

# Review of HIV treatment progress, gaps, and challenges in the Caribbean, 2005–2015

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## ABSTRACT

**Objective:** To highlight the current context of the HIV response in the Caribbean and what remains to be addressed to close gaps in HIV treatment and care and end AIDS by 2030.

**Methods:** We reviewed and analyzed reports from peer-reviewed and gray literature for the period of 2005–2015 on HIV treatment progress and gaps in the Caribbean, based on searches done in four bibliographic databases and three organizations' websites and/or libraries. Data were extracted using forms detailing study objectives, thematic areas for HIV care and treatment in the Caribbean, results, and other key information. Before being included in the descriptive review, each publication was assessed for its relevance to the HIV response in the Caribbean.

**Results:** We carefully analyzed a total of 62 sources addressing HIV treatment coverage in the Caribbean, including peer-reviewed articles, gray literature reports, and abstracts. The Caribbean has made remarkable progress in reducing new infections and in increasing health care access. Coverage with antiretroviral (ARV) treatment rose between 2005 and 2015, and HIV-related mortality fell by half. Despite the decline in HIV incidence rates, some Caribbean countries have reported challenges with linkages to care, access and adherence to ARV treatment, and viral suppression.

**Conclusion:** The risk of HIV infection in the Caribbean among at-risk populations, including men who have sex with men, transgender persons, and sex workers, is disproportionately high. Caribbean countries need to work together to face the HIV threat. National programs need to fast-track HIV treatment services and accelerate other responses to HIV by 2020, and then maintain sustained actions up through 2030.

## Key words

HIV infections; HIV seroprevalence; anti-HIV agents; patient care; government programs; Caribbean Region.

HIV/AIDS remains a major public health threat in the Caribbean. However, between 2005 and 2015, significant progress was made in treatment and care as well as in the elimination of mother-to-child HIV transmission. The Caribbean countries face some gaps and challenges in the application of new antiretroviral

(ARV) treatment guidelines and in reaching those most at risk and other vulnerable populations. The continuum of care for HIV treatment and care in most settings needs effective, structured interventions and support.

This paper presents a descriptive review of the response to HIV in the Caribbean over the period of 2005 through 2015. The review focuses on epidemiology, prevention, continuum of care, treatment progress, and remaining challenges.

There is an urgent need to address structural barriers, invest for the sustainability of HIV program response,

promote integration, and encourage innovative technical cooperation. There are enormous opportunities to build on the progress made in recent years and move toward the elimination of the AIDS epidemic in the Caribbean. There is a need to anticipate future challenges and to attain new goals and objectives beyond the 90-90-90 targets of the Joint United Nations Program on AIDS (UNAIDS). Under those UNAIDS targets, by 2020, 90% of all people living with HIV will know their HIV status, 90% of all people diagnosed with HIV infection will receive sustained

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antiretroviral therapy, and 90% of all people receiving antiretroviral therapy will have viral suppression.

The Caribbean has the second highest prevalence of HIV and AIDS in the world, after sub-Saharan Africa, with a rate of 1.1%. By the end of 2014, approximately 280 000 adults and children in the Caribbean were living with HIV (1–3).

The Caribbean is an archipelago in the Caribbean Sea and North Atlantic Ocean (4). Five countries (Cuba, Trinidad and Tobago, the Dominican Republic, Haiti, and Jamaica) account for 96% of the persons living with HIV (PLHIV) in the Caribbean. Fifty-five percent of PLHIV in the Caribbean live in Haiti, which also has the highest proportion of AIDS deaths in the region (2).

In the past decade, some countries in the Caribbean have progressed in reducing new HIV infections and improving access to services. Nevertheless, AIDS deaths remain a concern. Caribbean countries are faced with challenges that include stigma and discrimination, gender inequities, gender-based violence, and high-risk sexual practices (4, 5). In addition, high levels of poverty, unemployment, and marginalization increase vulnerability to HIV among youth and women (3). Despite high-level government leadership and country ownership of the HIV response, difficulties continue that are related to human resources shortages as well as the underutilization of scientific evidence, data, and best practices to improve decision-making.

