



DIRECTIONS IN DEVELOPMENT
Human Development

Thirty Years of the HIV/AIDS Epidemic in Argentina

*An Assessment of the National
Health Response*

Fernando Lavadenz, Carla Pantanali, and Eliana Zeballos



WORLD BANK GROUP

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Foreword

Thirty years after its first reported HIV/AIDS case, Argentina has become the country with the second lowest HIV/AIDS morbidity and mortality in South America. Furthermore, the incidence of HIV in Argentina decreased by 25 percent from 2001 to 2011.

This book describes and examines what lies behind this success. The authors reveal that universal access to treatment with financial protection for the poorest, continuous advances in the legal framework to reduce stigma and improve human rights, and innovations in the quality and service delivery of the HIV/AIDS health care service line have all been key contributors in this regard.

Over the past 30 years, Argentina has tackled the HIV/AIDS epidemic from various angles. To influence the behaviors of the population, especially high-risk groups, the country developed a comprehensive prevention policy for HIV/AIDS, including sexual and reproductive health education in schools nationwide and massive media campaigns. And it fundamentally changed the health service model for HIV/AIDS patients through innovations in the logistics of supplies and medicines, widespread distribution of condoms, an online system of clinical patient follow-up, and use of results-based financing for preventive and diagnostic services. Surveys of health facilities have improved the health delivery model and identified bottlenecks in access and coverage.

During these years, the World Bank has supported the HIV/AIDS National Program and accompanied the government's efforts through financing and technical support. Based on this experience, the authors compile information about innovative and critical interventions in Argentina's HIV/AIDS response. Although contexts vary, ending the HIV/AIDS epidemic requires new approaches to learning and sharing good practices that can be replicated in other countries to strengthen national ownership, ensure accountability, and increase efficiency in the context of an impending resource gap.

This analytic work provides evidence and experience to develop more efficient, effective, integrated, and systematic HIV/AIDS programs that could contribute to improved disease outcomes and reduce infections. Furthermore, using a cost-benefit analysis, the book details how key programmatic innovations in Argentina have resulted not only in more than US\$700 million in savings for the country between 2001 and 2010, but also, most important, the prevention of more than 230,000 disability-adjusted life years between 2001 and 2011.

Despite these successes, the fight against the HIV/AIDS epidemic in Argentina still poses key challenges, including inequalities in HIV/AIDS rates between provinces and the long-term financial sustainability of the program, considering the increasing number of patients in treatment and the high comparative cost of antiretroviral treatment.

Thirty Years of the HIV/AIDS Epidemic in Argentina provides a summary of the country's remarkable efforts to control the HIV/AIDS epidemic and is an analytical piece that could be used by Argentina and other countries to continue improving and innovating responses to HIV/AIDS. This study is a contribution to the long-standing partnership in public health between Argentina and the World Bank that seeks to improve the well-being of the Argentine population.

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Many people participated in systematic reviews at various stages of the book and provided thoughtful comments, including World Bank peer reviewers Veronica Vargas (Senior Health Economist), Tania Dmytraczenko (Senior Economist), Shiyong Wang (Senior Health Specialist), and Marelize Prestidge Gorgens (Senior Monitoring and Evaluation Specialist). We thank external peer reviewers Rosalia Rodriguez-Garcia, Norman Hearst, and Miguel Borrueal for their useful comments. Moreover, we extend our gratitude to the World Bank HIV/AIDS team for encouraging the authors to explore new analytical frontiers of HIV research.

Finally, the authors would especially like to thank Argentina's MSN policy makers and HIV/AIDS program managers throughout these decades for sharing their knowledge, experiences, and insights, as well as Argentina's current health authorities for their openness and continuous support during the preparation of this book.

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Abbreviations

AIDS	acquired immunodeficiency syndrome
ART	antiretroviral treatment
ARV	antiretroviral drug
AZT	zidovudine
BoD	burden of disease
CBA	cost-benefit analysis
CEA	cost-effectiveness analysis
DALY	disability-adjusted life year
DEIS	Office of Statistics and Health Information
DSyETS	<i>Dirección de SIDA y ETS</i> —National HIV/AIDS and STDs Office
EFV	efavirenz
EPHFP	Essential Public Health Functions Project
FESP	<i>Funciones Esenciales en Salud Publica</i> —Essential Public Health Functions and Programs Project
GBD	Global Burden of Diseases, Injuries, and Risk Factors Study
GDP	gross domestic product
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
HAART	highly active antiretroviral treatment
HDI	Human Development Index
HIV	human immunodeficiency virus
IDU	injection drug users
IHME	Institute for Health Metrics and Evaluation
IMF	International Monetary Fund
LAC	Latin America and the Caribbean
LUSIDA	Argentina AIDS and Sexually Transmitted Diseases Control Project
MC	marginal cost
MSM	men who have sex with men
MSN	<i>Ministerio de Salud de la Nación Argentina</i> —National Ministry of Health
OLS	ordinary least squares

PAHO	Pan American Health Organization
PLWHA	people living with HIV/AIDS
PMTCT	prevention of mother-to-child transmission
PPP	purchasing power parity
RBF	results-based financing
STD	sexually transmitted disease
STI	sexually transmitted infection
TB	tuberculosis
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
VIGI-A	Public Health Surveillance and Disease Control Project
VSL	value of a statistical life
WHO	World Health Organization
YLD	year lived with disability
YLL	year of life lost

Executive Summary

Argentina is a country of 41.45 million people (six percent of the population of Latin America and the Caribbean [LAC]), with a gross domestic product (GDP) of US\$14,760 per capita, surpassing the 2013 LAC regional average GDP of US\$10,512. Argentina also fares above regional averages in indicators such as mean years of schooling (9.7 years, compared with the 7.9 LAC average) and life expectancy (76 years, compared with 74.6; United Nations Development Programme 2014; World Bank 2014). In the 1990s, Argentina was greatly impacted by the HIV/AIDS epidemic. This report details the past 30 years of the country's efforts to combat the epidemic.

HIV/AIDS Epidemic and Burden of Disease

Argentina has felt the impact of the HIV/AIDS epidemic. HIV cases increased from 1,000 in 1990 to 4,223 in 1997, and peaked at more than 6,700 new infections per year in 2004 (National Ministry of Health [MSN] 2013). This amounts to 18.5 persons becoming infected per day in 2004. In 2013, there were around 110,000 people living with HIV/AIDS in the country, that is, one in every 365 people, and there were around 5,500 new HIV cases every year, or 15 new infections per day. Comparing 2004 with 2013, there was a reduction of 3.5 persons becoming infected daily. In 2011, the HIV incidence rate was 12 per 100,000 people and the incidence rate of AIDS cases was 3.6 per 100,000 people (4,915 new HIV infections and 1,454 cases of AIDS).

Between 2000 and 2010, the HIV incidence rate decreased in Argentina by 25 percent (cases identified). There was a decline in the number of new infections among most age and sex groups in the population, with the most visible decline among adults ages 25–34. Despite the decline in the number of new infections, this age group is still responsible for the largest number of new HIV cases. During 2000–10, there was an increase in the number of new cases in men ages 15–24. This increase in new cases in young males may be responsible for the further “masculinization” of the epidemic in Argentina, with the male-to-female ratio increasing from 1.8 in 2001 to 2.0 in 2011. In the City of Buenos Aires,

incidence rates decreased from 40.6 per 100,000 inhabitants in 2001 to 23.9 per 100,000 in 2011; in the province of Buenos Aires, incidence rates decreased from 21 to 9.9 per 100,000 in the same time frame. Although the trend of decline is positive, the incidence rate in the City of Buenos Aires is double that in all other regions.

Although there are still 100 mother-to-child transmitted infections each year, Argentina has reduced the vertical transmission rate from 13.7 per 100,000 live births in 2000 to 5.2 in 2011, a reduction of almost 62 percent. Multipronged efforts involving high financial investment, improvement in prenatal care and delivery for seropositive women, emphasis on HIV testing of pregnant women, higher coverage of prophylactic treatment, and the creation of a surveillance system to track seropositive pregnant women have contributed to progress against HIV/AIDS. A key lesson learned came from the strategic alliance with the Sexual and Reproductive Public Health and Blood Programs for increasing the access of mothers and children to health care. Between, 2009 and 2010, 47 percent of newly diagnosed HIV/AIDS-positive women were diagnosed in the context of pregnancy, of whom seven percent had a late diagnosis during labor or immediately after labor. These diagnoses show the need for improvement in early testing of pregnant women to detect HIV cases, and health provision for pregnant women as a means to stop vertical transmission of HIV.

Between 2000 and 2010, the burden of HIV/AIDS decreased by 21.2 percent in Argentina, which was the second largest percentage decrease in South America during that timeframe. This reduction shows that it is possible to further reduce the HIV/AIDS burden even when a country has already achieved a relatively low burden of HIV, as was the case in Argentina. The country had only 2.9 percent of the total regional HIV/AIDS disability-adjusted life years (DALYs) or burden of disease in 2010. By contrast, Colombia, a country with a similar GDP and population size, has 15.7 percent of the region's total HIV/AIDS DALYs (MSN 2013). Furthermore, Argentina has the second lowest HIV/AIDS burden in South America, after Chile (MSN 2013). However, while Chile showed a 28 percent increase in the HIV/AIDS burden from 2000 to 2010, Argentina further reduced its already low burden by 21.2 percent—the seventh largest reduction in LAC during the same period of time (Institute for Health Metrics and Evaluation [IHME] 2013; MSN 2013). In 2010, the HIV/AIDS burden in Argentina was 223 DALYs per 100,000, less than half the regional average of 519 HIV/AIDS DALYs per 100,000 (IHME 2013).

Despite the exponential growth of new HIV cases from 1990 to 1997, early financial coverage of antiretroviral treatment (ART) beginning in 1997 has been essential in keeping the number of AIDS cases under control. To achieve such important results, Argentina built a robust National HIV/AIDS Program. Since the creation of the program in 1995, key innovations have contributed to the reduction of the HIV/AIDS burden.

Argentina's HIV/AIDS Innovations

Throughout this book, we highlight eight key HIV/AIDS programmatic innovations in Argentina: (a) the introduction of free ART since 1997; (b) a comprehensive legal framework for sexual and reproductive rights; (c) a new sex education program in schools; (d) strategic alliances between key health programs for reducing mother-to-child transmission; (e) the introduction of incentives and results-based financing (RBF) in the HIV/AIDS program; (f) strategic planning that uses the findings from national supply-side surveys in public health facilities; (g) electronic monitoring of supplies and medicines for increased accountability; and (h) implementation of an electronic clinical governance system for improving the quality of care and patient follow-up.

These eight lessons from Argentina's HIV/AIDS programmatic innovations are described below.

1. Universal access to HIV/AIDS treatment is a key prevention intervention.

Argentina and Brazil have shown that universal access to HIV/AIDS treatment is key to reducing the HIV/AIDS burden. Argentina nearly achieved universal coverage of ART in 2012, with 79 percent coverage (universal coverage is defined by the World Health Organization [WHO] as over 80 percent ART coverage; Pan American Health Organization [PAHO] 2013). Both countries made HIV/AIDS treatment a public good, providing free access to all those in need.

2. A comprehensive legal framework for sexual and reproductive rights reduces stigma and discrimination.

In 1995, Argentina's Law 24455 guaranteed universal access to HIV/AIDS care and treatment. In 1997, the country introduced the free provision of ART, regardless of income or health insurance status, guaranteeing the financial protection of HIV/AIDS treatment for all. This legal framework became vital for reducing new HIV infections and AIDS deaths.

In 2002, Law 25543 mandated that all health providers and facilities offer HIV testing to pregnant women. The law also mandated financial coverage of testing, becoming a key for the prevention of vertical transmission. Also in 2002, the law on Sexual Health and Responsible Parenthood (Law 25673) mandated the provision of contraceptive methods and free family planning counseling in primary health care centers and public hospitals.

In 2006, another law (26150) established the creation of the National Comprehensive Sexual Education Program, which is part of federal and state school curricula across the country and seeks to expand knowledge on safe sexual practices.

In 2010, the Marriage Equality Law (26618) recognized unions between persons of the same sex. Most recently, in 2012, the Gender Identity Law (26743) allowed transgender and transsexual persons, who carry a disproportionate burden of HIV/AIDS in the country (34 percent HIV prevalence among

transgender people in Argentina), to change their gender (MSN 2013). These laws create a legal framework to reduce the stigma that prevents diverse populations from accessing health services.

3. Sex education in schools improves prevention knowledge among youth.

Since the 2006 passage of Law 26150, Argentina has implemented a new sexual health education program in all public schools. Argentine youth have the highest knowledge of HIV transmission and prevention in the region, with 84 percent of young men and 89 percent of young women (ages 15–24) accurately identifying prevention methods and major misconceptions about HIV transmission, followed by Chile with 78 and 85 percent of young men and women, respectively (PAHO 2010).

4. Strategic alliances in service delivery can help reduce mother-to-child transmission.

From 2009 to 2010, 47 percent of newly diagnosed HIV/AIDS-positive women were identified in the context of pregnancy, underlining the need for early HIV testing among women of all ages. Argentina has reduced its mother-to-child transmission rate by 62 percent, from 13.7 per 100,000 live births in 2000 to 5.2 in 2011. This success was possible thanks to the following: (a) a strategic alliance with the safe blood program, creating a comprehensive system for integrated prenatal testing of HIV/AIDS, sexually transmitted diseases, and other diseases, and (b) a strategic alliance with the public health surveillance system for the creation of epidemiological monitoring of health events of seropositive pregnant women and to analyze related data.

5. Incentives and results-based financing (RBF) can boost the effectiveness of HIV/AIDS programs.

The use of RBF by the HIV/AIDS Program increased overall system accountability and improved program performance (PAHO 2010). Under the Essential Public Health Functions Project (EPHFP), a package of guaranteed public health services was created with the use of RBF in six public health programs for the following conditions: vaccine preventable diseases, vector-borne diseases, tuberculosis, noncommunicable diseases, blood services, and HIV/AIDS. In each of the programs, intermediate results were identified as outputs. In the case of the National HIV/AIDS Program, a third-party external auditor verified the completion of six outputs prior to authorizing payments to provinces. The use of RBF has since been expanded, and the use of outputs has been consolidated throughout the country.

6. National supply-side surveys improve strategic planning.

Argentina conducted two national supply-side surveys (2007 and 2011) in health facilities throughout the country. Subnational HIV/AIDS program officers also participated in the survey. Responses, trends, practices, and results were used

to inform the national HIV/AIDS strategic planning process. The results show that 90 percent of provinces reported an improvement in the supply of and access to preventive, diagnostic, and health care services for people living with HIV/AIDS from 2007 to 2011.

7. Online monitoring systems can eliminate duplication and boost efficiency.

In 2009, the Ministry of Health introduced an online monitoring system that tracks the use and distribution of HIV/AIDS supplies. The system was designed with support from EPHFP to avoid loss and duplication of HIV/AIDS medications and supplies and to improve efficiency in the logistics of procurement, shipment, and accountability.

8. Clinical governance systems increase the quality of health service provision.

EPHFP also supported the National HIV/AIDS Program in the development and implementation of a patient case-management system. The system allows for online registration of patients, online requests for authorizations, monitoring of patients' viral load and other tests, as well as monitoring of drug regimen and treatment protocols. The case-management software, which was introduced in 2011, allows for assessment of treatment quality and adherence and resistance to treatment. All provinces are linked into the system, which, by the end of 2012, included more than 30,000 patients (PAHO 2010). The HIV monitoring system for patients has increased the efficiency of prescription and delivery of ART, as well as patient follow-up.

The Cost of HIV/AIDS in Argentina

Economic Analysis of the HIV/AIDS Program

HIV/AIDS expenditures per DALY in Argentina were the third highest in the region after Cuba and Chile in 2009–11. While the average HIV/AIDS expenditure per DALY in LAC between 2009 and 2011 was US\$1,052, in Argentina it was three times higher, at US\$3,178. Argentina's total domestic HIV spending was US\$285.95 million in 2012 and US\$287.1 million in 2009. The country also has the second highest spending per person living with HIV/AIDS in the region, after Barbados. Argentina currently spends US\$3,178 per DALY of HIV/AIDS, almost three times the regional average of US\$1,052 (UNAIDS 2012).

A cross-country comparison of HIV spending finds that Argentina has one of the lowest burdens of HIV in the region and is one of the highest spenders per DALY. However, the results are not as clear when looking at countries in the world with a similar HIV/AIDS burden: some countries spend more than Argentina and have more DALYs per 100,000; others spend less and have fewer DALYs per 100,000. Thus, although Argentina's spending is comparatively high, among countries with comparable HIV/AIDS spending, Argentina has had a significant reduction in HIV/AIDS burden from 2000 to 2010, while having a relatively low HIV/AIDS burden in 2010.

Sustainability

From 2006 to 2009, external HIV funding decreased by 89.63 percent, reaching 0.25 percent of total HIV spending in Argentina by 2009. In 2012, external funding was zero, showing important political commitment to achieving medium- and long-term program sustainability. Comparatively, external funding corresponds to approximately 46 percent of total expenditures in Africa and 13 percent in LAC.

Argentina has a similar allocation of HIV funds compared with the LAC average for treatment and prevention, where treatment and care represented 80 percent of total HIV spending in 2012 (75 percent in LAC). The difference is partially explained by the higher cost of ART in Argentina, which means that Argentina can allocate less to prevention (Argentina allocates 1.2 percent of HIV/AIDS spending to prevention activities, compared with 15 percent in LAC) (Arán-Matero et al. 2011).

Despite the high cost of ART, this study shows that the Argentine National HIV/AIDS Program is cost beneficial, with an estimated 1.03 benefit-to-cost ratio (chapter 7).

Lives Saved and Universal Access to Treatment

Our estimations indicate that, during the past decade, 2,258 lives were potentially saved under the most conservative scenario, and 4,379 lives were saved under the most likely epidemiological scenario. Over the 10 years analyzed, the 4,379 potential lives saved under the most probable scenario (approximately 440 lives per year) are a direct consequence of the measures implemented as part of the National Program for combating the HIV/AIDS epidemic.

The cases of Argentina, Brazil, and Mexico show that universal access to HIV/AIDS treatment and high coverage of ART are key measures for reducing the HIV/AIDS burden. Argentina had 79 percent ART coverage in 2012. In the three mentioned countries, national HIV/AIDS programs made ART a public good, providing free and universal access to all without distinction. Currently, the challenge for all countries, and specifically for Argentina, is to reach a new standard in treatment, under the new goals defined by WHO and PAHO to have 90 percent ART coverage (PAHO 2014).

Challenges Ahead

Despite its achievements, Argentina still faces several challenges in halting the spread of HIV, including but not limited to the following, which are described in detail in the indicated chapters:

- A stubbornly high number of new infections among young men who have sex with men, while most other groups show marked reductions (chapters 1 and 2)
- Geographical inequalities in HIV/AIDS rates between provinces (chapter 3)

- Insufficient coverage of HIV diagnostic testing and insufficient HIV testing of tuberculosis patients (chapter 4)
- Governance issues in health service delivery (service networks, human resources, training, budget) (chapters 1 and 4)
- Low expenditure on HIV prevention (chapter 6)
- High comparative cost of ART medicines (chapter 6)
- The long-term financial sustainability of the AIDS Program, considering the increasing number of patients in treatment (chapter 7)

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Thirty Years of the HIV/AIDS Epidemic in Argentina

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with Lais Miachon, Verónica Osorio, Nashira Calvo, and Rocío Manchado

Introduction

Three decades after the first AIDS diagnosis in Argentina (in 1982), the epidemic remains concentrated among certain population groups in major urban centers (World Health Organization [WHO] 2013).¹ Argentina is among the five countries with the lowest HIV/AIDS incidence and prevalence rates in Latin America and the Caribbean (LAC) (Joint United Nations Programme on HIV/AIDS [UNAIDS] 2012). The country has achieved remarkable results in reducing the burden of HIV over the past decade, reaching the second lowest burden for HIV/AIDS in South America in 2010, after Chile (Institute for Health Metrics and Evaluation [IHME] 2013). In that timeframe, the burden of HIV/AIDS decreased by 21 percent, from 283.8 disability-adjusted life years (DALYs) per 100,000 people in 2000 to 223.5 DALYs per 100,000 people in 2010 (IHME 2013). The HIV incidence rate decreased by 25 percent, from 15.9 per 100,000 in 2001 to 12 per 100,000 in 2011 (National Ministry of Health [MSN] 2013).

In 1992, Argentina introduced a national program to reduce the HIV/AIDS epidemic and disease burden (Lara and Hofbauer 2004). Since 1996, the MSN has implemented HIV/AIDS treatment as a public good, guaranteeing free and universal access for all citizens. The country implemented a comprehensive set of service delivery solutions that include free and universal access to treatment, social communication campaigns to promote the distribution and use of condoms, health education on sexual and reproductive rights, epidemiological surveillance systems for HIV/AIDS, monitoring and evaluation and clinical governance solutions using surveys, electronic information systems to monitor patients, online supply and medicine tracking systems, and social mobilization and consensus building to create new legal frameworks and reduce stigma and discrimination.

Over the past five years, efforts have been focused on improving health surveillance systems and implementing a new, results-based financing (RBF) for preventive and acute health care services and key essential public health

functions. All these efforts have brought substantial improvements to the quality of life and life expectancy of people living with HIV/AIDS, so that having HIV/AIDS in Argentina currently means living with a chronic and manageable disease.

In this chapter, we analyze the epidemiological situation of HIV/AIDS in Argentina and the sequence of key decisions implemented over the years, which led to the sustained reduction in the country's HIV/AIDS burden. In addition, we review the continuous and progressive legal framework that has accompanied Argentina's National HIV/AIDS Program and some of its key achievements. The next section discusses Argentina's HIV/AIDS epidemiological situation and provides an overview of changes during the past two decades, exploring tuberculosis (TB) and HIV co-infection, HIV prevention among youth, prevention of mother-to-child transmission (PMTCT), and antiretroviral treatment (ART) coverage. The following section provides information on the public policies that created the National HIV/AIDS Program, including programmatic structure, epidemiological surveillance, organizational structure, and the use of RBF.

Changes in the HIV/AIDS Epidemic during the Past Two Decades

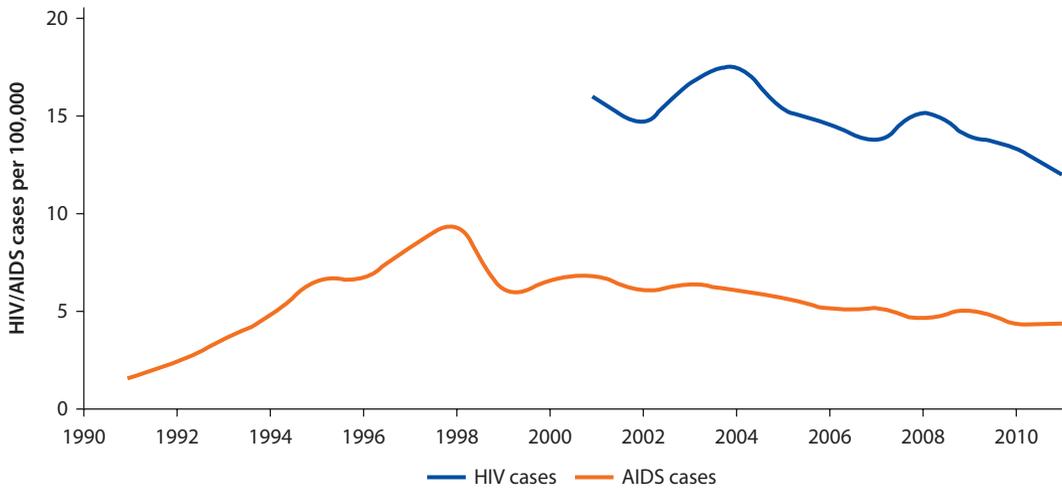
In 2013, there were around 110,000 people living with HIV/AIDS in Argentina, meaning that one in every 365 persons is infected with HIV. The HIV incidence across age groups has remained stable, with 4.8 of every 1,000 young people and adults (ages 15–49 years) infected with HIV in Argentina (United Nations 2012; MSN 2013). In 2013, around 30 percent of infected people were unaware of their status, which represents a 40 percent reduction from 2011 (MSN 2011). There are around 5,500 new HIV cases every year, which is 15 new infections per day, for a total of 66,657 new HIV cases between 2001 and 2012 (MSN 2013).

The incidence rate of AIDS has been declining since 1997 and incidence of HIV has been declining since 2004. In 2011, the HIV incidence rate was 12 per 100,000 people and the incidence rate of AIDS cases was 3.6 per 100,000 people (4,915 new HIV infections and 1,454 cases of AIDS in recent years) (MSN 2013) (figures 1.1 and 1.2).

As is the case in the majority of middle-income countries, HIV/AIDS in Argentina is concentrated in large cities. The provinces with the most HIV cases reported from 2001 to 2012 were Buenos Aires, with 42.8 percent of the cases, followed by the Autonomous City of Buenos Aires (the federal capital), with 16.7 percent; Córdoba, with 7.9 percent; and Santa Fe, with 5.5 percent (MSN 2013). These four provinces accounted for 72.9 percent of the accumulated HIV cases over the past decade, while the other 20 provinces together accounted for the remaining 25 percent of the diagnosed HIV cases. Nonetheless, the province of Buenos Aires, the City of Buenos Aires, and Santa Fe were the only localities to show decreases in HIV/AIDS from 2001 to 2011 (52.86, 41.13, and 6.8 percent decreases, respectively), while most other provinces remained stable

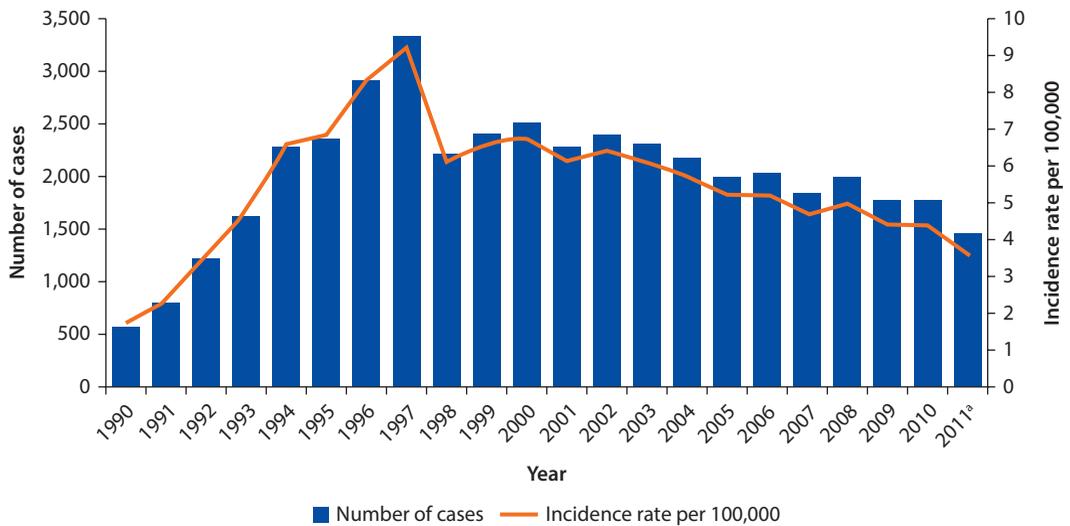
Figure 1.1 AIDS Cases and HIV Incidence in Argentina, 1991–2011

Per 100,000 people



Source: MSN 2013.

Figure 1.2 AIDS in Argentina, 1990–2011



Source: MSN 2013.

a. Data from 2011 was not finalized due to delays in notification.

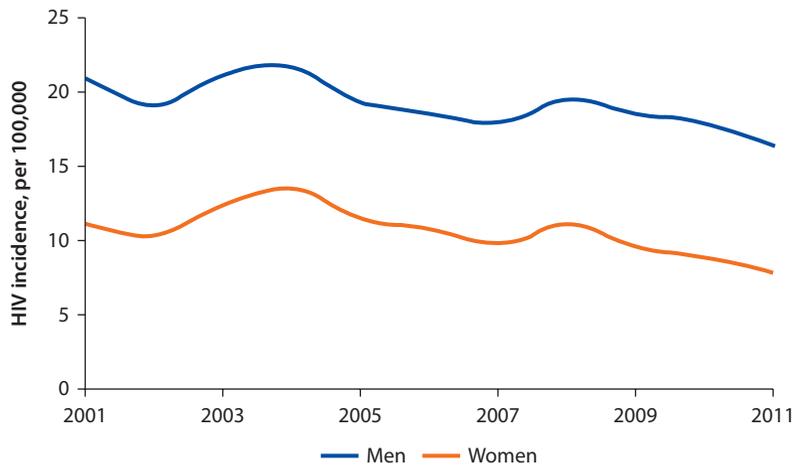
or showed increased HIV infections (MSN 2013). Changes in the provincial burden of HIV/AIDS are detailed in chapter 3.

National HIV rates have been on the decline over the past decade, especially among women. The HIV rate among men decreased from 20.9 per 100,000 in 2001 to 16.4 per 100,000 in 2011 (a 21.5 percent rate of decline), while the HIV rate among women decreased from 11 per 100,000 in 2001 to

7.8 in 2011 (a 29.1 percent rate of decline). The HIV incidence rate is twice as high among men as among women, a trend that has remained stable since 2000 (figure 1.3).

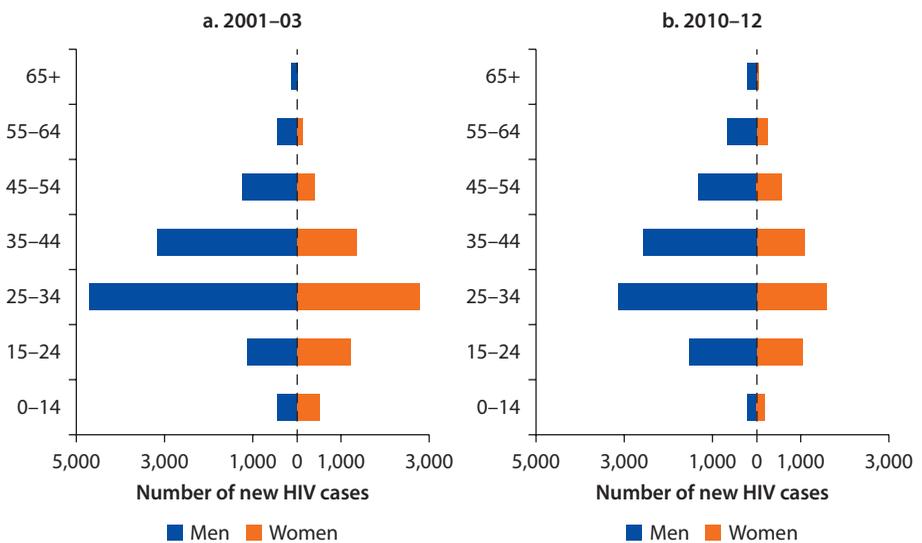
Looking at HIV incidence across age groups in 2001–03 and 2010–12, the highest HIV incidence occurred among individuals ages 25–34 years in both time periods. There were more infections among women than men in the 0–14 age group, a trend that is reversed later in life (figure 1.4). Looking at net values, there were more men and women ages 55 and older living with HIV in 2010–12

Figure 1.3 HIV Incidence in Argentina, by Sex, 2001–11



Source: MSN 2013.

Figure 1.4 Number of New HIV Cases in Argentina, by Age, 2001–03 and 2010–12



Source: MSN 2013.

than in 2001–03. There was also a reduction in the number of cases across all age groups, with the exception of young men (ages 15–24), a group that presented a net increase. The reduction in the number of new cases among the population under age 15 years is related to improvements in PMTCT, which is described in detail in the subsection on vertical transmission of HIV. The HIV incidence rate shows similar results (figure 1.5).

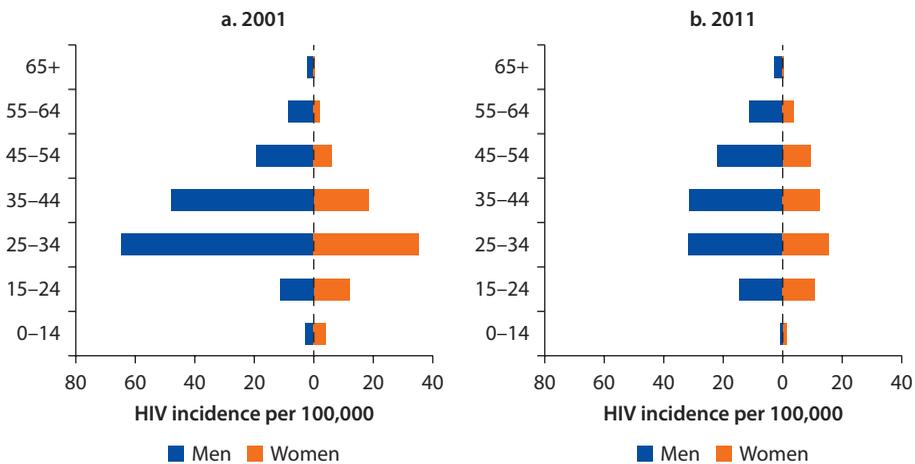
The ratio of male-to-female HIV infections increased slightly from 1.8 in 2001 to 2 in 2011. The male-to-female ratio by age shows nearly the same number of infections among children and young adults (ages 0–24)—a ratio that tends toward more male infections at later ages. These trends are relatively stable across time, with the exception of older adults (ages 55+), for whom there is greater fluctuation in the ratio (MSN 2013) (figure 1.6).

Sexual relations are the most prevalent route of HIV infection in Argentina, with sexual intercourse responsible for 89 percent of new male infections and 90.7 percent of new female infections between 2010 and 2012. In these years, 41.1 percent of new infections among men originated through sex with other men and 47.9 percent through sex with women. Vertical transmission caused 1.5 percent of new HIV infections among males and about 3.1 percent among females. Injection drug use transmissions represented 1.2 and 0.5 percent of new HIV infections among men and women, respectively (figure 1.7) (MSN 2013).

Recent trends in HIV incidence show the need to continue targeting high-risk groups to lower the number of new infections. From 2010 to 2012, approximately 66 percent of new HIV diagnoses occurred among men, with 30 percent of new infections occurring through homosexual intercourse (MSN 2013). Although there has been a reduction in the incidence of HIV among women,

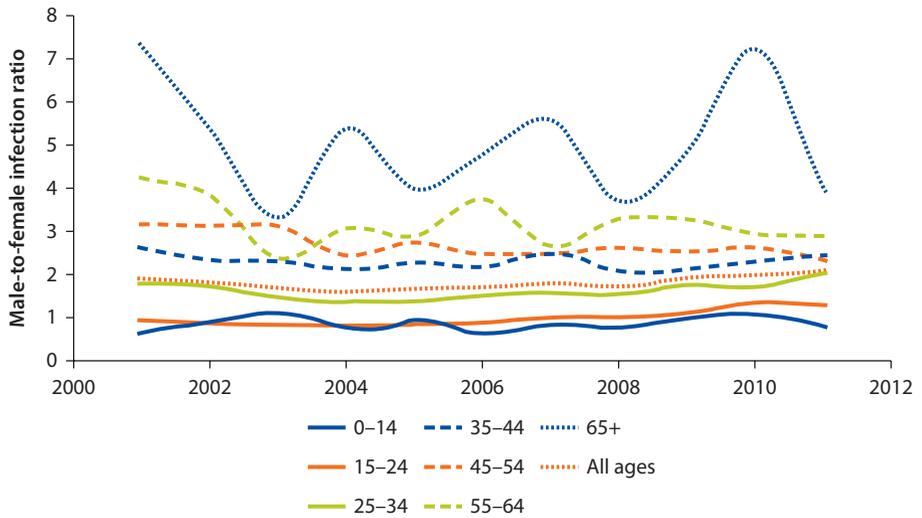
Figure 1.5 HIV Incidence in Argentina, by Age, 2001 and 2011

Per 100,000 people



Source: MSN 2013.

