuela, which are very different (e.g. Bolivia and Ecuador have very important native indigenous populations, while in Colombia and Peru, mestizo populations predominate); (vi) Mexico; and (vii) Brazil. These last two countries are usually considered separately from the regions, due to their own large populations and land areas.

LAC countries have a higher average per capita GDP (around US\$9000) than other developing regions, with 16 countries classified as middle-income and two as high-income (1). However LAC has the greatest income inequality of any region in the world (2).

The purpose of this article is to review research papers and reports from national governments and regional and international health agencies regarding HIV prevalence, incidence and trends, genotypes, key populations including women, HIV treatment and resistance, and highlights regarding prevention in the region. The goal is to illustrate the changing face of HIV in LAC and remaining challenges.

HIV in Latin America and the Caribbean

The HIV epidemic in LAC began in the early eighties and has evolved since (3). For 2012, the total estimated number of adults and children living with HIV in LAC reached 1.5 million (4), but the epidemic is not homogenous across the region (5). General population prevalence in LAC is 0.4%, based on the report of 26 LAC countries for 2012 (6). However as seen in Table 1, in the 8 Caribbean countries reporting data, 7 have prevalences over 1%, and 7 LA countries have prevalences over 0.5%. One country, Cuba, reported prevalence under 0.1%. Worldwide the Caribbean is the region with the second highest prevalence after sub-Saharan Africa(6).

Trends on HIV prevalence and incidence in LAC

As shown in Figure 1, data on HIV adult prevalence and incidence from the 2013 UNAIDS report (6) show interesting trends in LAC. From 1990 through 2012 there have been only slight variations in HIV prevalences in the Andean and Southern cone countries, Brazil and Mexico. By contrast, the prevalences for the Latin Caribbean, and moreso the Non-Latin Caribbean countries peaked above 1% in the same two decade period, indicating generalized epidemics, that are fortunately receding in both sub-regions. The behavior of the epidemic in Central American countries is more erratic, with peaks in 1992 and 2000, the first of which is probably an artifact of variations in the completeness of the data collected. In general,

sub-regions that reached the highest levels fortunately show important declines, while the other sub-regions have reached a steady state.

Incidence data are harder to obtain, and in many cases incidence estimates have not been properly adjusted (7)(8). The 2013 UNAIDS report showed that from 1990 to 2012 there was a dramatic sustained drop in annual incidence in the Latin and Non-Latin Caribbean countries (Figure 1). Annual incidence rates in Mexico have always been low, but also showed a decline. In the Andean countries, incidence peaked at 53 cases per 100,000 population in 2006, but then dropped to less than 20 cases after 2000, leveling off after 2005. To a large degree then, incidence figures are encouraging in all sub-regions with data available. The report did not include incidence data for Brazil or Southern cone countries.

HIV genotypes in LAC

HIV-1 subtype B has been the predominant form circulating in LAC, followed by subtypes C, F, and A. The BF circulating recombinant form (CRF) has been found in Brazil, Uruguay and Argentina (9)(10)(11).

Women Living with HIV in LAC—An estimated 31% of adults living with HIV in LA and 52% of adults in the Caribbean are women (6). The ratio of men to women living with HIV varies by country but on average in LA more men than women have HIV, ranging from 1.4 in Paraguay to 6.2 in Chile (Table 1). On the other hand in most Non-Latin Caribbean countries, more women than men are HIV positive. Women's vulnerability to HIV is influenced by diverse contextual factors – including physical, social, economic, and policy-related – operating at multiple levels and affects women from different ages and at different situations (12). However, most studies and efforts with women in the LAC region have been focused on pregnant women and sex workers.

Table 1 presents national statistics as reported to the Pan American Health Organization and the United Nations. HIV testing among pregnant women has increased greatly from 2005 to 2011, from 29% to 66% in LA and 24% to 61% in the Caribbean. However, the proportion of pregnant women who were tested for HIV and received their results varies greatly by country. In Guatemala and Mexico, only 30% and 37% of pregnant women, respectively, were tested. Coverage stood at less than 50% in the Dominican Republic and Paraguay and at 70% or less in several Central American, Andean and Non-Latin Caribbean countries (13).

Independent research studies show disparities in HIV testing by pregnant women's characteristics. In El Salvador, a national representative sample of 2,929 pregnant women showed that HIV testing was higher among women with more education, higher income, more antenatal care visits and living in areas with lower HIV incidence (14). Another study in Colombia showed that women with subsidized insurance for poor citizens had lower odds (OR=0.82) of being tested for HIV(15).

HIV prevalence among pregnant women in most countries in LAC is 0.5% or less, except for those in the non-Latin Caribbean region, with prevalences as high as 2.5% reported in

Haiti (13). However there has been a decline of HIV prevalence among pregnant women in this country (16)(17).

Prevention of Mother-to-Child Transmission (MTCT) of HIV

Antiretroviral coverage among pregnant women increased from 2005 to 2011 from 42% to 67% of pregnant women in LA and from 14% to 79% of pregnant women in the Caribbean (13). Antiretroviral coverage varies by country. As seen in Table 1, coverage is lowest in Guatemala (16%) and Venezuela (34%) and Belize, Dominica and St. Kitts and Nevis report coverage at 100%.

The MTCT rate for LAC decreased from 18.6% (10.5-22.9%) in 2010 to 14.2% (5.8-18.5%) in 2011 (13). Several countries reported reaching the regional target of vertical transmission rate under 2%, including Barbados, Dominica, Grenada, St. Kitts and Nevis and St. Lucia (all 0.0%), Panama (0.5%) and Cuba (1.1%). Argentina, Costa Rica and Nicaragua were close to the target (rates of 2-5%). However many countries remain with very high vertical transmission rates with the higher levels for Bolivia (21.7%), Venezuela (25.5%) and Guatemala (31.0%)(13).

Finally, the proportion of infants born to HIV-positive women receiving prophylaxis to prevent MTCT (Table 1) and receiving virological testing within two months of birth varies also greatly by country(13).

HIV infection in Children and Youth in LAC

The number of children acquiring HIV infection declined in both the Caribbean, by 32%, and LA by 24%, from 2009-2011(13).

There is limited information about young people living with HIV in LAC. Prevalence among 15-24 year olds was estimated at 0.3% or less among most males and females throughout LA. Estimates are lacking for six Caribbean countries. In others, prevalence among 15-24 year olds was estimated to be 0.5% or less in Cuba, Barbados, Dominican Republic and among males in Guyana and females in Jamaica. In other Caribbean countries, prevalence among youth stood at 0.6-0.9%, with the exception of Bahamas, with an estimated prevalence of 1.3% among male and 1.8% among female youth (6).

One study analyzed the characteristics of 12-21 year olds from a prospective cohort study of HIV-infected youth at 15 sites in Brazil, Argentina and Mexico. Sixty-nine (58%) participants acquired HIV through vertical transmission and 51(42%) through horizontal transmission. In the latter group, 33 (65%) were through sexual transmission, 10 (20%) through blood transfusions and 8 (15%) through unknown causes (18). In Haiti, a study on risk factors for HIV in adolescents and young adults attending a clinic for voluntary counseling and testing, showed a prevalence of 6.3% 2533 females and 5.5% of 858 males (19).

HIV in Key Populations

a. Men Who Have Sex with Men (MSM) and Transwomen (TW)—Recent reviews demonstrate that MSM and TW are at very high risk for HIV infection globally (20)(21) and

in LAC (22). The global review of MSM found pooled HIV prevalence of 14.9% (95% CI: 14.1-15.7) for Central and South America and 25.4% (95% CI: 21.4-29.5) for Caribbean, with the latter representing the highest pooled estimate of any region (20). The global review of transwomen found a pooled HIV prevalence of 17.7% (95% CI: 15.6-19.8) for 10 low- and middle-income countries, including 5 Latin American countries (21). The regional review found a median HIV prevalence of 10.6% among MSM in LAC (22).