This paper is a descriptive review of HIV in the Caribbean as it relates to treatment progress, gaps, and challenges for the period of 2005 through 2015. The article highlights the current context of the HIV response in the Caribbean and what remains to be addressed to close gaps and end AIDS by 2030. The 2005–2015 period was selected since there were major innovations in HIV treatment, testing, technologies, monitoring tools, elimination initiatives, and prophylaxis regimens. These modalities were articulated and accelerated with increased funding mechanisms.

## METHODS

A literature search for data published in English between January 2005 and December 2015 was completed, using the MEDLINE (PubMed), Journal Storage (JSTOR), Google Scholar, and National

Center for Biotechnology Information (NCBI) databases, as well as the library and/or website of three organizations: UNAIDS, the Pan American Health Organization (PAHO), and the World Health Organization (WHO). The search of the MEDLINE and Google Scholar databases used the following search words and terms: “HIV treatment Caribbean,” “HIV care in the Caribbean,” and “HIV in the Caribbean.” The initial screening search was based on the titles and abstracts of the articles. The reference lists of the articles found were also scanned to identify additional sources.

We characterize and discuss HIV treatment and care in the Caribbean in the following countries: the Bahamas, Barbados, Belize, Cuba, the Dominican Republic, Eastern Caribbean Countries [Anguilla, Antigua and Barbuda, Dominica, Grenada, Montserrat, Saint Kitts and Nevis, Saint Lucia, and Saint Vincent and the Grenadines], Guyana, Jamaica, Haiti, Suriname, and Trinidad and Tobago. We categorized information on epidemiology, key populations, treatment and care, antiretroviral therapy (ART) access, prevention of mother-to-child transmission of HIV, community viral suppression, and HIV drug resistance. We examined each peer-reviewed publication for the research evidence to assess its validity, study design, results, applicability, accuracy of reporting, and relevance prior to inclusion in the descriptive review. Data were extracted using forms detailing study objectives; thematic areas mentioned above; data collection; methodology (design, setting, population, sample size, geographical scope in the Caribbean); results and outcomes (number or percentages); author-defined strengths and limitations; and specific gender-related issues. After data extraction for each paper, the studies were grouped according to outcomes of interest. Narrative summaries of each outcome are presented below.

## RESULTS

The initial search generated 2 274 published articles on HIV in the Caribbean. Of that total, 239 articles discussed HIV treatment in the Caribbean during 2005–2015, and 79 were on HIV care in the Caribbean. In the final selection, a total of 62 items that specifically referenced HIV treatment coverage in the Caribbean were analyzed in depth:

42 peer-reviewed studies, 12 abstracts, and 8 gray literature reports.

## HIV epidemiology

There were 13 000 new HIV cases in the Caribbean in 2014 (1). Significant variations in new infections have been noted among the countries in the Caribbean region. Haiti reported a 44% reduction in new HIV infections, from 12 000 in 2005 to 6 700 in 2013. Similar data have been reported in the Dominican Republic (61%), Jamaica (42%), and Trinidad and Tobago (32%). Cuba reported an increase in new HIV cases (3). Overall, new HIV infections in the Caribbean were 17% lower in 2014 than they were in 2000 (1).

In 2013 and 2014, respectively, it was estimated that 11 000 persons (2) and 8 800 persons (1) died from HIV-related illnesses in the Caribbean. However, AIDS-related deaths declined by 50% between 2000 and 2014 (1). Significant decreases in AIDS-related deaths have been documented in the Dominican Republic, Haiti, and Jamaica. However, no improvement has been seen in persons dying from HIV-related illnesses in the Bahamas, Trinidad and Tobago, Barbados, and Cuba (2). Treatment coverage for HIV patients in the Caribbean > 15 years old was 42% in 2013 (3) and 44% in 2014 (1). Increases in treatment coverage in the Caribbean were also noted in children < 15 years, with treatment coverage increasing from 18% in 2011 to 24% in 2013 and 36% in 2014 (1, 2).