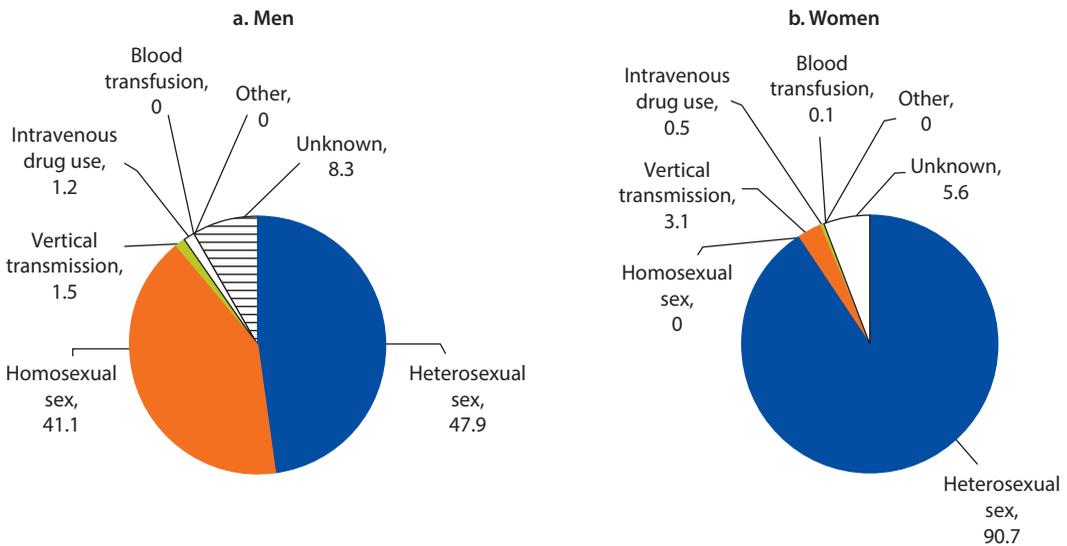
Figure 1.6 Male-to-Female HIV Infection Ratio, by Age, 2001–11



Source: MSN 2013.

Figure 1.7 HIV Transmission Routes in Argentina, 2010–12

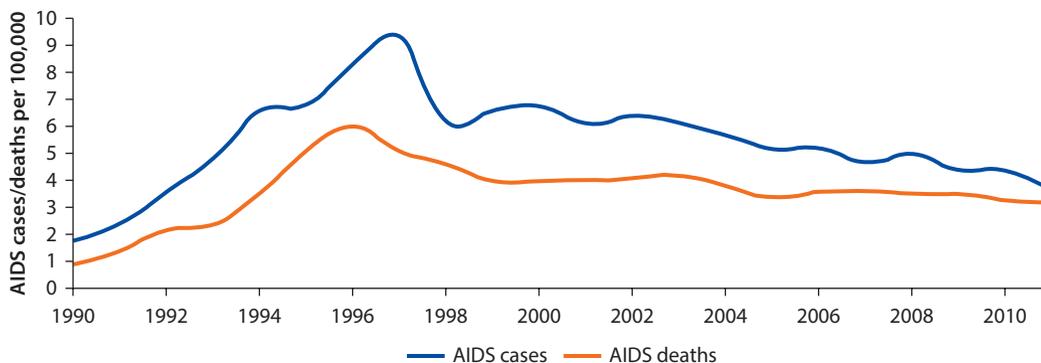
Percent



Source: Epidemiological bulletin, MSN 2013.

there have been increases in the incidence among men ages 15–24 and 45 and older (figure 1.5).

It is vital to understand the educational level of those most at risk of infection. Of new male diagnoses, almost half occurred in men who had completed at least secondary education, whereas only 35 percent of women had reached

Figure 1.8 AIDS Cases and Deaths Caused by AIDS, 1990–2011*Per 100,000 people**Source:* MSN 2013.

the same educational level (MSN 2013). Moreover, 58 percent of women and 42 percent of men over age 19 who were diagnosed from 2010 to 2012 had not completed secondary education (MSN 2013). Among men who have sex with men, 70 percent of those infected from 2010 to 2012 had completed at least secondary education (MSN 2013). Given the incidence of HIV in Argentina, it is possible to define young, educated men who have sex with men as one of the target high-risk groups, taking into account the high educational attainment and lower age of diagnosis among this subpopulation when developing interventions.

In deaths caused by AIDS, there have been three distinct historical periods in Argentina: (a) a rapid increase from 1990 to a peak in 1997; (b) a sustained decrease from 1997 to 2005 as a consequence of Law 24455, which guaranteed universal and free access to HIV/AIDS treatment; and (c) a leveling off since 2006 (figure 1.8).

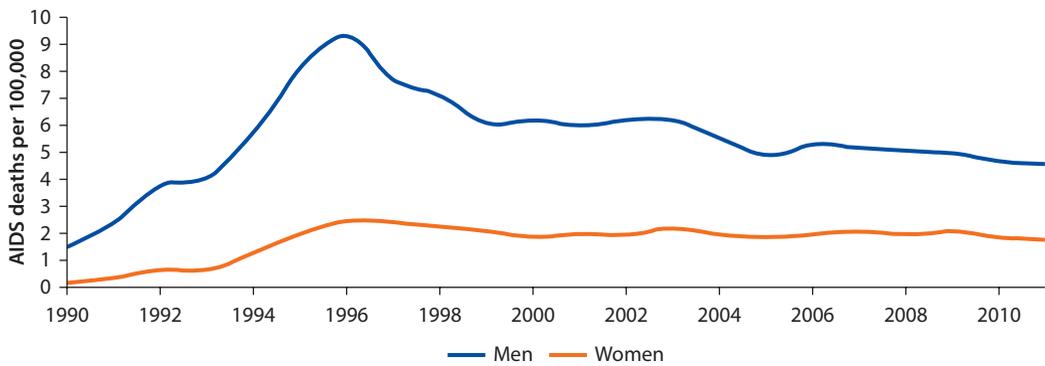
The rate of male AIDS deaths presents a pattern similar to that described above, with a peak in 1996. AIDS deaths among women show a different pattern; deaths increase until 1996, followed by a subsequent leveling off (figure 1.9).

Vertical Transmission of HIV

Vertical transmission is rare during early pregnancy and relatively frequent in late pregnancy and during childbirth, but can be prevented through early medical intervention (Goldenberg 2003). Breastfeeding contributes substantially to overall risk. In the absence of specific interventions, the estimated rate of vertical transmission ranges from 15 to 40 percent of pregnancies in infected women (Newell 2001). Studies suggest that most transmissions in developed countries occur at peripartum (i.e., during childbirth or labor) and one-third occur in utero. In developing countries, although the majority of infections also occur at peripartum, a significant percentage (10–17 percent)

Figure 1.9 Deaths Caused by AIDS, by Sex, 1990–2011

Per 100,000 people



Source: MSN 2013.

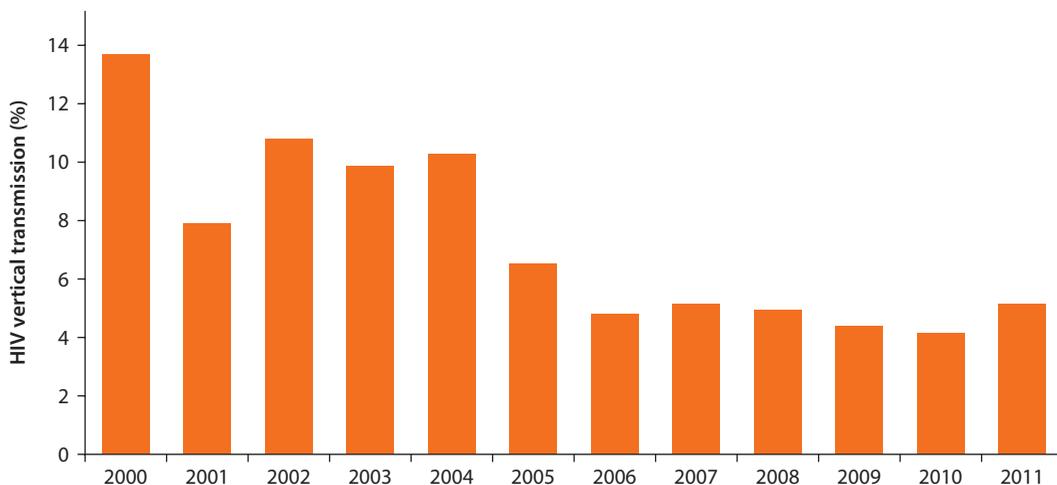
occurs through breastfeeding (Tóth and others 2001). In settings where combination therapy is applied during pregnancy and delivery and when breastfeeding does not take place, the reported infection rate can fall below two percent. Among breastfeeding mothers, the transmission rate at six weeks is around 10 percent, but can jump to 25 percent or more after 18 months of breastfeeding (Newell 2001). Therefore, it is necessary to counsel HIV-positive mothers on breastfeeding.

In June 2001, the United Nations Special Assembly on HIV/AIDS set targets to reduce the number of new HIV infections among children by 20 and 50 percent by the years 2005 and 2010, respectively (Newell 2001). Achieving these targets would require comprehensive policies, guidelines, and integrated service delivery in the health delivery model to ensure full access to the necessary range of services, including sexual and reproductive health care; antenatal care; and HIV and syphilis testing, treatment, and care (Pan American Health Organization [PAHO] 2010b).

According to PAHO and WHO, LAC is on track in implementing strategies or plans of action in support of the Elimination Initiative and presenting up-to-date guidelines. Twenty-two countries have plans and 26 have updated guidelines in compliance with WHO recommendations for PMTCT (PAHO 2010b). Argentina has an operational and strategic plan as well as up-to-date guidelines for the Elimination Initiative. In addition, Argentina has created partnerships between the National HIV/AIDS Program and the National Maternal and Child Health Program to increase screening, surveillance, and early treatment of HIV-positive mothers and their children, as well as universal and free access to milk formula for children of infected mothers.

Although there are still 100 mother-to-child transmission infections each year (MSN 2013), Argentina has reduced the vertical transmission rate from 13.7 per 100,000 live births in 2000 to 5.2 in 2011, a reduction of almost 62 percent (figure 1.10).

Figure 1.10 Vertical HIV Transmission Rate among Children Born to HIV Positive Mothers, 2000–11
Percent



Source: MSN 2013.

Although Argentina has substantially improved its HIV/AIDS epidemic situation, there has been a halt in the decline of HIV incidence, AIDS mortality, and vertical transmission (MSN 2013). While HIV transmission through sexual intercourse increased from 67.4 percent in 2001 to 90.9 percent in 2012 among men and from 78.1 to 89.6 percent among women, vertical transmission rates have declined for males and females (figure 1.11).

Between 2009 and 2010, 47 percent of newly diagnosed HIV-positive women were diagnosed in the context of pregnancy. Of these, seven percent had a late diagnosis during labor or immediately after labor (figure 1.12).

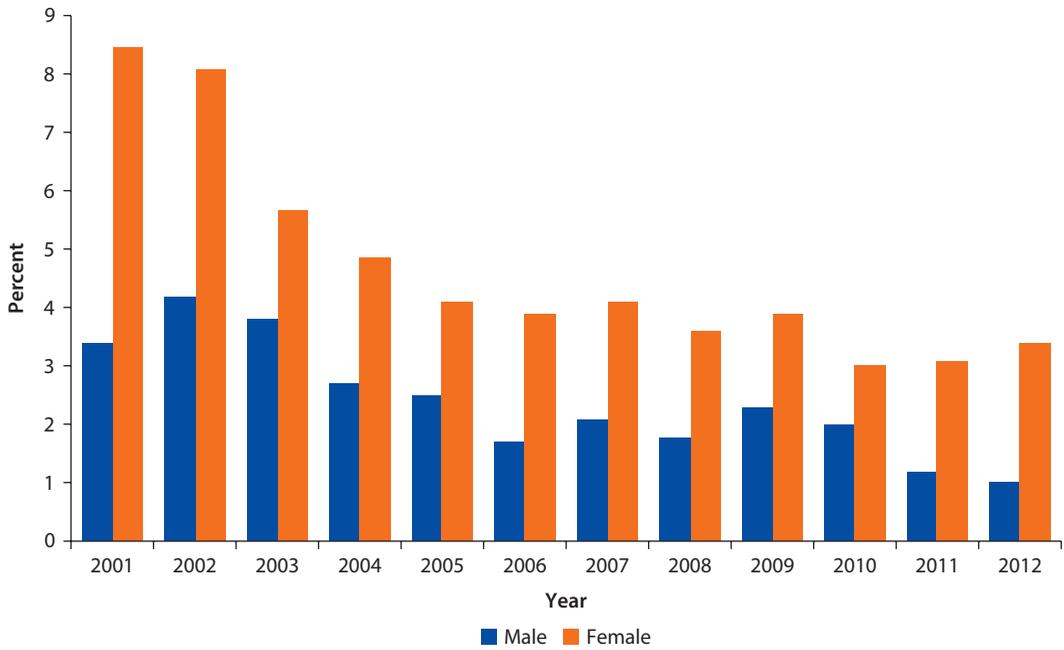
Regional HIV testing coverage during pregnancy in LAC increased more than 100 percent from 2005 (29 percent) to 2010 (61 percent) (figure 1.13). In Argentina, the reported national testing coverage is 90 percent.

The LAC region has greatly progressed in the provision of antiretroviral drugs (ARV) to pregnant women. ARV coverage among HIV-positive pregnant women increased from approximately 50 percent in 2005 to 61 percent in 2010 (PAHO 2010b). In Argentina, it is estimated that more than 95 percent of pregnant women living with HIV receive ART for PMTCT (PAHO 2010b). In 2010, four low- and middle-income countries in the region achieved universal access for ARV provision to HIV-positive pregnant women for PMTCT: Argentina, Brazil, Ecuador, and Honduras (PAHO 2010b).

Investment from public and international funding sources in national PMTCT programs (not including operating costs of prenatal care) varies between countries (figure 1.14). Average domestic spending per pregnant woman for PMTCT was US\$4 to US\$5 in 2008 and 2009 among the only 11 reporting countries. Argentina shows the highest PMTCT domestic spending

Figure 1.11 HIV Vertical Transmission, by Sex, 2001–12

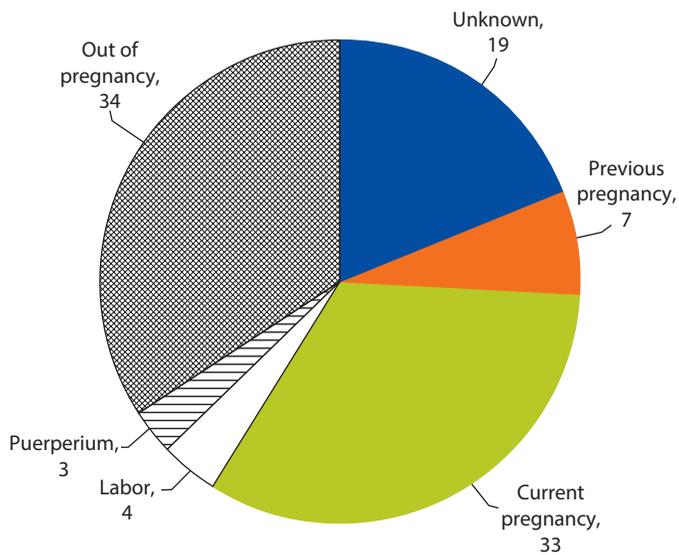
Percent of all transmission routes



Source: MSN 2013.

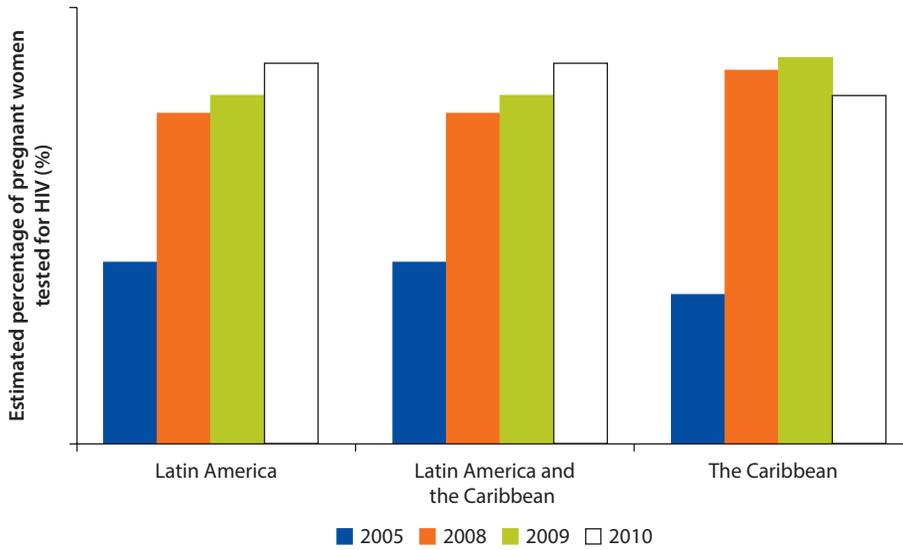
Figure 1.12 HIV Diagnosis Among Women According to Pregnancy Stage, 2009–12

Percent



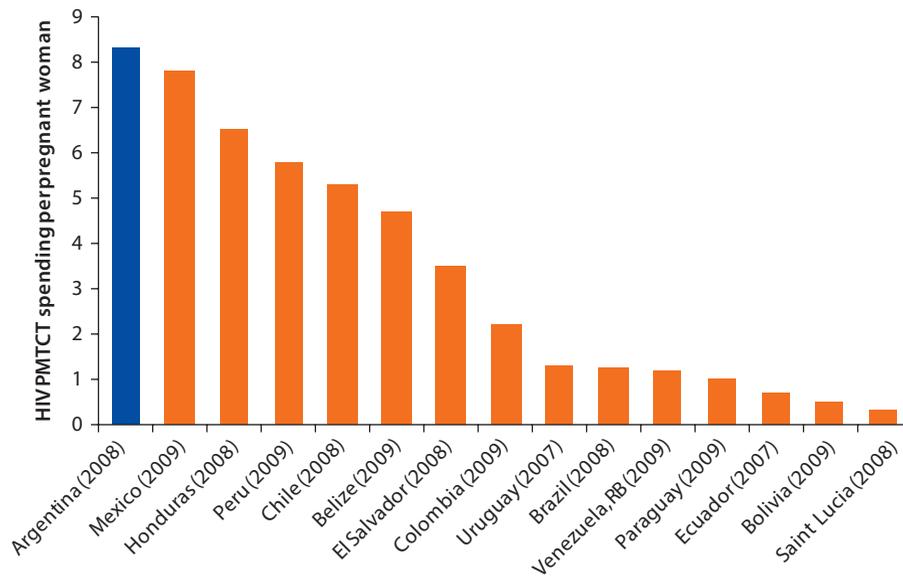
Source: MSN 2013.

Figure 1.13 Regional Percentages of Pregnant Women Who Received an HIV Test in Low- and Middle-Income Countries, 2005, 2008, 2009, and 2010



Sources: PAHO 2010b; WHO and others 2011.

Figure 1.14 Average Annual Domestic Spending per Pregnant Woman on Prevention of Mother-to-Child HIV Transmission, Selected Countries in Latin America and the Caribbean
US dollars



Source: PAHO 2010b.

per pregnant woman (PAHO 2010b). The percentage of antenatal prophylaxis coverage in Argentina has varied during the past four years, reaching 90 percent coverage in 2011. In 2012, coverage of intra-partum prophylaxis was 87.9 percent and the percentage of children who received neonatal exposure prophylaxis was 98.6 percent (MSN 2013).

Many countries use primary information systems based on the Perinatal Information System developed by PAHO/Perinatal Clinical Record. This tool has recently been updated to include HIV information and produce automatic reports (PAHO 2010b). Since 2009, the National HIV/AIDS and STDs Office (DSyETS) of MSN in Argentina receives notifications of births to women with HIV and pediatric information from laboratories performing diagnosis, with the goal of monitoring the rate of vertical transmission and analyzing the associated variables (MSN 2013).

Moreover, in an effort to strengthen information systems throughout Argentina, MSN experts, with technical support from PAHO, conducted a 2010–11 baseline study with the following three main objectives: (a) determine the national HIV and syphilis prevalence among pregnant women, (b) compare information from this study with routine information systems and quantify information gaps, and (c) assess the quality of antenatal care for women with HIV and syphilis.

Argentina conducted the national baseline study among 6,723 puerperal women attending 23 public hospitals. Of these women, 49 percent sought their first prenatal care visit during the first trimester, 36 percent during the second trimester, and seven percent during the third trimester; three percent did not receive prenatal care; and data were unavailable for five percent. A total of 85 and 87 percent of women, respectively, received HIV and syphilis testing during antenatal care; the corresponding national prevalence of HIV and syphilis was 0.44 and 1.32 percent, respectively. Of the 24 women with HIV, 11 were diagnosed before their current pregnancy, 12 during their current pregnancy, and one was diagnosed during the peripartum period; 22 received ARVs for PMTCT. Among all women with syphilis at puerperium, 33.5 percent started their pregnancy without syphilis (i.e., had an initial negative test during pregnancy and were infected during pregnancy). Among women who did not undergo HIV testing during antenatal care, 46 percent had at least one antenatal care encounter and 15 percent had five or more encounters with health professionals (PAHO 2010b).

In LAC, an estimated 15–30 percent of children become HIV-infected during pregnancy or birth to HIV-infected women who do not undergo ART; an additional 5–20 percent become infected through breast milk. The use of ART medication significantly reduces mother-to-child transmission (PAHO 2010a).

Prevention and Youth in LAC

Based on a report from PAHO and WHO, less than half of young people ages 15–24 in LAC know how to prevent sexual transmission of HIV and reject stigma and major misconceptions about HIV transmission (PAHO 2010b).

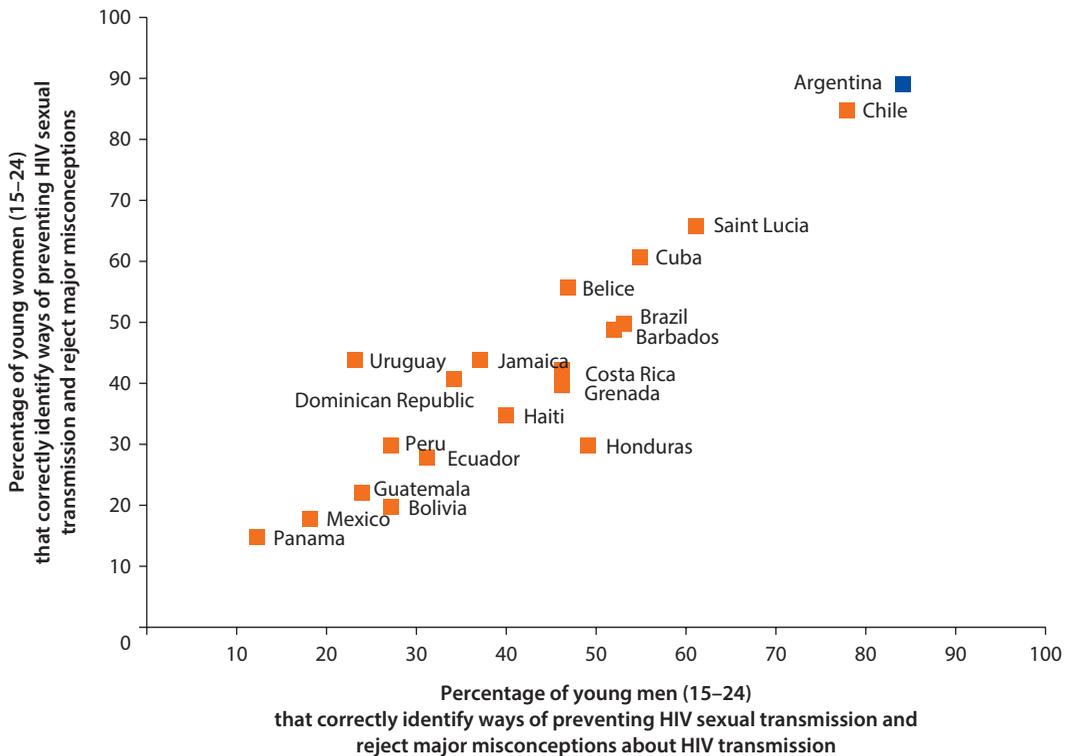
Median values are low (around 40 percent) for males and females. In addition, Argentina, Chile, and Nicaragua are the only countries with reliable data regarding youth knowledge on HIV/AIDS, among which Argentina and Chile have more than 80 percent of youth accurately identifying how to prevent the sexual transmission of HIV. Argentina is the highest rated in the region in youth knowledge about HIV transmission and prevention (figure 1.15) (PAHO 2010b).

Efforts to include sexual and reproductive health education in schools in Argentina in the early 1990s are visible in the high rates of youth knowledge about HIV transmission and prevention. However, the rate of new infections among males ages 15–24 increased from 11.3 in 2001 to 15.7 per 100,000 in 2011 (figure 1.5).

TB and HIV

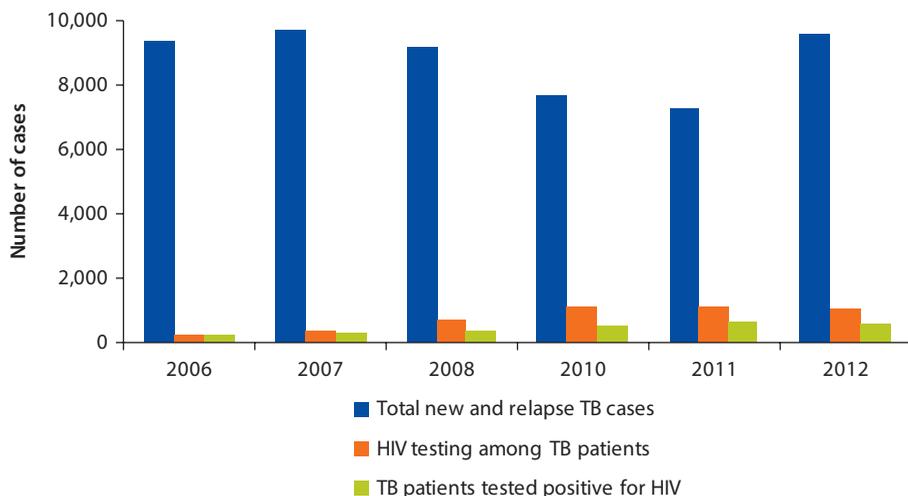
Given the high risk of TB deaths among people living with HIV/AIDS, it is important to strengthen HIV/AIDS testing on people receiving TB treatment. It is also important to improve detection, prevention, and access to

Figure 1.15 Youth Knowledge about HIV Transmission and Prevention in Latin America and the Caribbean, 2007–09



Source: PAHO 2010b.

Note: Information on the study methodology is not available at the source of information, so the data included are subject to variation and should be considered carefully.

Figure 1.16 Registered Cases of Tuberculosis and HIV Testing, 2006–12

Source: UNAIDS 2014.

Note: TB = tuberculosis.

TB treatment for HIV/AIDS patients, as well as to ensure the benefits of integrated HIV and TB services.

In Argentina, the number of new and relapse cases of TB has remained relatively stable since 2006 (figure 1.16). However, only a small proportion of people with TB are screened for HIV. In 2012, 11 percent of TB patients were tested for HIV. Of these, 53 percent tested positive, resulting in 559 TB-HIV co-infected patients (UNAIDS 2014). There is a need to increase coverage of HIV testing among TB patients, which would likely lead to an increase in the number of HIV cases among TB patients.

In LAC, 2010 saw an estimated 267,000 new TB cases. More than two-thirds (69 percent) of the TB cases occurred in South America, 14 percent in the Caribbean, 12 percent in Mexico and Central America, and 5.5 percent in North America. The total TB incidence rate is 28.6 per 100,000 people. In 2010, there were an estimated 334,000 TB cases in the Americas and an estimated 20,000 TB deaths among HIV-negative patients (PAHO 2011).

ART Coverage

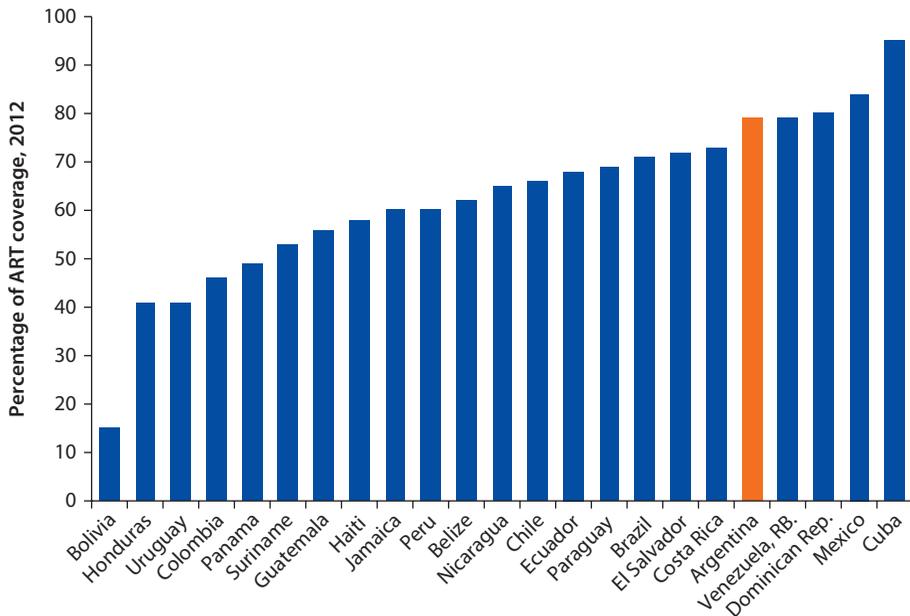
Argentina and Brazil have led the way in universal and free access to ART provision since 1995 and 1996, respectively. For people with advanced HIV infections, both governments have prioritized ART through the public health system. In Argentina, Law 24455, passed in 1995, guarantees universal access to HIV/AIDS treatment, including the provision of medical, psychological, and pharmaceutical therapy (Bianco and others 1998). In Brazil, free and universal provision of ART through the public health system was mandated by the 1996 Federal Law 9313 (UNAIDS 2013).

In 2011, LAC had higher coverage of ART than the global average (68 percent in Latin America, 67 percent in the Caribbean, 54 percent globally). Since highly active antiretroviral treatment (HAART) became available to treat HIV in the late 1990s, there has been wide and impressive distribution of this treatment across the region.

Nonetheless, disparities in access to treatment remain across the region. On average, ART is more accessible in South America than in Central America. And while some countries have reached more than 80 percent treatment coverage (Cuba, the Dominican Republic, and Mexico), others have achieved more than 60 percent coverage (Argentina with 79 percent, Brazil, Chile, Ecuador, El Salvador, Jamaica, Nicaragua, Peru, and República Bolivariana de Venezuela). Some countries (Bolivia, Colombia, Honduras, and Uruguay) have yet to reach 50 percent access (UNAIDS 2012) (figure 1.17).

Although over 70 percent of total HIV spending in LAC between 2009 and 2011 was spent on ART (PAHO 2013), nearly one-third of HIV-infected people have not received treatment. Bolivia has the lowest ART coverage in the region, with a 15 percent coverage rate in 2011. Although the supply of ART has improved in the region over the past few years, in 2012 45 percent of LAC countries still reported at least one episode of ART being out of stock (PAHO 2013).

Figure 1.17 Estimated Antiretroviral Treatment Coverage in Latin America, 2012



Source: UNAIDS 2012.

Note: ART = antiretroviral treatment

HIV/AIDS Response in Argentina: National Public Policy and Public Good

Argentina's HIV/AIDS response was created as a national public policy that is part of a solid legal framework. This national policy articulates systems of functions, activities, actors, resources, and information flows that are in constant interaction.

Programmatic Structure

Preventive and treatment strategies to respond to the HIV/AIDS epidemic have evolved—accompanied by new knowledge and treatment options—since the mid-1980s, when diagnostic tests were the only resource available. Argentina and Brazil were pioneers in the introduction of comprehensive and universal HIV/AIDS programs for reducing the spread and burden of the epidemic, including universal and free access to health care for people living with HIV/AIDS.

From 1983 to 1989, MSN started the response to the HIV/AIDS epidemic by incorporating HIV/AIDS into the agenda of the existing STDs Department and creating the National Register of HIV/AIDS. In 1990, the Argentine government declared the fight against AIDS to be a matter of national interest with the adoption of National AIDS Law 23798, which holds the Ministry of Health and Social Action as the responsible authority. The 1991 promulgation of this law by Decree 1244/91 established the requirement of informed consent for disease detection and reaffirmed the confidentiality rule for HIV testing and results. Moreover, it introduced HIV/AIDS prevention education into teaching programs at the primary, secondary, and tertiary school levels (Lara and Hofbauer 2004).

In 1992, as a result of Law 23798 (Lara and Hofbauer 2004), the National Control Program of Human Retroviruses (Leukemia and AIDS) was created under MSN. Until 1997, the program functioned with a structure based on two main pillars of activities: diagnosis and care of infected patients and distribution of drugs. The program includes medical assistance, viral load testing, reagents for blood banks, epidemiological surveillance, AIDS research, control and prevention of sexually transmitted infections (STIs), and dissemination of information. It also includes a free and anonymous telephone line, Dial Health/Ask AIDS, aimed at meeting public demand for information on issues such as prevention and discrimination (Lara and Hofbauer 2004).

Subsequently, Law 24455 was passed in 1995. It guarantees universal access to HIV/AIDS treatment, including the provision of medical, psychological, and pharmaceutical therapy (Bianco and others 1998). Law 24455 defined treatment and care as a public good for the entire affected population regardless of individual differences in health insurance and coverage. Under the law, the social security system must provide free treatment for its affiliates (provincial and municipal *Obras Sociales* from the social security system), as they are not ruled by the same legal framework as public facilities (Bianco and others 1998).

In 1996, the Supreme Court ruled that all private medical insurance schemes were obliged to provide free treatment and medicines to HIV/AIDS patients under Law 24754. MSN also approved the Obligatory Medical Program for Social Medical Security, which included complete coverage of treatment and medicines for people living with HIV/AIDS. In addition, the Supreme Court made each of the country's hospitals accountable for providing free HIV/AIDS medical treatment, making HIV/AIDS care and prevention an obligation of the state (Bianco and others 1998). In 1997, the provisions of this law became applicable to private medical insurance (Bianco and others 1998).

Since 1996, the provision of ARVs has been managed by MSN (Lara and Hofbauer 2004). In 1997, by virtue of Resolution 346, MSN changed the HIV/AIDS medicine purchase and distribution system, making it the responsibility of the National Department of Services Regulations in the sub-secretariat of Medical Treatment. This resolution defines the responsibilities of the National HIV/AIDS Program as follows: (a) assessment of necessities, (b) technical specifications of products to be purchased, (c) technical reporting during the purchasing process, and (d) determination of the quantity and quality of products to be distributed in entities and jurisdictions. The resolution decentralized the distribution of medicines through the signing of agreements between MSN and the provincial ministries, in which MSN commits to providing ART to the HIV/AIDS cases reported by each province. These agreements delineate the joint responsibilities of the nation and the provinces, although according to the AIDS law, the main responsibility still rests with MSN (Bianco and others 1998).

The Argentina AIDS and Sexually Transmitted Diseases Control Project (LUSIDA) was established by the 1997 loan agreement for US\$15 million signed with the World Bank and managed by MSN (Gobierno de la Nación Argentina 1999). LUSIDA's main objective was to reduce the transmission of HIV/AIDS through a permanent program aimed at the prevention of AIDS and STIs, prioritizing geographical areas with the greatest number of registered cases: the City of Buenos Aires, the province of Buenos Aires, Santa Fe, and Córdoba. LUSIDA was designed to function collaboratively with the existing national program against HIV/AIDS and STIs and integrates five elements (Lara and Hofbauer 2004): (a) a fund to provide economic support to the prevention programs of civil society organizations that participated in the design, implementation, and monitoring of each initiative; (b) social communication; (c) AIDS and STI education; (d) strengthening of governmental health sector areas dedicated to AIDS; and (e) evaluation and monitoring.

LUSIDA has had a significant development impact on the AIDS epidemic in Argentina, mostly through support for the prevention of vertical transmission, the development of an HIV/AIDS surveillance system, and the implementation of a prevention communication campaign. Moreover, the project has helped strategize and manage HIV/AIDS prevention and ARV programs during the peak of the country's 2001 crisis and thereafter (World Bank 2004). Among notable activities developed by the project is its support of the HIV/AIDS

prevention programs of civil society organizations, targeted at vulnerable groups; training for primary and secondary level teachers in HIV/AIDS prevention; and AIDS prevention media campaigns (Lara and Hofbauer 2004). The project also included basic maternal and child health interventions, expansions of immunizations and TB programs, PMTCT of HIV, operation of blood banks, and support of the National HIV/AIDS Program (focusing on procurement of medicine) (MSN 2004).