Recent studies with MSM in LAC have used different sampling methods and most have used respondent-driven sampling (RDS), as shown in a review of RDS-based HIV surveillance among MSM and other key populations in LAC (23). Other recent studies have included data on transwomen. (See Table 2)

Studies in the Andean Region found HIV prevalences ranging from 5.6% to 15.3% among MSM (24)(25)(26)(27). HIV prevalence in Cali, Colombia was higher, at 24.1% (25). Colombia and Peru had very large samples and Peru's sample included a high proportion of transwomen (17.8%). Peruvian transwomen had a higher HIV prevalence (20.8%) than the overall sample (12.4%) of MSM and transwomen (27). Two research studies in Lima, Peru warrant mention. An RDS study with only transwomen (n=439) found an estimated HIV prevalence of 29.6% (28). A small study that compare 89 Cercado (downtown) and non-Cercado (close urban) MSM sex workers, found much higher HIV prevalence among the Cercado (23%) versus non-Cercado sex workers (4%) (29). No data are available for Venezuela.

In 2009, Brazil carried out its first national biological and behavioral HIV surveillance survey among MSM. The study used RDS to sample 3,859 MSM across 10 cities. Overall HIV prevalence among those tested was 11.1%. HIV prevalence was highest in Rio de Janeiro (16.5%) but transwomen were not included in the survey (30).

Most recent studies in Central America have used RDS and reported HIV prevalences ranging from 2.8% to 10.9%. Central America is a leader in the region for considering transwomen as a unique population. In all studies except the one in Panama, the proportion of transwomen included ranged from 5.4% to 27.9% of the sample or testing pool. HIV prevalences among transwomen ranged from 14.6% to 23.8% (31)(32)(33)(34)(35)(36)(37)

High-quality data on HIV prevalence among MSM in the Caribbean is highly limited, with the exception of the Dominican Republic. Many studies used convenience sampling with very small or biased samples and most provided little information about the methodologies employed or samples included. Nevertheless, these studies represent an important step forward in countries that previously had no previous data about HIV prevalence among MSM, particularly considering that several countries found very high prevalences (38)(39)(40)(41)(42)(43)(44)(45). Jamaica reported the highest HIV prevalence among MSM (32.8%) of any country in the entire LAC region(46).

Mexico carried out the largest recent study in LAC, with 6,723 MSM from 24 cities. After mapping MSM gathering points in each city, the study used a two-stage probabilistic design to select cities and gathering points in each city. Overall HIV prevalence was 16.9%,

ranging from 9.9% in central west to 20.4% in central east Mexico. The study did not analyze transwomen separately (47).

Regarding the Southern Cone countries, studies from Argentina, Chile and Paraguay that used RDS with MSM, with no separate analyses for transwomen. The HIV prevalence was 17.3% in Buenos Aires, 21.1% in Santiago/Valparaíso, and a very low 0.5% in Ciudad del Este, in the Paraguayan triple-border area with Brazil and Argentina. (48)(49)(50)(51).

One of the remaining significant challenge in the region, having recognized the magnitude of the epidemic among MSM and transwomen, is to focus enough resources on prevention and treatment within these groups. A study evaluating resource allocation for HIV, demonstrated that in the 23 countries reporting data, 75% of expenses go to treatment and care while only 15% go to prevention. Moreover, of the 12 countries reporting investments in prevention, only Peru reported more than 5% of HIV prevention funding directed towards MSM prevention activities (52). The funding mismatch regarding treatment and prevention and regarding appropriate targeting of prevention activities to those key populations with the highest vulnerabilities needs to be resolved.

b. HIV and Prisons in LAC—Early during the HIV/AIDS epidemic, prisons were recognized as areas where HIV transmission could happen more often due to overcrowding, violence, lack of information about HIV, and the presence of people infected prior to imprisonment. Frequent, although not always “accepted,” practices such as drug use, same sex intercourse or commercial sex increase the risk of HIV acquisition or transmission among these confined individuals (53). However data relevant to these populations are limited (54). One global review regarding HIV in prisons showed that prevalences could be as high as 37.5% (55). Three LA countries reported very high prevalences: Argentina (37.5%); Cuba (25.8%); and Brazil (from 3.4% to 17.4% in Rio de Janeiro). Most of the data came from conference abstracts, from specific cities or institutions, and from the 1990s. A review of articles published in scielo (www.scielo.org) showed more recent data. In prisons in Peru, there was a prevalence of 1.1% for men in one of the largest prisons in the country (56) and 2.2% for women, the latter with very high prevalences of other sexually transmitted diseases (57). Studies in other countries showed higher HIV prevalences among male prisoners: Belize with 4.0% (58), Uruguay with 6.5% (59), and Venezuela with 4.0% (60).

There are very few studies regarding prevention or challenges of antiretroviral treatment among prisoners. One recent study from Brazil demonstrated a high proportion of virologic failure among inmates under treatment, with low adherence to ARV and high proportion of primary and secondary resistance (61). There is a need to have more and better information to guide prevention and treatment and care strategies in prisons in LAC, particularly considering the risks, high morbidity and the potential of transmission of HIV and resistance within and outside such facilities.

c. Female sex workers (FSW)—Commercial sex varies across the world but has been identified as one of the key practices driving the HIV pandemic (62). HIV infection among FSWs varies by geographical epidemic typology, structural factors (power dynamics,

violence, stigma, policies) and overlapping risk behaviors such as injection drug use and condom use (63).

Despite the fact that FSW have lower reported HIV prevalences than MSM, they represent a key population for transmission of HIV and other STIs and for prevention activities in LAC due to the high percentage of men visiting FSWs on average 5-7% of men in the region (64).

Although data characterizing HIV risk among FSWs are scarce, the burden of disease is high overall and even higher in non-Latin Caribbean countries. A recent meta-analysis of HIV infection in FSW, included data from 9 countries in LA and two from the non-Latin Caribbean region (65). The estimated HIV prevalence among FSWs in LA countries was 4.9%, with values ranging from 0% in Chile to 9.7% in Honduras. HIV prevalence among FSWs was higher in the Caribbean, 8.8% in Jamaica, and 27.6% in Guyana, as confirmed in a recent UNAIDS report (66). Another interesting observation was that the estimated odds ratio for HIV infection among FSWs vs general population females for LAC was 12.0, high but still lower than for Africa or Asia (65).

In a comprehensive national survey from Peru, HIV prevalence among FSWs was estimated at 0.5%, versus 0.1% for general population females, with an excess odds of 5.0 (67). Promotion of protective sexual practices including access to HIV/STI prevention services and testing might be higher among FSW than among women in the general population. In the case of Peru, the National HIV/STI Program began implementing HIV/STI prevention activities and services to FSWs very early in the epidemic, which may explain the low HIV prevalence in this population (68). In Honduras a prevention intervention with FSWs in 3 cities maintained HIV were associated with HIV prevalences at about 0.44% among FSWs. (69)

A survey of 19 Latin American countries regarding organizational aspects of HIV/STI National programs showed that regular HIV screening (together with syphilis screening) is almost universal in the region for FSWs (16/19 countries). Availability of regular HIV screening for other key populations is much lower: pregnant women (8/19); men who have sex with men (4/19); and prisoners (1/19) (70). The early recognition of a need and implementation of services for FSWs as an HIV prevention strategy in several countries in LAC region could explain the relatively low levels of HIV infection in this population compare with MSM, and highlights the importance of such services. However it is clear that there is a great variability between and within countries, including for example differences within the same city by type of commercial sex venue.