The predominant mode of transmission of HIV in the Caribbean is heterosexual transmission (7). In Jamaica in 2012, heterosexual transmission was implicated in 22% of new HIV cases (8). However, 64% of men who have sex with men (MSM) in Jamaica reported having sexual intercourse with a female counterpart, which contributed to the spread of HIV in the general population (9). Inconsistent or nonexistent condom use contributes to HIV transmission in the Caribbean. For example, in Saint Lucia, only 45% of persons reported using condoms during sexual intercourse in the preceding 12 months (10).

## Populations at higher risk for HIV

There are key populations in the Caribbean that are disproportionately at risk of HIV infection, including MSM,

transgender persons, sex workers, and women and young girls (11–20).

**Men who have sex with men and transgender persons.** HIV prevalence among MSM is high in the Caribbean and continues to be a challenge (7). Modeling suggests that MSM have 6 to 30 times greater risk of HIV infection than do persons in the general population (3). It is difficult to estimate the extent of HIV transmission among MSM (12). It is reported in Cuba that 68% of HIV cases are related to MSM. In Jamaica, some 33% of MSM or gay men are HIV-positive. The Bahamas, Belize, Dominica, Guyana, Haiti, and Saint Vincent and the Grenadines have reported higher HIV prevalence among MSM (13).

Many reports for the Caribbean region categorize MSM and transgender people into one risk group, rather than separately. This practice distorts the true picture of the epidemic within the two groups, whose experiences, barriers, and challenges are different (14). MSM remain a high-risk population in the Caribbean, largely because of stigma and discrimination based on sexual orientation and homophobia (3).

**Sex workers.** The HIV epidemic among sex workers continues to be a prominent issue in the Caribbean (13). Sex workers are highly stigmatized in the region, and sex work is illegal in much of the English-speaking Caribbean (15). While legislation differs among countries in the Caribbean, the exchange of sex for money is generally considered a criminal act. There are exceptions: sex work in the Dominican Republic is considered to be legal, and it is a lucrative business. It is estimated that 100 000 women are involved in the sex industry in that country (16).

Such factors as stigma and discrimination have contributed to the high seroprevalence of HIV in female sex workers in the Caribbean (17). During the 2005–2009 period, seroprevalence surveys demonstrated that the HIV prevalence among sex workers ranged from 5% in Haiti, the Dominican Republic, and Jamaica, to 17% in Guyana, and 24% in Suriname (11). A WHO 2011 progress report indicated that HIV prevalence in sex workers in Jamaica was 8.8%, but in Guyana it was 27.6% (18). In Haiti, the HIV prevalence among female sex workers was 8.4% in 2014 (13).

**Women and young girls.** In the Caribbean, women and young girls are particularly vulnerable to HIV infection. A higher percentage of females than of males have been diagnosed with HIV. Approximately 53% of the HIV cases in the Caribbean are among females (11). The proportion of persons living with HIV who are female varies depending on the country: around 60% in the Bahamas, Haiti, Belize, and the Dominican Republic; 50% in Guyana; 34% in Jamaica; 31% in Suriname; and 19% in Cuba (11, 12). Further, the number of young women living with HIV is 1.2 times higher than the number of young men living with HIV (2).

Several factors contribute to young people having a higher rate of HIV in the Caribbean. Low condom use puts youth at high risk for HIV infection. The Global School-based Student Health Survey (GSHS) found that 38% of adolescents between the ages of 13 and 15 years did not use a condom during their last sexual intercourse (19). Another study, conducted in Haiti, reported that young females themselves demonstrated low-risk behaviors but were at a greater danger of contracting HIV due to high-risk behavior among their male counterparts, such as having multiple partners (20).

### Treatment and care

An estimated ART coverage of 71% for the Caribbean region was reported in 2012 (6). The three Caribbean countries with universal access in 2012 were Barbados, Cuba, and Guyana. Caribbean countries close to achieving universal access were the Bahamas, Belize, the Dominican Republic, Jamaica, and Trinidad and Tobago. Among the Caribbean countries, the retention rate after ART initiation ranged from 53% to 97% in 2012 (6).