In 1998, the National HIV/AIDS Program realized the need for a strategic plan to coordinate the growth of the AIDS response at the national and local levels. To this end, there were efforts to create a national decentralized planning network to devise a national response to the epidemic while increasing management capacity and sustainability (Lara and Hofbauer 2004). At the national level, execution falls under the Coordination and Execution Unit. MSN purchases medications centrally; the medications are then distributed to the various jurisdictions and program hospitals or directly to patients. Similarly, MSN authorizes and supplies virus load tests for all people being cared for by the public health system (Lara and Hofbauer 2004).

In 1999, Argentina signed an agreement with the World Bank for a loan in the amount of US\$52.5 million to strengthen the epidemiological surveillance system and support disease prevention and control. The main areas of action include training human resources, hiring staff to work in national and provincial epidemiology units, developing software systems for epidemiological surveillance, strengthening the network of diagnostic laboratories, and carrying out a campaign to discourage tobacco use and promote healthy habits (PAHO 2002). Strengthening the country's overall epidemiological surveillance systems has improved HIV/AIDS surveillance, monitoring, and reporting.

In 2006, the Essential Public Health Functions and Programs Project (FESP) (US\$220 million) was approved to support the Federal Health Plan and the reduction of mortality and morbidity associated with communicable diseases. The three main objectives of the project were to (a) increase the coverage of 10 prioritized public health programs, including HIV/AIDS; (b) reduce the population's exposure to the principal risk factors associated with collective illness, including supply-side surveys such as the one conducted through the National HIV/AIDS Program in health facilities in 2007; and (c) improve the stewardship role and appropriate regulatory environment of the nation's public health system, including epidemiological surveillance of selected programs such as the HIV/AIDS program (World Bank 2013). Among the many project results, there was an increase in the number of voluntary HIV/AIDS tests and HIV monitoring systems for patients, increasing the efficiency of prescriptions and delivery of medicines, as well as improvement in patient follow-up. These positive results were partially achieved through the use of RBF and output-based disbursements, which were included in the project's financial design.

Finally, FESP II (US\$460 million) was approved in 2011 (World Bank 2013). The project focused on chronic conditions, including HIV/AIDS. The project conducted the second survey of HIV/AIDS in health facilities in 2013

(supply side) and the second risk factors survey (demand side). With the support of FESP II and FESP I, over the past three years Argentina's MSN innovated the National HIV/AIDS Program by adding two service solutions: (a) an online monitoring system that tracks efficient use and distribution of HIV/AIDS medicines and supplies, and (b) RBF systems that encourage intermediate results (outputs) while improving efficiency and expanding preventive and quality health care services (World Bank 2004). These outputs are defined strategically to achieve results and increase accountability between provincial and national governments. Payments are allocated to subnational levels and providers only after outputs have been reached and verified by an external technical auditor.

Currently, DSyETS is responsible for defining and coordinating policies for the prevention and care of HIV/AIDS and other STIs at the national level. The department also plays a role in coordinating actions with provincial, territorial, and municipal programs; civil society actors; and international organizations. DSyETS's guiding principle is access to services and strengthening of the population. In particular, DSyETS works to provide comprehensive care for people with HIV/AIDS, promote condom use and testing with counseling, and reduce discrimination in the health system and society as a whole (MSN 2014).

Because of the country's federal structure, the provincial ministries of health are responsible for coordinating the response to HIV/AIDS. There are 22 provincial programs, 12 regional AIDS programs in the province of Buenos Aires, and 26 municipal programs. Differences are apparent in the management of resources. The AIDS health authorities in each jurisdiction must develop programs for the implementation of measures to combat AIDS, manage resources for funding and implementation, promote human resources training, and foster the development of research activities.

In practice, tasks are jointly distributed. MSN's role, through the National HIV/AIDS Program, is to (a) purchase and supply drugs, (b) authorize and fund viral load tests, (c) purchase and distribute reagents for blood banks and tests for pregnant women, (d) purchase reagents for the enzyme-linked immunosorbent assay (ELISA) and Western blot tests, (e) provide prevention information and communication materials, (f) distribute condoms, (g) fund the 0-800 telephone information line, (h) fund lymphocyte count (CD4 and CD8) studies for jurisdictions that request them (since 2003), and (i) manage the records of infected patients.

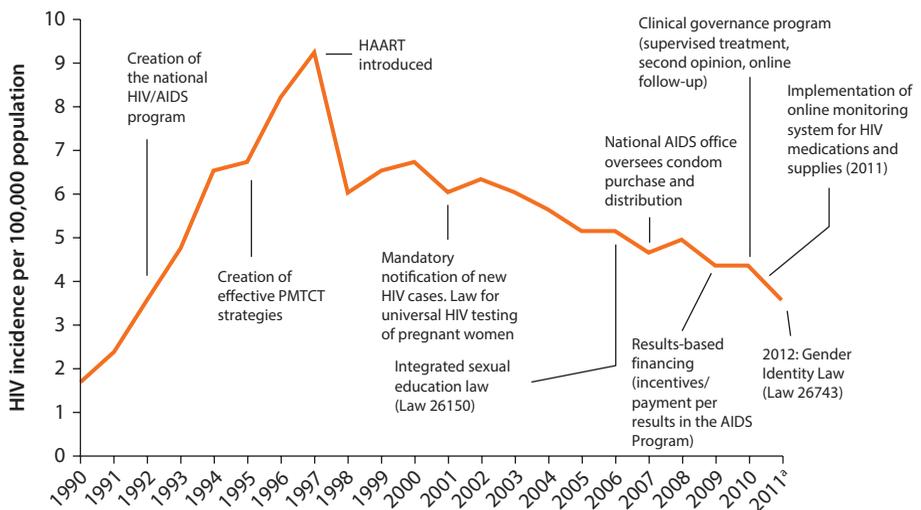
The provincial jurisdictions should cover the following: (a) transportation costs of medicines and reagents acquired by MSN from the capital to the respective jurisdiction, (b) sending viral load tests to the respective analysis centers, (c) studies of lymphocyte counts or costs of sending them to laboratories (offered by MSN since 2003), (d) purchase and financing of reagents to test the general population (outside blood banks), (e) purchase and provision of milk formula for babies of HIV-positive mothers, (f) organization and financing of surveillance tasks (including sentinel centers), and (g) carrying out public health activities in their jurisdictions.

Epidemiological Surveillance

Strengthening epidemiological surveillance has been essential throughout this process. In 2001, it became mandatory to notify the health system of all new HIV diagnoses (figure 1.18). Data captured through this and other notification channels (including second-generation surveillance with more specific information about patients) allow for better understanding and management of the epidemic through the use of epidemiological indicators (UNAIDS 2012). According to WHO, second-generation surveillance includes surveillance of sexually transmitted infections and risky behavior to monitor high-risk groups, in addition to systematic data collection and analysis (WHO 2014).

The main objective of epidemiological surveillance is to improve the understanding of the HIV/AIDS situation at the national and subregional levels to define lines of work and establish priorities. Second-generation studies of surveillance have also been key in characterizing high-risk groups, their size, risk behavior, and main determinants of health (UNAIDS 2012). Moreover, since 2002, the rapid diagnostic HIV test has become available and free for all pregnant women in public and private facilities. Since 2008, 32 provincial situation rooms have been added to the surveillance system, reinforcing subnational health surveillance capacity and provincial health intelligence. Situation rooms include a group of three to four epidemiologists and economists connected to national and provincial online surveillance systems. The situation rooms analyze monthly reports and annual studies and

Figure 1.18 Milestones in Response to the HIV/AIDS Epidemic in Argentina, 1990–2012



Source: Authors' elaboration based on Argentina's National HIV/AIDS Program.

Note: HAART = highly active antiretroviral treatment; PMTCT = prevention of mother-to-child transmission.

a. 2011 data were not finalized due to delays in notification.

provide continuous support to public health programs. The National HIV/AIDS Program has greatly benefitted from the situation rooms, which produce programmatic and epidemiological subnational analyses and situation reports. Nonetheless, there is still a need to produce more rigorous reports and expand HIV/AIDS studies that address the most current challenges in tackling the epidemic.

Finally, a system for monitoring HIV/AIDS patients was created in 2011 and has since been implemented throughout the country. The monitoring system can be used by physicians to authorize treatments, and it allows for online updates of patients under treatment, provision of medicines, and connectivity with the inputs monitoring system. This makes DSyETS the epicenter for control and clinical governance of HIV/AIDS in Argentina. Recently, the government has implemented the use of rapid HIV testing to expand detection efforts. These and other services were evaluated by the Monitoring and Evaluation Study of the Current Status of the Preventive and Social Protection to HIV/AIDS, STIs and Viral Hepatitis in Argentina surveys, which are described in greater detail in chapter 4.

Organizational Structure

DSyETS currently depends directly on the Under-Secretary of Prevention and Risk Control, which is responsible for defining and coordinating policies for prevention and control of HIV/AIDS and other STIs at the national level. DSyETS is also responsible for coordinating actions with provincial, territorial, and municipal programs; civil society actors; and international organizations. Access to services and strengthening citizenship are the principles that guide DSyETS's strategies. DSyETS provides comprehensive care for people with HIV/AIDS, promotes condom use and testing with counseling, and works to reduce discrimination in the health system and society as a whole.

DSyETS implements policies and strategies to reduce the number of new infections, improve asymmetrical gender relations, and eliminate stigmatization and discrimination. These actions are carried out through a process of diversification of supply consisting of four main lines of work:

1. *Improved accessibility to information and prevention resources.* The state distributes free condoms and lubricants and disseminates information and materials. In 2010, DSyETS distributed a monthly average of 3.7 million condoms, reaching a total of 44 million condoms during the year. It also increased the number of fixed points for condom distribution, with a large concentration in the province of Buenos Aires. Moreover, the program has developed a 0-800 telephone line for information about HIV/AIDS.
2. *Improved accessibility to diagnosis of HIV and other STIs.* The regulations enforced in Argentina set free provision of drugs, diagnostic tests, and supplemental coverage for people without health insurance. In addition, "friendly" health centers were created to provide counseling and offer diagnostic testing.

3. *Improvement in the quality of care for people with HIV.* This line of work includes ART and follow-up.
4. *Reduction of stigma and discrimination.* This line of work aims to improve access to health care and quality of life for the most affected populations.

RBF in the HIV/AIDS Program

Argentina uses RBF to strengthen the stewardship role of MSN and the provincial ministries to achieve universal health coverage. This strengthening has had the support of two public health projects, FESP I and FESP II, financed by the World Bank. The projects aim to reduce risk factors and the BoD for eight diseases, including HIV/AIDS. FESP I and II support MSN's stewardship capacity through strengthening 11 essential public health functions: monitoring and evaluation, surveillance and disease control, health promotion, social participation, regulation, policy making, equity promotion, human resource development, quality assurance, public health research, and disaster risk management. Each of the 11 essential public health functions is applied to the eight selected public health programs.

The purpose of the RBF mechanism via the use of "output-based disbursements" is to improve institutional and financial relations between the national government and the provinces and allow MSN a level of provincial health budget allocation and results control. The RBF mechanism was initiated under FESP I to improve the functioning of the health system via incremental, incentive-based payments transferred to the provinces per results achieved. This mechanism included the National HIV/AIDS Program. Since the RBF mechanism provided funds above those earmarked in the menu of outputs (results) identified in the provincial budget, it generated an extra incentive to comply with project requirements and facilitated control over implementation of provincial health policies within the federal system, where generally there is significant provincial independence.

Output-based disbursements and payments to provinces include a small fraction of the total costs of the output that is disbursed. This fraction includes only "non-procurable items," such as overtime payments for doctors and nurses in situation rooms, wards, and intensive health care units; per diem payments for vaccinators; paper, gasoline, fax, Internet connections, and labor for handling and distributing supplies and vaccines, as well as local media campaigns in provinces and municipalities, etc. As an example, an output payment for a vaccine application at a facility does not include the cost of the vaccine, cold chain, supplies, etc.; but the payment includes the cost of transport, per diem of the personnel, minor supplies, etc. Reimbursements are made in the amount agreed, only after the output has been achieved and verified by an independent third party.

In the case of FESP I and II applied to the National HIV/AIDS Program, specific outputs refer to a portfolio of selected public health activities geared to specific interventions. In some cases, interventions strengthen public health functions (quality, monitoring, and surveillance systems for example) and in others interventions achieve a concrete result (number of people receiving counseling

or HIV/AIDS diagnosis) (World Bank 2013). RBF based on outputs in the case of the HIV/AIDS program serve as incentives for achieving intermediate and final results.

In the FESP I and II projects, RBF services have linked approximately two-thirds of project financing directly to results. In addition, the results have been tracked and verified by independent external auditors. Although the use of RBF requires external review and supervision, the continuous use of RBF has increased overall systemic accountability in public health, as in the case of the National HIV/AIDS Program, where some results in the intermediate results-based chain were achieved before expected in most provinces. Table 1.1 shows the 11 essential public health functions as they relate to the National HIV/AIDS Program, with details on some of the outputs (public health activities) applied in some functions and used to define funding during FESP I.

Table 1.1 Essential Public Health Functions in the HIV/AIDS Program at the National and Subnational Levels

<i>Essential public health function</i>	<i>National level</i>	<i>Provincial level</i>
Monitoring and evaluation	Monitors provincial coverage, ART medicines, and supply distribution; develops M&E instruments, tools, and guidelines. Develops human resources manuals and trainings for strengthening M&E and analysis of indicators. Creates and maintains online information systems for monitoring enrolled patients.	Monitors local coverage, ART medicines, and supply distribution; implements M&E.
Surveillance and disease control	Definitions and norms for surveillance of HIV/AIDS cases and for treatment complications; information system development; guidelines for treatment; assistance to provinces. Releases annual epidemiologic bulletins. Training and technical assistance to local teams.	Implementation of surveillance systems; identification and reporting of cases; early management of cases.
Health promotion	Develops communication and education materials on HIV/AIDS prevention. Supervises strategic alliances with education about sexual and reproductive health and HIV/AIDS prevention. Health promotion and HIV and STI prevention within the penitentiary system. HIV/AIDS and STI training to those working with inmate population. Education and sensitivity training for men who have sex with men and transsexual population, for sex workers, and adolescents. Training and technical assistance to promote responsible sexuality among youth.	Implements communication and education materials; may develop locally appropriate materials. Operational cultural and social engagement. Operational implementation of outputs for various audiences.
Social participation	Involvement of key groups in national decision making and social participation. Financial planning and technical assistance to civil society projects to improve access to prevention and care.	Involvement of key local groups to ensure improved coverage levels, knowledge, prevention, etc.
Regulation	May develop national laws related to HIV/AIDS (sexual and reproductive health), regulation of medicines, and unified purchases. Supervises 12 laboratories for HIV viral load count and CD4. Review and updating of existing legislation. Evaluation of health facilities. Supervision of centers for prevention, counseling, and testing.	May develop provincial laws related to HIV/AIDS. Operational rules for supplies.

table continues next page

Table 1.1 Essential Public Health Functions in the HIV/AIDS Program at the National and Subnational Levels
(continued)

<i>Essential public health function</i>	<i>National level</i>	<i>Provincial level</i>
Policy making	National HIV/AIDS policies; decisions on new medicines. Introduction of new protocols. Management training courses. Develops procedural manuals for DSyETS. Training on strategic planning. Implements the supply monitoring system. Agreements for health promotion within the prison system. Develops reports on the quality of medication management. Hospitals in online network with the National HIV/AIDS Program.	Subnational feedback.
Equity promotion	Ensuring equitable ART coverage between provinces. Procurement of inputs, condoms, and reagents. Implementation of centers for prevention, counseling, and testing. Number of people counseled and tested. Implementation of the plan for prevention and care for HIV/AIDS and STIs in penal institutions. Intervention projects to improve accessibility of vulnerable populations.	Ensuring equitable coverage within provinces.
Human resource development	Training at the national and provincial levels; ensuring a cadre of experts.	Training at the departmental and local levels.
Quality assurance	Development of norms, guidelines, etc. on all aspects of ART utilization, including dosages, medicines, second opinions, and HIV/AIDS prevention centers; supervises provinces. Ensures clinical governance implementation.	Implements national norms and guidelines; supervises local programs.
Public health research	Finances public health research related to various aspects of HIV/AIDS, behavioral issues related to coverage, etc. Finances situation rooms. Develops research on female condoms acceptability and protocols for Hepatitis C protocol–drug rescue.	Situation rooms analyzing and producing operational and analytical research.
Emergencies and disasters	Blood control/test in massive transfusions. Develops guidelines.	Implements guidelines.

Source: Authors' elaboration.

Note: ART = antiretroviral treatment; DSyETS = *Dirección de SIDA y ETS* (National HIV/AIDS and STDs Office); M&E = monitoring and evaluation; STI = sexually transmitted infection.

Conclusion

A look at changes in Argentina's HIV/AIDS epidemic over the past 30 years highlights trends that must be closely observed as the epidemic enters a new phase. The HIV/AIDS epidemic went from rapid spread from 1990 to 1997, to steep decline from 1997 to 2006, to stabilization and stable decline from 2006 to the present. The HIV epidemic requires renewed efforts to continue its reduction. From 2000 to 2010, the number of new infections declined among most age and sex groups in the population, with the most visible decline among adults ages 25–34. But despite the decline in the number of new infections, this group is still responsible for the largest number of new HIV cases. In addition, there has been a small increase in new cases among adults ages 45 and older. With the introduction of HAART and other HIV/AIDS treatment options, people living

with HIV/AIDS tend to live longer. An unfortunate consequence is that older cohorts become more at risk for sexual transmission of HIV, which is the most common form of infection in Argentina.

Despite the overall decline in HIV incidence in Argentina, there was an increase in the number of new cases among men ages 15–24, while the number of new cases among women of the same age group declined. This increase in new cases among young males is responsible for the further “masculinization” of the epidemic in Argentina, with the male-to-female ratio increasing from 1.8 in 2001 to 2.0 in 2011. It is interesting to note that this trend contradicts the global trend of feminization of the HIV/AIDS epidemic, as is the case in many African countries. Although PAHO reports that Argentine youth have the best knowledge of HIV prevention in Latin America, this knowledge is not being translated into prevention among young males. Given that 41.1 percent of new HIV infections among males between 2010 and 2012 occurred through same-sex intercourse, there is a need for renewed HIV prevention efforts that target young men who have sex with men.

The increase in the diagnoses of men infected through sex with other men (MSN 2013) shows the need to target HIV prevention and control efforts on the population of men who have sex with men. It is also vital to consider particular age groups, taking into account the mean age of diagnosis, which is 32 among women, 37 among men infected through heterosexual sex, and 31 for those infected through sex with other men (MSN 2013). Targeting should also consider the geographic concentration of new infections, of which 65 percent have occurred in the central area of the country (including the Autonomous City of Buenos Aires, Gran Buenos Aires, and Central regions) (MSN 2013).

Notwithstanding the currently low rates of mother-to-child HIV transmission, some lessons can be gleaned from the prevention efforts. Argentina achieved a 62 percent reduction in vertical transmission from 2001 to 2011, a success that was only possible through multi-pronged efforts that involved high financial investment and improvement in prenatal care and delivery for seropositive women, emphasizing the need for HIV testing of pregnant women, higher coverage of prophylactic treatment, and the creation of a surveillance system to track seropositive pregnant women. Successes in PMTCT showcase the need for a coordinated approach that targets multiple facets of the issue. As the HIV epidemic in Argentina becomes ever more concentrated in selected populations, HIV prevention and treatment services must be incorporated into the public health system, as has been done with PMTCT, to ensure the quality and sustainability of these services.

Recent changes in the epidemiology of HIV in Argentina must be considered in the context of national programs and policies that have been designed to halt and reverse the epidemic over the past decades. The solid regulatory legal framework that supports Argentina’s National HIV/AIDS Program and the expansion of coverage have helped to maintain relatively low levels of HIV/AIDS infection. And extensive work to understand the epidemic has allowed the government to

stabilize and concentrate on groups with high-risk practices and low prevalence. Although Argentina has a system to provide services to people with HIV/AIDS, as well as universal access to the provision of goods and services for all citizens of the country, irrespective of insurance plans, public treatment coverage has stabilized at around 79 percent of all people receiving treatment, because of fragmentation and private agents providing services that differ from those provided by the national and provincial governments.

In spite of Argentina's concerted efforts, recent years have seen an inability to sustain the recent and continuous decline in the number of new HIV cases. Although the overall quality of promotion, prevention, and response has improved, geographical inequities linked to the availability of and access to services remain, especially in rural areas. The high number of late diagnoses and cases of people with HIV shows that preventive actions are still insufficient. Moving forward, the country must intensify prevention and promotion to reduce geographical inequalities in service provision and improve coordination between national and provincial plans.

Note

1. A concentrated HIV/AIDS infection means the epidemic is primarily concentrated in certain subpopulations and that HIV/AIDS has spread rapidly in one (or frequently more than one) defined subpopulation, but is not well established in the general population. Concentrated epidemics consistently show HIV/AIDS prevalence greater than five percent in at least one defined subpopulation, and HIV prevalence in pregnant women in urban areas is less than one percent.

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Burden of HIV/AIDS in Argentina: Global and Regional Comparative Analysis

Fernando Lavadenz, Carla Pantanali, and Eliana Zeballos
with Nashira Calvo, Lais Miachon, and Verónica Osorio

Introduction

Argentina is among the five Latin American countries with the lowest incidence and prevalence rates of HIV/AIDS. A recent study by the Institute for Health Metrics and Evaluation (IHME) uses Global Burden of Disease, Injuries, and Risk Factors Study (GBD) data to analyze the global burden of HIV from 1990 to 2010 (IHME 2013a). Box 2.1 describes the concept of burden of disease (BoD). Although most of the global HIV burden falls on countries where HIV/AIDS is the first or second leading cause of death and disability, the data show an increasing burden on countries where HIV is not ranked in the top 10 causes of BoD. In 2005, for instance, countries where HIV ranked first or second carried 68.7 percent of the total burden, which decreased to 59.4 percent in 2010. Conversely, countries where HIV ranked lower carried 15.5 percent of the burden in 2005, increasing to 20 percent in 2010. Although efforts to control HIV in highly endemic countries have produced positive results, these data suggest that countries in which, similar to Argentina, HIV is not among the top causes of morbidity and mortality carry an increasingly larger portion of the global burden of HIV/AIDS (IHME 2013b).

The HIV/AIDS epidemic in Argentina could be better understood through a comparative study of neighboring countries' experiences with HIV control. As such, this chapter will (a) introduce a description of the GBD approach, (b) situate the HIV epidemic in Argentina within the country's recent historical background, and (c) analyze the burden of HIV in Argentina compared with other countries in Latin America and the Caribbean (LAC).

Box 2.1 Burden of Disease

Measuring burden of disease (BoD) allows for a better understanding of years of life lost because of premature death and disability as a consequence of disease. Disability-adjusted life years (DALYs) include the number of years lost because of premature death and years lived with various types and severity of disabilities. Therefore, one DALY is one healthy year of life lost. To calculate a DALY for a given illness, one must estimate (a) the number of years lost and (b) the number of years lived with disability (YLDs) of specific duration and severity associated with the illness. These two calculations are combined to obtain the DALYs for a given disease.

- Years of life lost (YLL) are calculated by subtracting the age at death from life expectancy at birth.
 - YLDs are calculated from the beginning to the end of a disease.
-

Global Burden of Disease Approach

A comparative analysis of the HIV/AIDS burden in Argentina with similar countries in LAC is conducted with data from the GBD and Joint United Nations Programme on HIV/AIDS ([UNAIDS] 2012).

The GBD approach is a systematic and scientific global assessment that quantifies the comparative magnitude of health lost to disease and injury. The GBD approach results from a worldwide collaboration between researchers and accounts for risk factors by age, sex, and geographical location over time (IHME 2013a). The guiding principle of the GBD approach is that the best estimates are generated by analyzing all available sources of information and then correcting for potential problems with the data.

The GBD published by IHME, analyzes information for 291 causes, 20 age groups, and 187 countries, aggregating the data into regional and global estimates of BoD for three points in time with strictly comparable definitions and methods. The results are presented in disability-adjusted life years (DALYs), a time-based measure that combines years of life lost (YLLs) because of premature mortality and years lived with disability (YLDs)—metrics specifically developed to measure BoD (IHME 2013a). Box 2.2 explains how DALYs are calculated.

HIV/AIDS Epidemics in Argentina Using a BoD Approach

An analysis of BoD shows that HIV/AIDS is responsible for 0.84 percent of the total DALYs in Argentina in 2005 (Borrue!l, Mas, and Borrue!l 2010). The analysis also shows that in men, HIV/AIDS DALYs account for 1.4 percent of total YLDs and among women, HIV/AIDS accounts for 0.9 percent of total DALYs (figure 2.1).

In 2010, HIV/AIDS was responsible for 0.84 percent of the total YLDs, 1.06 percent in the case of men and 0.57 percent in the case of women. HIV/

Box 2.2 How Is a DALY Calculated?

Murray (1994) first presents the technical basis to measure a disability-adjusted life year (DALY) by assessing the duration of time lost because of premature death. He then defines the social value of the time lived at different ages, which is calculated from an exponential function of the form $Cxe^{-\beta x}$ and the time preferences that are discounted at a rate using a continuous discounting function of the form $e^{-r(x-a)}$. Finally, disabilities are divided by their severity into several classes and the time lived in each class is multiplied by the disability weight to make it comparable with the years lost because of premature mortality. In this case, Murray divides the disability into six classes, each class with a severity weight between 0 and 1.

As a result, a general formula for the number of DALYs lost by one individual is equal to $\int_{x=a}^{x=a+L} DCxe^{-\beta x} e^{-r(x-a)} dx$, where D is the disability weight (or 1 for premature mortality), r is the discount rate, C is the age-weighting correction constant, β is the parameter from the age-weighting function, a is the age of onset, and L is the duration of disability or time lost because of premature mortality.

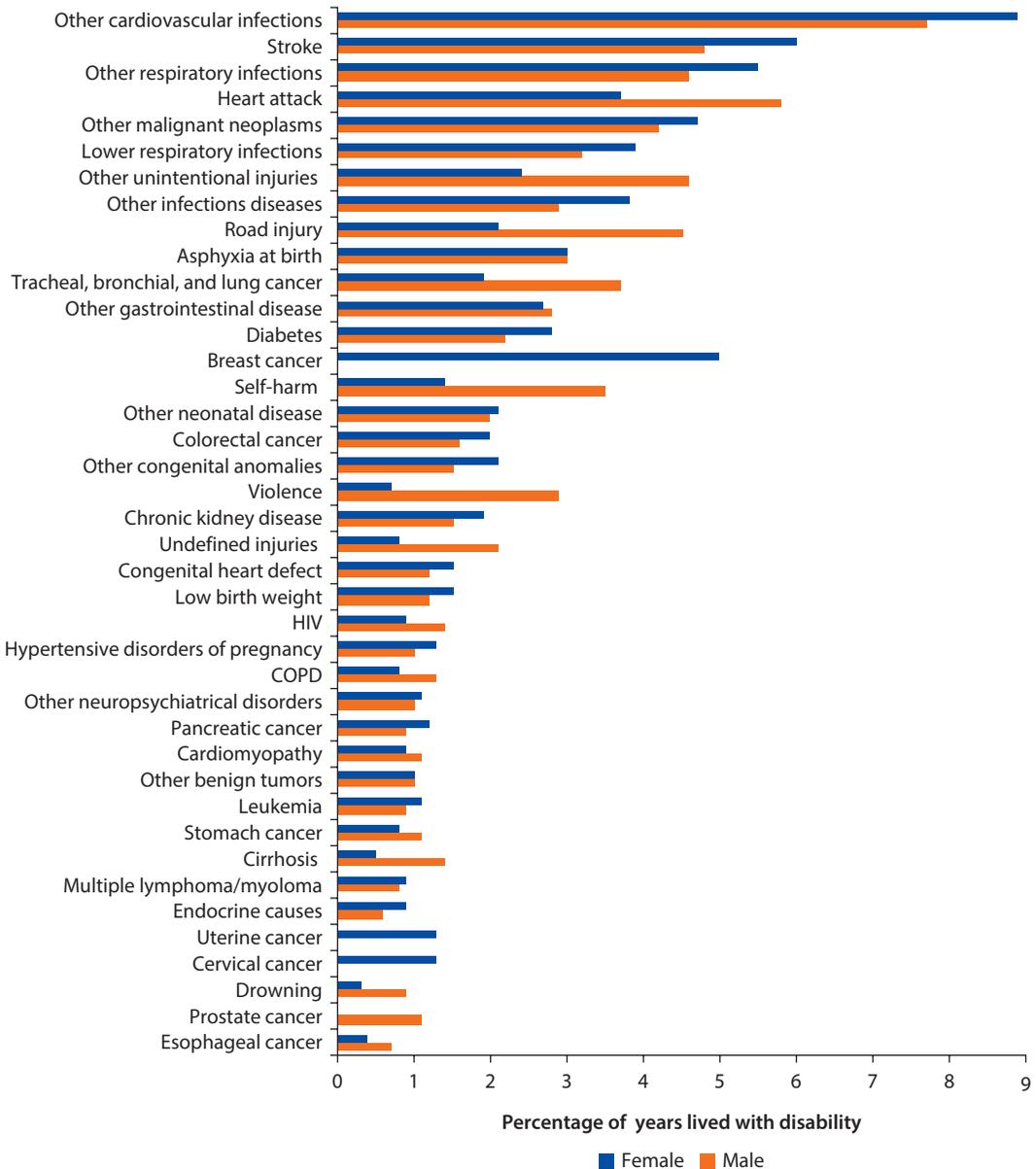
AIDS was the fourth leading cause of disease burden in the communicable, maternal, neonatal, and nutritional disorders category,¹ which accounts for around 13 percent of total DALYs (IHME 2013b).

Noncommunicable diseases have a heavier BoD in Argentina, corresponding to 76 percent of total DALYs lost because of mortality and morbidity in 2010. Communicable, maternal, neonatal, and nutritional disorders correspond to 13 percent and injuries contribute to 11 percent of DALYs lost (IHME 2013b). Among these three disease categories, noncommunicable diseases correspond to the largest number of YLLs among people ages 35 to 85 years, with the highest burden among people ages 60 to 69 years. The main causes of death among men and women are cardiovascular disease and cancer, which represent a combined 40 percent of YLLs among men and 47.7 percent among women (Borrueal, Mas, and Borrueal 2010).

Argentina is among the region's lowest in burden of HIV. Despite the low burden in 2000, the country has made progress in further reducing HIV/AIDS among the population. Data from 2010 report 62,414 DALYs among men and 28,076 DALYs among women corresponding to HIV/AIDS, almost a total calculated BoD of 90,500 DALYs (Borrueal, Mas, and Borrueal 2010).

Over the past 20 years, the burden of HIV/AIDS has declined as a percentage of the burden of all diseases, at the expense of an increase in the burden of chronic diseases. All BoD-related indicators (deaths, YLLs, YLDs, and DALYs) follow the same general trend from 1990 to 2010: HIV burden increased starting in 1990, peaked in 1995, followed by a decline beginning in 2000 with the introduction of antiretroviral treatment (ART), and stabilization around 2005 (figure 2.2). Consequently, the number of premature deaths declined, positively impacting the total number of DALYs lost to HIV/AIDS. The YLD trend line remains stable

Figure 2.1 Percentage of YLDs per Health Condition among Men and Women in Argentina, 2005

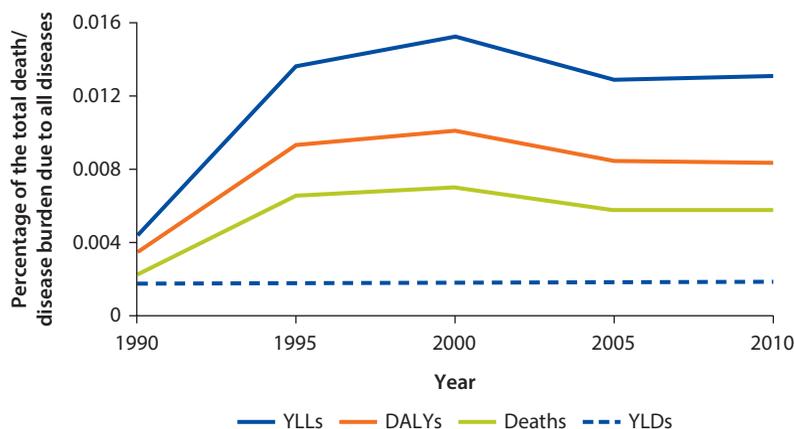


Source: Borruel, Mas, and Borruel 2010.

Note: COPD = chronic obstructive pulmonary disease; YLD = year lived with disability.

throughout the period analyzed because of the decline in the HIV incidence rate (Borruel, Mas, and Borruel 2010).

With advances in HIV/AIDS treatment, DALY indicators have changed. Premature deaths (YLLs) in 2010 were responsible for 90.5 percent of DALYs, with the remaining 9.5 percent corresponding to YLDs. In 1990, 82.6 percent of

Figure 2.2 Progression of Burden of HIV in Argentina, 1990–2010

Source: IHME 2013b.

Note: DALY = disability-adjusted life year; YLD = year lived with disability; YLL = year of life lost.

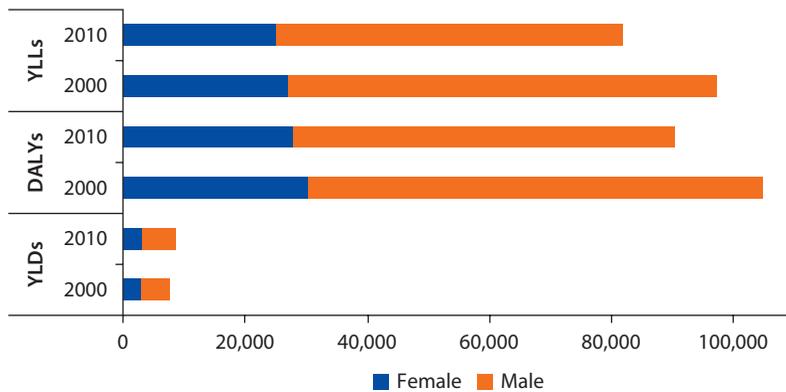
DALYs came from YLLs and 17.5 percent from YLDs (IHME 2013b). This change indicates that treatment advances brought an increase in the number of YLDs (and a reduction in YLLs), since mortality declined.

There was also a shift in the composition of DALYs by sex. Although there was a decrease in total YLLs to HIV for both sexes between 2000 and 2010, the decrease in DALYs among men (from 74,482 to 62,335) was much greater than the decline of HIV DALYs among women (from 30,296 to 28,016). Consequently, in 2010 women made up 30.5 percent of the YLLs to HIV and men made up 69.5 percent of YLLs.

The YLD composition has reversed completely. Men accounted for 57.8 percent of YLDs caused by HIV/AIDS in 2000 and 64.5 percent in 2010. Women's YLDs caused by HIV/AIDS decreased from 42.2 to 35.5 percent (figure 2.3).

According to the GBD study, deaths from HIV/AIDS in Argentina accounted for 0.7 percent of all deaths in 2000 and 0.58 percent in 2010. This reduction is explained by the decline in HIV incidence and the impact of highly active antiretroviral treatment (HAART), also known as the AIDS cocktail. In 2010, 0.78 percent of male deaths in Argentina were attributed to HIV; among women, the percentage was 0.36 percent. The decrease in deaths from 2000 to 2010 was comparable for men and women, 10.5 percent for men and 14 percent for women (IHME 2013b).

The burden of HIV by age group shows a decrease in HIV/AIDS DALYs among individuals ages 15–49 years, who account for approximately 80 percent of the BoD in 2010. A quick look at the disease progression by age group shows that total YLLs to HIV/AIDS declined until 2010 as a consequence of the introduction of HAART and health promotion policies such as massive distribution of condoms, implementation of social communication policies, and inter-sector

Figure 2.3 Changes in the Composition of DALYs in Argentina, by Sex, 2000–10

Source: IHME 2013b.

Note: DALY = disability-adjusted life year.

agreements on increasing public health education. Nonetheless, there is a need to examine further the growing age gap in the burden between sexes.

Among children younger than five years of age, there was around a 57 percent decline in the disease burden from 1995 to 2010, which coincides with the 1995 introduction of strategies to prevent vertical transmission of HIV in Argentina. In 2001, prenatal HIV testing became a mandatory part of prenatal care. In 2009, information on the births of HIV positive women was systematized.