There is a need to further study the legal and policy environments in which sex workers operate and the effects of interventions in this area e.g. “registration” of FSWs (71)(72). There is evidence of the positive effect of prevention interventions which suggests the need to continue, scale up and strengthen HIV prevention programs directed to FSWs in LAC.

d. Drug users—According to a study published by the United Nations Office for Drug and Crime (UNODC) (73), the use of illegal drugs in LAC is 4.8%, higher than the global average of 3.8%. However the region has certain peculiarities. Marijuana and cocaine are

the most common used, after alcohol. Injected drugs are mainly used in the Southern Cone, Brazil and in Caribbean countries (74). In Andean countries like Bolivia, Colombia, Ecuador and Peru smoking cocaine base paste is more popular (75).

HIV is associated with intravenous drug use (IDU) in certain parts of LAC (76). However data on this issue is scarce. According to a recent systematic review, in the Caribbean data are only available for Puerto Rico (HIV prevalence 12.9% in IDU) and for Latin America, only for Argentina, Brazil and Colombia with prevalences of 49.7%, 48% and 1.0% respectively (77). In Puerto Rico, IDU accounted for 40% of men and 26% of women newly infected with HIV in 2006 (78). In Mexico, a mixture of commercial sex and IDU has been documented as an important driver of the epidemic, especially along the US-Mexico border (79)(80)(81). Crack cocaine users appear to be another affected population in the region due to risky behaviors as unsafe sex and commercial sex in order to support their drug use habits (82). Finally, and given the high prevalence of alcohol use region-wide, a recent study explored alcohol use among 5,148 men who have sex with men in Peru. The study found that 62.8% had at least one alcohol use disorder and that having a disorder was associated with higher HIV risk-taking behavior (83)

e. Indigenous populations—HIV among indigenous populations is an emerging public health concern (84). These populations have socioeconomic and health disadvantages. Although they account for 4.5% of the total global population, they represent 10% of the global poor (85). In LAC, 512 indigenous populations have been identified. Brazil has the higher number of groups, but approximately 87% of all indigenous population live in Bolivia, Colombia, Guatemala, Mexico and Peru (86). Nonetheless, HIV data on indigenous populations in Latin America are scarce. In Peru, a seroprevalence study in 2004 found a very high HIV prevalence of 7.5% and 6.3% among two Chayahuita communities, associated with male to male sex and returning migrants to the community (87). In a more recent study from Peru, HIV prevalence was 0.16% and 0.29% for women and men, respectively, for 6 Amazon Basin communities (88). In two other remote Peruvian communities, HIV prevalence was 0.0% for women and 0.7% for men, with both HIV positive cases among men who reported sex with other men (89).

In Brazil, a study with indigenous populations from the Amazon found an HIV prevalence of 0.1% (90). In Honduras, a study with Garifuna Indians found a prevalence of 4.5% (91). In Venezuela, a study with the Warao Amerindians found a very high prevalence of 15.6% for men and 2.6% for women (92). In Paraguay a study on indigenous women from different ethnic groups showed a prevalence of 0.6% (93).

As shown, although data varies according the group studied, HIV is already affecting indigenous populations. Overall, prevalence remains low, but is associated with risk factors such as same sex intercourse among men and migration. Some of these indigenous groups are nearing extinction and the promotion of condom use is not popular since they are trying to have more children. Therefore, there is an urgent need to monitor trends but more importantly to develop culturally appropriate sexual health programs and prevention strategies targeted specifically to these population.

Antiretroviral therapy (ART) in LAC—LAC initiated the introduction of ART relatively early. Brazil and Argentina took the lead in the implementation of ART free access programs in 1991-1992, together with laboratory systems for monitoring (94). Impressive progress has been seen in the last years, with ART treatment coverage increasing from 64% to 80% in Latin America and 45% to 70% in the Caribbean between 2009 and 2012 (6). Universal access to treatment has been achieved in Brazil, Costa Rica and Mexico (95). Funding for ART in LAC is mainly through domestic resources (52). The scale up of treatment in the region has been achieved due to decentralization, community programs, price negotiations, and expanding local production and distribution of ART drugs (95). Increase access to ARV has resulted in decrease mortality due to HIV/AIDS in the region at least 50% between 2001 and 2010 (96).

Since ART implementation in LAC began more than a decade ago, concerns about the emergence and spread of drug resistance strains have arisen. Since most patients in LAC started directly with HAART instead of mono or biotherapies like in the US or Europe, initially concerns were lower. Nevertheless, other issues such as low adherence, stockouts or the lack of second-line therapies could promote emergence or resistance and then spread to new HIV infections. A recent review on ART resistance in LAC highlighted differences within the region and showed that most countries have reached WHO threshold of 5% of resistance, with a regional average of 7.7% resistance strains. This underscores the need to monitor resistance in the region (97).

There are important gaps related to ART coverage in LAC. For example estimated ART coverage is higher among men (64%) than women (56%) for the Caribbean countries (76). Coverage for key populations is estimated to be much lower due to lack of knowledge, fear to discrimination and poor access to overall health and HIV-related services. One study on the treatment cascade in LAC comes from Brazil and showed that people are lost at various stages during ART, reducing significantly the proportion reaching viral load suppression (6).

Conclusions

The face of HIV is changing in LAC, with overall trends indicating a positive evolution with declining prevalences. However disparities and challenges remain. There is an important pending agenda to (1) improve monitoring of the epidemic, especially among key populations, such as MSM; (2) resolve the funding mismatch between treatment and prevention; and (3) target prevention and treatment services to key populations while assuring continuity and monitoring of care.

References

1. Country and Lending Groups | Data. 2013. Internet[cited 2014 Feb 6]. Available from: <http://data.worldbank.org/about/country-classifications/country-and-lending-groups#LAC>
2. Gasparini, L.; Lustig, N. Ecineq WP 2011-213. Society for the Study of Economic Inequality; 2011. The rise and fall of income inequality in Latin America. Internet[cited 2014 Feb 6]. Available from: <http://www.ecineq.org/milano/wp/ecineq2011-213.pdf>
3. Quinn TC, Zacarias FR, John RK. HIV and HTLV-I infections in the Americas: a regional perspective. *Medicine (Baltimore)*. 1989 Jul; 68(4):189–209. [PubMed: 2544782]