In 2005, the International Epidemiologic Databases to Evaluate AIDS programs study reported that low access to care in Haiti was linked to low socioeconomic status and older age (21). Variation in treatment coverage in any given country could be a reflection of differences in the local prescription guidelines for highly active antiretroviral therapy (HAART) initiation (21–23). In 2006, the trans-Caribbean HIV/AIDS Research Initiative was launched, involving 8 203 ARV-naïve HIV patients 13 years and older in seven Caribbean countries (24). With those patients, 75% of them were

started on ART with a CD4 cell count of  $< 200$  cells/mm<sup>3</sup>. Overall, there were 1 048 mortalities in the study period. At the end of the study, in 2008, 75% of the patients were alive and receiving care (24). In Guyana, another study demonstrated that all 50 patients who started HAART in 2007 were alive and remained on first-line treatment at the end of the year. For the patients who had started HAART in 2002, 58% of the cohort were alive and on HAART after a six-year period (25).

Impressive progress has been made in ART treatment in the Caribbean, with coverage increasing from 45% in 2009 to 70% in 2012 (3). This result, however, has to be viewed with caution due to changes in the ARV treatment guidelines and in eligible populations in subsequent years. In 2012, greater than 80% coverage was reported in Cuba, the Dominican Republic, and Guyana (26). The treatment coverage for the Caribbean in 2013 was estimated to be 42%, with 221 710 eligible people receiving ART as recommended under the new WHO 2013 treatment guidelines, of initiating HAART at a CD4 count of  $\leq 500$  cells/mm<sup>3</sup> (3). In 2014, the treatment coverage improved to 44% for PLHIV aged 15 years or older, and it grew to 36% among children (1).

In Haiti, the number of newly enrolled patients on ART increased from 2 659 in 2005 to 13 710 in 2012. As of December 2013, a total of 53 781 persons were receiving ART, compared with a few hundred prior to 2002. Over a ten-year period, the growing numbers of persons on ARVs resulted in an increase in life expectancy for PLHIV, a decline in the number of new infections, and a 50% decrease in mortality (27).

Overall, in the Caribbean in 2012, 78% of HIV-infected adults were receiving WHO-recommended first-line ART regimens, and 39% were on second-line regimens. Among the countries, the coverage rates ranged from 28% to 100% for first-line treatment and 0% to 95% for second-line treatment. Between 2010 and 2012, the percentage of patients on treatment increased dramatically in 12 countries. Additionally, Cuba and Belize saw improvements in first-line treatment, and Grenada saw improvements in both first- and second-line regimens (6).

Antiretroviral stockouts that interrupt the treatment of PLHIV are a serious public health problem in many countries (28). Caribbean nations and other nearby

countries that reported stockouts in 2012 included Anguilla, Antigua and Barbuda, the Bahamas, Belize, the Dominican Republic, and Venezuela (6).

### Prevention of mother-to-child transmission

The percentage of ART coverage among pregnant women with HIV in the Caribbean increased from 14% in 2005 to 79% in 2011. The coverage in 2011 ranged from 57% in Jamaica to 100% in Belize, Dominica, and Saint Kitts and Nevis. During the period of 2011 to 2013, the percentage of pregnant women with HIV in the Caribbean on ART increased from 72% to more than 92%. This upsurge reflects the region's tremendous efforts to accelerate elimination of vertical HIV transmission. Several countries in the Caribbean, including Barbados, Dominica, Grenada, Saint Kitts and Nevis, and Saint Lucia, reported reaching a target of keeping vertical HIV transmission below 2.0%. Cuba reported achieving a 1.1% level of vertical transmission (29–32). In 2015, Cuba became the first country to receive a WHO validation certification of the elimination of mother-to-child transmission of HIV and syphilis (33).

In the Caribbean, the number of new HIV cases among children ages 0–14 years old declined by 72% between 2001 and 2013. In 2013, the percentage of infants with an HIV-positive mother who underwent early diagnosis within two months of the birth ranged from 1% to more than 95%. Antigua and Barbuda, Grenada, Saint Lucia, and Saint Vincent and the Grenadines had very low testing coverage levels, whereas Cuba, the Dominican Republic, Guyana, and Belize reported rates of between 65% and 95% (31, 32).