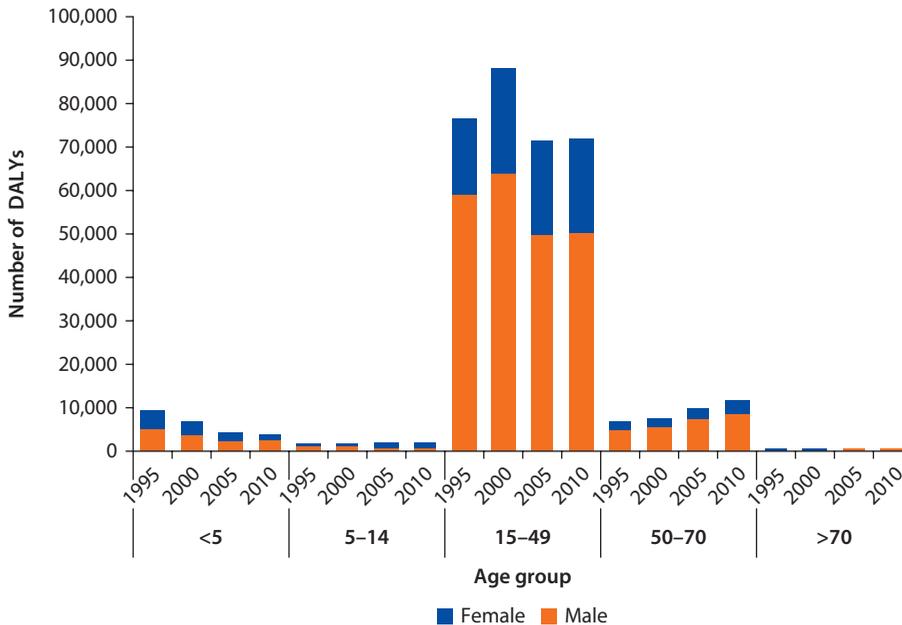
For males ages five to 14 years, there was a sustained decline and stabilization of the HIV BoD; among females in this age range, the trend is less clear. For ages 15–49 years, after a peak in 2000, there is a downward tendency in the burden in both sexes: BoD for men decreased by 30 percent in the past decade and 18 percent for women.

The only age group that showed sustained growth in HIV BoD over time was ages 50–70 years. Between 1995 and 2010, their BoD increased by 39 percent among men and by 42.5 percent among women, which seems to be a consequence of an evident increase in survival of persons living with HIV/AIDS (figure 2.4).

Argentina in the Latin American and Caribbean Context

From 1990 to 2000, the burden of HIV/AIDS increased dramatically globally and regionally. Globally, HIV/AIDS was the 33rd cause of BoD in 1990 and increased to the fifth leading cause of BoD in 2010 (Murray and others 2012). In absolute terms, the burden of HIV/AIDS increased during that period by 240 percent, and global YLDs from HIV/AIDS increased by 43 percent, compared with a 0.6 percent increase in YLDs from all causes.

In the LAC region as a whole, the story is similar. Between 1990 and 2000, HIV/AIDS BoD, as measured by the number of DALYs per 100,000 people, increased by 86 percent, while the number of HIV/AIDS-related deaths increased by 96 percent in the same period (IHME 2013b).

Figure 2.4 DALYs from HIV in Argentina, by Age Group, 1995–2010

Source: IHME 2013b.

Note: DALY = disability-adjusted life year.

From 2000 to 2010, the burden of HIV/AIDS increased globally by two percent and global YLDs from HIV/AIDS increased by 46 percent. In the LAC region as a whole, the story is different. Between 2000 and 2010, HIV/AIDS BoD, as measured per the number of DALYs per 100,000 people, decreased by 22 percent, while the number of HIV/AIDS-related deaths decreased by 20 percent in the same period (IHME 2013b).

The LAC region is very unequal and heterogeneous in terms of incidence, prevalence, access to treatment, and resource availability. Although the Caribbean is the second hardest hit region by HIV/AIDS in the world after Sub-Saharan Africa, many countries in LAC have stable epidemics with values around 0.4 percent of the total population.

The past decade has seen a steady and significant decline in new infections in Latin America, from 93,000 in 2001 to approximately 83,000 in 2011. There has also been a decline in the number of people dying from AIDS-related causes, which declined by 10 percent between 2005 and 2011 (from 60,000 to 54,000). The Caribbean region has seen an even steeper reduction, of 42 percent, in new infections from 2001 to 2011 (from 22,000 to 13,000 new infections). Deaths caused by AIDS also declined from 20,000 in 2005 to 10,000 in 2011. However, adult prevalence in 2011 in the Caribbean was still around one percent, which is higher than any other region in the world outside Sub-Saharan Africa, making the Caribbean one of the regions most challenged by the HIV epidemic. Furthermore, the total number of people living with HIV/AIDS in the Caribbean

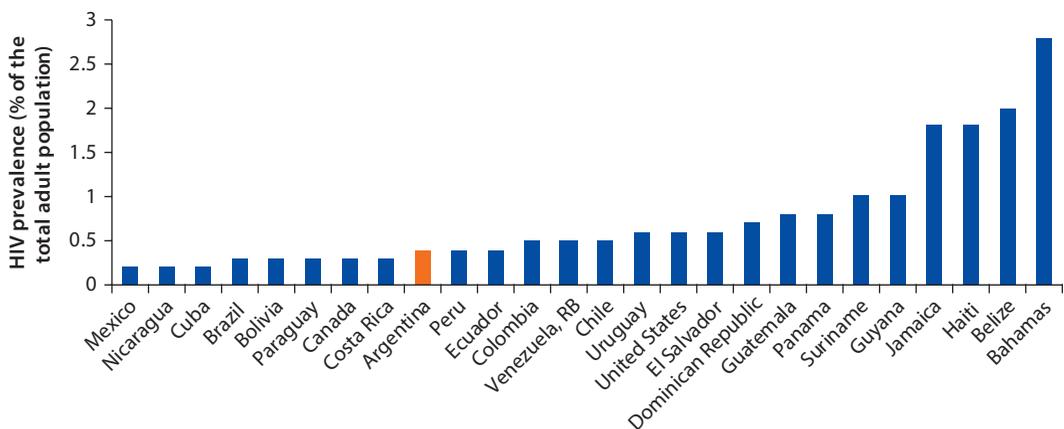
has continued to grow, from 1.2 million in 2001 to an estimated 1.4 million in 2011 (UNAIDS 2012).

In the LAC region, the HIV prevalence rate among adults (ages 15–49 years) was around 0.8 percent in 2011, which is a 17.2 percent decline since 2001. However, there are wide disparities between countries in the region, which has some of the highest rates of HIV/AIDS prevalence outside Sub-Saharan Africa (2.8 cases per 100 residents in the Bahamas) and one of the world's lowest rates (0.2 percent in Cuba). In absolute terms, in 2011 almost half (47.3 percent) of the people living with HIV/AIDS in LAC are in Argentina, Brazil, and Mexico, the three largest countries in the region. Although Brazil has a relatively low HIV prevalence of 0.3 percent, 490,000 people live with HIV in that country. However, smaller countries, such as the Bahamas, Belize, Haiti, Jamaica, and Trinidad and Tobago, have the highest HIV prevalence in the region (figure 2.5), but have a lower comparative burden (UNAIDS 2012).

In Latin America, the epidemic is concentrated in high-risk populations, mainly men who have sex with men, injection drug users, and sex workers and their clients. As seen in figure 2.5, the majority of countries in the region have prevalence rates less than one percent. However, prevalence among specific groups is often very high. In Argentina, the prevalence rate among vulnerable groups is as follows: 12 percent among men who have sex with men, 34 percent among transgender people, seven percent among injection drug users, and two percent among sex workers (MSN 2013).

Argentina is among the five countries in the region with the lowest notified AIDS cases among men, with rates four times lower than the incidence rate in the United States and nine times lower than the incidence rate in Brazil (figure 2.6). Moreover, Argentina has one of the highest men-to-women AIDS ratios, at 2.82, similar to rates in the United States and Canada (3.05 and five,

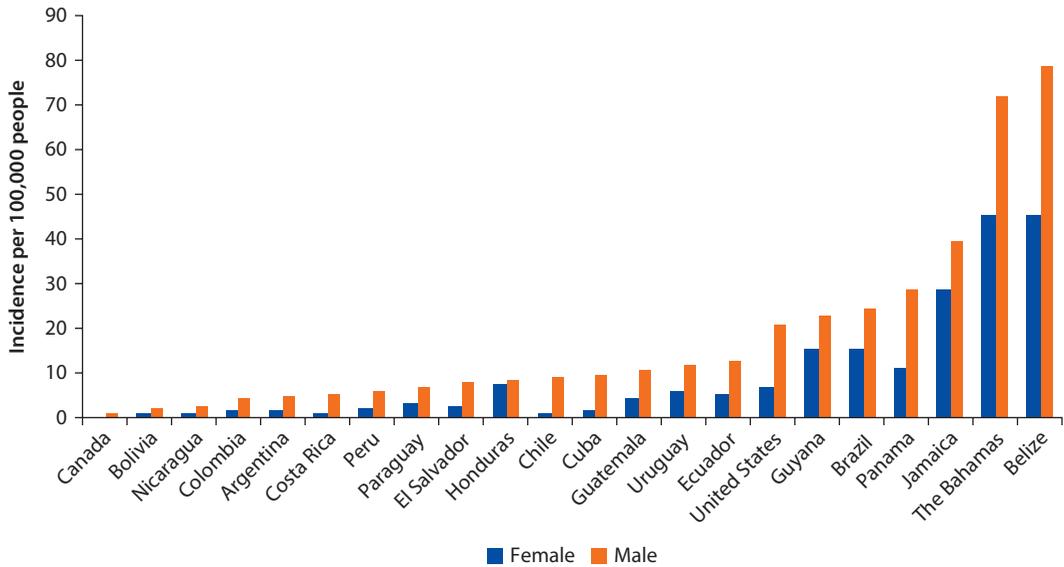
Figure 2.5 HIV/AIDS Adult Prevalence in Selected LAC Countries, Ages 15–49, 2011



Source: UNAIDS 2012.

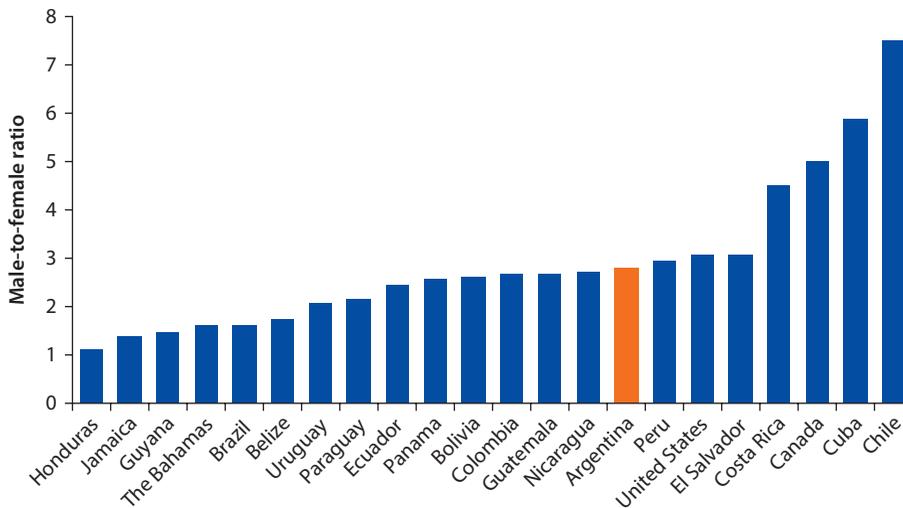
Note: LAC = Latin America and the Caribbean.

Figure 2.6 Annual Incidence of AIDS Cases in Men and Women, by Country, 2010



Source: PAHO 2011.

Figure 2.7 Male-to-Female Ratio of AIDS Cases, by Country, 2010

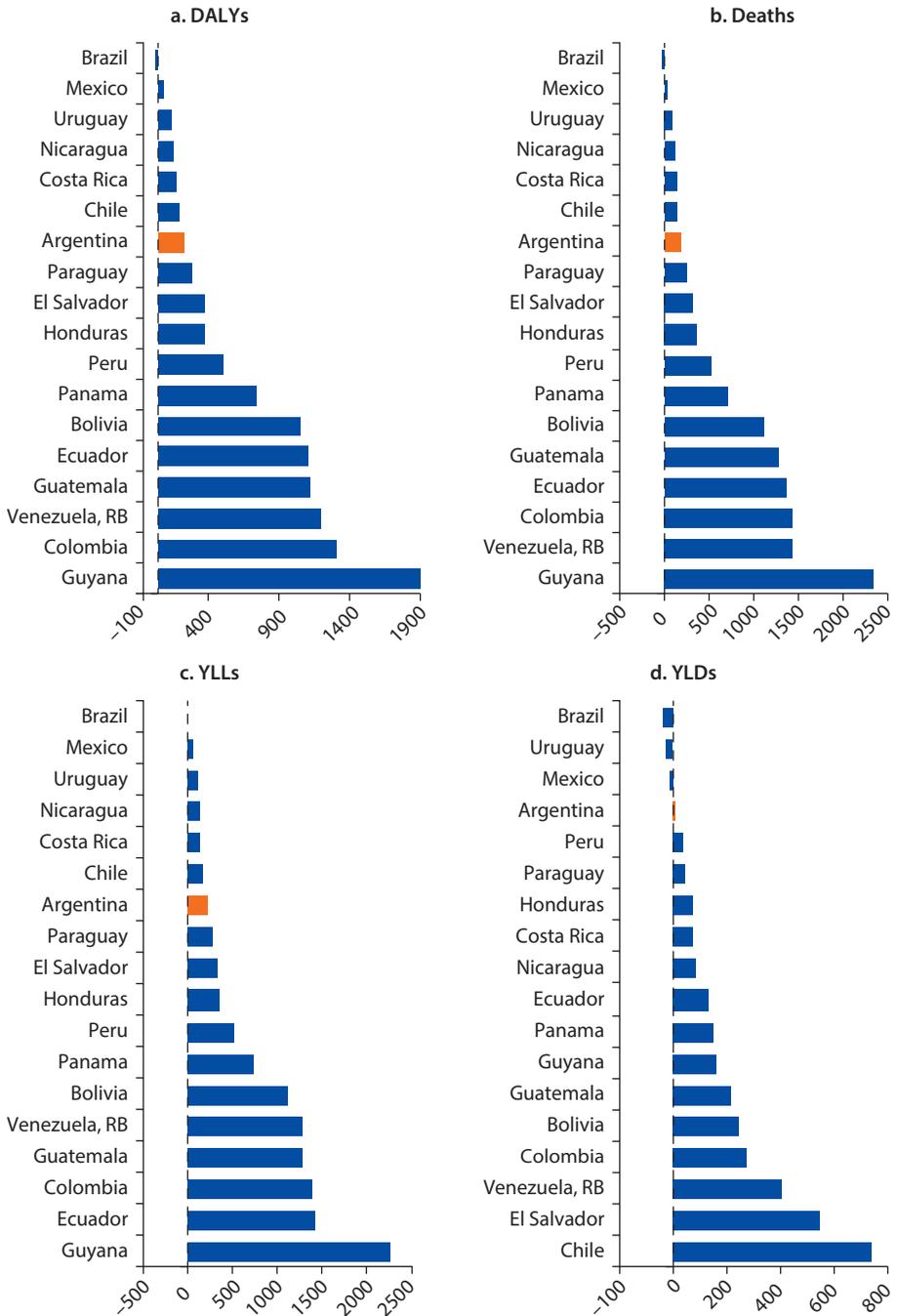


Source: PAHO 2011.

respectively), making Argentina’s HIV epidemic a mostly male one (figure 2.7) (Pan American Health Organization [PAHO] 2011).

Analysis from the BoD perspective shows that every country in Latin America had a large increase in YLLs to HIV/AIDS from 1990 to 2000 (figure 2.8). DALYs summarize YLLs and YLDs and serve as an overall metric of disease burden. Almost every country also shows increases in YLDs, although some

Figure 2.8 Percentage Change in DALYs, Deaths, YLDs, and YLLs, by Country, 1990–2000



Source: IHME 2013b.

Note: DALY = disability-adjusted life year; YLD = year lived with disability; YLL = year of life lost.

exceptions arise in countries where ART was introduced in the late 1990s. Brazil, Mexico, and Uruguay experienced a decrease in YLDs related to HIV/AIDS as a consequence of a decrease in incidence. Argentina, although not showing an absolute decrease, shows a very small increase in YLDs (10 percent). The data show the same changes for deaths as for DALYs (IHME 2013b).

From 2000 to 2010, the results were heterogeneous, as they are directly determined by the time of establishment, efficiency, and sustainability of the national programs to fight HIV/AIDS in different countries. In the LAC region, Mexico leads the reduction of HIV/AIDS burden during this period, decreasing the number of DALYs lost from 517 to 224. El Salvador, Honduras, Panama, and Peru also made remarkable efforts in the reduction of HIV burden in this decade. Nevertheless, all of these countries had among the highest burden of HIV/AIDS in the region in 2000, with DALYs in the 600s. As happens with infant and maternal mortality, it seems that reductions are easier to attain during the first phases of interventions and while there is a higher BoD.

Within the LAC regional context, the change in burden of HIV/AIDS that occurred in Argentina is all the more remarkable, given that in 2000 the country had the fifth lowest absolute burden of HIV (284 DALYs per 100,000 people), yet the country was able to further reduce its burden by 21.2 percent. The size of the change was similar to that of El Salvador, Guyana, Honduras, Mexico, Panama, and Peru, all of which had burdens over 600 DALYs (figures 2.9 and 2.10) (IHME 2013b).

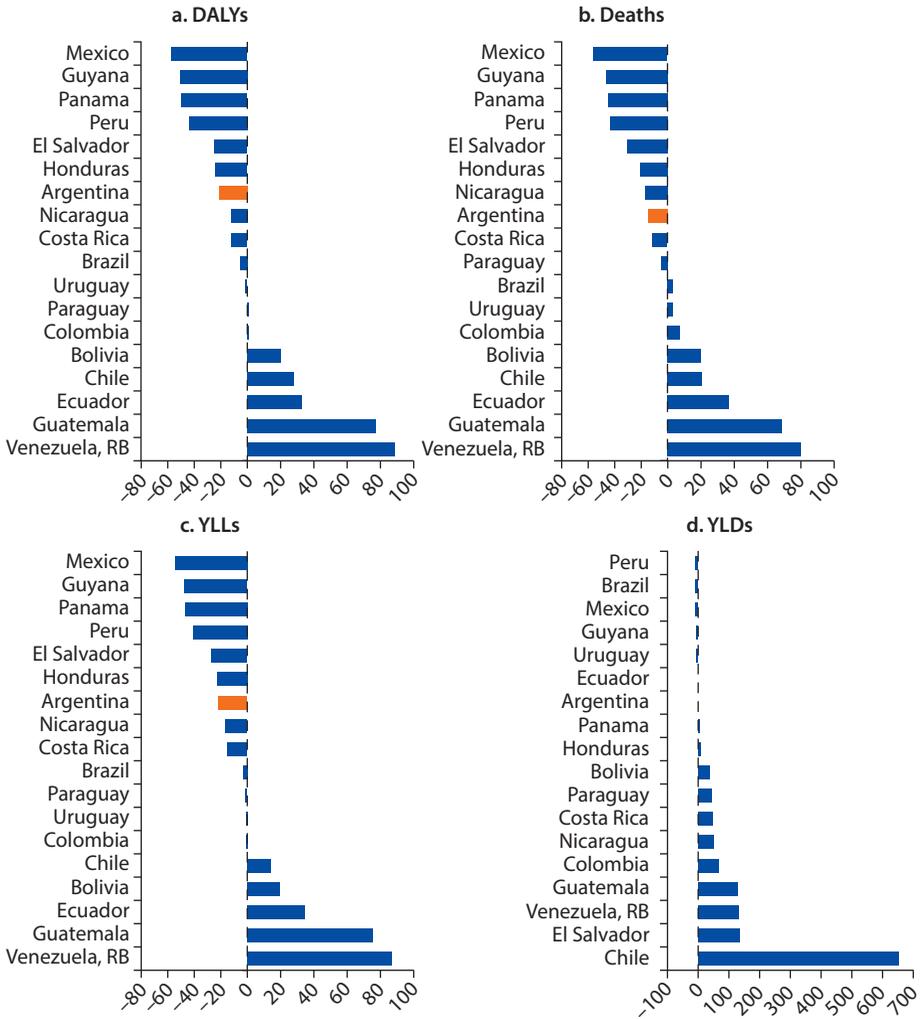
The Best Performers in the Reduction of HIV/AIDS Burden in LAC

The analysis below will focus on the current burden of HIV in middle-income countries in Latin America that can be compared with Argentina and that have had good performance toward the reduction of HIV BoD in the past decade (Brazil, Chile, Mexico, and Peru). In the framework of the analysis, it is important to understand where countries stand in current burden, as well as their beginning rates and efforts involved in burden reduction. There are examples of countries that, despite having a low HIV/AIDS burden compared with other countries in the region in 2010, actually showed an increase in the burden over the past years. Despite seemingly successful interventions, these countries have yet to succeed in keeping the HIV/AIDS burden at its lowest levels. Some countries have been able to modify their endemic channel and make improvements, yet have not achieved an extremely low rate of burden.

From 2000 to 2010, there was a 57 percent reduction in the burden of HIV/AIDS in Mexico, making the country a best performer in LAC. Although triple therapy for HIV was introduced in 1996, it was not until 2003 that waiting lists for access to treatment disappeared. The provision of universal access to treatment through the national health system allowed the country to significantly reduce the BoD and reach the low HIV prevalence of 0.2 percent (Secretaría de Salud 2012).

Chile is another good performer. ART was first introduced in Chile in 1993, after the creation in 1990 of the National Commission for AIDS, which

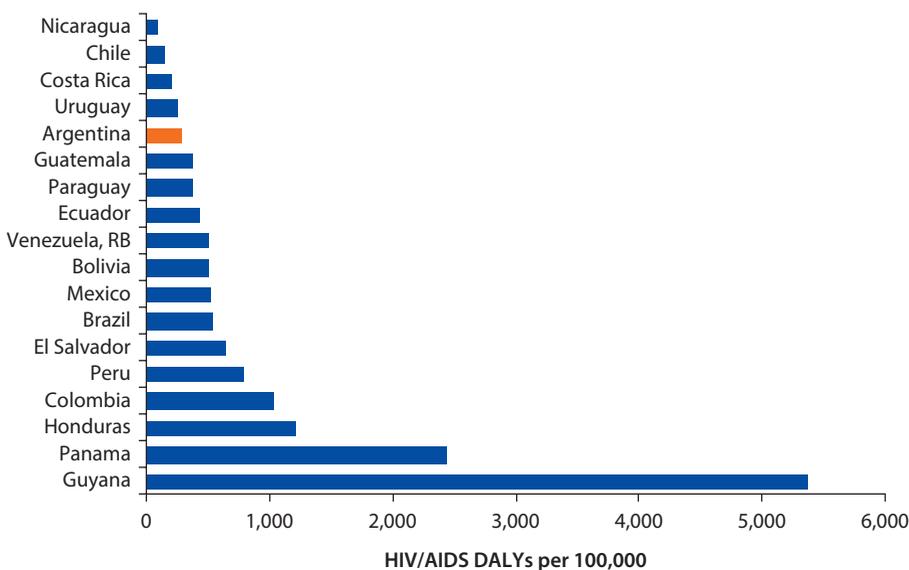
Figure 2.9 Change in DALYs, Deaths, YLLs, and YLDs in Latin America, 2000–10



Source: IHME 2013b.

Note: DALY = disability-adjusted life year; YLD = year lived with disability; YLL = year of life lost.

was created to act as the technical body responsible for the design, executive coordination, and global evaluation of the HIV/AIDS Control and Prevention Program in Chile. However, it was not until 2003 that the public health system offered universal coverage to all patients. Before then, because of the high costs of drugs and the low budget available for treatment, clinical guidelines distinguished three types of patients depending on their probability of progression of the illness, which determined different combinations of treatments. It was not until the National Commission for AIDS and UNAIDS negotiation with the pharmaceutical companies in June 2001 that the price of treatment was reduced on average by 50 percent. Moreover, there was a 33 percent increase in the

Figure 2.10 Burden of HIV in Latin America, 2000

Source: IHME 2013b.

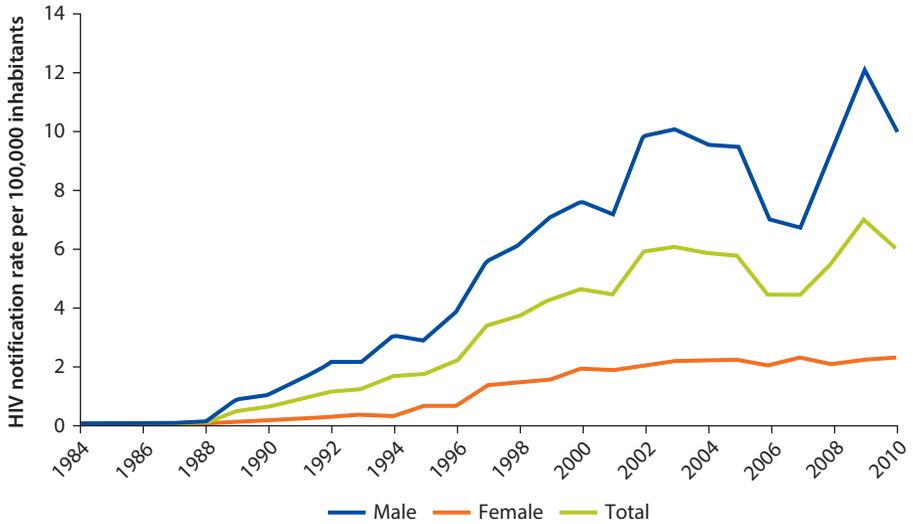
Note: DALY = disability-adjusted life year.

budget in 2003, which helped to raise ART coverage to 100 percent of diagnosed patients in the public sector and 100 percent coverage in the preventive treatment of HIV/AIDS vertical transmission through pregnancy. In addition, starting in 2005, the private sector began to guarantee 100 percent ART coverage. Chile does not use ART generics, which increases the cost of treatment (Cáceres and García 2012).

Chile had the second lowest BoD in 2010, but experienced an increase of 28 percent in the number of DALYs lost to HIV between 2000 and 2010. This increase may have been because of improvements in case notification, diagnosis, and reporting. The number of new HIV cases notified increased sharply until 2003, with a decrease in 2006 and a subsequent increase. From 2006 to 2009, the increase in the number of notifications achieved a maximum rate of 7.4 per 100,000 people (9.0 per 100,000 in men). This increase is once more related to the introduction of an online surveillance system to improve audits of processes from diagnosis to notification (figure 2.11) (Cáceres and García 2012). When comparing Chile with Argentina, although the former had an increase in its HIV burden of 28 percent from 2000 to 2010, the latter was able to reduce its burden by 21 percent in the same period.

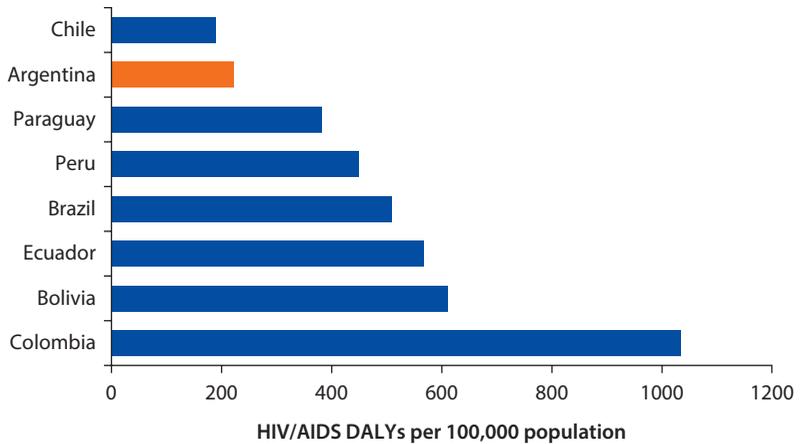
Peru has taken many actions in the past decade to reduce its BoD by over 40 percent. As of 2010, it presented a BoD of 450 DALYs per 100,000 (figure 2.12). Peru did not begin to address the HIV epidemic consistently until 1995, when there was a stabilization of the country's political situation, but it was not until the past few years that the country has incorporated several prevention programs, including a new planning and payment mechanism called

Figure 2.11 Change in HIV Notification Rate in Chile, by Sex, 1984–2010



Source: Cáceres and García 2012.

Figure 2.12 HIV/AIDS DALYs per 100,000 People in Selected Countries in Latin America, 2010



Source: IHME 2013b.
 Note: DALY = disability-adjusted life year.

payment per results. One of the current major challenges in reducing the HIV BoD is the high prevalence of tuberculosis/HIV co-infection, which poses a major threat to the country (Ministerio de Salud de Peru, Direccion General de Epidemiologia 2013).

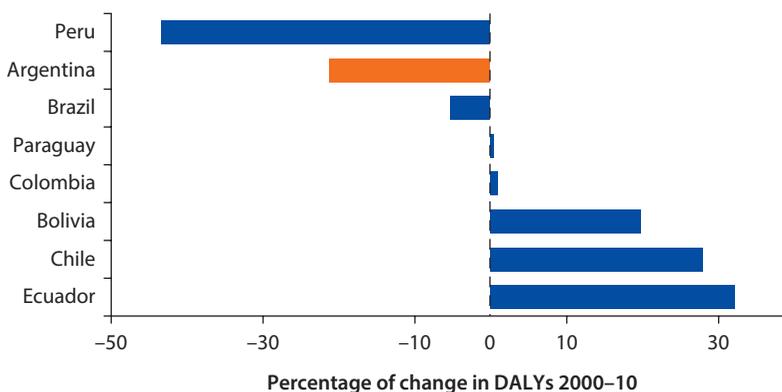
Although Brazil still has a large burden of HIV and is home to the majority of cases in the region, the country’s efforts against HIV/AIDS are noteworthy. The National AIDS Control Program, which was established in 1986, has since

become a reference for all other programs in the world. Brazil became one of the first countries to have free and universal provision of ARTs, including protease inhibitors, as of December 1996,² almost simultaneously with Argentina. Initially, the policy was widely criticized because of the high costs of the treatment and presumably low adherence in resource-poor settings in developing countries. However, empirical evidence from studies carried out in Brazil demonstrates that the very large increase in survival between the 1980s and 1996 could only be explained by the introduction of ARTs. Moreover, Brazil's unique AIDS strategy extends beyond treatment and is based on a human rights-based prevention strategy developed in partnership with at-risk communities (UNAIDS 2013).

Argentina's performance should be analyzed in the context of these countries. Similar to Brazil, Chile, Mexico, and Peru, Argentina is a middle-income country with a large territory and important disparities at the economic and social levels. Argentina was, together with Brazil, a pioneer in LAC in introducing a comprehensive and universal health care program. Both governments prioritized treatment, providing universal access to ART for people with advanced HIV infections through public health systems. As a result, the burden of HIV/AIDS decreased by 21 percent from 2000 to 2010 in Argentina (equivalent to 14,467 DALYs). In 2010, there were only 223 DALYs lost to HIV/AIDS (IHME 2013b).

In the past decade, Argentina has become one of the best performers in the reduction of the HIV/AIDS burden, measured by the actual level of BoD and its long-term sustainability. Although Peru showed a larger reduction in burden, the country had a burden 2.8 times higher than Argentina's (794 compared with 284 DALYs per 100,000 people in 2000), which likely contributed to a steeper and quicker reduction in the burden of HIV compared with that of Argentina during the same period (figure 2.13). Argentina also appears among the countries with the lowest BoD in South America in 2010, after Chile (figure 2.12). However, Chile's burden increased during the period analyzed (IHME 2013b).

Figure 2.13 Percentage Change in HIV Burden in Selected Countries in Latin America, 2000–10



Source: IHME 2013b.

Note: DALY = disability-adjusted life year.

In addition to the proactive comprehensive legal framework created in Argentina regarding sexual and reproductive health, the pillars of the country's National HIV/AIDS Program include universal access to ART, health prevention actions, social mobilization, epidemiological surveillance, and a results-based financing system to improve the quality of HIV/AIDS health care and the follow-up of patients, medicines, and supplies. All of these components have contributed not only to burden reduction, but also to the sustainability of the reduction over time.

Conclusion

Argentina has the second lowest BoD in South America after Chile, a BoD that has continued to decrease since 2000. Analysis of Argentina, Brazil, and Mexico shows that a comprehensive approach to HIV/AIDS, in which universal access and treatment coverage is provided for ART, has been the key to BoD reduction. In these countries, national HIV/AIDS programs made access to treatment available to all.

From the beginning of the epidemic, Brazil has evidenced a strong will to focus its strategy on universal access to treatment, strong prevention policy, and promotion of human rights. The partnership between the private sector, civil society, and the public sector has been the key to achieve a sustainable price of treatment through the manufacturing of generic drugs. This path has proven effective to tackle the epidemic and change the projected path of infection.

Different from these cases, Chile has struggled during the past decade to find sustainable options to cover universal ART. Budget constraints, issues with the use of generic drugs, and incentives to move from the private sector to the public sector have contributed to an expensive individual price for treatment.

Although Argentina had the third lowest BoD in South America in 2000 and the fifth lowest in Latin America, it still managed to have the second largest percentage decrease from 2000 to 2010, after Peru. In this time period, Argentina's HIV burden decreased by 21 percent, saving 4,379 potential lives. This large decrease is evidence of the potential to reduce the burden of HIV/AIDS even when the burden is relatively low, thus setting an example in the region on what is possible to achieve through the creation of public policies to continue the reduction of HIV/AIDS.

However, compared with similar economies in Europe, it is clear that Argentina remains behind in the burden of HIV/AIDS. This does not mean, however, that Argentina has to revisit its program in light of the national programs or policies of other countries, since some of them have different approaches. But it does mean that Argentina needs to develop a more sophisticated response, use lessons learned in other situations, and innovate. In the case of Central and Eastern Europe, solid work by nongovernmental organizations during the past decade likely contributed to stopping the increase in infection rates via AIDS prevention programs targeting vulnerable groups. Argentina could

explore the positive “demand side” interventions applied by some Western European countries with similar incomes to that of Argentina, including education and primary and secondary prevention that likely contributed to keeping the burden of HIV/AIDS within reasonable limits.

Although the policy-legal frameworks and sociocultural context are extremely different in Argentina compared with Europe and Central Asia, both epidemics are highly concentrated in at-risk populations and the countries are similar in income. Despite the differences, this comparison may be useful to understand how the policies implemented in European and Central Asian countries have contributed to weaken the HIV/AIDS epidemic.

Notes

1. Murray and others (2012) divide the BoD into three main categories: (a) communicable, maternal, neonatal, and nutritional disorders; (b) noncommunicable diseases; and (c) injuries.
2. Federal Law 9313.

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Subnational Analysis of the Burden of HIV/AIDS in Argentina

Miguel Borruel, Fernando Lavadenz, and Carla Pantanali
with Eliana Zeballos, Nashira Calvo, Lais Miachon, and Verónica Osorio

Introduction

In the past two decades, Argentina has made substantial improvements in the fight against HIV/AIDS, reducing the epidemic, burden of disease (BoD), and number of new HIV infections. However, disparities in the burden of HIV/AIDS still persist at the subnational level, even if these differences have been reduced in recent years. BoD varies across the 24 provinces that make up the federal structure of the country. Implementation of the National HIV/AIDS Program varies depending on the decisions made by each of the 24 ministries of health. Geographical and social differences across provinces also directly impact the supply and demand sides of the HIV/AIDS equation.

Most of the total HIV cases in Argentina are concentrated in four provinces; in two of these provinces, HIV prevalence rates have decreased in the past decade, while they increased in the other two provinces. As a result, the epidemiological patterns and BoD are changing within provinces and slightly from men to women, generating a panorama that differs greatly from that of 10 years ago.

The chapter will address the following: (a) the methodology used to calculate the burden of HIV in Argentina in 2005 and 2010 by province and sex; (b) the epidemiology of HIV/AIDS at the interprovincial level; (c) comparative analysis of the HIV/AIDS burden in all Argentine provinces, including changes between 2005 and 2010; and (d) conclusions about existing gaps.

Methodology

Following the methodology of the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) (Institute for Health Metrics and Evaluation [IHME] 2013), Argentina performed the first BoD study in 2010, with data from 2005 (Borruel, Mas, and Borruel 2010). The study was supported by the Essential Public Health Functions Project (EPHFP) in an effort to improve the National Health Intelligence System. The goal of the study was to strengthen the

formulation and implementation of public health policies using evidence-based findings to reduce the BoD.