- 4**. De Boni R, Veloso VG, Grinsztejn B. Epidemiology of HIV in Latin America and the Caribbean. *Curr Opin HIV AIDS*. 2014 Jan 3. Provides key information on the current state of the HIV epidemic in the LAC region, including overall prevalence and incidence and the situation among key populations including MSM, TW, FSWs and IDUs.
5. Bastos FI, Cáceres C, Galvão J, Veras MA, Castilho EA. AIDS in Latin America: assessing the current status of the epidemic and the ongoing response. *Int J Epidemiol*. 2008 Aug; 37(4):729–37. [PubMed: 18653508]
- 6**. Joint United Nations Programme on HIV/AIDS (UNAIDS). Global Report: UNAIDS Report on the Global AIDS Epidemic 2013. Geneva: Joint United Nations Programme on HIV/AIDS (UNAIDS); 2013. Provides information on changes in the HIV epidemic globally and in the LAC region from 2001 to 2012, with a focus on advances toward the achievement of the Millennium Development Goals
7. Hargrove J, van Schalkwyk C, Eastwood H. BED estimates of HIV incidence: resolving the differences, making things simpler. *PLoS One*. 2012; 7(1):e29736. [PubMed: 22235334]
8. Bärnighausen T, McWalter TA, Rosner Z, Newell ML, Welte A. HIV incidence estimation using the BED capture enzyme immunoassay: systematic review and sensitivity analysis. *Epidemiol Camb Mass*. 2010 Sep; 21(5):685–97.
9. Buonaguro L, Tornesello ML, Buonaguro FM. Human immunodeficiency virus type 1 subtype distribution in the worldwide epidemic: pathogenetic and therapeutic implications. *J Virol*. 2007 Oct; 81(19):10209–19. [PubMed: 17634242]
10. McCutchan FE. Global epidemiology of HIV. *J Med Virol*. 2006; 78(Suppl 1):S7–S12. [PubMed: 16622870]
11. Butler IF, Pandrea I, Marx PA, Apetrei C. HIV genetic diversity: biological and public health consequences. *Curr HIV Res*. 2007 Jan; 5(1):23–45. [PubMed: 17266555]
12. Strathdee SA, Wechsberg WM, Kerrigan DL, Patterson TL. HIV prevention among women in low- and middle-income countries: intervening upon contexts of heightened HIV risk. *Annu Rev Public Health*. 2013; 34:301–16. [PubMed: 23297666]
- 13**. 2012 Progress Report: Elimination of Mother-to-Child Transmission of HIV and Congenital Syphilis in the Americas. Washington, DC: Pan American Health Organization (PAHO); 2013. Provides information on changes in key indicators related to the prevention of MTCT of HIV (and congenital syphilis) in the LAC region from 2005 to 2011. Includes many statistics that are unavailable in national and international reports, particularly for small countries
14. El Bcheraoui C, Nieto Gómez AI, Dubón Abrego MA, Gagnier MC, Sutton MY, Mokdad AH. Disparities in HIV Screening among Pregnant Women - El Salvador, 2011. *PLoS One*. 2013; 8(12):e82760. [PubMed: 24349356]
15. Ettenger A, Bärnighausen T, Castro A. Health insurance for the poor decreases access to HIV testing in antenatal care: evidence of an unintended effect of health insurance reform in Colombia. *Health Policy Plan*. 2013 Apr 18.
16. Gaillard EM, Boulos LM, André Cayemittes MP, Eustache L, Van Onacker JD, Duval N, et al. Understanding the reasons for decline of HIV prevalence in Haiti. *Sex Transm Infect*. 2006 Apr; 82(Suppl 1):i14–20. [PubMed: 16581754]
17. Hallett TB, Aberle-Grasse J, Bello G, Boulos LM, Cayemittes MPA, Cheluget B, et al. Declines in HIV prevalence can be associated with changing sexual behaviour in Uganda, urban Kenya, Zimbabwe, and urban Haiti. *Sex Transm Infect*. 2006 Apr; 82(Suppl 1):i1–8. [PubMed: 16581753]
18. Santos Cruz ML, Freimanis Hance L, Korelitz J, Aguilar A, Byrne J, Serchuck LK, et al. Characteristics of HIV infected adolescents in Latin America: results from the NISDI pediatric study. *J Trop Pediatr*. 2011 Jun; 57(3):165–72. [PubMed: 20685800]
19. Dorjgochoo T, Noel F, Deschamps MM, Theodore H, Dupont W, Wright PF, et al. Risk factors for HIV infection among Haitian adolescents and young adults seeking counseling and testing in Port-au-Prince. *J Acquir Immune Defic Syndr* 1999. 2009 Dec 1; 52(4):498–508.
- 20**. Beyrer C, Baral SD, van Griensven F, Goodreau SM, Chariyaertsak S, Wirtz AL, et al. Global epidemiology of HIV infection in men who have sex with men. *Lancet*. 2012 Jul 28; 380(9839): 367–77. Provides estimates of the epidemiology and drivers of HIV among men who have sex

- with men worldwide, including important molecular epidemiology and network simulation modeling data as well as data from the LAC region. [PubMed: 22819660]
- 21**. Baral SD, Poteat T, Strömdahl S, Wirtz AL, Guadamuz TE, Beyrer C. Worldwide burden of HIV in transgender women: a systematic review and meta-analysis. *Lancet Infect Dis.* 2013 Mar; 13(3):214–22. Provides estimates of HIV prevalence among transwomen in low- and middle-income countries and includes data from Latin America. [PubMed: 23260128]
 - 22**. Miller WM, Buckingham L, Sánchez-Domínguez MS, Morales-Miranda S, Paz-Bailey G. Systematic review of HIV prevalence studies among key populations in Latin America and the Caribbean. *Salud Pública México.* 2013 Jul; 55(Suppl 1):S65–78. Provides a detailed, comprehensive review of HIV prevalence studies among MSM and FSWs in the LAC region that were published from 1986-2010 in English, Portuguese and Spanish.
 23. Montealegre JR, Johnston LG, Murrill C, Monterroso E. Respondent driven sampling for HIV biological and behavioral surveillance in Latin America and the Caribbean. *AIDS Behav.* 2013 Sep; 17(7):2313–40. [PubMed: 23568227]
 24. Study about Masculine Sexuality and HIV in Bolivia (SEMVBO). Bolivia: Ministerio de Salud y Deportes, Programa Nacional de ITS/VIH/SIDA; 2010.
 25. Study about Sexual Behaviors and HIV Prevalence among Men who have sex with men in Seven Cities in Colombia. Bogotá: Ministerio de Protección Social, Fondo de Población de las Naciones Unidas; 2011.
 26. Jacobson JO, Sánchez-Gómez A, Montoya O, Soria E, Tarupi W, Chiriboga Urquiza M, et al. A Continuing HIV Epidemic and Differential Patterns of HIV-STI Risk among MSM in Quito, Ecuador: An Urgent Need to Scale Up HIV Testing and Prevention. *AIDS Behav.* 2014 Jan; 18(1): 88–98. [PubMed: 23620242]
 27. Final Report: Study of Epidemiologic Surveillance of STIs and HIV among Men Who Have Sex with Men Comparing Recruitment Methodologies: Convenience Sampling, Time Space Sampling and Respondent Driven Sampling. Coordinadora Nacional Multisectorial en Salud, Fondo Mundial de Lucha Contra el Sida, la Tuberculosis y la Malaria; CARE – PERU: 2011. Lima
 28. Silva-Santisteban A, Raymond HF, Salazar X, Villayzan J, Leon S, McFarland W, et al. Understanding the HIV/AIDS epidemic in transgender women of Lima, Peru: results from a sero-epidemiologic study using respondent driven sampling. *AIDS Behav.* 2012 May; 16(4):872–81. [PubMed: 21983694]
 29. Bayer AM, Garvich M, Díaz DA, Sánchez H, García PJ, Coates TJ. “Just getting by”: a cross-sectional study of male sex workers as a key population for HIV/STIs among men who have sex with men in Peru. *Sex Transm Infect.* 2014 Jan 3.
 30. Kerr LRFS, Mota RS, Kendall C, Pinho A, de A, Mello MB, Guimarães MDC, et al. HIV among MSM in a large middle-income country. *AIDS Lond Engl.* 2013 Jan 28; 27(3):427–35.
 31. Solano Chinchilla, T. Prevalence of HIV, syphilis and risk behaviors among men who have sex with men in the Greater Metropolitan Area of Costa Rica. San José, Costa Rica: Ministerio de Salud; 2010.
 32. Galván Orlich, G.; Armero Guardado, J.; Paz Bailey, G.; Creswell, J. Central American Survey for Surveillance of Sexual Behavior and HIV/STI Prevalence among Vulnerable Populations (ECVC) El Salvador. San Salvador: Ministerio de Salud, Programa Nacional de ITS/VIH SIDA - El Salvador, Universidad del Valle de Guatemala, Centers for Disease Control and Prevention, Global AIDS Program Regional Office and Central America and Panama; 2010.
 33. Creswell J, Guardado ME, Lee J, Nieto AI, Kim AA, Monterroso E, et al. HIV and STI control in El Salvador: results from an integrated behavioural survey among men who have sex with men. *Sex Transm Infect.* 2012 Dec; 88(8):633–8. [PubMed: 22917694]
 34. Morales-Miranda, S.; Álvarez-Rodríguez, B.; Arambú, N.; Aguilar, J.; Huamán, B.; Figueroa, W., et al. Survey for Surveillance of Sexual Behavior and HIV/STI Prevalence among Vulnerable Populations and Key Populations. Guatemala 2013. Ciudad de Guatemala: Universidad del Valle de Guatemala, Ministerio de Salud Pública y Asistencia Social de Guatemala, HIVOS; 2013.
 35. Paredes, M.; Morales Miranda, S. Central American Survey for Surveillance of Sexual Behavior and HIV/STI Prevalence among Vulnerable Populations Men who have sex with men ECVC Honduras. Tegucigalpa: Secretaría de Salud de Honduras, Centers for Disease Control and Prevention, Global AIDS Program Regional Office and Central America and Panama; 2008.