### Viral suppression and drug resistance

A study conducted in Barbados described the viral load (VL) of patients between 2002 and 2011. Viral suppression significantly improved, from 33.6% of patients achieving the 200 copies/ml threshold in 2002 to 70.3% of patients in 2011. At the population level, the estimated VL suppression was 26.2%, taking into account the patients who were alive and on treatment as well as the persons living with HIV in Barbados (34).

In contrast to Barbados, many other small island developing states lack the necessary infrastructure to carry out VL testing, despite its recognized role in the monitoring of HIV treatment programs. None of the Organization of Eastern Caribbean States (OECS) nations has in-country access to this test. In response, seven OECS countries (Antigua and Barbuda, Dominica, Grenada, Montserrat, Saint Kitts and Nevis, Saint Lucia, and Saint Vincent and the Grenadines) have been utilizing a laboratory referral service for HIV-1 VL testing offered by the Ladymeade Reference Unit laboratory in Barbados. The number of samples assessed under that arrangement rose from 312 in 2009 to 1 060 in 2013. Over that time period, a total of 3 543 blood samples from HIV patients were tested at the referral center. Aggregate data showed the odds of VL suppression in the Eastern Caribbean increased by 66% for each additional year after 2009 (odds ratio, 1.66; 95% confidence interval, 1.46 to 1.88;  $P < 0.001$ ) (35).

By December 2010, 21 countries in the Americas (including 11 from the Caribbean) had implemented early warning indicators to assess the extent to which their sites that provide care and treatment to persons living with HIV were optimally functioning to prevent development of resistance to HIV drugs (36). Nevertheless, data on HIV drug resistance in the Caribbean are still very scarce. In 2011, transmitted HIV drug resistance for any ARV drug in the Caribbean was estimated to be 4.3%, based on studies in Cuba and the Dominican Republic (36).

For a study in Jamaica where blood samples were extracted from 16 HIV-positive pregnant mothers, 5 were found to be ARV-drug-naïve and 4 were treatment-experienced. The HIV genome of the ARV-drug-naïve mothers had 75% of the mutations that conferred drug resistance when compared to the drug-experienced individuals (37). This indicates that viruses are being transmitted with ARV resistance and thus there is a need to initiate a national baseline survey on HIV drug resistance in that country.

## DISCUSSION

While the prevalence of HIV in the Caribbean is high, the region has made substantial progress in reducing new infections and in increasing health care

access. Coverage with ARV treatment rose between 2005 and 2015. However, gaps still remain in areas such as treatment coverage, quality of HIV care, and prevention and support services; further, there are still high mortality rates due to AIDS (14).

There are enormous opportunities to build on the progress made over the 2005–2015 period, and to move closer to eliminating the AIDS epidemic in the Caribbean. The HIV epidemic there is worsened by such social and cultural factors as stigma and discrimination as well as attitudes related to sexual expression (38). The strong stigmatization against HIV infection and homosexuality has driven the problem underground, encouraged risky behavior, and prevented policymakers from supporting safe-sex programs and from increasing access to treatment and care. High levels of stigmatization also discourage many PLHIV from disclosing their status. There is a need to revamp discriminatory laws, eliminate stigma, and strengthen recognition of the right to health. Victims of discrimination need access to administrative and judicial procedures so they can fully assert their rights (39).

Financing HIV/AIDS prevention and control efforts in the Caribbean is becoming a challenge. Donor funding has decreased, and domestic spending has not reached the levels needed to sustain the national programs. Increasing the amount of domestic funding and mobilizing new resources is essential. Stronger collaboration at the national and regional level is needed in order to retain HIV patients in care and to achieve viral suppression, so as to end the AIDS epidemic by 2030. The dwindling of donor funds, an increased number of people on ART, and ARV stockouts all warrant serious attention. It is becoming extremely difficult to convince the ministry of finance in some Caribbean countries to increase spending on HIV programs (3). Countries need to come into alignment with global targets and to revise treatment guideline so they conform to the WHO's consolidated antiretroviral guidelines.