The BoD study in Argentina is a systematic assessment that calculates the diseases that cause 85 percent of disability-adjusted life years (DALYs), a time-based measure that combines years of life lost (YLLs) because of premature mortality and years lived with disability (YLDs) (Borrueal, Mas, and Borrueal 2010). The study by Borrueal and others has been used as the baseline for a series of other BoD studies at the subnational level. In this chapter, we will present the results of a study performed in Argentina in 2013 on the comparative BoD of HIV/AIDS at the provincial level.

The study provides data on the burden of HIV/AIDS in Argentina by province and sex for 2005 and 2010. The data are analyzed with a new methodology from IHME's 2010 GBD study (Murray and others 2012).¹ The data are provided in tables 3A.1–3A.4 for all provinces for 2005 and 2010.

Calculations were made to adapt the available data at the provincial level. The calculation of YLLs was done without applying the three percent social adjustment of death in different age groups, as is recommended by the 2010 GBD. The life expectancy table was set at 86 years for men and women, and values of the burden of disability for each disease or each step of certain illnesses were based on values from the 2010 GBD (Murray and others 2012). Finally, ages were grouped in ranges compatible with the information available in Argentina; although the 2010 GBD methodology is based on 20 age ranges that include early neonatal, late neonatal, and post neonatal, the study utilized 16 age ranges (0–4 years; 5–9 years; 10–14 years; 15–19 years; 20–24 years; 25–29 years; 30–34 years; 35–39 years; 40–44 years; 45–49 years; 50–54 years; 55–59 years; 60–64 years; 65–69 years; 70–74 years; and 75 and older).

For the calculation of YLLs, the 2010 GBD methodology presents no challenges when disaggregating the database by sex and age. On the contrary, the methodology for calculating YLDs was not published and the results seem to be the product of the analysis of several distinct populations that are used as occurrence patterns. The 2010 GBD also abandons the need for incidence of each disease in certain populations, replacing it with a calculation based on prevalence rates that are generally easier to obtain. In IHME, opinions vary on the use of the substitution of prevalence rates for incidence rates. The use of incidence data in countries where this information is available strengthens the calculation. In fact, it allows more precise differentiation of incidence of disease on a population across many years or when one seeks to understand the result of an intervention to control selected diseases or risk factors.

Incidence information was based on notification registries from the Ministry of Health (MSN) and related organisms in Argentina and its provinces in 2005 and 2010. The distribution of incident cases by jurisdiction was done by sex and age range according to available data. However, although the BoD data by sex are solid,² the age distribution is less reliable, as the number of cases by sex in age ranges is not published and the data are only available in proportion tables. Distribution by age must be calculated, but the numbers will not be as precise as

the number of individual cases registered. For this reason, this study should not be used to identify the number of cases of HIV attributable to vertical transmission.

In the methodology applied for calculating the burden of disability for HIV/AIDS, some parameters were defined as follows:

- Of the population infected with HIV in Argentina, 30 percent is unaware of their condition as recognized by MSN. For the calculations, the study considered these patients asymptomatic. This population was assigned the weight of 0.20, which was accepted by the 2010 GBD, and we consider that these individuals will come to know of their HIV status within a five-year time span.
- According to the 2010 GBD, the weight of disability for patients under treatment is 0.053. We consider that weight for a period of 10 years, which is the average length of treatment from the start of highly active antiretroviral treatment (HAART), and we apply it to the 73 percent of patients who are in treatment in Argentina.
- Twenty-seven percent of patients are not under treatment, which is considered a 0.55 disability weight, and assigned five years duration.
- For deceased patients, we assumed they went through all phases of the disease before death. As such, we assigned a period of six months for the terminal stage with a weight of 0.56 and one month of terminal stage with a disability weight of 0.93.³
- We assumed that 100 percent of patients younger than 15 years of age are under treatment and that they only add YLDs for their condition.

For the number of deceased, we used the adjustment recommended by the Office of Statistics and Health Information (DEIS). The adjustment comes from the multifactorial statistical study conducted to present the real number of notified deaths and the percentage calculated through the subregistry. The adjustment published by DEIS recommends a rate of 17.5 percent for 2005 and a rate of 28.5 percent for 2009 and 2010.

The study uses various sources of data. For mortality data, the study uses statistics and health information from DEIS for 2005 and 2010. Data on incidence are derived from an MSN database and specifically from the National HIV/AIDS and STDs Office (Dirección de SIDA y ETS [DSyETS]).⁴ Population data were obtained from the 2005 National Census (INDEC 2005). Finally, following the classifications of the Ministry of Economy of Argentina, provinces were grouped into the following regions: the City of Buenos Aires, Greater Buenos Aires (24 *partidos* of the province of Buenos Aires), the Center Region (the remaining 11 *partidos* of the province of Buenos Aires and the provinces of Santa Fe, Córdoba, and Entre Ríos), the Northwest region (the provinces of Catamarca, Jujuy, Salta, La Rioja, Santiago del Estero, and Tucumán), the Northeast region (Corrientes, Formosa, and Chaco), Cuyo (Mendoza, San Juan, and San Luis), and Patagonia (Chubut, La Pampa, Neuquén, Rio Negro, Santa Cruz, and Tierra del Fuego).

Subnational Epidemiological Analysis

Because Argentina is a federal country, there are significant differences across provinces in the quality of and access to health services. Although the disparities have decreased over time, Argentina still evidences disparities in terms of HIV/AIDS burden when comparing provincial data. Ten years ago, HIV cases were concentrated in large urban areas (as is the case in the majority of middle-income countries); recent years have seen an increase in the HIV/AIDS burden in small provinces, among less concentrated populations.

However, HIV/AIDS in Argentina is still largely concentrated in urban centers. The provinces with the most HIV cases reported from 2001 to 2012 were Buenos Aires, with 42.8 percent of the cases, followed by the Autonomous City of Buenos Aires, with 16.7 percent; Córdoba, with 7.9 percent; and Santa Fe, with 5.5 percent (MSN 2013). These four provinces, which contain 59.9 percent of the country's population, accounted for 72.9 percent of accumulated HIV cases over the past decade, while the other 20 provinces together accounted for the remaining 25 percent of diagnosed HIV cases. Nonetheless, the province of Buenos Aires, the City of Buenos Aires, and Santa Fe were the only localities to show decreases in HIV/AIDS from 2001 to 2011 (52.86, 41.13, and 6.8 percent decreases, respectively), while all other provinces remained stable or even showed an increase in HIV infections (MSN 2013) (see map 3.1).

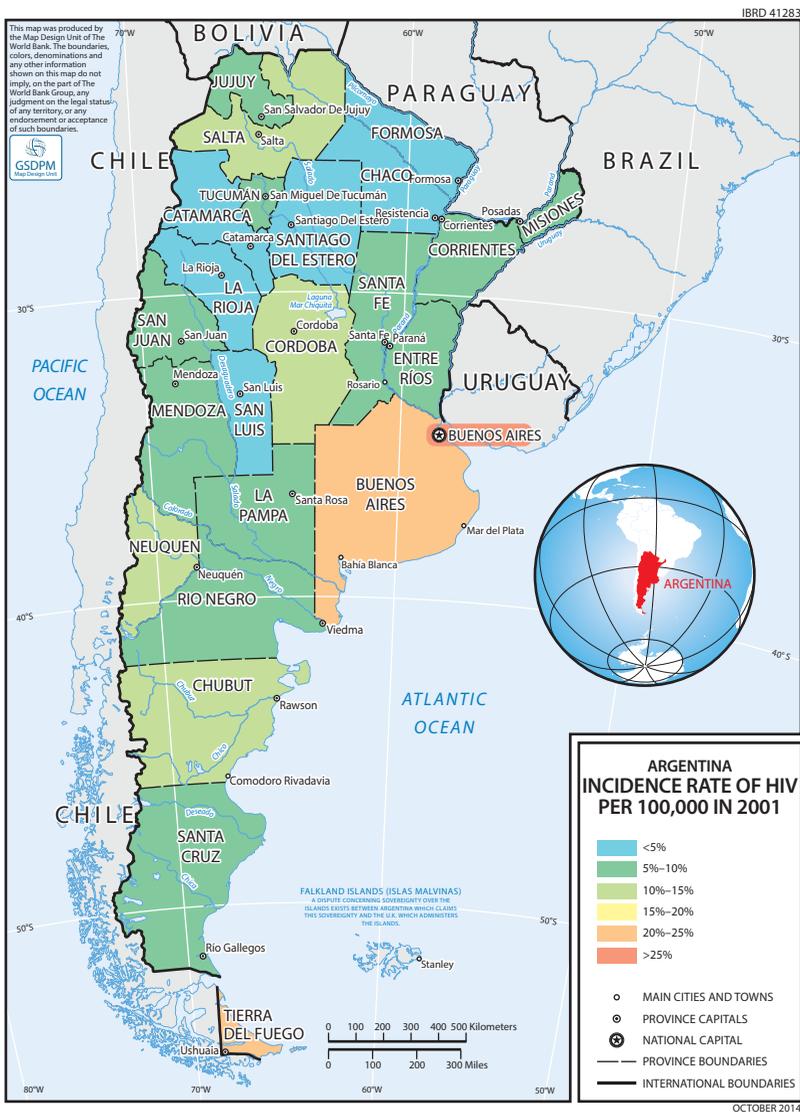
HIV incidence rates show similar behavior, although the disparities are larger. In the City of Buenos Aires, incidence rates decreased from 40.6 per 100,000 inhabitants in 2001 to 23.9 per 100,000 in 2011; and in the province of Buenos Aires, incidence rates decreased from 21 to 9.9 per 100,000 in the same time frame. Although the trend is positive, the incidence rate in the City of Buenos Aires is double that in all other regions. In the Cuyo, Northwest, Northeast, and Patagonia regions, rates have steadily increased since 2005—to 12.6, 13.6, 6.4, and 17 per 100,000, respectively. Following a peak in 2003, all three regions showed a sudden decrease tied to the introduction of ART. In the Center (Córdoba and Santa Fe), where a high number of cases are concentrated, there has been a steady decrease since 2005, to the current incidence rate of 10.5 per 100,000 inhabitants.

The analysis of notification rates can go as far back as 2001, when HIV became a notifiable disease (see figures 3.1 and 3.2). At that time, 48 percent of total diagnoses were in the province of Buenos Aires, followed by the City of Buenos Aires (19 percent), Córdoba (6.6 percent), and Santa Fe (4.9 percent). Between 2001 and 2012, in the City of Buenos Aires, the number of notified HIV diagnoses declined from 19 to 15 percent of total nationally reported cases; in the province of Buenos Aires, the number of notified HIV diagnoses declined from 48 to 30.5 percent during the same time frame. In all other provinces, HIV/AIDS notifications increased in the last decade, which is likely related to service improvements in the provinces and the increase in MSN treatment centers. During 2010–12, 13.3 percent of notifications came from the Northwest

region, 5.3 percent from the Northeast region, 8.1 percent from the Cuyo region, 7.8 percent from the Patagonia region, and 34 percent from Buenos Aires and the City of Buenos Aires.

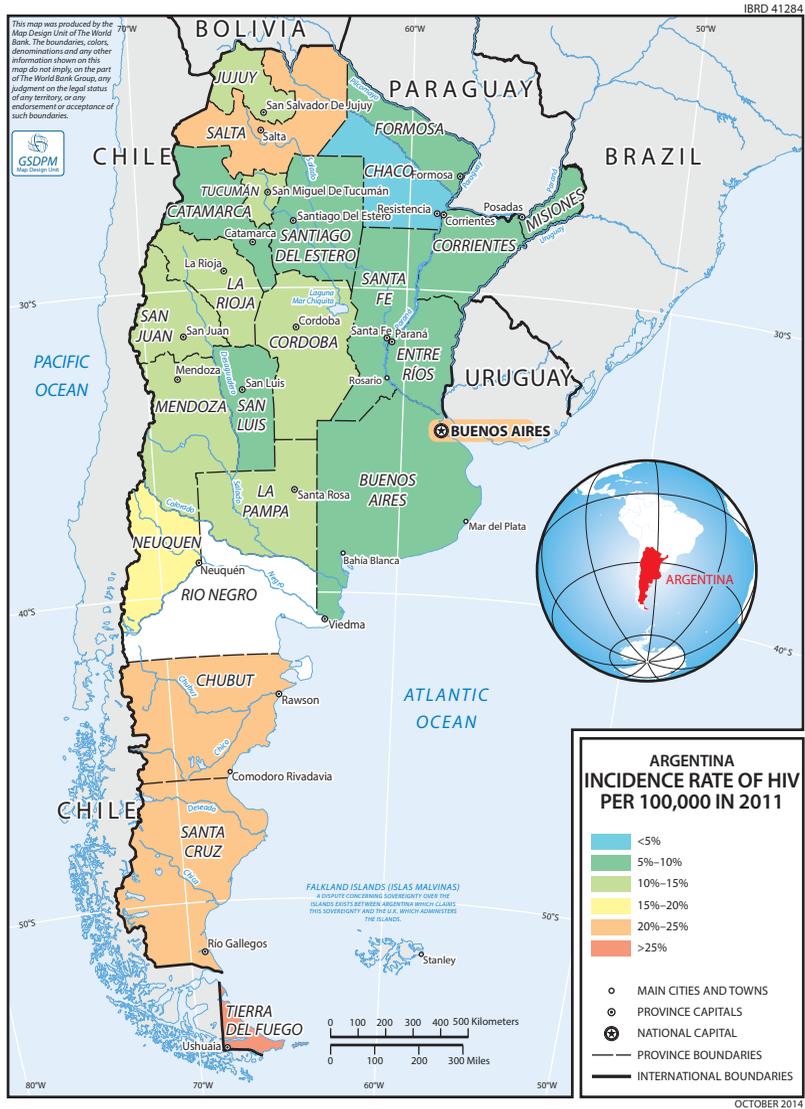
Disparities across provinces and regions are even larger when analyzed by sex. Although a first look at the regional comparison shows that the regions with higher prevalence are the same for men and women, the burden rates vary. The data show that disparities in men are larger than those among women, which is likely related to access to health services and the type of transmission (figure 3.3).

Map 3.1 HIV Incidence in Argentina, by Province, 2001 and 2011



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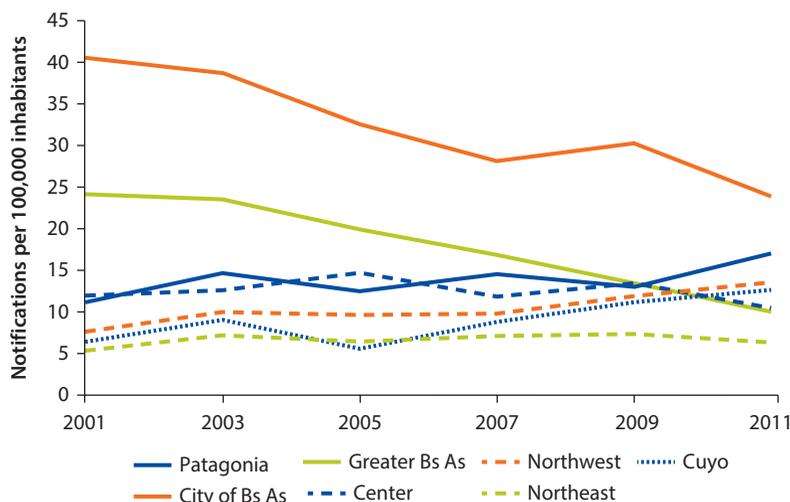
Map 3.1 HIV Incidence in Argentina, by Province, 2001 and 2011 (continued)



Source: Based on MSN 2013.

HIV incidence rates among men in the City of Buenos Aires are more than double the rates among men in other regions. Although the City of Buenos Aires now has a rate of 43 per 100,000 men, other regions have much lower rates, from 21 per 100,000 in Patagonia to nine per 100,000 in Northeast. Northwest, Cuyo, Center, and the province of Buenos Aires have a rate of 17 per 100,000 men, in line with the national average.

For women, differences across regions are smaller and have been diminishing over time. Today, the City of Buenos Aires has a rate of 26 per 100,000 women and all other regions are below 12 per 100,000.

Figure 3.1 Notification Rates per 100,000 Inhabitants, by Region, 2001–11

Source: MSN 2013.

Note: Bs As = Buenos Aires

Prevalence rates in women decreased by almost half in the past decade in the City of Buenos Aires and the province of Buenos Aires. The regions with lower incidence (Patagonia, Cuyo, and Northwest) have seen a remarkable increase in HIV prevalence in recent years in men and women (figure 3.4). In the Patagonia region, the incidence of HIV among women increased 60 percent between 2001 and 2011; in men, the increase was close to 50 percent. Among men, Cuyo and Northwest had an increase of 87 percent in the same period; HIV rates among women have increased by 67 and 116 percent, respectively, in Cuyo and Northwest.

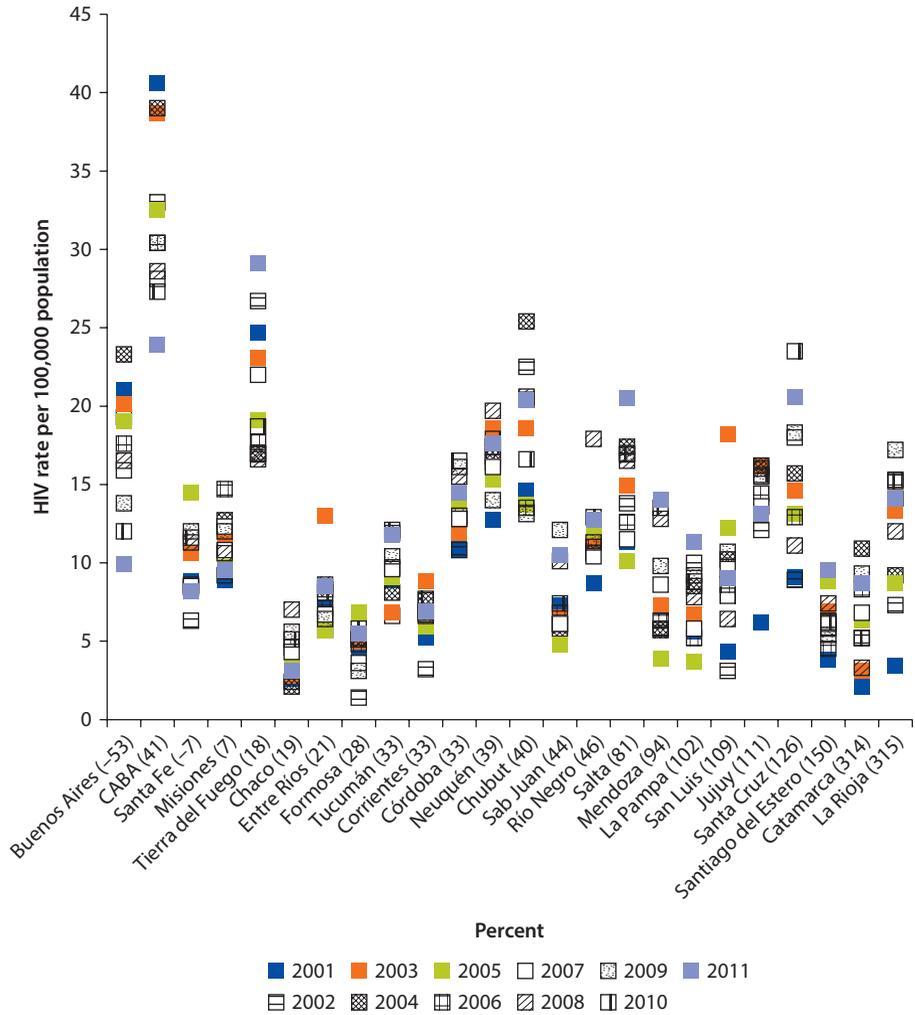
Subnational Burden of Disease Analysis

Results from the HIV/AIDS BoD study in Argentina evidence high heterogeneity across provinces and regions. In line with tendencies shown by the epidemiological data derived from the study, it is possible to make comparisons by province and sex in two time periods between 2005 and 2010.

At the provincial level, the burden of HIV/AIDS varies from 12 per 100,000 inhabitants in Catamarca to 433 and 444 per 100,000 inhabitants in Salta (Northwest) and Tierra del Fuego (Patagonia region), respectively, with a national average of 194 per 100,000 in 2010 (figure 3.5).

Changes in HIV/AIDS burden trends during the past decade also show high heterogeneity across provinces and regions. Although there was a slight decrease in Buenos Aires and the Center from 2005 to 2010, the burden increased in Northwest, Northeast, Cuyo, and Patagonia in these years, in line with trends analyzed for notification and incidence. The most urbanized regions of Buenos

Figure 3.2 Changes in HIV Prevalence, by Province, 2001–11

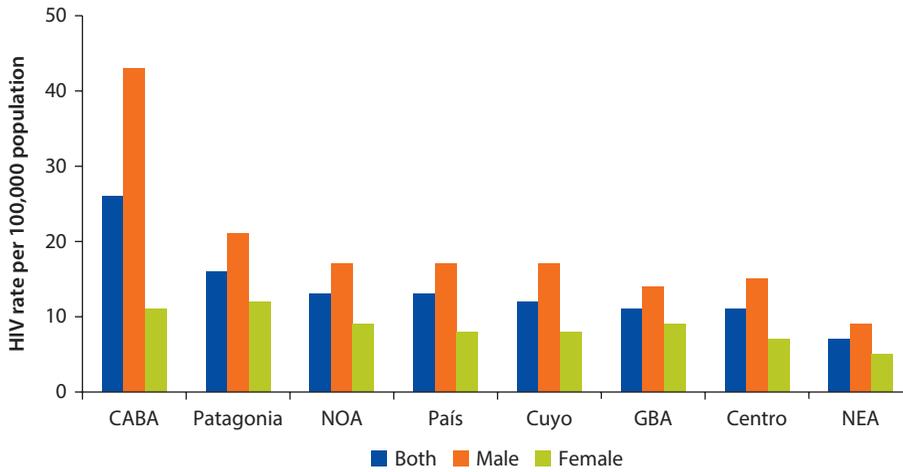


Source: MSN 2013.
 Note: CABA = City of Buenos Aires.

Aires, Córdoba, Santa Fe, and the City of Buenos Aires have been able to decrease their BoD from 1,164 per 100,000 in 2005 to 989 in 2010 (figure 3.6). Although the decline was achieved at a slow rate, it has been sustained over time. By contrast, other regions suffered a sharp peak in their rates during the same period: Patagonia increased its BoD by 75 percent from 2005 to 2010, going from 796 to 1,400 cases per 100,000. The region of Cuyo followed, with an increase of 73 percent, and Northeast and Northwest had rates around 37 and 28 percent, respectively.

Among all 24 provinces, only six were able to reduce their BoD between 2005 and 2010 (Buenos Aires, City of Buenos Aires, Neuquén, Catamarca, San Juan,

Figure 3.3 HIV Rates, by Region and Sex, 2010–11



Source: MSN 2013.

Note: CABA = City of Buenos Aires; GBA = Greater Buenos Aires; NEA = Northeast region; NOA = Northwest region.

Figure 3.4 HIV Rate per 100,000, by Sex, 2001–11

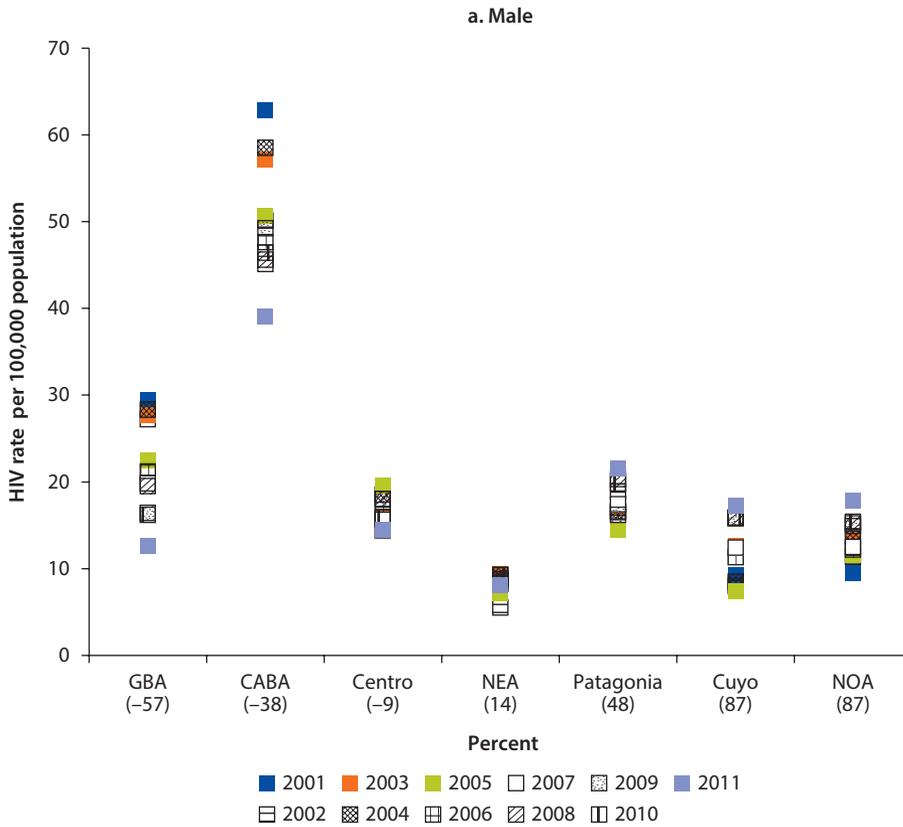
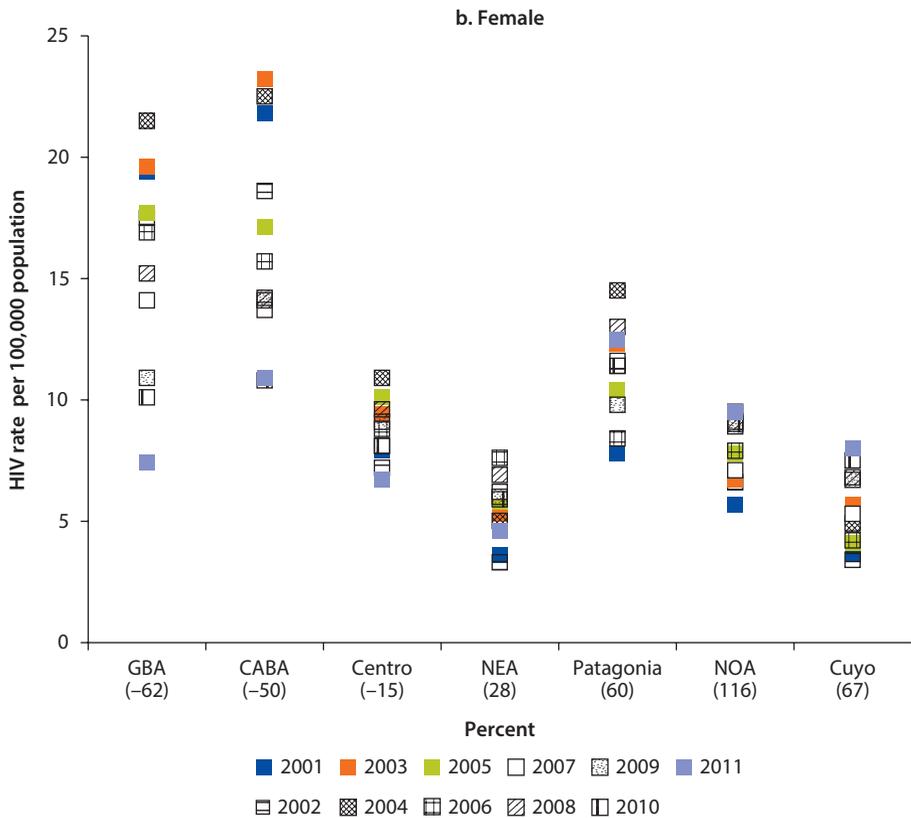


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Figure 3.4 HIV Rate per 100,000, by Sex, 2001–11 (continued)

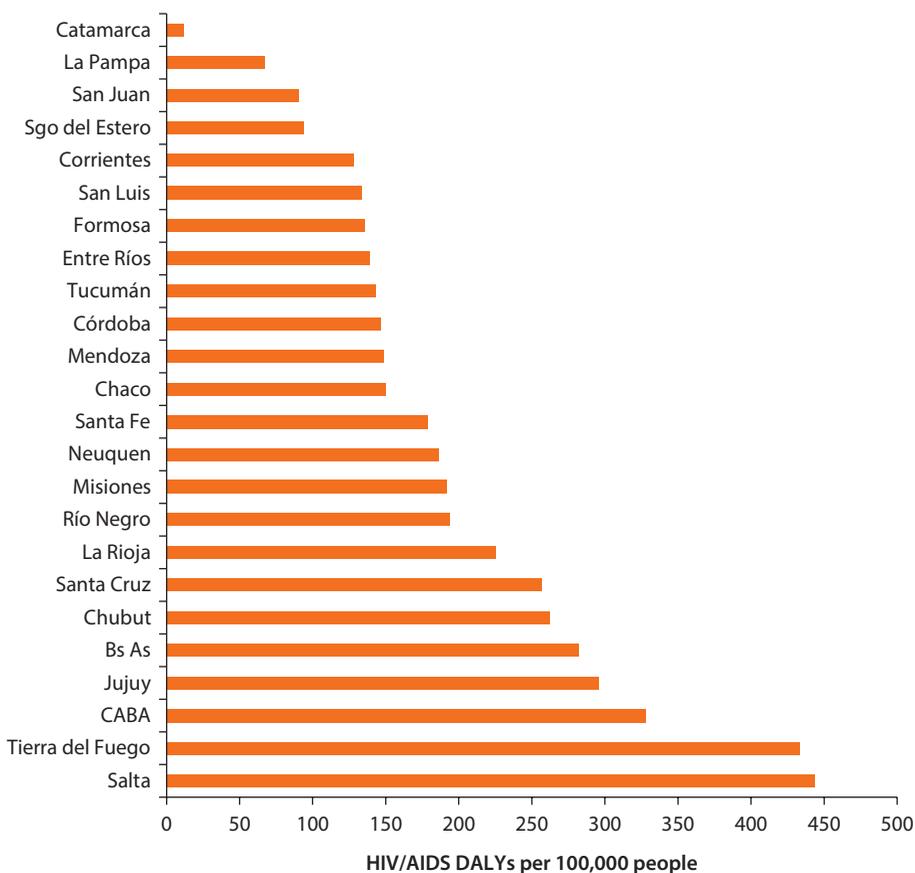
Source: MSN 2013.

Note: CABA = City of Buenos Aires; GBA = Greater Buenos Aires; NEA = Northeast region; NOA = Northwest region.

and Santiago del Estero), of which Buenos Aires and the City of Buenos Aires bear a higher burden of HIV (figure 3.7). On average, in all other provinces, the HIV burden increased by 130 percent in five years—an increase that was mostly concentrated in adult men.

At the subnational level, there are large disparities in HIV/AIDS burden, although this tendency seems to be decreasing over time. There is no clear evidence on why some provinces had a surge in their rates; however, there is a sense that prevention and treatment efforts in large urban centers—where cases used to be concentrated—are yielding reductions in rates.

The study shows that 18 of the 24 provinces increased their BoD during 2005 to 2010. Although six provinces had only a small increase in burden (less than 12 percent, with the exception of Misiones, which had an increase of 21 percent), 12 provinces had increases of 45 to 759 percent. Among these exponential increases, the provinces of the Patagonia region were the leaders in HIV/AIDS burden, with the exception of Neuquén. Santa Cruz showed an

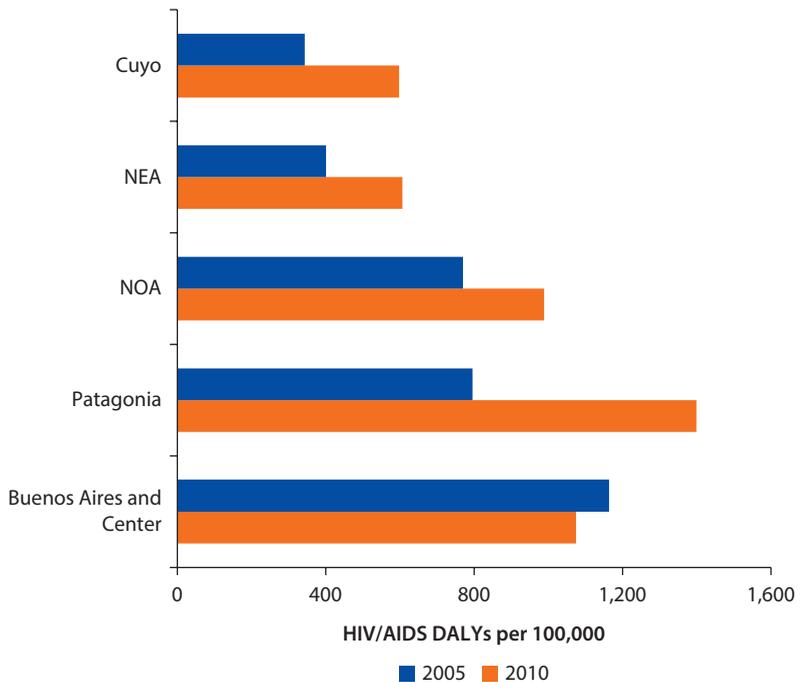
Figure 3.5 HIV/AIDS Burden of Disease, by Province in Argentina, 2010

Source: Borrueal, Mas, and Borrueal 2010.

Note: DALY = disability-adjusted life year.

increase of 759 percent in its burden in the five-year period analyzed, followed by La Pampa (190 percent), Río Negro (175 percent), and Tierra del Fuego (129 percent). The burden in the provinces in the Northeast region also had high rates of increase (Formosa, 155 percent, and Chaco, 103 percent) (table 3.1).

Changes in the HIV/AIDS burden by sex at the provincial level show striking results. Although there was a reduction in the HIV burden among women in some provinces, there was also an increase in the burden among men in those same provinces between 2005 and 2010. The reverse also occurred, with an increase in the HIV burden among women and a decrease in the burden among men occurring in the same province. Ten provinces (Chubut, Córdoba, Corrientes, Formosa, Misiones, San Juan, San Luis, Santa Fe, Tierra del Fuego, and Tucumán) showed opposite changes in the burden of HIV for men and women between 2005 and 2010. Among women, the burden in Chubut increased from

Figure 3.6 HIV/AIDS Burden, by Region, 2005 and 2010

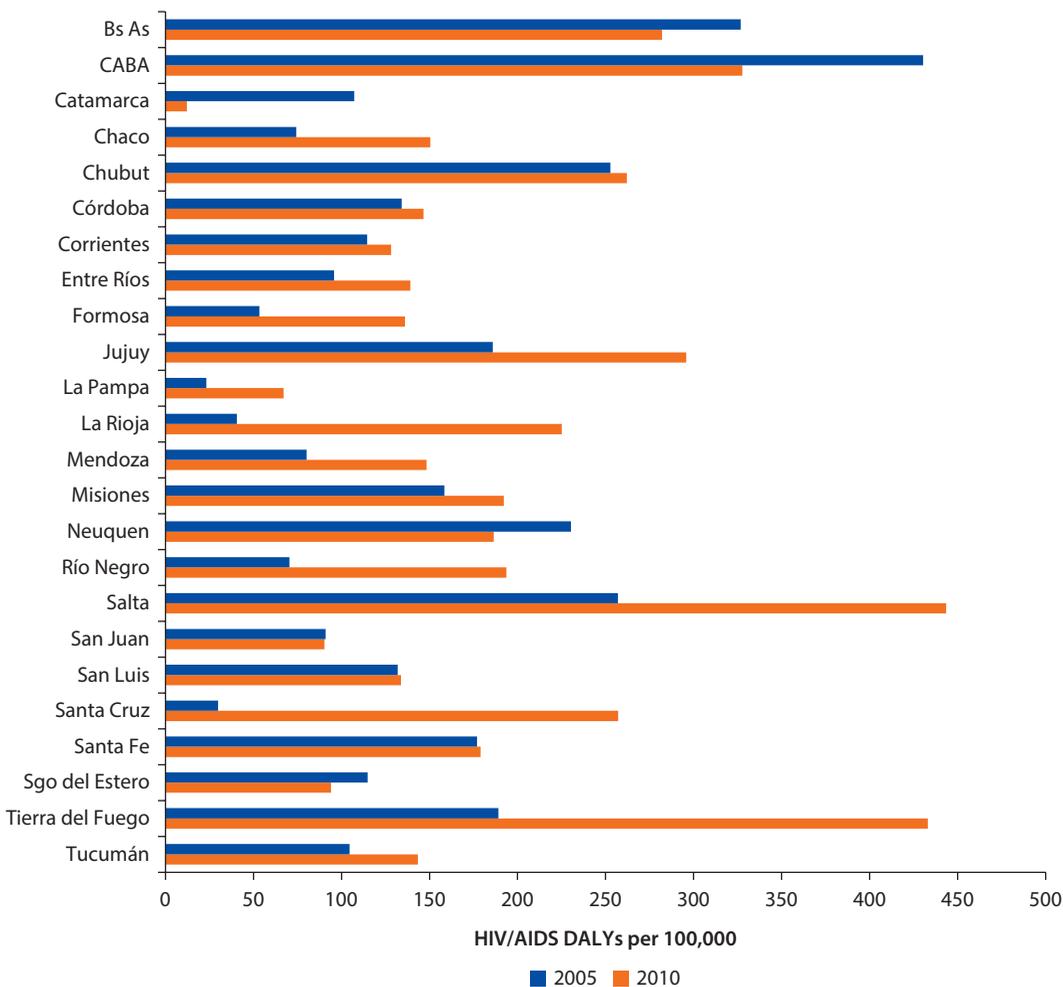
Source: Borrueal, Mas, and Borrueal 2010.