36. Principal results among men who have sex with men and transwomen. Managua: Gobierno de Reconciliación y Unidad Nacional de Nicaragua, Universidad del Valle de Guatemala; 2009. Central American Survey for Surveillance of Sexual Behavior and HIV/STI Prevalence among Vulnerable Populations. ECVC Nicaragua.
37. Report to UN General Assembly Special Session on HIV/AIDS (UNGASS). Ciudad de Panamá: Ministerio de Salud, Programa Nacional de ITS, VIH y SIDA; 2012. National Report of Advances in Country. Panama, 2012.
38. The Commonwealth of The Bahamas. Country Report 2012. Nassau: Ministry of Health/PEPFAR Office; 2012. Global AIDS Response Progress Reporting. Monitoring the 2011 Political Declaration on HIV/AIDS. Report to UN General Assembly Special Session on HIV/AIDS (UNGASS)
39. Report to UN General Assembly Special Session on HIV/AIDS (UNGASS). La Habana: 2012.
40. Commonwealth of Dominica. Global AIDS Report 2012. Narrative Report. Roseau: National HIV and AIDS Response Programme Secretariat; 2012. Report to UN General Assembly Special Session on HIV/AIDS (UNGASS)
41. Johnston LG, Vaillant TC, Dolores Y, Vales HM. HIV, hepatitis B/C and syphilis prevalence and risk behaviors among gay, transsexuals and men who have sex with men, Dominican Republic. *Int J STD AIDS*. 2013 Apr; 24(4):313–21. [PubMed: 23970664]
42. Country Progress Report. Republic of Guyana. Global AIDS Response Progress Report. Georgetown: Presidential Commission on HIV and AIDS; 2012. Report to UN General Assembly Special Session on HIV/AIDS (UNGASS)
43. Report of the National Situation. Haiti. Port-au-Prince: Ministère de la Santé Publique et de la Population, Programme National de Lutte Contre le SIDA; 2012. Declaration of Commitment in HIV/AIDS, UNGASS.
44. St Vincent and the Grenadines. Kingstown: Ministry of Health, Wellness and the Environment; 2012. Global AIDS Response Progress Report 2012. Report to UN General Assembly Special Session on HIV/AIDS (UNGASS)
45. Suriname AIDS Response Progress Report. January 2009-December 2011. Paramaribo: Ministry of Health; 2012. Report to UN General Assembly Special Session on HIV/AIDS (UNGASS)
46. Country Progress Report. Jamaica. Kingston: National HIV/STI Programme; 2012. Report to UN General Assembly Special Session on HIV/AIDS (UNGASS)
47. Bautista-Arredondo S, Colchero MA, Romero M, Conde-Glez CJ, Sosa-Rubi SG. Is the HIV Epidemic Stable among MSM in Mexico? HIV Prevalence and Risk Behavior Results from a Nationally Representative Survey among Men Who Have Sex with Men. *PLoS ONE*. 2013 Sep 5.8(9) Internet. cited 2014 Jan 26. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3764146/>.
48. Pando MA, Balán IC, Marone R, Dolezal C, Leu CS, Squiquera L, et al. HIV and other sexually transmitted infections among men who have sex with men recruited by RDS in Buenos Aires, Argentina: high HIV and HPV infection. *PloS One*. 2012; 7(6):e39834. [PubMed: 22768137]
49. National Report of Advances in the Application of UNGASS. Chile. January 2010-December 2011. Santiago: Ministerio de Salud; 2012.
50. Chinaglia, M.; Tun, W.; Mello, M.; Insfran, M.; Díaz, J. Horizons Final Report. Washington, DC: Population Council; 2008. Assessment of risk factors for HIV infection in female sex workers and men who have sex with men at the triple-border area of Ciudad del Este, Paraguay.
51. Report of Global Advances in AIDS 2012. Follow-up to the Political Declaration on HIV/AIDS 2011. Uruguay. Montevideo: Ministerio de Salud Pública, Programa Nacional ITS-VIH/Sida; 2012. Report to UN General Assembly Special Session on HIV/AIDS (UNGASS)
- 52***. Arán-Matero D, Amico P, Arán-Fernandez C, Gobet B, Izazola-Licea JA, Avila-Figueroa C. Levels of spending and resource allocation to HIV programs and services in Latin America and the Caribbean. *PloS One*. 2011; 6(7):e22373. Provides an analysis of HIV spending patterns in LAC countries, including the levels and patterns of HIV spending from both domestic and international sources. [PubMed: 21799839]