The HIV epidemic in the Caribbean disproportionately affects the most vulnerable populations. The main route of HIV transmission is through heterosexual contact, including in sex work. Men who have sex with men are an emerging

community with a high prevalence of and many risk factors for HIV infection. There is an epidemiological data gap in estimating HIV prevalence, access to care, and viral suppression in some population groups, making it difficult to construct a reliable treatment cascade on an annual basis. Overall ART coverage has increased in many countries, but there is still a need to reorganize the ART campaigns to meet the Sustainable Development Goals.

There is an urgent need to increase the availability of HIV testing, encourage early linkage to care, and support retention in care. Access to HIV testing and counseling should be expanded, and new strategies to reach key populations are required. Improving and simplifying diagnostic algorithms, applying

new technologies, and standardizing and supporting engagement across the HIV continuum of care are all critical to ending the AIDS epidemic in the Caribbean by 2030.

This review has some limitations. The use of different study designs and sampling methodologies in the sources utilized may diminish the validity of generalizing about the overall HIV situation in the Caribbean. More recent studies may not have been included in this review due to the lag time between data collection and publication of results. The inclusion of gray literature may also contribute to selection bias. This variability in the materials, as well as a lack of information for some countries (such as on treatment cascades for key populations or on HIV drug

resistance), limited the ability to compare the results from different studies.

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## RESUMEN

### Examen del progreso, los retos y las brechas en torno al tratamiento de la infección por el VIH en el Caribe, 2005-2015

**Objetivo.** Destacar el contexto actual de la respuesta a la infección por el VIH en el Caribe y las acciones pendientes para subsanar las brechas en el tratamiento y la atención de la infección por el VIH y poner fin al sida para el 2030.

**Métodos.** Se examinaron y analizaron informes tanto de la bibliografía revisada por pares como la bibliografía gris en el período comprendido entre el 2005 y el 2015 sobre el progreso y las brechas en el tratamiento de la infección por el VIH en el Caribe, encontrados por medio de búsquedas en cuatro bases de datos bibliográficas y sitios web o bibliotecas de tres organizaciones. Los datos se extrajeron empleando formularios que detallaban los objetivos del estudio, las áreas temáticas de la atención y el tratamiento de la infección por el VIH en el Caribe, los resultados y otra información de importancia. Antes de incluirlos en el examen descriptivo, se evaluó la relevancia de cada publicación en lo concerniente a la respuesta a la infección por el VIH en el Caribe.

**Resultados.** Se hizo un análisis pormenorizado de un total de 62 fuentes que abordaban la cobertura del tratamiento de la infección por el VIH en el Caribe, entre las que se incluyeron artículos sometidos a revisión de pares, informes de bibliografía gris y resúmenes. El Caribe ha logrado avances notables en la reducción del número de nuevas infecciones y el aumento del acceso a la atención de salud. La cobertura del tratamiento antirretroviral (ARV) se incrementó entre el 2005 y el 2015 y la mortalidad atribuible a la infección por el VIH se redujo a la mitad. Si bien las tasas de incidencia de la infección por el VIH han disminuido, algunos países del Caribe han informado que los vínculos entre la atención, el acceso y el cumplimiento del tratamiento antirretroviral, así como la supresión de la carga viral, plantean retos.

**Conclusiones.** El riesgo de contraer la infección por el VIH en las poblaciones en riesgo, especialmente en el caso de los hombres que tienen relaciones sexuales con otros hombres, las personas transgénero y los profesionales del sexo, es desproporcionadamente alto en el Caribe. Los países del Caribe deben unir esfuerzos para enfrentarse a la amenaza del VIH. Los programas nacionales deben agilizar los servicios de tratamiento de la infección por el VIH y acelerar otras respuestas a la infección por el VIH para el 2020 y, posteriormente, aplicar medidas sostenidas para mantener los logros hasta el 2030.

#### Palabras clave

Infecciones por VIH; seroprevalencia de VIH; fármacos anti-VIH; atención al paciente; programas de gobierno; Región del Caribe.