Note: DALY = disability-adjusted life year; NEA = Northeast region; NOA = Northwest region.

193 to 298 per 100,000 women, while it decreased from 312 to 226 per 100,000 men. The same situation occurred in Córdoba, where the burden among women almost doubled from 2005 to 2010 (from 44 to 82), while it decreased among men (from 228 to 214). The HIV burden among women in Santa Fe, Córdoba, Corrientes, and San Juan also increased, while it decreased among men. By contrast, in San Luis and Tucumán, there was an improvement in incidence among women, while the situation seemed to be worsening among men. Finally, Tierra del Fuego and Formosa had an exponential increase in the burden of HIV/AIDS among men, from 161 to 831 per 100,000 and from 45 to 224 per 100,000, respectively, from 2005 to 2010. Among women, disease prevalence seemed to decrease (from 218 to 22 per 100,000 in Tierra del Fuego and from 62 to 47 per 100,000 in Formosa).² The province of Tierra del Fuego, however, is a specific case, because of its low population and high internal and external migration, which could bias the data when comparing one year with another (figure 3.8).

All other provinces had similar behavior in their HIV/AIDS burden rates among men and women, although the rates of change varied. While Buenos Aires, the City of Buenos Aires, Catamarca, Neuquén, and Santiago del Estero showed similar rates of HIV/AIDS burden reduction in the past five years, Chaco, Entre Ríos, Jujuy, and Salta saw an increase in rates for men and women. In the case of La Pampa, the burden of HIV/AIDS among women increased by

Figure 3.7 Comparison of HIV/AIDS Burden, by Province, 2005 and 2010



Source: Borruel, Mas, and Borruel 2010.
 Note: DALY = disability-adjusted life year.

over 500 percent in the last year, compared with an increase of 100 percent among men. Inversely, La Rioja saw an increase of over 500 percent among men, compared with an increase of 167 percent among women in the same period (figure 3.8).

Finally, this report presents some projections for the HIV/AIDS rate for the next 10 years based on data from MSN on the rate of HIV/AIDS per 100,000 inhabitants from 2001 to 2011. HIV/AIDS rates show a decrease of 15 percent in Argentina by 2025, when considering the trends of the epidemic between 2001 and 2011 (figure 3.9).

There are profound heterogeneities in the HIV/AIDS burden across provinces. The same behavior is shown by projections of HIV/AIDS prevalence rates.

Table 3.1 Provincial Performance in Terms of Burden of HIV/AIDS, 2005–10

<i>Provinces that reduced their burden</i>	<i>Provinces that increased their burden by less than the average</i>	<i>Provinces that increased their burden by more than the average</i>
Buenos Aires	Chubut	Chaco
City of Buenos Aires	Córdoba	Formosa
Catamarca	Corrientes	Jujuy
Neuquen	San Luis	La Pampa
San Juan	Misiones	La Rioja
Santiago del Estero	Santa Fe	Mendoza
		Entre Ríos
		Tierra del Fuego
		Tucuman
		Río Negro
		Salta
		Santa Cruz

Source: Borruel, Mas, and Borruel 2010.

Figure 3.8 Comparison of HIV/AIDS Burden by Province and Sex, 2005 and 2010

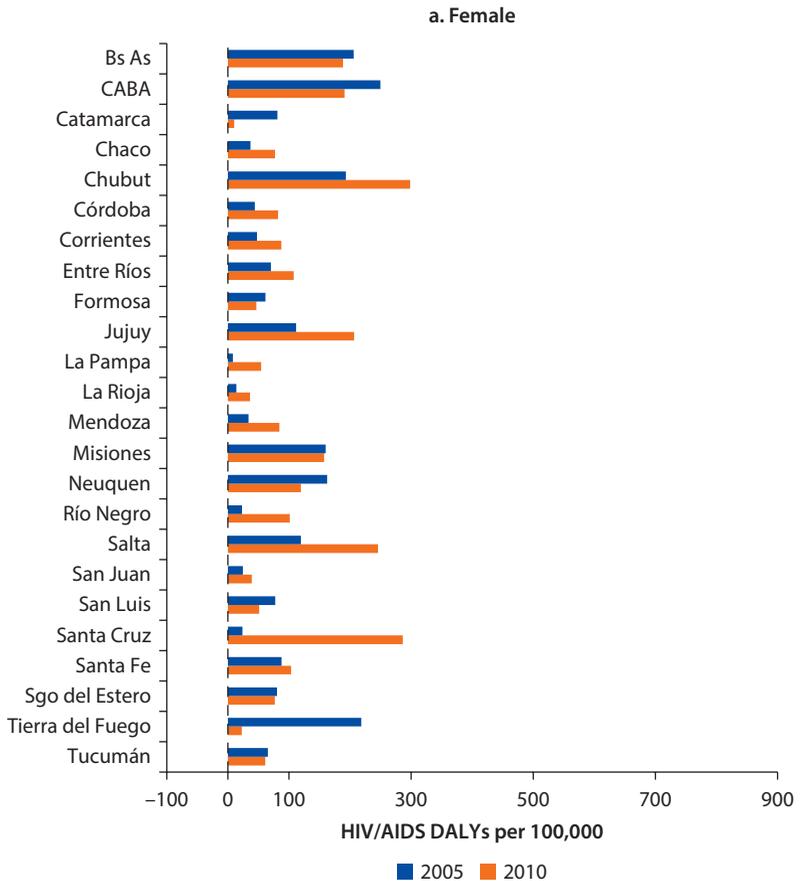
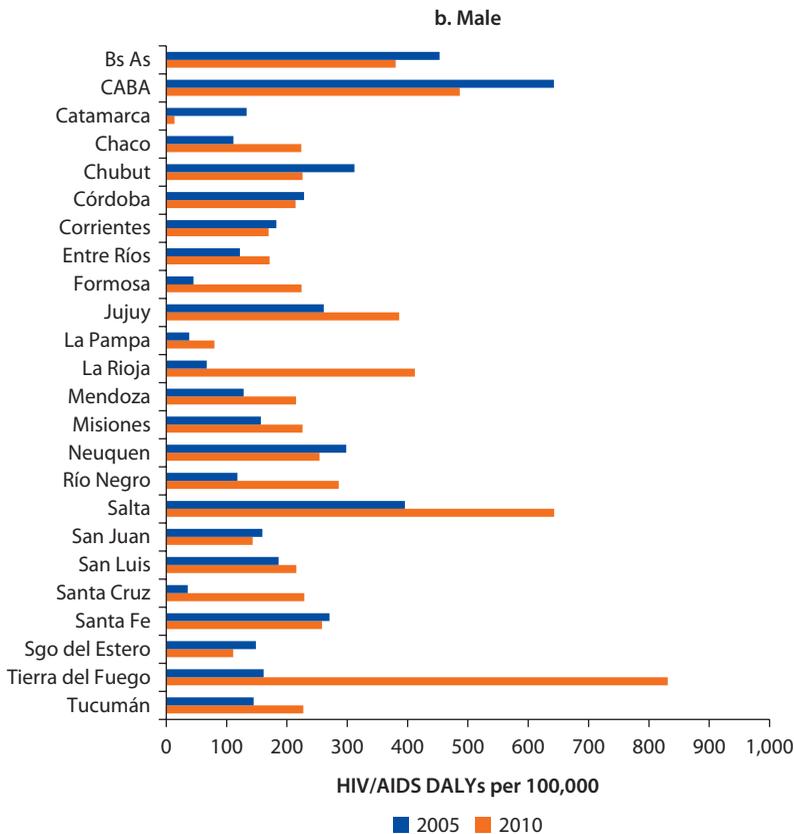


figure continues next page

Figure 3.8 Comparison of HIV/AIDS Burden by Province and Sex, 2005 and 2010
(continued)



Source: Borruel, Mas, and Borruel 2010.

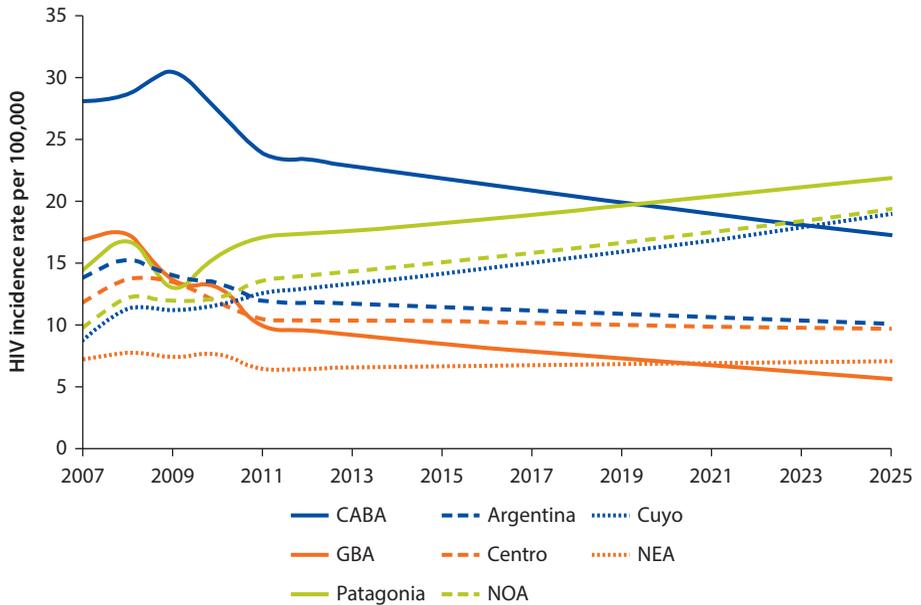
Note: Bs As = Buenos Aires; CABA = City of Buenos Aires; DALY = disability-adjusted life year.

Although the area of Buenos Aires and the Center show positive perspectives, the Northwest, Northeast, Cuyo, and Patagonia regions are projected to have worsening rates in the future.

Conclusion

In 2013, a BoD analysis for HIV/AIDS was carried out at the provincial level of Argentina to assess differences in prevalence of the disease and changes over time. The study used the new GBD methodology from IHME's 2010 study.

In line with tendencies shown by the epidemiological data, results from the BoD study confirm a high heterogeneity of HIV/AIDS burden across provinces and regions in Argentina. Although the measure of national average DALYs due to HIV/AIDS was 194 DALYs per 100,000 people in 2010,⁶ the HIV/AIDS burden varies from 12 DALYs per 100,000 inhabitants in Catamarca to 433 and 444 per 100,000 inhabitants in Salta and Tierra del Fuego, respectively. Moreover,

Figure 3.9 HIV/AIDS Incidence Rate Projections, by Region, 2007–25

Source: Author's calculations based on Borrueal, Mas, and Borrueal 2010.

Note: CABA = City of Buenos Aires; GBA = Greater Buenos Aires; NEA = Northeast region; NOA = Northwest region.

most of the cases of HIV in Argentina are concentrated in four provinces (72.9 percent of accumulated HIV cases over the past decade). Finally, analysis by sex at the provincial level shows high discrepancies in BoD change between 2005 and 2010.

During the past decade, Argentina was able to reduce its HIV/AIDS BoD by 21 percent, constituting the second highest reduction in South America after Peru. In 2010, Argentina had one of the lowest BoDs in the region. However, among all 24 provinces, only six were able to reduce their BoD between 2005 and 2010, two of which had the most cases in the region. Eighteen of the 24 provinces increased their BoD in the same period and, in line with the available epidemiological data, these increases were particularly high in Patagonia and the Northwestern region of the country. The province of Santa Cruz had the highest burden increase, followed by La Pampa (190 percent), Río Negro (175 percent), and Formosa (155 percent).

Although reductions in large urban areas are related to strong policies of prevention and treatment, it is not clear why some provinces saw a surge in their rates during the past years. In particular, in some regions, it will be challenging for MSN to bring those regions on track. Demand- and supply-side factors determine changes in the patterns of disease. On the demand side, cultural changes, stigma, and education may have affected the increase of HIV burden. On the supply side, HIV/AIDS treatment provision has posed challenges related to access to health services, procurement, and distribution in some provinces.

In recent years, some of this work is being done. The National HIV/AIDS Program has strengthened its territorial presence, working with provincial ministries to reduce gaps and increase access to treatment and prevention policies. According to a recent supply-side study by MSN (described in chapter 4), 90 percent of HIV/AIDS program heads reported an improvement in the supply of and access to preventive, diagnostic, and health care services for people living with HIV/AIDS. Moreover, there has been a substantial increase in the procurement and distribution of condoms throughout the country, as well as the installation of fixed delivery points that ensure systematic distribution and improved accessibility. Results could be seen in the coming years. However, the demand side is still in need of new actions at the national and provincial levels.

Annex 3A: Burden of HIV/AIDS in Argentina, 2005–10

Table 3A.1 Burden of HIV/AIDS among Men, 2005

<i>Province</i>	<i>Population</i>	<i>Deaths</i>	<i>YLLs</i>	<i>YLLs/100,000</i>	<i>New cases</i>	<i>YLDs</i>	<i>DALYs</i>	<i>DALYs/100,000</i>
Buenos Aires	7,839,998.0	267.0	12,996.0	165.8	706.0	1,787.0	4,783.0	188.6
City of Buenos Aires	1,643,809.0	50.0	2,207.0	134.3	390.0	933.0	3,141.0	191.1
Catamarca	201,359.0	—	—	—	9.0	21.0	21.0	10.4
Chaco	536,228.0	7.0	378.0	70.5	14.0	36.0	414.0	77.2
Chubut	235,254.0	13.0	619.0	263.1	33.0	83.0	702.0	298.4
Córdoba	1,739,001.0	23.0	1,010.0	58.1	171.0	419.0	1,429.0	82.2
Corrientes	522,305.0	6.0	389.0	74.5	28.0	69.0	458.0	87.7
Entre Ríos	650,972.0	10.0	606.0	93.1	39.0	96.0	702.0	107.8
Formosa	276,000.0	1.0	85.0	30.8	18.0	44.0	129.0	46.7
Jujuy	351,837.0	13.0	619.0	175.9	44.0	109.0	728.0	206.9
La Pampa	171,032.0	1.0	66.0	38.6	11.0	27.0	93.0	54.4
La Rioja	176,664.0	1.0	14.0	7.9	21.0	50.0	64.0	36.2
Mendoza	900,569.0	13.0	590.0	65.5	70.0	168.0	758.0	84.2
Misiones	551,080.0	15.0	736.0	133.6	55.0	133.0	869.0	157.7
Neuquen	284,054.0	6.0	274.0	96.5	29.0	66.0	340.0	119.7
Río Negro	301,932.0	5.0	240.0	79.5	27.0	66.0	306.0	101.3
Salta	636,575.0	27.0	1,370.0	215.2	78.0	195.0	1,565.0	245.8
San Juan	361,868.0	3.0	95.0	26.3	19.0	46.0	141.0	39.0
San Luis	227,721.0	1.0	70.0	30.7	19.0	47.0	117.0	51.4
Santa Cruz	115,625.0	5.0	279.0	241.3	21.0	52.0	331.0	286.3
Santa Fe	1,682,660.0	30.0	1,424.0	84.6	133.0	319.0	1,743.0	103.6
Sgo del Estero	437,020.0	5.0	279.0	63.8	24.0	56.0	335.0	76.7
Tierra del Fuego	65,847.0	—	—	—	6.0	15.0	15.0	22.8
Tucumán	762,870.0	6.0	330.0	43.3	47.0	136.0	466.0	61.1

Source: Borruel, Mas, and Borruel 2010.

Note: DALY = disability-adjusted life year; YLD = year lived with disability; YLL = year of life lost; — = not available.

Table 3A.2 Burden of HIV/AIDS among Men, 2010

<i>Province</i>	<i>Population</i>	<i>Deaths</i>	<i>YLLs</i>	<i>YLLs/100,000</i>	<i>New cases</i>	<i>YLDs</i>	<i>DALYs</i>	<i>DALYs/100,000</i>
Buenos Aires	7,475,844.0	546.0	25,502.0	341.1	1,130.0	2,915.0	28,417.0	380.1
City of Buenos Aires	1,414,500.0	130.0	5,778.0	408.5	445.0	1,102.0	6,880.0	486.4
Catamarca	202,881.0	—	—	—	12.0	28.0	28.0	13.8
Chaco	534,913.0	22.0	1,091.0	204.0	41.0	106.0	1,197.0	223.8
Chubut	235,479.0	9.0	419.0	177.9	46.0	113.0	532.0	225.9
Córdoba	1,657,684.0	57.0	2,590.0	156.2	391.0	962.0	3,552.0	214.3
Corrientes	513,407.0	15.0	740.0	144.1	52.0	130.0	870.0	169.5
Entre Ríos	631,042.0	21.0	917.0	145.3	65.0	164.0	1,081.0	171.3
Formosa	279,694.0	13.0	588.0	210.2	14.0	39.0	627.0	224.2
Jujuy	346,637.0	22.0	1,175.0	339.0	65.0	163.0	1,338.0	386.0
La Pampa	170,424.0	3.0	90.0	52.8	19.0	46.0	136.0	79.8
La Rioja	178,686.0	13.0	656.0	367.1	33.0	80.0	736.0	411.9
Mendoza	865,116.0	33.0	1,457.0	168.4	170.0	405.0	1,862.0	215.2
Misiones	560,363.0	22.0	1,099.0	196.1	70.0	168.0	1,267.0	226.1
Neuquen	281,188.0	13.0	543.0	193.1	72.0	171.0	714.0	253.9
Río Negro	301,829.0	15.0	739.0	244.8	51.0	124.0	863.0	285.9
Salta	630,736.0	76.0	3,713.0	588.7	137.0	343.0	4,056.0	643.1
San Juan	353,184.0	9.0	424.0	120.1	34.0	81.0	505.0	143.0
San Luis	229,046.0	10.0	411.0	179.4	34.0	83.0	494.0	215.7
Santa Cruz	118,462.0	5.0	192.0	162.1	33.0	79.0	271.0	228.8
Santa Fe	1,602,510.0	80.0	3,526.0	220.0	248.0	612.0	4,138.0	258.2
Sgo del Estero	446,553.0	9.0	420.0	94.1	32.0	76.0	496.0	111.1
Tierra del Fuego	67,847.0	13.0	514.0	757.6	19.0	50.0	564.0	831.3
Tucumán	748,646.0	28.0	1,393.0	186.1	128.0	308.0	1,701.0	227.2

Source: Borruel, Mas, and Borruel 2010.

Note: DALY = disability-adjusted life year; YLD = year lived with disability; YLL = year of life lost; — = not available.

Table 3A.3 Burden of HIV/AIDS among Women, 2005

<i>Province</i>	<i>Population</i>	<i>Deaths</i>	<i>YLLs</i>	<i>YLLs/100,000</i>	<i>New cases</i>	<i>YLDs</i>	<i>DALYs</i>	<i>DALYs/100,000</i>
Buenos Aires	7,493,881.0	260.0	13,172.4	175.8	930.0	2,285.9	15,445.5	206.1
City of Buenos Aires	1,631,023.0	67.0	3,235.0	198.3	350.0	852.0	4,075.0	249.8
Catamarca	182,221.0	2.0	124.5	68.3	10.0	24.0	148.0	81.2
Chaco	511,841.0	4.0	147.5	28.8	17.0	43.0	190.0	37.1
Chubut	221,700.0	7.0	358.7	161.8	28.0	69.0	428.0	193.1
Córdoba	1,665,446.0	9.0	417.2	25.1	134.0	319.0	737.0	44.3
Corrientes	494,407.0	5.0	197.0	39.8	16.0	39.0	236.0	47.7
Entre Ríos	618,123.0	7.0	361.9	58.6	30.0	73.0	435.0	70.4
Formosa	256,678.0	2.0	121.0	47.1	15.0	37.0	158.0	61.6
Jujuy	328,996.0	5.0	274.6	83.5	39.0	93.0	368.0	111.9
La Pampa	160,736.0	—	—	—	5.0	13.0	13.0	8.1
La Rioja	159,397.0	—	—	—	9.0	22.0	22.0	13.8
Mendoza	854,690.0	5.0	240.2	28.1	20.0	49.0	289.0	33.8
Misiones	510,424.0	14.0	709.9	139.1	42.0	107.0	817.0	160.1

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Table 3A.3 Burden of HIV/AIDS among Women, 2005 (continued)

Province	Population	Deaths	YLLs	YLLs/100,000	New cases	YLDs	DALYs	DALYs/100,000
Neuquen	260,946.0	7.0	353.3	135.4	29.0	71.0	424.0	162.5
Río Negro	293,689.0	—	—	—	29.0	68.0	68.0	23.2
Salta	583,439.0	11.0	595.9	102.1	42.0	103.0	698.0	119.6
San Juan	338,427.0	1.0	64.0	18.9	8.0	19.0	83.0	24.5
San Luis	203,997.0	2.0	127.0	62.3	13.0	31.0	158.0	77.5
Santa Cruz	104,792.0	—	—	—	11.0	25.0	25.0	23.9
Santa Fe	1,627,506.0	22.0	1,087.5	66.8	138.0	343.0	1,431.0	87.9
Sgo del Estero	416,046.0	5.0	254.0	61.1	35.0	81.0	335.0	80.5
Tierra del Fuego	56,344.0	2.0	103.9	184.4	8.0	20.0	123.0	218.3
Tucumán	718,929.0	7.0	364.3	50.7	43.0	106.0	470.0	65.4

Source: Borruel, Mas, and Borruel 2010.

Note: DALY = disability-adjusted life year; YLD = year lived with disability; YLL = year of life lost; — = not available.

Table 3A.4 Burden of HIV/AIDS among Women, 2010

Province	Population	Deaths	YLLs	YLLs/100,000	New cases	YLDs	DALYs	DALYs/100,000
Buenos Aires	7,839,998.0	267.0	12,996.0	165.8	706.0	1,787.0	14,783.0	188.6
City of Buenos Aires	1,643,809.0	50.0	2,207.0	134.3	390.0	933.0	3,141.0	191.1
Catamarca	201,359.0	—	—	—	9.0	21.0	21.0	10.4
Chaco	536,228.0	7.0	378.0	70.5	14.0	36.0	414.0	77.2
Chubut	235,254.0	13.0	619.0	263.1	33.0	83.0	702.0	298.4
Córdoba	1,739,001.0	23.0	1,010.0	58.1	171.0	419.0	1,429.0	82.2
Corrientes	522,305.0	6.0	389.0	74.5	28.0	69.0	458.0	87.7
Entre Ríos	650,972.0	10.0	606.0	93.1	39.0	96.0	702.0	107.8
Formosa	276,000.0	1.0	85.0	30.8	18.0	44.0	129.0	46.7
Jujuy	351,837.0	13.0	619.0	175.9	44.0	109.0	728.0	206.9
La Pampa	171,032.0	1.0	66.0	38.6	11.0	27.0	93.0	54.4
La Rioja	176,664.0	1.0	14.0	7.9	21.0	50.0	64.0	36.2
Mendoza	900,569.0	13.0	590.0	65.5	70.0	168.0	758.0	84.2
Misiones	551,080.0	15.0	736.0	133.6	55.0	133.0	869.0	157.7
Neuquen	284,054.0	6.0	274.0	96.5	29.0	66.0	340.0	119.7
Río Negro	301,932.0	5.0	240.0	79.5	27.0	66.0	306.0	101.3
Salta	636,575.0	27.0	1,370.0	215.2	78.0	195.0	1,565.0	245.8
San Juan	361,868.0	3.0	95.0	26.3	19.0	46.0	141.0	39.0
San Luis	227,721.0	1.0	70.0	30.7	19.0	47.0	117.0	51.4
Santa Cruz	115,625.0	5.0	279.0	241.3	21.0	52.0	331.0	286.3
Santa Fe	1,682,660.0	30.0	1,424.0	84.6	133.0	319.0	1,743.0	103.6
Sgo del Estero	437,020.0	5.0	279.0	63.8	24.0	56.0	335.0	76.7
Tierra del Fuego	65,847.0	—	—	—	6.0	15.0	15.0	22.8
Tucumán	762,870.0	6.0	330.0	43.3	47.0	136.0	466.0	61.1

Source: Borruel, Mas, and Borruel 2010.

Note: DALY = disability-adjusted life year; YLD = year lived with disability; YLL = year of life lost; — = not available.

Notes

1. As the new methodology was published with general parameters for calculations, the team in Argentina recreated different analytical models to verify that the procedures used were similar to those of the IHME group. Moreover, there are no provincial-level data in the IHME results.
2. In HIV/AIDS bulletins from the Argentine National Health Ministry (MSN), there is information about the ratio of men to women for each region. With enough analysis time, it would be possible to obtain a more precise adjustment of the distribution of incidence by sex for each province. The time limitations and the publication of HIV/AIDS Bulletin Number 30 in the last days of December 2013 allowed for an adequate calculation of the burden of HIV per province. Nonetheless, this calculation is less precise in attributing the BoD for each age range and sex.
3. Applying disability to deceased patients during the year studied seems reasonable, given that terminal phases of disease add time lived with disability until the moment of death. Although this step is logical, it is not known whether IHME considers this rationale in its calculations.
4. The number of incident cases registered nationally was taken from table 3.1, “Cases and Rates of HIV per 100,000 People by Jurisdiction and Year of Diagnosis, Argentina (2001–11),” page 69 of the HIV/AIDS Bulletin number 30, December 2013.
5. Information from the MSN HIV Bulletin 2013 shows that the rate of HIV among women and men in Tierra del Fuego was erratic between 2001 and 2011. The comparison between two periods of time, then, should not be considered determinate of the future tendency of disease.
6. Data on the BoD at the national level are the sum of the HIV/AIDS burdens in all provinces.

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Advances and Challenges in the Supply of HIV/AIDS and STI Prevention, Diagnosis, and Treatment from the Argentine Public Health System

Supply Side: Advances and Challenges in HIV/AIDS Health Care Line in Argentina, 2007–11

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Introduction

In 2012, Argentina's National HIV/AIDS and STDs Office (Dirección de SIDA y ETS [DSyETS]) conducted a Monitoring and Evaluation Study of the Current Status of the Preventive and Social Protection Response to HIV/AIDS, sexually transmitted infections (STIs), and Viral Hepatitis in Argentina, based on survey data collected in 2011. The study was a partial replica of a similar survey conducted in 2007, which served as a baseline for the strategic planning for DSyETS from 2008 to 2011 (Weller and others 2009).

The 2012 study included the HIV/AIDS programs of the 24 provincial jurisdictions, 10 of the 12 health regions of the province of Buenos Aires, and 18 municipal AIDS programs that had been in operation for at least one year. The study also surveyed 191 hospitals and 348 primary health centers that are part of the national public health system. Although based on the previous survey, the 2012 study also incorporated a viral hepatitis investigation and surveyed a greater number of institutions. Furthermore, adding municipal HIV/AIDS programs helped identify cases in which fragmentation between prevention and care was overcome at the local level.

The study focused on four main areas: (a) access to prevention inputs; (b) access to diagnostic counseling; (c) comprehensive care for people living with HIV/AIDS (PLWHA), viral hepatitis, and STIs and (d) management of epidemiological information. The research carried out by the Studies and Monitoring Area was developed through a participatory model involving

prevention, communication, and assistance teams from DSyETS and the heads of HIV programs in defining objectives, formulating data survey instruments, conducting local surveys, and selecting health indicators to be included in the sample. In addition, this collaborative process became a vehicle for setting collaborative HIV/AIDS agendas among program managers and local actors.

The main objective of the study was to generate quality information that would support actions to strengthen existing health practices and the development of new practices. As such, the research was designed to inform decision making with the goal of triggering changes at the local level. This chapter presents a comparison between the 2007 baseline data and the 2011 results from the supply of services survey. The chapter discusses prevention, diagnostic, and HIV/AIDS care service indicators that have been part of the Essential Public Health Functions Project (EPHFP) since 2009.

Conceptual Definitions of the Participatory Diagnostic Study

A few key concepts must be clarified to set this study apart from more traditional monitoring and evaluation studies. First, we understand health and sickness as complex and mutable processes that may have multiple determinations. As such, health care cannot be reduced to the provision of services, but must also embrace various practices, wisdom, and actors that may operate on different institutionalization levels (Menéndez 1994). Considering care as a process can help delimitate the sphere in which the state and other actors may act with the objective of producing better results in health.

The health processes can only be understood in the historic context of the public sector's response to the HIV/AIDS epidemic, and can be observed at the time of diagnosis and provision of health services for affected persons and populations. These instances integrate the knowledge and practices of professional health care workers and those of the population that requires care.

Access to health care involves health care professionals and the population seeking care. As such, considering access from only one side of the spectrum (most often the supply side) means fragmenting the full and complex reality. This one-sided view hides the fact that the population seeking health care is also involved in constructing the concept of access and should therefore have their health and life practices represented in studies of access to a health care system (Comes and others 2007).

In the particular case of the response to the HIV/AIDS epidemic, interviewees mentioned bureaucratic barriers, geographic distance, delays, and lack of budget. Unfortunately, the limitations of using a survey instrument make it impossible fully to capture the underlying cultural barriers that perpetuate stigma and discrimination among health care providers and the population that seeks care.

Research as a tool for management was among the main conceptual contributions from the previous study, since that study was the foundation for developing a participatory working method (Weller and others 2009). This method promoted the active participation of local actors involved with AIDS programs

in systematically collecting information on preventive and acute care response to HIV/AIDS, STIs, and viral hepatitis, thus increasing overall capacity to manage the epidemic.

Expanded management triggers a democratization of the forms of care, in which exchanges that incorporate new actors and new perspectives on the epidemic become relevant (Campos 2000). For example, the study's incorporation of municipalities deepened the local point of view, since it assumed that the provincial and national levels bring different perspectives.

Methodology

Although the main focus of this chapter is the HIV/AIDS response in Argentina, the development of the study brought to light issues of accessibility to promotion, prevention, diagnosis, treatment, and follow-up services for other diseases.

The public health subsector is the universe of inquiry, while provincial, municipal, and regional AIDS programs are the units of analysis alongside hospitals and health care facilities. The sample includes all programs from the 24 provinces and 10 of the 12 sanitary health regions of the province of Buenos Aires. Eighteen municipal programs were selected based on their level of organizational development and type of AIDS program activities. Selected hospitals included maternity hospitals with more than 1,000 deliveries per year. Health centers were selected among those that were part of Programa Remediar,¹ a project financed by the Inter-American Development Bank. Jurisdiction supervisors selected participating institutions based on updated listings previously considered under the Evaluation and Monitoring of the Response to HIV survey conducted in 2008. The sample is intentional, since the selection of health care facilities is not statistically representative; each unit of study was selected by other criteria (the study objectives and the search for typical cases). Between eight and 10 health care facilities (hospitals and health centers) were selected per jurisdiction.

Questionnaires from the 2008 research were the basis for developing instruments for this study and DSyETS suggested adaptations (Weller and others 2009). The survey included questions for capturing data from the municipal and local programs. Four distinct surveys were created—for jurisdictions, municipal programs, hospitals, and health centers—and included open-ended and closed questions. Members of DSyETS interviewed heads of the provincial and municipal programs.

DSyETS selected 53 interviewers from a list provided by local program heads to disseminate the questionnaires in hospitals and health centers. Interviewers were trained and gathered survey data from 191 hospitals (13 of which were maternity hospitals) and 348 primary health care centers. Information was divided according to the following regions²:

*CABA: Autonomous City of Buenos Aires,*³ health regions V, VI, VII, and XII of the province of Buenos Aires and the municipalities of Avellaneda, Florencio

Varela, General Rodríguez, La Matanza, Lomas de Zamora, Moreno, Morón, Quilmes, San Fernando, San Martín, Tigre, and Tres de Febrero.

The remaining province of Buenos Aires regions. These include health regions I, II, III, IV, VIII, IX, X, and XI of the province of Buenos Aires and the municipality of La Plata.

Central. This region includes provinces of Córdoba, Santa Fe, and Entre Ríos and the municipalities of the capital city of Córdoba, Rosario, Venado Tuerto, and Gualeguaychú.

Northwest. This region includes the provinces of Jujuy, Salta, Santiago del Estero, Tucumán, and Catamarca.

Northeast. This region includes the provinces of Misiones, Formosa, Chaco, and Corrientes.

Cuyo. This region includes the provinces of Mendoza, San Luis, San Juan, and La Rioja.

Patagonia. This region includes provinces of Chubut, La Pampa, Neuquén, Río Negro, Santa Cruz, and Tierra del Fuego.

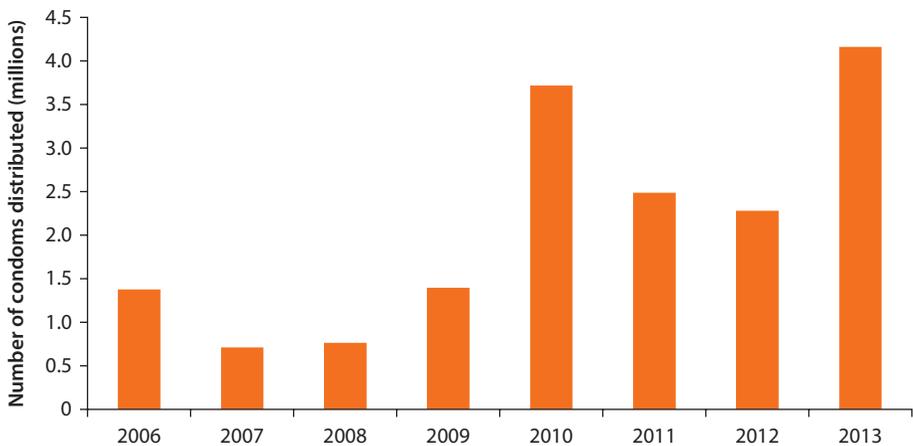
Comparative Analysis for 2007–11

This section analyzes the results of the surveys conducted in 2011 and compares them with the results of the 2007 surveys. The comparative analysis is divided into three areas: prevention materials, diagnosis, and health care.

Prevention Materials

The distribution of condoms increased 250 percent over four years, jumping from 8,550,780 units distributed in 2007 to 29,841,880 in 2011 (figure 4.1). The main condom supplier in 2007 was the Global Fund to Fight AIDS,

Figure 4.1 Average Monthly Condom Distribution by the National HIV/AIDS and STDs Office, 2006–13



Source: MSN 2013.

Tuberculosis, and Malaria (GFATM), which funded the purchase of approximately 50 percent of the condoms distributed. Although DSyETS contributed supplies, the distribution was not continuous. By 2011, 100 percent of the jurisdictions (52) received condoms from DSyETS and 41.2 percent (14) also received them from the National Program of Sexual and Reproductive Health and supplies procured by their own jurisdictions. The 18 municipal AIDS programs surveyed in 2011 received condoms from provincial jurisdictions. These changes came from a DSyETS policy to promote condom use through guaranteed distribution, creation of fixed distribution points, and dissemination of communication materials to support the process. Moreover, this policy transformed the main financing source from international aid to domestic sources, increasing the long-term sustainability of condom distribution.

An estimated 4,161,294 condoms were distributed in 2013—three times the number distributed in 2006. In 2011 and 2012, fewer condoms were distributed because of delays in the delivery of international bidding processes.⁴ At the jurisdictional and health provider levels, the increase in condom distribution was greater than 200 percent over four years.