53. Prisons and AIDS. prisons-tu_en.pdf [Internet] [cited 2014 Jan 19]. Available from: http://www.unaids.org/en/media/unaids/contentassets/dataimport/publications/irc-pub05/prisons-tu_en.pdf
54. Eldridge GD, Robinson RV, Corey S, Brems C, Johnson ME. Ethical challenges in conducting HIV/AIDS research in correctional settings. *J Correct Health Care Off J Natl Comm Correct Health Care*. 2012 Oct; 18(4):309–18.
55. Dolan K, Kite B, Black E, Aceijas C, Stimson GV. Reference Group on HIV/AIDS Prevention and Care among Injecting Drug Users in Developing and Transitional Countries. HIV in prison in low-income and middle-income countries. *Lancet Infect Dis*. 2007 Jan; 7(1):32–41. [PubMed: 17182342]
56. Cárcamo CC, Blitchtein-Winicki D, Valverde RA, Best RJ, Suárez-Ognio L, Campos GJ, et al. Estudio basal de prevalencia de sífilis y VIH y comportamientos asociados en población privada de libertad, Perú 1999. *Rev Peru Med Exp Salud Publica*. 2003 Mar; 20(1):9–14.
57. Garaycochea M, del C, Pino R, Chávez I, Portilla JL, Miraval ML, Arguedas E, et al. Sexually transmitted infections in women living in a prison in Lima, Peru. *Rev Peru Med Exp Salud Pública*. 2013 Jul; 30(3):423–7. [PubMed: 24100816]
58. Gough E, Edwards P. HIV seroprevalence and associated risk factors among male inmates at the Belize Central Prison. *Rev Panam Salud Pública Pan Am J Public Health*. 2009 Apr; 25(4):292–9.
59. Macri Troya M, Berthier Vila R. Infección por el Virus de Inmunodeficiencia Humana y conductas de riesgo asociadas en un Centro Penitenciario de Montevideo, Uruguay. *Rev Esp Sanid Penit*. 2010 Jun; 12(1):21–8. [PubMed: 23128485]
60. Posada A, Díaz Tremarias M. Infección por VIH, Hepatitis B y Sífilis en reclusos de centros penitenciarios de Venezuela, 1998-2001. *Rev Esp Sanid Penit*. 2008 Feb; 10(3):15–21.
61. Prellwitz IM, Alves BM, Ikeda MLR, Kuhleis D, Picon PD, Jarczewski CA, et al. HIV behind bars: human immunodeficiency virus cluster analysis and drug resistance in a reference correctional unit from southern Brazil. *PloS One*. 2013; 8(7):e69033. [PubMed: 23874857]
62. UNAIDS. Joint United Nations Programme on HIV/AIDS (UNAIDS). Geneva: UNAIDS; 2010. Global report: UNAIDS report on the global AIDS epidemic 2010. InternetReport No. UNAIDS/10.11E | JC1958E.; 2010 [cited 2014 Feb 6]. Available from: http://www.unaids.org/documents/20101123_globalreport_em.pdf
63. Vanwesenbeeck I. Another decade of social scientific work on sex work: a review of research 1990-2000. *Annu Rev Sex Res*. 2001; 12:242–89. [PubMed: 12666742]
64. Carael M, Slaymaker E, Lyerla R, Sarkar S. Clients of sex workers in different regions of the world: hard to count. *Sex Transm Infect*. 2006 Jun; 82(Suppl 3):iii26–33. [PubMed: 16735289]
- 65*. Baral S, Beyrer C, Muessig K, Poteat T, Wirtz AL, Decker MR, et al. Burden of HIV among female sex workers in low-income and middle-income countries: a systematic review and meta-analysis. *Lancet Infect Dis*. 2012 Jul; 12(7):538–49. Provides estimates of HIV prevalence among female sex workers in low- and middle-income countries and includes data from Latin America. [PubMed: 22424777]
66. WHO. Progress report 2011: Global HIV/AIDS response. WHO; Internet[cited 2014 Feb 7]. Available from: http://www.who.int/hiv/pub/progress_report2011/en/index.html
67. Cárcamo CP, Campos PE, García PJ, Hughes JP, Garnett GP, Holmes KK, et al. Prevalences of sexually transmitted infections in young adults and female sex workers in Peru: a national population-based survey. *Lancet Infect Dis*. 2012 Oct; 12(10):765–73. [PubMed: 22878023]
68. García PJ. Historical perspective of sexually transmitted infections and their control in Peru. *Int J STD AIDS*. 2010 Apr; 21(4):242–5. [PubMed: 20378893]
69. Tinajeros F, Miller WM, Castro L, Artiles N, Flores F, Evans JL, et al. Declining sexually transmitted infections among female sex workers: the results of an HIV and sexually transmitted infection prevention strategy in Honduras, 2006-08. *Int J STD AIDS*. 2012 Feb; 23(2):88–93. [PubMed: 22422681]
- 70*. Garcia PJ, Benzaken AS, Galban E, ALAC-ITS members. STI management and control in Latin America: where do we stand and where do we go from here? *Sex Transm Infect*. 2011 Dec; 87(Suppl 2):ii7–9. Provides a review of the current state of HIV/STI national programs in Latin

- America, including the availability of HIV/STI screening for key populations. [PubMed: 22110156]
71. Sirotin N, Strathdee SA, Lozada R, Nguyen L, Gallardo M, Vera A, et al. A comparison of registered and unregistered female sex workers in Tijuana, Mexico. *Public Health Rep Wash DC* 1974. 2010 Aug; 125(Suppl 4):101–9.
 72. Perla ME, Ghee AE, Sánchez S, McClelland RS, Fitzpatrick AL, Suárez-Ognio L, et al. Genital tract infections, bacterial vaginosis, HIV, and reproductive health issues among Lima-based clandestine female sex workers. *Infect Dis Obstet Gynecol*. 2012; 2012:739624. [PubMed: 22811592]
 73. Report on Drug Use in the Americas 2011. Organization of American States. Secretariat for Multidimensional Security. Inter-American Drug Abuse Control Commission. Inter-American Observatory on Drugs; 2011. Internet[cited 2014 Feb 6]. Available from: http://www.cicad.oas.org/oid/pubs/DrugUse_in_Americas_2011_en.pdf
 74. Rodríguez CM, Marques LF, Touzé G. HIV and injection drug use in Latin America. *AIDS Lond Engl*. 2002 Dec; 16(Suppl 3):S34–41.
 75. Attas JD, de Pabón EV, Cueva RN. Current challenges and future perspectives in the field of addiction psychiatry in Latin America. *Int Rev Psychiatry*. 2010 Aug; 22(4):347–54. [PubMed: 20874064]
 76. Progress Report 2011. Geneva: WHO, UNAIDS, UNICEF; 2011. Global HIV/AIDS Response Epidemic Update and Health Sector Progress towards Universal Access.
 77. Mathers BM, Degenhardt L, Phillips B, Wiessing L, Hickman M, Strathdee SA, et al. Global epidemiology of injecting drug use and HIV among people who inject drugs: a systematic review. *Lancet*. 2008 Nov 15; 372(9651):1733–45. [PubMed: 18817968]
 78. Centers for Disease Control and Prevention (CDC). Incidence and diagnoses of HIV infection - Puerto Rico, 2006. *MMWR Morb Mortal Wkly Rep*. 2009 Jun 5; 58(21):589–91. [PubMed: 19498337]
 79. Strathdee SA, Magis-Rodriguez C. Mexico's evolving HIV epidemic. *JAMA J Am Med Assoc*. 2008 Aug 6; 300(5):571–3.
 80. Strathdee SA, Philbin MM, Semple SJ, Pu M, Orozovich P, Martinez G, et al. Correlates of injection drug use among female sex workers in two Mexico-U.S. border cities. *Drug Alcohol Depend*. 2008 Jan 1; 92(1-3):132–40. [PubMed: 17714888]
 81. Beletsky L, Lozada R, Gaines T, Abramovitz D, Staines H, Vera A, et al. Syringe confiscation as an HIV risk factor: the public health implications of arbitrary policing in Tijuana and Ciudad Juarez, Mexico. *J Urban Health Bull N Y Acad Med*. 2013 Apr; 90(2):284–98.
 82. Wagner KD, Pitpitan EV, Chavarin CV, Magis-Rodriguez C, Patterson TL. Drug-using male clients of female sex workers who report being paid for sex: HIV/sexually transmitted infection, demographic, and drug use correlates. *Sex Transm Dis*. 2013 Aug; 40(8):619–23. [PubMed: 23863514]
 83. Ludford KT, Vagenas P, Lama JR, Peinado J, Gonzales P, Leiva R, et al. Screening for drug and alcohol use disorders and their association with HIV-related sexual risk behaviors among men who have sex with men in Peru. *PloS One*. 2013; 8(8):e69966. [PubMed: 23936364]
 - 84*. Minichiello V, Rahman S, Hussain R. Epidemiology of sexually transmitted infections in global indigenous populations: data availability and gaps. *Int J STD AIDS*. 2013 Oct; 24(10):759–68. Provides an overview of HIV/STI epidemiology among indigenous populations worldwide and includes several studies from the LAC region. [PubMed: 24052012]
 85. Hall, G.; Patrinos, HA. Indigenous peoples, poverty and development. The World Bank; 2006.
 86. Los Pueblos Indígenas en America Latina. UNICEF. 2011. Internet Available from: www.unicef.org/lac/pueblos_indigenas.pdf
 87. Zavaleta C, Fernández C, Konda K, Valderrama Y, Vermund SH, Gotuzzo E. High prevalence of HIV and syphilis in a remote native community of the Peruvian Amazon. *Am J Trop Med Hyg*. 2007 Apr; 76(4):703–5. [PubMed: 17426174]
 88. Ormaeche M, Whittombury A, Pun M, Suárez-Ognio L. Hepatitis B virus, syphilis, and HIV seroprevalence in pregnant women and their male partners from six indigenous populations of the

- Peruvian Amazon Basin, 2007-2008. *Int J Infect Dis IJID Off Publ Int Soc Infect Dis*. 2012 Oct; 16(10):e724–730.
89. Bartlett EC, Zavaleta C, Fernández C, Razuri H, Vilcarromero S, Vermund SH, et al. Expansion of HIV and syphilis into the Peruvian Amazon: a survey of four communities of an indigenous Amazonian ethnic group. *Int J Infect Dis IJID Off Publ Int Soc Infect Dis*. 2008 Nov; 12(6):e89–94.
90. Benzaken A, Sabidó M, Galban E, Rodrigues Dutra DL, Leturiondo AL, Mayaud P. HIV and sexually transmitted infections at the borderlands: situational analysis of sexual health in the Brazilian Amazon. *Sex Transm Infect*. 2012 Jun; 88(4):294–300. [PubMed: 22317841]
91. Paz-Bailey G, Morales-Miranda S, Jacobson JO, Gupta SK, Sabin K, Mendoza S, et al. High rates of STD and sexual risk behaviors among Garifunas in Honduras. *J Acquir Immune Defic Syndr* 1999. 2009 May 1; 51(Suppl 1):S26–34.
92. Villalba JA, Bello G, Maes M, Sulbaran YF, Garzaro D, Loureiro CL, et al. HIV-1 epidemic in Warao Amerindians from Venezuela: spatial phylodynamics and epidemiological patterns. *AIDS Lond Engl*. 2013 Jul 17; 27(11):1783–91.
93. Mendoza L, Mongelos P, Paez M, Castro A, Rodriguez-Riveros I, Gimenez G, et al. Human papillomavirus and other genital infections in indigenous women from Paraguay: a cross-sectional analytical study. *BMC Infect Dis*. 2013; 13:531. [PubMed: 24206645]
94. Chequer P, Cuchí P, Mazin R, García Calleja JM. Access to antiretroviral treatment in Latin American countries and the Caribbean. *AIDS Lond Engl*. 2002 Dec; 16(Suppl 3):S50–57.
95. Ki-moon B, Zuma J, Piot P. AIDS at 30: Nations at the crossroads: Joint United Nations Programme on HIV. AIDS UNAIDS. 2011
96. Gonzalez MA, Martin L, Munoz S, Jacobson JO. Patterns, trends and sex differences in HIV/AIDS reported mortality in Latin American countries: 1996-2007. *BMC Public Health*. 2011; 11:605. [PubMed: 21801402]
- 93*. Pineda-Peña AC, Bello DC, Sussmann O, Vandamme AM, Vercauteren J, van Laethem K, et al. HIV-1 transmitted drug resistance in Latin America and the Caribbean: what do we know? *AIDS Rev*. 2012 Dec; 14(4):256–67. Provides estimates of the prevalence of HIV-1 transmitted drug resistance in the LAC region. [PubMed: 23258300]

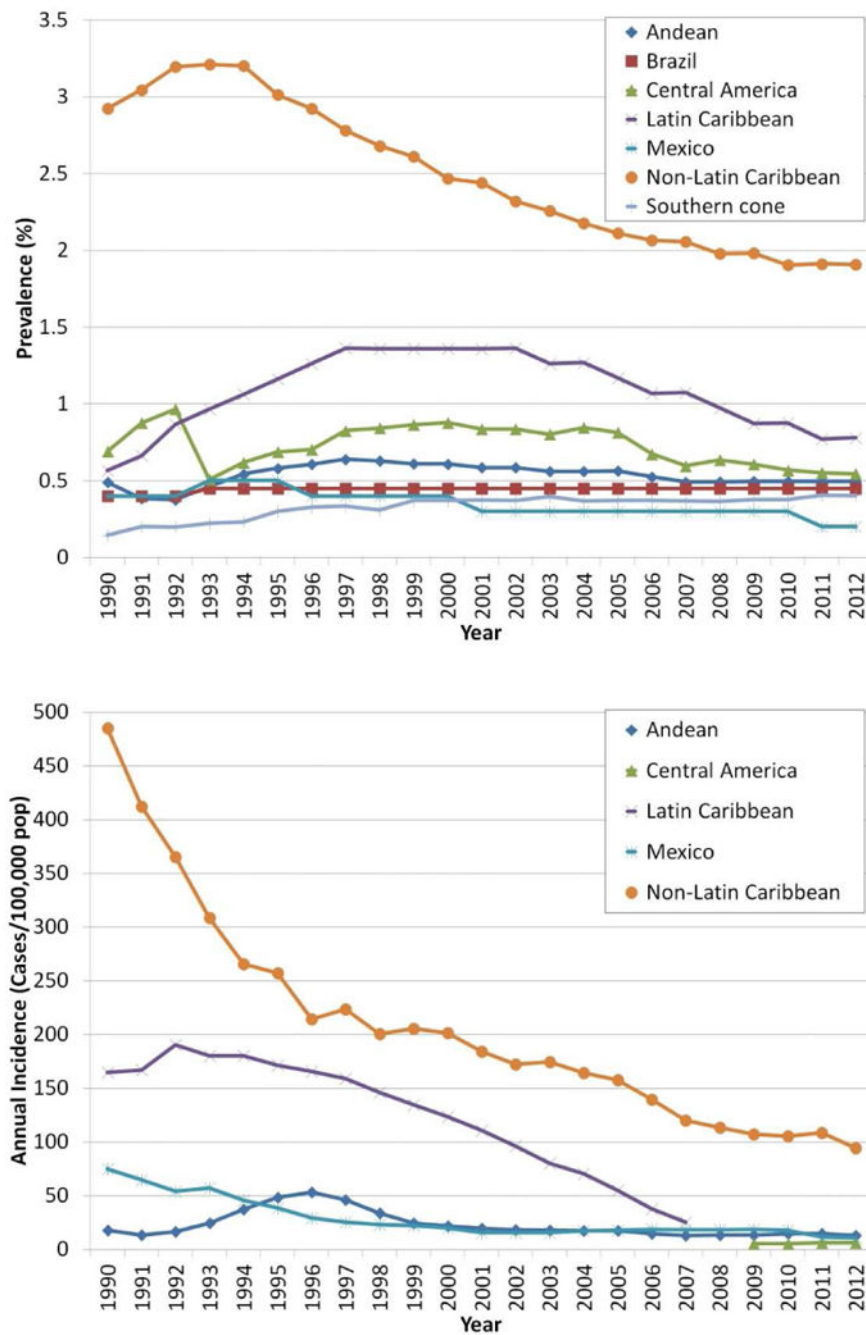


Figure 1. HIV prevalence and incidence in Latin America and the Caribbean by country group, General population, adults 1990 – 2012. Source: UNAIDS 2013 (6)

Table 1
Key HIV-related indicators for adults, women, infants and children in Latin America and the Caribbean (LAC), by sub-regions