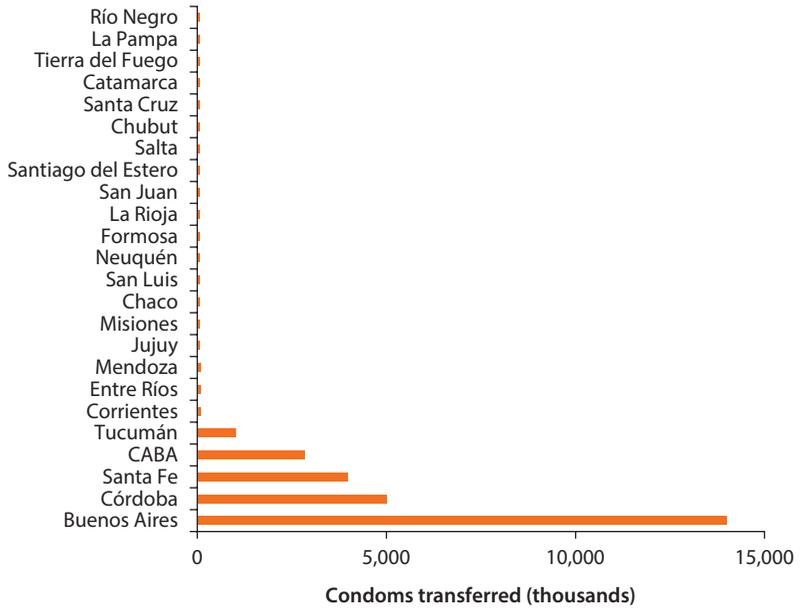
The 2007 and 2011 surveys showed that health care facilities established requirements for condom distribution, such as a medical prescription or collection of personal data from those requesting condoms. Nonetheless, in 2011 only 10 percent of facilities enforced the prerequisites, compared with 25 percent in 2007.

In 2007, distribution patterns varied greatly by jurisdiction and distribution largely took place through sporadic events. In 2007, the average number of condoms distributed at fixed points in the 21 jurisdictions was 37 percent of all condoms distributed, with variations ranging between 10 and 97 percent. DSyETS policy aimed to implement fixed distribution points in each jurisdiction, as reflected in the 2011 data, which show that the jurisdictions accounted for between 80 and 100 percent of condom distribution (figure 4.2). Fixed delivery points helped maintain a regular supply in locations that are routinely visited by the population inside and outside the health system, at public institutions and civil society organizations.

As of September 2013, there was a total of 3,156 fixed condom distribution points in all provinces, an 8.7 percent increase from 2012. The City of Buenos Aires and Central regions have the majority of these points (figure 4.3): 15 percent are located in the City of Buenos Aires, 38 percent in the province of Buenos Aires, 38 percent in Santa Fe, and seven percent in Córdoba.

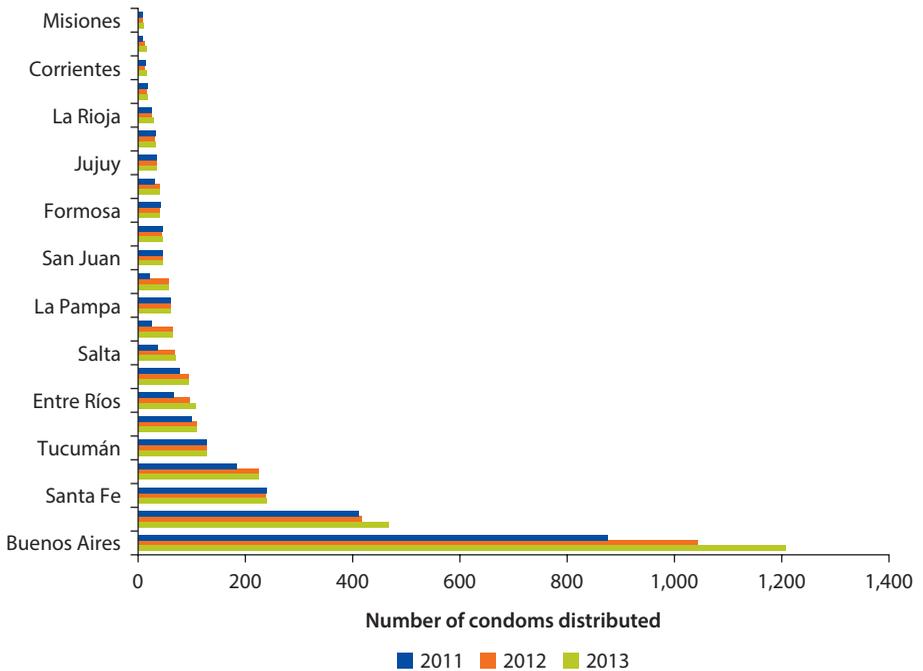
In addition, DSyETS has been involved in the production of a variety of communication materials that target specific populations (figure 4.4). At the time of the first study, 79 percent of health facilities reported offering promotion and prevention print materials. However, most respondents reported that the arrival of such material to hospitals and health centers was sporadic. In response, DSyETS prioritized the production of communication materials for health promotion and prevention of HIV/AIDS, developing 21 communication pieces in 2011; 100 percent of the health care institutions and providers surveyed in 2011 reported regularly receiving these materials.

Figure 4.2 Number of Condoms Transferred to the 24 Provinces, 2011



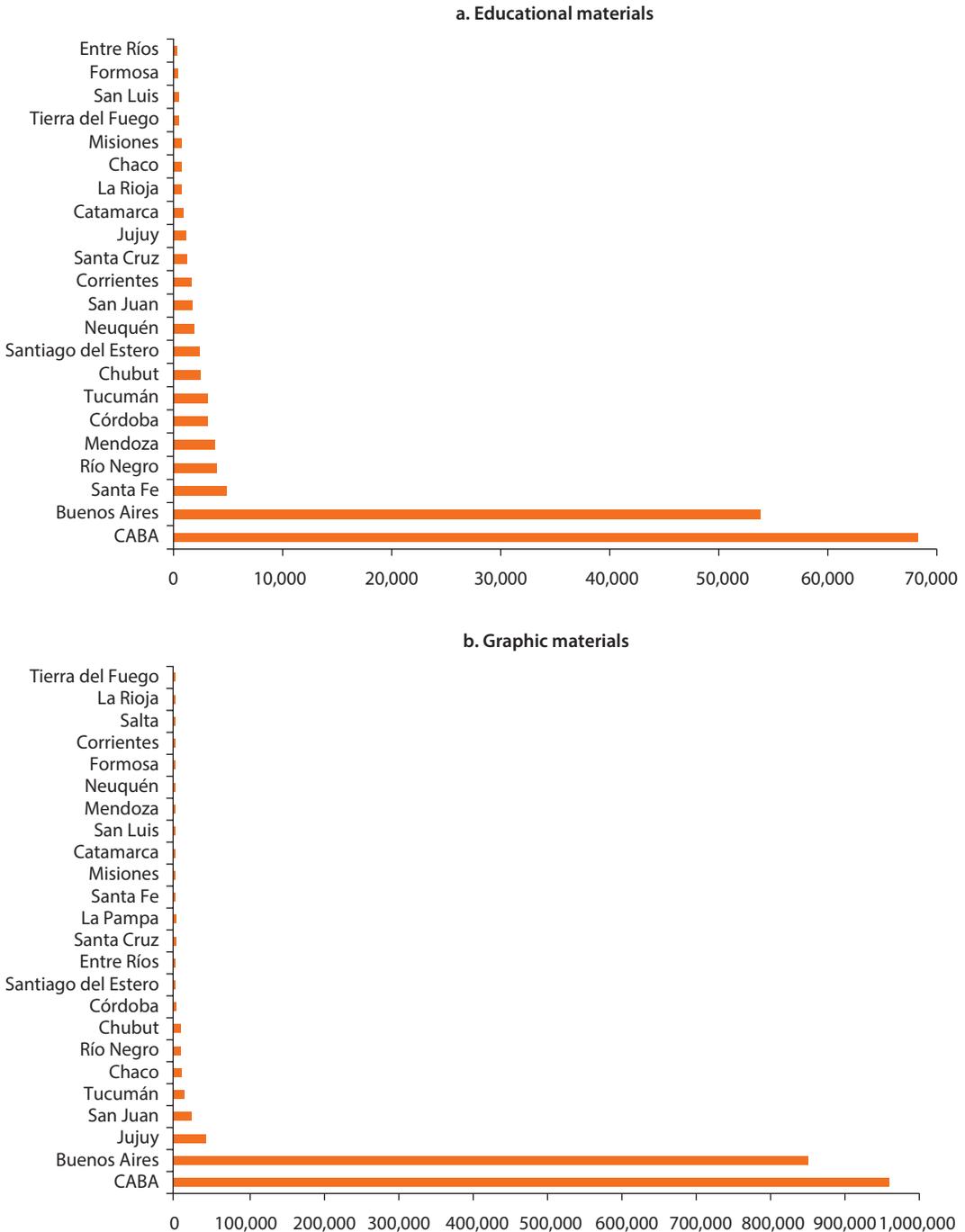
Source: MSN 2012.
 Note: CABA = City of Buenos Aires.

Figure 4.3 Condom Distribution at Fixed Points, by Province, 2011–13



Source: MSN 2013.

Figure 4.4 AIDS Materials Distributed, by Jurisdiction, 2011



Source: MSN 2012.
 Note: CABA = City of Buenos Aires.

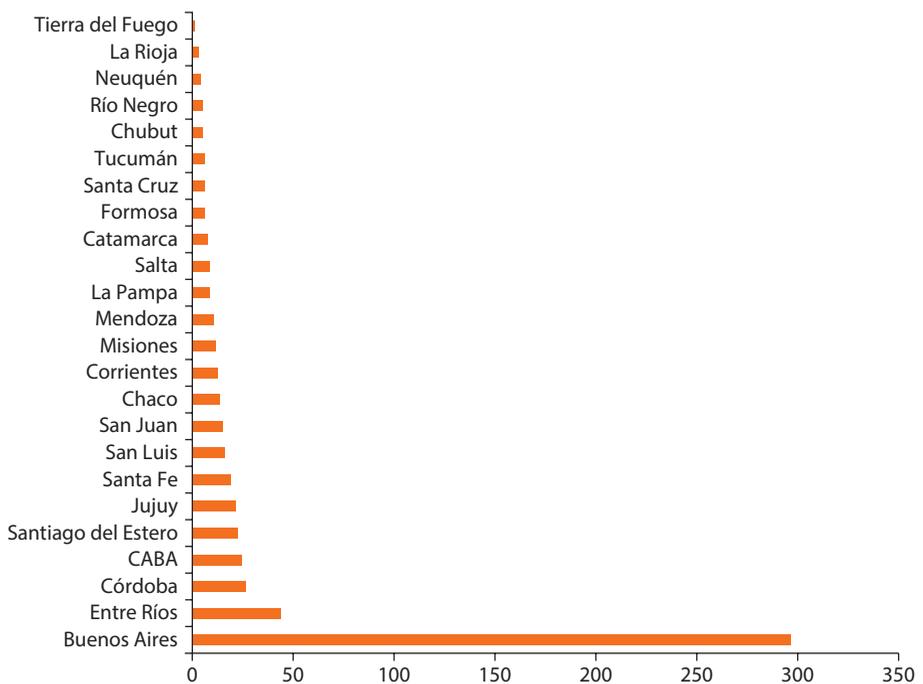
Materials were distributed throughout the country, not only in major cities. In 2007, 17 programs located outside the provincial capitals reported receiving jurisdictional prevention materials; in 2011, this occurred in all 24 jurisdictions.

Diagnostic Services

Until 2007, DSyETS had no national policy to promote active testing. The 2007/2008 investigation served as a baseline for designing policies and action plans to promote HIV/AIDS testing among the general population. This policy resulted in the mobilization of resources and the creation of Centers for Prevention, Counseling, and Testing and other spaces to facilitate access to HIV testing and counseling, which counted on the financial support of the EPHFP (figure 4.5).

In 2007, 25 percent of health care institutions counted on a specialized team for pre- and post-HIV test counseling. In 2011, this percentage increased to 32 percent. Similar to 2007, in 2011 counseling teams were more frequently found in hospitals than in health centers. In hospitals, the prevalence rose from 39 to 47 percent over four years; in primary health care institutions, it increased from 17 to 24 percent.

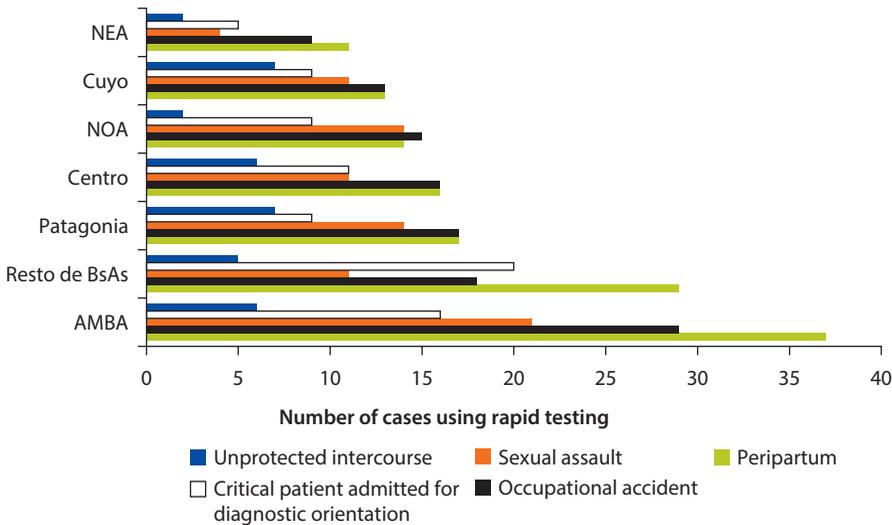
Figure 4.5 Number of Centers for Prevention, Counseling, and Testing, by Province, as of July 2013



Source: MSN 2013.

Note: CABA = City of Buenos Aires.

Figure 4.6 Use of Rapid HIV Testing in Hospitals, by Region, 2011



Source: MSN 2012.

Note: AMBA = Buenos Aires Metropolitan Area; NEA = Northeast region; NOA = Northwest region.

Testing for male partners of pregnant women remains one of the major systematic health challenges, as the supply of testing for this subpopulation has not yet been made universal. The 2011 survey did not find the anticipated increase among this population. However, the number of establishments that supply testing to male partners of pregnant women improved: the number of hospitals that provide testing increased from 36 to 71 percent and the number of health centers increased from 23 to 52 percent over the period analyzed.

Last, DSyETS has been promoting the incorporation of rapid HIV testing in the public health system (figure 4.6). The percentage of hospitals that use rapid testing increased from 75 to 88 percent between 2007 and 2011. In 2007, rapid testing was used almost exclusively for peripartum HIV diagnoses. In 2011, in addition to the 77 percent (40) of HIV program managers who responded that their jurisdiction used the testing in peripartum, 56 percent (29) confirmed use for post-exposure accidents, 44 percent (23) for rape cases, and 19 percent (10) for exposure through unprotected sex.

Of the 168 hospitals that reported using rapid HIV testing, 69.6 percent (117) used rapid HIV testing in situations of post-exposure caused by work accidents, 51.2 percent (86) for rape, 20.8 percent (35) in the case of unprotected sex, 47 percent (79) for critical patients admitted for diagnostic guidance, and 81.5 percent (137) during peripartum. The use of rapid testing in most hospitals may be a result of recommendations from DSyETS

Health Care Services

From 2007 to 2011, there was a national increase in the number of institutions providing HIV/AIDS care services to adults, pregnant women, and children.

This increases the access of PLWHA to services and prevents referrals from one facility to another. Most jurisdictions maintained or increased the number of health care facilities and providers that serve the seropositive population. From 2007 to 2011, the 28 jurisdictions that participated in both surveys showed an increase of 21 percent in the number of hospitals serving PLWHA, a 17 percent increase in facilities serving seropositive pregnant women, a six percent increase in facilities serving children, and a 25 percent increase in facilities that dispense medications.

In 2007, the hospitals surveyed showed that 56 percent of people on antiretroviral treatment (ART) used drugs provided by the Ministry of Health (MSN), while in 2011 that number rose to 70 percent. In 2007, 104 hospitals reported monitoring 26,670 people and providing ART to 14,343 people. In 2011, 158 hospitals reported monitoring 40,878 people and providing ART to 24,386 people.

Teams composed exclusively of biomedical professionals decreased from 26 to 23 percent, while the percentage of multidisciplinary teams⁵ increased from 58 to 62 percent. Nonetheless, the latest study shows that many of the multidisciplinary teams include members of civil society and PLWHA (in seven percent of all health care facilities).

Although there has been a tremendous effort to disseminate information on the modes of transmission and standards of care for PLWHA, negative attitudes and discrimination are still present in the health care system. PLWHA face underlying discrimination even when seeking care for ailments not associated with their seropositive status. In 2011, 73 percent of health centers confirmed serving PLWHA for reasons other than HIV-related issues, which shows a favorable outlook for the public response to HIV. However, 22.7 percent of health centers reported they were not able to serve seropositive people because of the need for specialized services. Similarly, they mentioned problems with cross-specialty consultations for people with HIV, especially between mental health and emergency care, which are referred to other hospitals.

In 2011, infectology services for HIV patients were mostly open during the mornings from Monday to Friday (30.4 percent) or once a week (25 percent). Some 34.2 percent (50) of the hospitals provided care on weekdays during the morning and early afternoon hours. Extended care hours (Monday to Saturday or Monday to Friday from 8:00 a.m. until after 5:00 p.m.) were observed in only eight hospitals. Although the 2007 study made no specific reference to opening hours, it is assumed that care offered during the afternoons and during extended hours was the result of recent changes.

The study also examined the supply of viral load testing for PLWHA. The 2007 survey found that it took between 49 and 93 days from the time a viral load is requested until results are obtained. The data obtained in 2011 do not show substantial changes, with an average time between 45 and 75 days. Even longer delays were observed in a small number of health care institutions.

In comparison, less time is required to obtain test results for a CD4 lymphocyte count test that monitors patients' immune systems than to obtain results for

viral load tests. Data from 2011 indicate that the majority of surveyed hospitals (63 percent) take up to 30 days between blood samples and delivery of CD4 test results. There were instances of CD4 test results taking longer than 30 days, yet delays never reached the wait times for viral load testing. In the absence of 2007 data on this item, it is impossible to make a comparative analysis. It should be noted that, although viral load testing requires prior approval from DSyETS, CD4 testing does not. An option to reduce delays in conducting viral load testing is to remove the requirement to request authorization.

In 2007, insufficient antiretroviral drug (ARV) dissemination points hindered the population's access to treatment in certain provinces. As a response, more distribution points were created in places that did not previously serve PLWHA, such as within preventive medicine services and local AIDS programs, among others.

In 2011, the number of health facilities delivering ART medication increased by 30 percent compared with 2007. Most providers and health institutions (70 percent) did not report issues in the receipt or delivery of HIV medication in 2011. The 30 percent of institutions that reported problems with drug supply indicated the following issues: transport delays, incomplete deliveries (lacking specific drugs such as tenofovir, kaletra, and truvada), the drugs that were requested were not delivered, medications with imminent expiration dates, and communication and administrative issues in coordinating deliveries.

In relation to medication delivery locations, the number and diversity of dispensary types stayed the same or increased in 2011 compared with 2007. Almost two-thirds (114) of hospitals allowed patients to access medication through the pharmacy, 10.8 percent (17) allowed access via other areas or services in the hospital, 9.5 percent (15) allowed access via the local or jurisdictional HIV program, and a small number accessed medication through other hospitals. An increased number of HIV medication dispensary locations can result in improved adherence to treatment. Although many health institutions and providers only dispensed medication during the mornings (32 percent), a significant number of hospitals (38 percent) implemented extended hours that included evenings or Saturdays in addition to weekday mornings.

According to data provided by the heads of the AIDS program, there was an increase from 151 hospitals and maternity facilities serving HIV-seropositive pregnant women in 2007 to 218 in 2008. Of the 127 maternity hospitals surveyed in 2007, 57 percent (72) served HIV-seropositive pregnant women. According to the results of the survey, 57 percent of the maternity hospitals surveyed in 2007 served HIV-seropositive pregnant women (72 out of 127 hospitals surveyed). In 2011, 68 percent of the hospitals and maternity facilities surveyed provided these services (130 out of 191 maternity hospitals surveyed). These changes in the provision of services are partially related to the efforts made by DSyETS to increase obstetric care coverage for HIV-positive women and to build capacity among health teams to serve PLWHA.

HIV testing was offered as part of prenatal care in the 175 hospitals that served pregnant women sampled in 2011. However, only 71 percent of these facilities offered HIV testing to both partners when the woman was seropositive. As noted in the previous section, there has been no substantial change in this regard since 2007.

Regarding the supply of medication for preventing mother-to-child transmission (PMTCT) of HIV, the 2007 rates were sustained in 2011. Zidovudine (AZT) syrup and ampoules were available in 90 percent of hospitals in 2007 and 92 percent in 2011; replacement milk for exposed children was available in 98 and 92 percent of hospitals, in 2007 and 2011, respectively; and lactation inhibitors were available in 87 percent of facilities in 2007 and 89 percent in 2011.

As reported by the heads of the jurisdictional AIDS programs in 2007, 111 hospitals catered to children with HIV—a number that rose to 140 in the 2011 study. In 2007, 43 percent of surveyed hospitals offered pediatric care to children exposed at the time of delivery. In 2011, 52 percent of the surveyed hospitals had equipment for the care of these children, while the remainder of the hospitals transferred these cases to other providers.

Conclusion

According to this study, 90 percent of HIV/AIDS program heads reported an improvement in the supply of and access to preventive, diagnostic, and health care services for PLWHA between 2007 and 2011. The reported improvements are based on a greater number of trained and skilled human resources for health; a greater number and higher quality of prevention supplies, drugs, and tests; a decline in transfers, especially among pregnant women; and greater availability of HIV/AIDS health care services in decentralized locations.

In addition to the increased national supply of preventive materials, medications, and testing by DSyETS, jurisdictions and providers also demonstrated a greater commitment to the creation of dedicated budgets for purchasing preventive and diagnostic supplies.

The data gathered show a substantial increase in the procurement and distribution of condoms throughout the country as well as the installation of fixed delivery points that ensure systematic distribution and improved accessibility. There has also been an increase in communication materials, including print materials (dominant in 2007) as well as audiovisual and other promotional materials (key chains, fans, etc.). The 34 jurisdictions and 18 municipal programs reported having used the 0–800 telephone information line, and a large majority of them had consulted the website of DSyETS.

Regarding access to diagnostic services, access of pregnant women to HIV testing improved between 2007 and 2011, but that improvement is not reflected in testing for couples.

Although the number of facilities that counted on pre- and post-testing counseling teams increased (in 2011, nearly 50 percent of hospitals and

25 percent of health centers had counseling teams in operation), there is insufficient information to evaluate the work quality of these teams. We also found that the integration of these multidisciplinary counseling teams into the health service system has not yet reached the goals established following the 2007 study.

We can conclude that the existing barriers to accessing HIV diagnostic services are linked to the structure of the health system and surpass the scope of specific issues related to HIV, STIs, and hepatitis. These problems are largely attributed to operating hours, fragmentation between medical specialties, delays in obtaining test results, and provider discrimination against PLWHA.

Broader participation of actors and institutions involved in the public preventive and health care response to HIV/AIDS, viral hepatitis, and STIs—with support from DSyETS between 2008 and 2012—has produced significant changes in various jurisdictions. These changes are reflected in the responses of the jurisdictional leaders interviewed regarding prevention inputs, diagnosis, and treatment, as well as the gradual development of technology that allows for monitoring.

In 2007 and 2011, all regions counted on health providers (hospitals and health centers) that served PLWHA, and the number of these institutions increased nationally for the care of adults and pregnant women and children with HIV. Nonetheless, jurisdictional and intra-jurisdictional differences remain in the quality and number of services offered by different institutions. Regarding service hours, there were no major differences between 2007 and 2011. In both years, all institutions served PLWHA at least during morning shifts, although in 2011 a small number of hospitals implemented extended service hours.

We continue to observe a small rate of participation of PLWHA, civil society organizations, and sexually diverse people in health care services and support to the affected population.

Another aspect that requires further improvement is care for PLWHA in general hospitals and health centers. In light of three decades of knowledge on HIV/AIDS, dissemination of standards of care, and the distribution of state resources, all general hospitals are expected to care for PLWHA. However, 17 percent of the health facilities are still transferring PLWHA to other centers to receive care, making the tracking of these patients through the health system a persistent issue.

Although we observe some signs of improvement in the care of PLWHA (such as greater availability of testing for monitoring disease progression, ART medication, infant formula, lactation inhibitors, and pill and syrup form AZT for PMTCT), institutional barriers remain, such as delays in doctor appointments and delivery of test results and discriminatory attitudes.

The 2008 and 2012 studies aimed to analyze the public health system response to HIV/AIDS, taking into account relevant supply-side data gathered verbally from heads of programs and key informants. A comprehensive understanding of accessibility can only be obtained when the narrative is completed by those who compose the demand side of this system.

Notes

1. The Ministry of Health, with financial support from the Inter-American Development Bank, created Programa Remediar in response to the 2002 financial crisis as an effort to advance equitably the provision of primary health care and essential medications (<http://www.remediar.gov.ar>).
2. For the analysis of rates, we group the 24 provinces in the following regions, following the classification of the Ministry of Economy of Argentina (www.mecon.gov.ar): Autonomous City of Buenos Aires, Greater Buenos Aires (24 *partidos* of the province of Buenos Aires), Center region (the remaining 11 *partidos* of the province of Buenos Aires, the provinces of Santa Fe, Córdoba, and Entre Ríos), Northwest (the provinces of Catamarca, Jujuy, Salta, Santiago del Estero, and Tucumán), Northeast (Corrientes, Formosa, and Chaco), Cuyo (Mendoza, San Juan, and San Luis), and Patagonia (Chubut, La Pampa, Neuquén, Río Negro, Santa Cruz, and Tierra del Fuego).
3. Hospitals included in the sample from the Autonomous City of Buenos Aires are Álvarez, Argerich, Durand, and Ramos Mejía. The data presented from responses on HIV, STIs, and hepatitis only include these four hospitals.
4. The number for 2013 is a projection for the estimated condom distribution during October to December and the actual distribution numbers during January to September.
5. Multidisciplinary teams are composed of health professionals from different areas, possibly including PLWHA, who oversee access to and offer counseling for HIV testing.

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Social and Economic Factors Related to the Demand Side of the HIV/AIDS Burden in Argentina

Fernando Lavadenz, Eliana Zeballos, and Verónica Osorio
with Lais Miachon and Nashira Calvo

Introduction

This chapter analyzes demand-side factors, aiming to (a) identify groups most at-risk for HIV infections in Argentina, (b) identify leading demand-side risk factors linked to the burden of HIV/AIDS in Argentina, and (c) identify key challenges on the demand side that could jeopardize further reduction of the HIV/AIDS burden in Argentina.

There were two main challenges in conducting this study. First, the confidentiality law surrounding HIV/AIDS testing, diagnosis, treatment, and results in Argentina (as in many countries in the region) makes it difficult, if not impossible, to obtain individual-level information or data related to the HIV/AIDS patients as a group. However, such data are necessary to conduct more detailed studies on the relationships between demand-side risk factors and the burden of HIV/AIDS. Second, given the highly concentrated nature of the HIV epidemic in Argentina, country-level analysis that uses general data can misrepresent the size and direction of the relationship between demand-side risk factors and the HIV burden. This can occur when the HIV-affected population has characteristics and behaviors that are distinct from the general population. Given these challenges, each risk factor category is examined separately, with country- and provincial-level data.

First, we identify Argentina's high-risk-of-infection group. The next section presents the methodology of the study and the following section presents analyses and results, which are divided into five demand-side factor categories. Finally, the last section concludes and presents policy recommendations.

High-Risk Populations in Argentina

Public health measures to decrease HIV/AIDS in Argentina have successfully prevented infections through lower-cost interventions, mostly for urban populations in the province of Buenos Aires and the City of Buenos Aires. Continuing to reduce the HIV/AIDS burden will require cost-effective interventions, specifically prevention and treatment that are tailored to priority high-risk groups, while still providing universal preventive services and free access to HIV/AIDS treatment to the currently affected population and highly concentrated urban populations. The epidemiological characteristics of the HIV priority and high-risk populations are described below (National Ministry of Health [MSN] 2012).

Transmission Route

In Argentina, sexual intercourse causes 90 percent of infections between men and women, making sexual relations the most prevalent route of transmission. Although 44.4 percent of new infections among men originated through sex with other men, 46.5 percent originated through sex with women. Vertical transmission caused one percent of new HIV infections among males in 2012 (compared with 3.4 percent in 2001) and about 3.4 percent among females (compared with 8.5 percent in 2001). Transmission related to injection drug users (IDUs) decreased from 21.7 percent in 2001 to 0.3 percent in 2012 among males, and from seven percent in 2001 to 0.1 percent in 2012 among females.

Place of Residence

From 2009 to 2011, 32 percent of new HIV diagnoses occurred in the Center of the country, 20 percent in the Buenos Aires metropolitan area, 13 percent in the City of Buenos Aires, and 13 percent in Northwest (the provinces of Jujuy, Salta, Tucumán, Santiago del Estero, and Catamarca) (MSN 2013).

Sex

Sixty-seven percent of new HIV diagnoses occur among males—a rate that has remained stable over the past decade. The male-to-female ratio increases among older demographics, with many more new diagnoses among older men than older women. The male-to-female ratio is higher in the City of Buenos Aires than in any other region, at 3.1 new male diagnoses for every new female diagnosis (MSN 2013).

Age

Approximately one-third of new diagnoses occur among individuals ages 25 to 34 years for both sexes. Among women, 22 percent of new infections occur among females ages 15 to 24 years and 23 percent among women ages 35 to 44 years, with these two age groups accounting for a combined 45 percent of new infections. Among males, 26 percent of new cases occur in men ages 35 to 44 years and only 16 percent among males ages 15 to 24 years. The median age of new infections is higher among men (at 34 years of age) compared with

women (32 years of age). The median age of infection among men who have sex with men (MSM), 31 years, is lower than that of heterosexual men, whose median age of infection is 37 years (MSN 2013).

Education

Almost 50 percent of women recently diagnosed with HIV completed primary education and some years of high school and 25 percent completed high school and some years of college. Among men, 32 percent of those recently diagnosed completed primary education and some years of high school and 30 percent completed high school and some years of college. Around 19 percent of recently diagnosed men completed college, compared with 10 percent of recently diagnosed women (MSN 2013).

This analysis shows that the population most at-risk for contracting HIV in Argentina is males, ages 25 to 34 years, with a high school diploma, sexually active, engaging in sexual intercourse with men, and originating from the provinces of the Center territory of Argentina (including the province of Buenos Aires, the City of Buenos Aires, and most recently the Northwest provinces). Among young men ages 17 to 27, the analysis shows that 60 percent of transmissions occur through same-sex intercourse. In the case of men ages 56 and older, 20 percent of transmissions occur through homosexual intercourse, and 70 percent of transmissions occur through heterosexual intercourse. This shows that younger MSM and older heterosexual men are high-risk priority HIV groups, with an inflection point at age 30 (MSN 2013).

Methodology

Based on current knowledge of the HIV/AIDS epidemic in Argentina, and on a review of the relevant literature, we identified several individual, interpersonal, social, and environmental factors that influence HIV/AIDS transmission risk. The frequently appearing key factors are education and literacy, income level, sexual behavior (such as premarital sex), condom use, number of sexual partners, monogamy, gender-based violence, age, occupation, and alcohol and drug use. Considering the concentrated nature of the HIV/AIDS epidemic as well as evidence-based literature related to key risk factors in the country, we chose to investigate how the following five risk factors currently impact the HIV burden in Argentina: (a) violence, (b) condom use, (c) education, (d) alcohol and drug use, and (e) income level. These five risk factors are widely used to understand the global spread of HIV; a brief review of the literature is included in each of the five case studies.

An ideal analysis of demand-side risk factors would be based on individual-level data, which would produce more accurate and unambiguous results. However, the 1991 Law 23798 established strict confidentiality rules in Argentina, making it extremely difficult to obtain HIV/AIDS data at the individual level. Therefore, the data analyses are conducted at the country and provincial levels within Argentina.

This chapter analyzes the HIV/AIDS epidemic in Argentina by establishing comparisons with Latin American countries. We also draw comparisons with African countries as a point of reference, since there is a large body of HIV/AIDS research related to African countries.

All countries selected, including Argentina, have a concentrated HIV/AIDS epidemic (UNAIDS 2012), which implies that the HIV/AIDS infection is primarily concentrated in certain subpopulations. It also implies that HIV/AIDS has spread rapidly in one (or frequently more than one) defined subpopulation, but is not well established in the general population. Concentrated epidemics consistently show HIV/AIDS prevalence over five percent in at least one defined subpopulation, and the HIV prevalence in pregnant women in urban areas is less than one percent. A concentrated epidemic usually indicates active, risky networks within subpopulations.

When dealing with a concentrated HIV/AIDS epidemic, it is possible to focus on prevention, treatment, care, and support for the most affected subpopulations, while recognizing that no subpopulation is fully self-contained (UNAIDS 2011). As a result, effective prevention should focus directly on the subpopulations driving the epidemic. Although the general population cannot be completely ignored, interventions outside the core transmission groups will have smaller public health impacts.

In the next section, we analyze information from the Global Burden of Diseases, Injuries, and Risk Factors (GBD) (Institute for Health Metrics and Evaluation [IHME] 2013), the International Monetary Fund (IMF 2013), and the Joint United Nations Programme on HIV/AIDS (UNAIDS) (UNAIDS 2012). For the analysis on Argentina, we use additional information from the National Survey of Risk Factors 2009 (MSN 2009) and the 2013 Epidemiological Bulletin of Argentina (MSN 2013).

We run a multiple linear regression and a bivariate analysis (simple correlations) at the country and provincial levels to analyze whether significant relations exist between the five risk factor categories selected and the HIV/AIDS burden of disease (BoD). A linear regression analysis allows us to quantify the strength of the relationship between HIV/AIDS burden (y variable) and all the variables that we want to analyze (x variables), to assess which x variables may have no relationship with y and which subsets of the x variables contain redundant information about y (i.e., HIV/AIDS burden measured as disability-adjusted life years [DALYs] per 100,000 people).

Data Analysis and Results

Table 5.1 shows the results of the multiple linear regressions at the country level with selected economies (located in South America, the European Union, and the G7), based on epidemiological and economic characteristics. The dependent variable is the HIV/AIDS burden measured in DALYs per 100,000 people and the independent variables are education, alcohol and drug use, and violence. Education is measured as mean years of education (UNDP 2013); violence is

Table 5.1 Multiple Linear Regression between HIV/AIDS Burden and Education, Violence, Alcohol, and Drug Use at the Country Level

Variable	Coefficient (SE)		
	1	2	3
Mean years of schooling	-68.2049*** (23.34)	-5.0235 (37.63)	-19.1249 (67.81)
Violence	0.1930*** (0.07)	0.1755** (0.06)	0.1737** (0.06)
Sexual abuse	1.3537** (0.59)	1.2547* (0.62)	1.2115* (0.64)
Alcohol and drug use	0.0995* (0.05)	0.0752 (0.05)	0.0678 (0.05)
GDP (PPP) per capita		-0.0020 (0.01)	-0.0022 (0.01)
Expenditure on health		-0.0240 (0.07)	-0.0262 (0.07)
Human Development Index		-1042.6440 (1031.27)	
Health Index			-938.0482 (1046.67)
Education Index			-125.8761 (1270.89)
Observations	33	33	33
R ²	0.69	0.76	0.76

Sources: IHME 2013; UNDP 2013.

Note: The HIV/AIDS burden is the dependent variable. The regressions include countries in South America, advanced economies in Europe, and the G7. GDP = gross domestic product; PPP = purchasing power parity. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

measured as the number of instances of self-harm and sexual abuse from GBD data in DALYs per 100,000 people; and alcohol and drug use is also measured in DALYs per 100,000 people, with data from GBD (IHME 2013). Regression 2 is calculated with income (gross domestic product [GDP] per capita), health expenditure, and the Human Development Index (HDI).¹ Similarly, regression 3 controls for income, health expenditure, and the health and education indices, which are two components of the HDI.

The first regression shows a negative and significant correlation between years of schooling and HIV/AIDS burden at the one percent significance level. Conversely, higher levels of violence, sexual abuse, and alcohol and drug use are related to a higher HIV/AIDS burden. Variables related to violence are robust across the three regressions when controlling for income, health expenditure, and HDI-related indexes (regressions 2 and 3).

A bivariate analysis is presented in table 5.2. The signs remain as expected in South America and selected countries. However, contrary to what would be expected, education is positively correlated with HIV/AIDS burden among African countries and is positively and significantly correlated at the provincial level in Argentina.