Country	Adult HIV prevalence (%) (2013)	Ratio of men / women living with HIV (2012) ⁶	% of pregnant women tested for HIV and received results (2010-11) ¹³	HIV prevalence (%) among pregnant women (2010-11) ¹³	% of HIV-positive pregnant women who receive ARTs (2011) ¹³	Vertical HIV transmission rate % (2012) ¹³	% infants born to HIV-positive women on prophylaxis (2010-11) ¹³
Andean							
Bolivia	0.3	2.3	61%	0.12	52%	21.7%	79%
Colombia	0.5	2.3	61%	0.13	49%	17.4%	14%
Ecuador	0.6	3.3	94%	0.24		4.4%	56%
Peru	0.4	2.1	78%	0.23	56%	3.9%	NR
Venezuela	0.6	1.6	NR	NR	34%	25.5%	6-12%
Brazil	0.5	2.3	79%	0.41	50%	6.8%	87%
Central America							
Costa Rica	0.3	1.4	84%	0.04	71%	2.9%	19%
El Salvador	0.6	1.7	67%	0.09	69%	6.9%	8-50%
Guatemala	0.7	1.7	30%	0.25	16%	31.0%	6%
Honduras	0.5	1.5	62%	0.50	45%	22.0%	34-82%
Nicaragua	0.3	2.3	87%	0.03	94%	4.4%	20%
Panama	0.7	2.2	>95%	0.30	71%	0.5%	69%
Latin Caribbean							
Cuba	0.0	3.7	>95%	0.03	99%	1.1%	>95%
Dominican Republic	0.7	0.9	46%	0.83	81%	10.0%	64%
Mexico	0.2	3.5	37%	0.03	43%	12.9%	4-15%
Non-Latin Caribbean							
Antigua & Barbuda	NR	NR	55%	1.50	NR	20.0%	NR
Bahamas	3.3	1.0	73%	0.88	88%	5.0-7.0%	NR
Barbados	0.9	2.0	63%	0.22	96%	0.0%	NR
Belize	1.4	0.9	87%	0.86	100%	6.6%	54%
Dominica	NR	NR	64%	0.30	100%	0.0%	NR

Country	Adult HIV prevalence (%) (2013)	Ratio of men / women living with HIV (2012) ⁶	% of pregnant women tested for HIV and received results (2010-11) ¹³	HIV prevalence (%) among pregnant women (2010-11) ¹³	% of HIV-positive pregnant women who receive ARTs (2011) ¹³	Vertical HIV transmission rate % (2012) ¹³	% infants born to HIV-positive women on prophylaxis (2010-11) ¹³
Grenada	NR	NR	>95%	0.06	NR	0.0%	NR
Guyana	1.3	0.9	>95%	0.88	65%	4.6%	>95%
Haiti	2.1	0.7	51%	2.50	78%	11.1%	31%
Jamaica	1.7	2.0	55%	0.93	57%	7.6%	69%
St. Kitts & Nevis	NR	NR	56%	0.17	100%	0.0%	100%
St. Lucia	NR	NR	65%	0.24	80%	0.0%	NR
St. Vincent&Grenadines	NR	NR	>95%	0.70	89%	6.7%	NR
Suriname	1.1	0.9	85%	0.70	NR	5.5%	>95%
Trinidad and Tobago	1.6	0.9	70%	1.36	82%	14.9%	NR
Southern Cone							
Argentina	0.4	2.0	>95%	0.44	83%	4.4%	>95%
Chile	0.4	6.2	82%	0.14	72%	5.1%	NR
Paraguay	0.3	1.4	48%	0.34	43%	15.5%	52%
Uruguay	0.7	3.8	72%	0.03	84%	2.6%	23%

NR=NR

Table 2
HIV Prevalence Studies among Men Who Have Sex with Men (MSM) and Transwomen (TW) in Latin America and the Caribbean, 2004-2013

Country, City	Year	Sampling method	N tested for HIV	HIV prevalence in MSM and TW (%; 95% CI)	HIV prevalence in only TW (%; 95% CI)	Country, City (capital)	Year	Sampling method	N tested for HIV	HIV prevalence in MSM and TW (%; 95% CI)	HIV prevalence in only TW (%; 95% CI)
Andean						Nicaragua ³³					
Bolivia ²¹						Managua	2009	RDS	639	7.5, 4.5-11.1	18.8, 2.5-38.6
Santa Cruz	2008	RDS	361	15.3, 9.9-21.8	NR	Chinandega	2009	RDS	313	3.1, 1.2-6.3	14.6, 3.4-55.0
Cochabamba	2008	RDS	232	10.2, 6.1-18.1	NR	Panama ³⁴	2011	NR	800	22.8, NR	NR
La Paz / El Alto	2008	RDS	203	9.6, 0.0-26.2	NR	Latin Caribbean					
Colombia ²²						Cuba ³⁶					
Bogotá	2010	RDS	485	15.0, 10.9-19.9	NR	La Habana	2010	Conven	484	7.4, NR	NR
Cali	2010	RDS	333	24.1, 18.1-30.4	NR	Dominican Republic ³⁸					
5 other cities	2010	RDS	1,744	Range 5.6 to 13.6	NR	Santo Domingo	2008	RDS	510	5.9, 3.2-9.0	NR
Ecuador						Barahona	2008	RDS	281	5.7, 1.5-10.5	NR
Quito ²³	2010-11	RDS	414	11.0, 7.3-15.5	NR	La Alta Gracia	2008	RDS	270	7.6, 4.1-12.0	NR
Peru						Santiago	2008	RDS	327	5.1, 2.3-8.7	NR
Lima/Callao ²⁴	2011	Conven	2,959	12.4, 11.2-13.6	20.8, 17.2-24.3	Mexico					
Lima/Callao ²⁵	2009	RDS	439		29.6, 22.6-38.7	24 cities ⁴⁴	2011	Probabil	6,723	16.9, 15.6-18.4	NR
Brazil ²⁷	2009	RDS	3,384	11.1, 9.1-13.6	TNI	Non-Latin Caribbean					
Rio de Janeiro	2009	RDS	NR	16.5, 9.3-22.8	TNI	Bahamas ³⁵	2012	Conven	36	14.0, NR	NR
9 other cities	2009	RDS	NR	Range 1.7 to 10.2	TNI	Dominica ³⁷	NR	Conven	NR	26.7, NR	NR
Central America						Guyana ³⁹	2009	NR	108	19.4, NR	NR
Costa Rica ²⁸						Haiti ⁴⁰	2011	RDS	860	13.4, 11.1-17.2	NR
San José	2009	RDS	300	10.9, 5.3-18.3	NR	Jamaica ⁴³	2011	NR	NR	32.8, NR	NR
El Salvador ^{29, 30}						St. Vincent and the Grenadines ⁴¹	2010	Conven	75	29.5, NR	NR

Country, City	Year	Sampling method	N tested for HIV	HIV prevalence in MSM and TW (%; 95% CI)	HIV prevalence in only TW (%; 95% CI)	Country, City (c if capital)	Year	Sampling method	N tested for HIV	HIV prevalence in MSM and TW (%; 95% CI)	HIV prevalence in only TW (%; 95% CI)
San Salvador	2008	RDS	516	10.8, 7.4-14.7	19.7, 5.4-39.4	Suriname ⁴²	2004	NR	NR	6.7, NR	NR
San Miguel	2008	RDS	183	8.8, 4.2-14.5	23.3, 6.3-47.6	Southern Cone					
Guatemala ³¹						Argentina ⁴⁵					
Guatemala City	2012-13	RDS	435	8.9, 5.4-13.2	NR	Buenos Aires	2007-09	RDS	296	17.3, 14.0-20.8	TNI
Coatepeque	2012-13	RDS	106	2.8, 0.6-8.0	NR	Chile ⁴⁶					
National	2012-13	RDS	126		23.8, 16.7-32.2	Santiago / Valparaiso	2008-09	RDS	469	21.1, 12.8-30.0	NR
Honduras ³²						Paraguay ⁴⁷					
Tegucigalpa	2006	RDS	193	5.7, NR	NR	Ciudad del Este	2006	RDS	296	0.5, 0.0-1.2	NR
San Pedro Sula	2006	RDS	204	9.7, 4.6-15.2	NR	Uruguay ⁴⁸	2008	NR	309	9.0, NR	NR
La Ceiba	2006	RDS	(est. 167)	4.8, 1.4-8.6	NR						

NR = not reported; TNI: Transwomen not included; RDS=respondent-driven sampling; Conven=Convenience sample; Probabil=Probability sample