Table 5.2 Bivariate Analysis of HIV/AIDS Burden and Education, Violence, Alcohol, and Drug Use at the Country Level

Variable	Coefficient (p)		
	Africa	South America	SA, EU, and G7
Education Index	0.354 (0.017)	-0.574 (0.065)	-0.577 (0.000)
Mean years of schooling	0.407 (0.006)	-0.625 (0.040)	-0.545 (0.001)
Expected Years of Schooling	0.187 (0.218)	-0.290 (0.387)	-0.474 (0.005)
Violence	0.814 (0.000)	0.809 (0.003)	0.722 (0.000)
Sexual abuse	0.743 (0.000)	0.440 (0.176)	0.316 (0.073)
Alcohol and drug use	0.619 (0.000)	0.034 (0.920)	0.466 (0.006)
GDP (PPP) per capita	0.086 (0.574)	-0.442 (0.173)	-0.608 (0.000)

Sources: IHME 2013; IMF 2013; UNDP 2013.

Note: EU = European Union; GDP = gross domestic product; PPP = purchasing power parity; SA = South America.

Table 5.3 Multiple Linear Regression between HIV/AIDS Burden and Education, Violence, Alcohol, and Drug Use at the Provincial Level in Argentina

Variable	Coefficient (SE)	
	1	2
Education level	16.2230*** (2.93)	11.4276** (4.05)
Violence index	0.3949 (0.80)	0.4038 (0.76)
Binge drinking	-47.7564 (60.46)	-35.1524 (58.55)
Regular alcohol consumption	-7.5744 (32.45)	8.6137 (32.67)
GDP per capita		0.0002 (0.00)
Observations	25	25
R ²	0.66	0.70

Sources: Abeceb Economía Online 2008; MSN 2009, 2013.

Note: HIV incidence is the dependent variable. GDP = gross domestic product.

** $p < 0.5$, *** $p < 0.01$.

To conduct a multivariable analysis applied to Argentina, we use HIV incidence per 100,000 in 2009 for each province as the dependent variable (MSN 2013). Each of the independent variables is constructed with data from the National Survey of Risk Factors for 2009 (MSN 2009) and Abeceb (Abeceb Economía Online 2008), also by province.

Table 5.3 shows that level of education is a positive and significant predictor of HIV incidence, even when controlling for wealth. The analysis also shows that

Table 5.4 Bivariate Analysis of HIV/AIDS Burden and Education, Violence, Alcohol, and Drug Use at the Provincial Level in Argentina

Variable	<i>HIV incidence per 100,000 Coefficient (p)</i>
Education level	0.802 (0.000)
Violence Index	0.336 (0.100)
Binge drinking	-0.110 (0.599)
Regular alcohol consumption	-0.155 (0.459)
GDP per capita	0.740 (0.000)

Sources: Abeceb Economía Online 2008; MSN 2009, 2013.

Note: GDP = gross domestic product.

violence and alcohol consumption are not significant predictors of HIV incidence at the provincial level in Argentina.

Table 5.4 presents a bivariate analysis at the provincial level. As expected, violence is positively correlated with HIV. Contrary to findings from South America, education and wealth are positively and significantly correlated with HIV incidence. Regular alcohol consumption and binge drinking are negatively correlated with HIV incidence, but these correlations are insignificant.

Case Studies

We first analyze violence, given its robustness and significance, followed by the use of condoms as a main risk factor. Then we will present the analysis and results for education, drug and alcohol use, and finally GDP as a proxy for poverty and wealth.

Violence

According to the latest World Health Organization (WHO) and UNAIDS global estimates, 50 percent of people living with HIV are women. Although MSM, IDUs, and sex workers and their clients are the most affected groups in many areas of the world, the prevalence of HIV among other segments of the population has been growing worldwide over the past 10 years (WHO 2009). One of the key drivers of the HIV epidemic among women is gender-based violence. In Argentina, approximately 30 percent of people living with HIV are women (MSN 2013).

Physical, sexual, and emotional violence affects 10 to 60 percent of women ages 15 to 49 years worldwide. Forced sex can contribute directly to HIV transmission through tears and lacerations resulting from the use of force. Violence can also diminish a woman's ability to negotiate and enforce condom use, and fear of violence can prevent women from learning and sharing their HIV status and seeking treatment, increasing their vulnerability to HIV (WHO 2009).

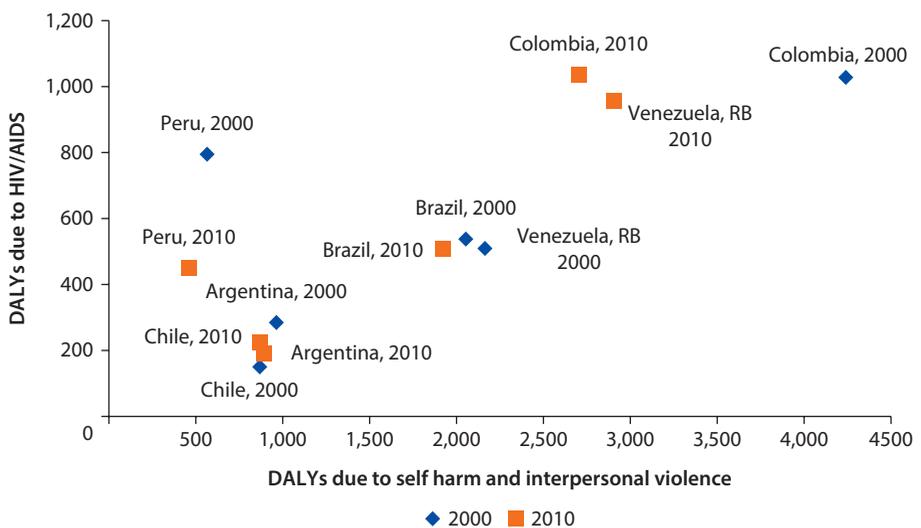
The analysis conducted in the previous section shows that violence is positively and significantly related to HIV/AIDS burden at the country level (table 5.1). We use data from the GBD database to analyze two variables related to violence: (a) violence as a cause of disease or injury and (b) sexual abuse and violence as risk factors leading to BoD. Violence as a cause of BoD is further divided into self-harm and interpersonal violence, which accounted for 1.74 and 1.5 percent, respectively, of the total DALYs in Argentina in 2010. The following analysis groups self-harm and interpersonal violence as one category. Sexual abuse and violence account for 286.96 DALYs per 100,000 people in Argentina, which represents 1.07 percent of the risk factors of all causes in 2010. The sexual abuse and violence category is divided into two risk factors: childhood sexual abuse and intimate partner violence. Intimate partner violence was the ninth leading risk factor of DALYs for Argentine women in 2010.

Analysis and Results

Figure 5.1 presents time comparisons between burden of HIV/AIDS and violence, measured as self-harm and interpersonal violence, for six countries in South America: Argentina, Brazil, Chile, Colombia, Peru, and República Bolivariana de Venezuela. With the exception of Chile and República Bolivariana de Venezuela, the selected countries had a decrease in violence between 2000 and 2010. But they did not show a decrease in their levels of HIV/AIDS burden. While Argentina, Brazil, and Peru had decreased levels of violence, República Bolivariana de Venezuela showed a significant increase in HIV/AIDS burden, demonstrating the positive relation seen in the cross-correlation (table 5.2).

Figure 5.1 Changes in HIV/AIDS BoD and Violence Levels, 2000–10

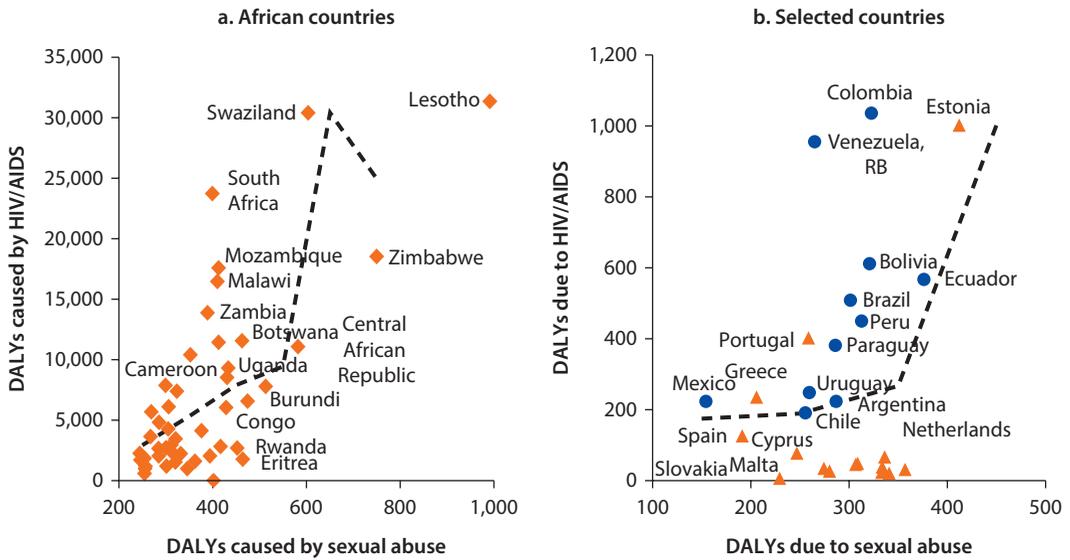
DALYs per 100,000 people



Source: IHME 2013.

Note: BoD = burden of disease; DALY = disability-adjusted life year.

Figure 5.2 HIV/AIDS BoD and Sexual Abuse and Violence, 2010
 DALYs per 100,000 people



Source: IHME 2013.
 Note: BoD = burden of disease; DALY = disability-adjusted life year.

Chile and República Bolivariana de Venezuela presented an increase in both variables.

Figure 5.2 shows a cross-country analysis of the relation between sex abuse and violence as a risk factor and the HIV/AIDS burden. The expected relation is positive, where higher levels of sex abuse and violence correlate to higher levels of HIV/AIDS burden among African and selected countries.

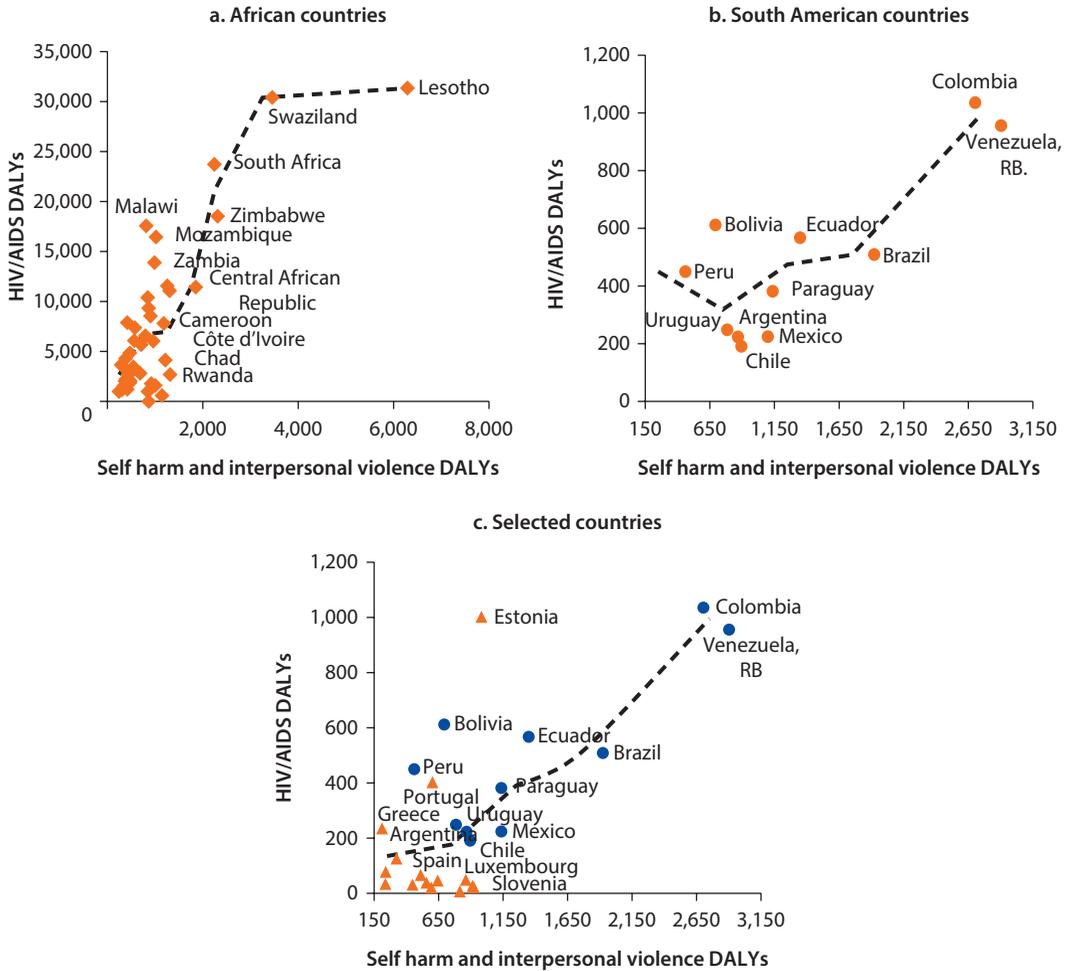
Figure 5.3 examines the relationship between self-harm and interpersonal violence and HIV/AIDS burden, with dashed lines showing partial averages. All three of the country groups analyzed show a positive relationship between violence and HIV/AIDS. Considering only females, the relationship between HIV/AIDS and violence is further reinforced.

Figure 5.3, panel b, shows that Colombia and República Bolivariana de Venezuela are the countries with the highest burden of violence and the highest HIV/AIDS burden in South America. Argentina is at the other end of the spectrum, with the lowest HIV/AIDS burden in South America after Chile, and is among the countries with the lowest self-harm and interpersonal violence burden, after Bolivia, Peru, and Uruguay.

There is an overall positive and significant correlation between self-harm and interpersonal violence and the HIV/AIDS burden in all regions examined. There is also a positive and significant relation between sex abuse and HIV/AIDS burden for African and selected countries, but this relationship is insignificant in South America (table 5.2 and figures 5.2 and 5.3).

Figure 5.3 HIV/AIDS BoD and Self-Harm and Interpersonal Violence, 2010

DALYs per 100,000 people



Source: IHME 2013.

Note: BoD = burden of disease; DALY = disability-adjusted life year.

To evaluate the relationship between violence and HIV incidence at the provincial level in Argentina, we used factor analysis to create a violence index. Factor analysis is a statistical method used to describe variability among observed and correlated variables in terms of a potentially lower number of unobserved variables. Factor analyses search for joint variations in response to unobserved latent variables. The observed variables are modeled as linear combinations of the potential factors, plus “error” terms. The information gained about the interdependencies between observed variables can be used to reduce the set of variables in a data set. We use three highly correlated variables related to violence gathered from National Survey of Risk Factors data. These variables are based on answers to the

following survey questions: (a) Have you ever been beaten? (b) Have you ever seen an armed robbery? (c) Have you ever been the victim of an armed robbery?

Figure 5.4 shows the relationship between the violence index and HIV incidence for females and both sexes. As can be seen, there is no clear relation between these variables, reinforcing the insignificant correlation that we found in the cross-correlation analysis (table 5.4).

Conclusion

There is a strong positive correlation between violence and HIV/AIDS burden at the country level in Africa, South America, and selected countries. The correlation is significant and robust after controlling for socioeconomic characteristics such as the HDI, health expenditure, and GDP (table 5.1) and the correlation is stronger among women. However, there is no significant correlation between HIV and violence at the provincial level in Argentina, even when violence and HIV incidence were analyzed by sex. The lack of a significant correlation between violence and HIV incidence may be related to the concentrated nature of the epidemic in Argentina. As the epidemic is concentrated in specific subpopulations, there is a need to gather more information pertaining to these populations to understand potential correlations between HIV infection and violence.

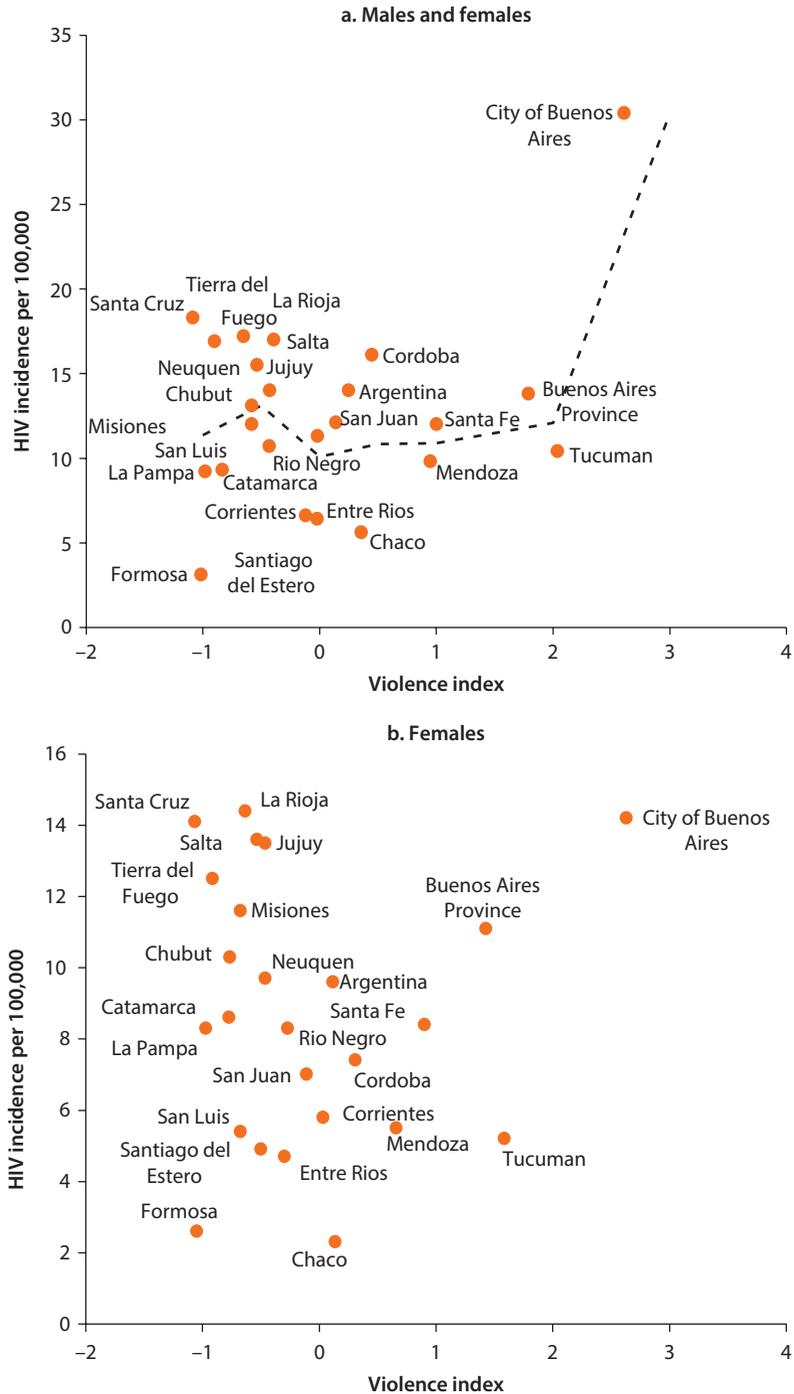
Condom Use

Although condom use is not 100 percent effective, the consistent and correct use of condoms reduces the spread of sexually transmitted infections (STIs). Research shows that a wide variety of individual, interpersonal, and social factors may influence the choice and ability to engage in safe sexual practices. For instance, in an analysis of 59 countries, Wellings and others (2006) find that universal trends toward later marriage led to an increase in premarital sex. The authors also found that men are more likely to have had two or more partners in the past year (Wellings and others 2006). Adih and Alexander (1999) also observe a male propensity toward unsafe sexual practices: although 65 percent of the sexually active male respondents had used condoms at least once, only 25 percent had used condoms during their most recent intercourse (Adih and Alexander 1999). In addition, Gari and others (2013) conducted a meta-analysis of quantitative studies and found that lack of condom use is common in high- and low-income countries. Although condom use has increased at the global level, rates of condom use remain low in many developing countries (Wellings and others 2006).

The use of condoms can still be associated with lack of trust (King and Marston 2006) and the predictors of condom use include an individual's perceived susceptibility to HIV infection, self-efficacy for condom use, barriers to condom use, and perceived social support (Adih and Alexander 1999). Nonetheless, Semaan and others (2012) find that even high-risk populations such as IDUs can reduce unprotected sex and increase use of the male condom through the help of interventions (Semaan and others 2012).

In Argentina, unprotected heterosexual sex is the most common route for new HIV transmissions (48.5 percent of new male cases and 89.6 percent of new

Figure 5.4 HIV Incidence and the Violence Index in Argentina, 2009



Sources: MSN 2009, 2013.

female cases, 2009–11), followed by intercourse between men (39.1 percent of new male cases) and injection drug use (MSN 2012). For instance, only 81 percent of males and females ages 15–65 years were found to have used a condom during their last intercourse with a casual partner (MSN 2013). Although condom use increased among all social segments in the past decade, 90 percent of females and 88 percent of males diagnosed with HIV each year were infected through unprotected sex (MSN 2013). Given the high rates of new HIV infections through unprotected sexual intercourse in Argentina, this section seeks to shed light on behaviors that determine condom use among the Argentine population.

Analysis and Results

To establish the determinants that influence condom use among the Argentine population, we performed a probabilistic analysis with data from the National Surveys of Risk Factors (2005 and 2009) (MSN 2005, 2009). The determinants of condom use are proxy variables that influence the decision to use condoms. We consider structural risk factor determinants (income, education, medical insurance, and unemployment), individual risk factor determinants (age, sex, and being in a stable relationship), and social and cultural risk factors (habitual alcohol consumption and binge drinking). According to the population characteristics and availability of data, the following risk factor determinants are considered independent variables:

Age. Age is a discrete variable with the following categories: (a) 18 to 24 years, (b) 25 to 34 years, (c) 35 to 49 years, (d) 50 to 65 years, and (e) 66 years and older.

Education level. Education level is a discrete variable that takes eight values: (a) no education, (b) incomplete primary education, (c) complete primary education (six years), (d) incomplete secondary education, (e) complete secondary education (12 years), (f) incomplete tertiary education, (g) complete tertiary education and above, and (h) special education.

Income level. Income level is a discrete variable that takes four values: (a) no income, (b) low income (Arg\$0 to Arg\$1,750 monthly), (c) middle income (Arg\$1,751 to Arg\$4,000 monthly), and (d) high income (Arg\$4,001 and above monthly).

Medical insurance. Medical insurance is a dichotomous variable.

Unemployment: Unemployment is a dichotomous variable.

Alcohol use. Alcohol use is divided into habitual alcohol consumption (more than one drink per day in the case of women and more than two drinks per day in the case of men) and binge drinking, which is the sporadic consumption of an excessive amount of alcohol in a short period of time (more than five drinks on one occasion).

Stable relationship. Stable relationship is a dichotomous variable. A relationship is deemed stable from a “married” civil status or by people that cohabit with a partner.

Condom use is the dependent variable, which is attributed the value 1 if the individual or his or her partner uses a condom and 0 if the individual or his

or her partner does not use a condom, based on answers to the National Risk Factors Survey. Among preventive practices questions, the survey includes a follow-up question on frequency of condom use between partners with the following answer categories: sometimes, always, they do not use protection, or they do not have sex.

Since condom use is a binary dependent variable, we use a multivariable probabilistic model (i.e., probit) to establish the determinants that influence that variable. In statistics, a probit model is a type of regression where the dependent variable can only take two values (i.e., use of condom or no use). This model estimates the probability that an observation with particular characteristics falls into one of the two categories. After calculating the probit model, it is necessary to conduct a marginal effects analysis that takes the partial derivative of each independent variable with respect to the dependent variable: $\frac{\partial P[y_i = 1]}{\partial x_i} = f$.

The marginal effect measures the change in the conditional probability of occurrence times a marginal change in each of the other variables while holding everything else constant. We perform the probit as follows:

$$\text{condom use} = \varphi (\text{age, income level, education level, medical insurance, unemployment, alcohol use, stable relationship}).$$

We then conduct a marginal effects analysis to determine how much variation the dependent variable experiences when each independent variable increases by one unit, holding everything else constant. Since the analysis uses only discrete and dichotomous variables, the marginal effect analysis considers the increase from one category to the next. For discrete variables (age, education, and income level), a one-unit increase, for example, can be from 18–24 to 25–34 years of age within the age category. For the dichotomous variables (medical insurance, unemployment, habitual alcohol consumption, binge drinking, and stable relationship), a one-unit increase could be from lacking medical insurance to having medical insurance within the medical insurance category, for example.

The results show that sex, age, education level, and being in a stable relationship are the determinants with the highest marginal effect on condom use in 2005 and 2009 (table 5.5). With the exception of unemployment, all variables were significant in 2005, at least at the 10 percent significance level. In 2009, income level, unemployment, and habitual alcohol consumption were not significant.

There is a positive relationship between the use of condoms and being male, and a negative relationship when the interviewee is in a stable relationship. Similarly, the likelihood of condom use decreases at older ages. Although the marginal effect is relatively small, higher levels of education increase the likelihood of condom use. Binge drinking has a positive and significant effect on the use of condoms in both years analyzed.

In the analysis of the likelihood of condom use based on sex (table 5.6), age and binge drinking are the most important predictors of condom use among

Table 5.5 Marginal Effects of Condom Use, 2005–09

Variable	dy/dx	
	2005	2009
Male	0.1576***	0.1956***
Age	-0.1352***	-0.1265***
Stable relationship	-0.0520***	-0.1151***
Education level	0.0299***	0.0298***
Income level	0.0002**	0.0016
Unemployment	-0.0039	0.0183
No health insurance	0.0238***	0.0106*
Habitual alcohol consumption	0.0227***	-0.0105
Binge drinking	0.0384***	0.0435***

Sources: MSN 2005, 2009.

Note: * $p < 0.10$, ** $p < 0.5$, *** $p < 0.01$.

Table 5.6 Marginal Effects of Condom Use, by Sex, 2009

Variable	dy/dx	
	Female	Male
Age	-0.0995***	-0.1439***
Stable relationship	-0.0014	-0.2890***
Education level	0.0287***	0.0289***
Income level	0.0018	0.0011
Unemployment	0.0263**	-0.0146
No health insurance	0.0060	0.0166
Habitual alcohol consumption	0.0357*	-0.0305***
Binge drinking	0.0766***	0.0362***

Source: MSN 2009.

* $p < 0.10$, ** $p < 0.5$, *** $p < 0.01$.

women, although the marginal effects are small. Being in a stable relationship has almost no effect for women, but it is the most important determinant of condom use among men. For men and women, higher education levels increase the likelihood of condom use. Among men, it is striking that habitual alcohol consumption has a negative and significant effect on the likelihood of using condoms.

A multivariable probabilistic analysis (i.e., probit) was performed with a comparison between two national Risk Factors Surveys (2005 and 2009) to establish the key determinants of condom use in Argentina. The results show that binge drinking has a positive effect on the likelihood of condom use among men and women and habitual alcohol consumption has a negative and significant effect on condom use among men. Higher levels of education were found to increase the likelihood of condom use among women, which shows the importance of empowering women through education. Being in a stable relationship is the most important determinant of condom use among men, but the least important and insignificant determinant among women. Being in a stable relationship has

a negative and significant effect on condom use among men, which implies higher condom use during casual intercourse. Despite the higher rates of condom use in casual encounters, having multiple sexual partners is not necessarily a safer sexual practice.

Given the results of this analysis, the following sections will address education and alcohol consumption, as they are two of the most relevant determinants of condom use.

Education

The previous section showed a positive correlation between education level and use of condoms among Argentine men and women. Since behavioral change—linked to educational level—is a key strategy for reducing HIV/AIDS transmission, this section further explores the relationship between education and HIV/AIDS burden. The body of literature on the topic shows that higher educational attainment can be positively or negatively correlated to HIV seropositive status.

In a systematic review of 27 articles pertaining to HIV and educational attainment in developing countries, Hargreaves and Glynn (2002) find that higher educational attainment in developing countries is often associated with higher risk of HIV infection. However, the results were not homogenous across all countries studied and the authors observed a negative correlation between educational level and HIV infection in Thailand, Uganda, and Zambia (Hargreaves and Glynn 2002). Conversely, Kirunga and Ntozi (1997) find that level of education is positively and significantly related to HIV infection in Uganda.

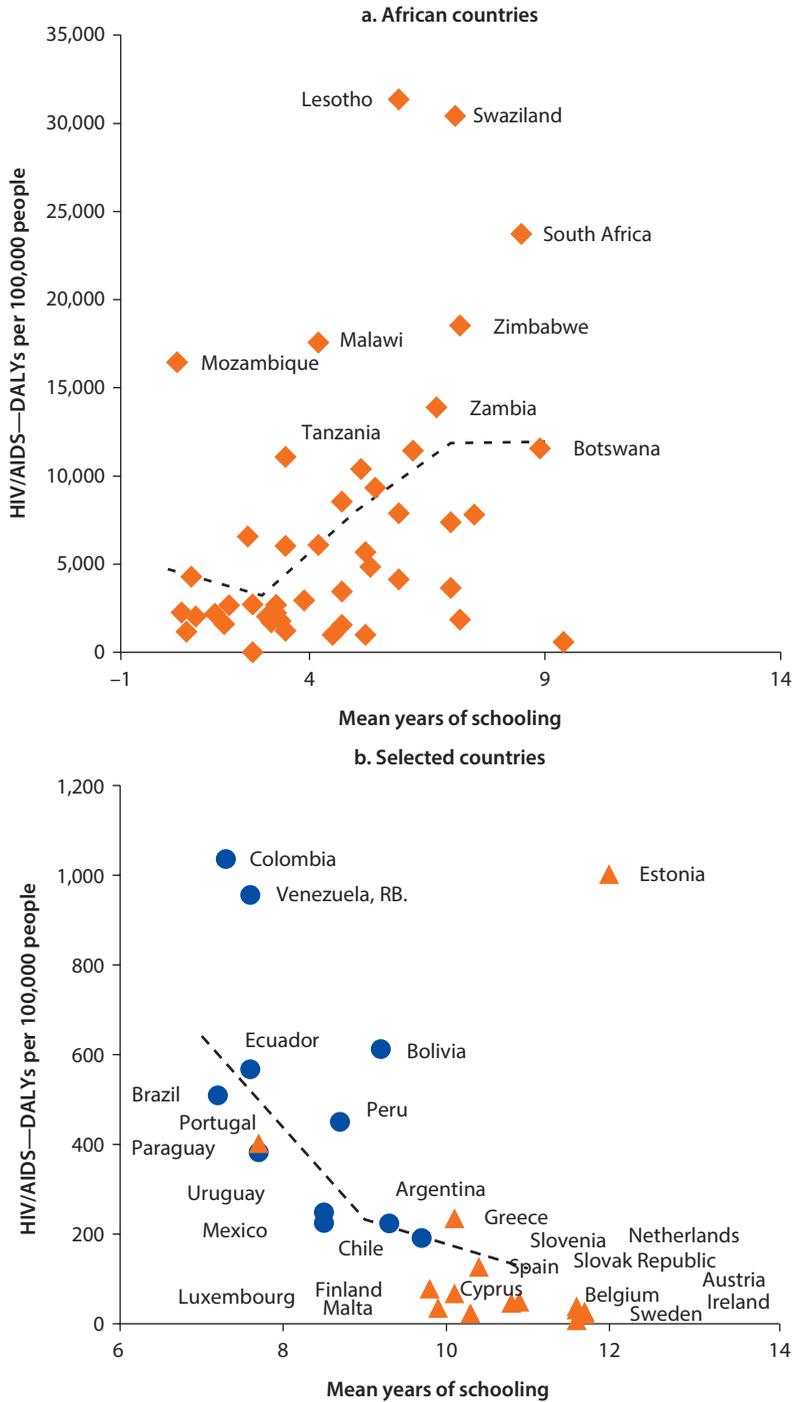
Although school attendance may affect access to health services and exposure to health interventions, socioeconomic and lifestyle changes that accompany increased schooling may be associated with behaviors that increase the risk of HIV infection (Hargreaves and Glynn 2002).

Analysis and Results

Similar to Kirunga and Ntozi (1997), we find a positive and significant correlation between HIV/AIDS burden and the education index (0.354 [0.017]) and average years of schooling (0.407 [0.006]) for African countries (table 5.2). However, South American and selected countries have a negative relationship between average years of schooling and HIV/AIDS burden. The correlations found in South American and selected countries between average years of schooling and HIV/AIDS burden are significant at the five percent level, with correlation coefficients equal to -0.625 (0.040) and -0.545 (0.001), respectively. Figure 5.5 presents a cross-country analysis of the relation between average years of schooling and level of HIV/AIDS burden.

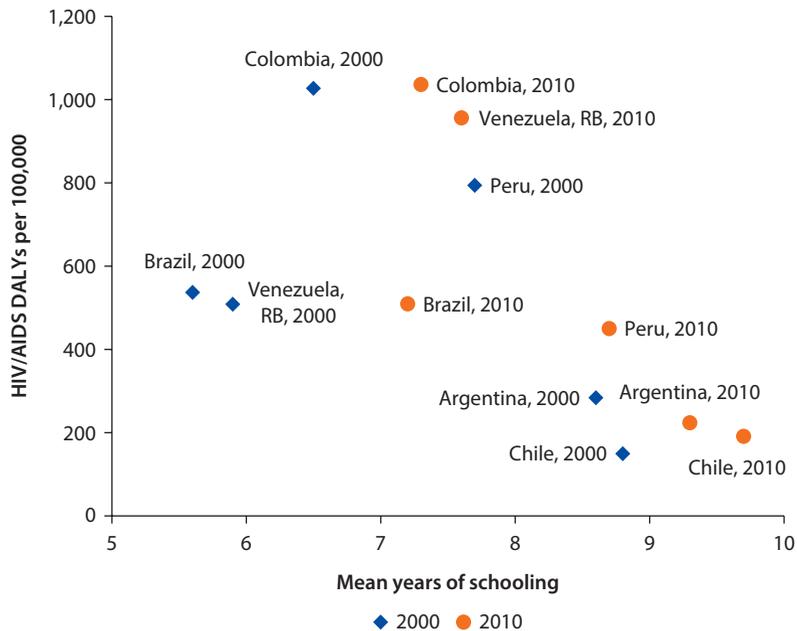
With the same analysis used to explore the relationship between violence and HIV prevalence, we compare the relationship between HIV/AIDS burden and education across two points in time (2000 and 2010), in which education is measured by average years of schooling (figure 5.6). Although all the countries studied had a significant increase in average years of schooling, the results are

Figure 5.5 HIV/AIDS BoD and Average Years of Schooling, 2010



Source: IHME 2013.

Note: BoD = burden of disease; DALY = disability-adjusted life year.

Figure 5.6 Changes in HIV/AIDS BoD and Mean Years of Schooling, 2000–10

Source: IHME 2013.

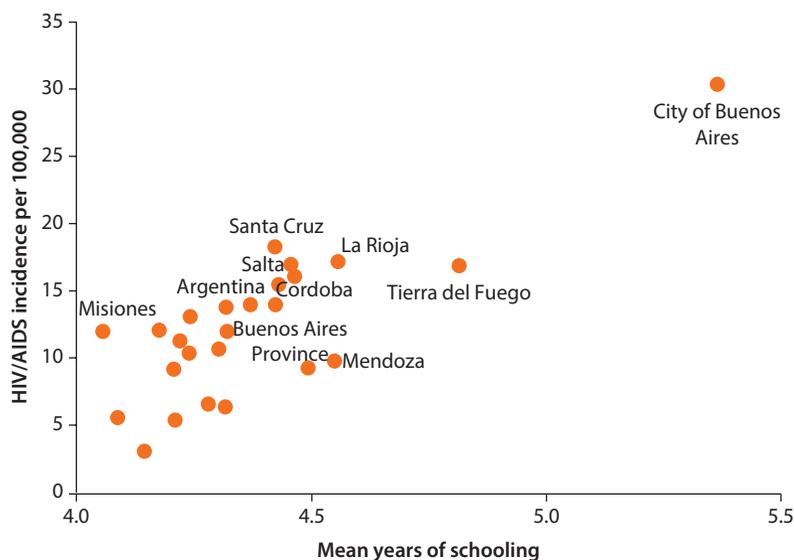
Note: BoD = burden of disease; DALY = disability-adjusted life year.

mixed. On the one hand, Argentina and Peru present a negative correlation (i.e., higher education, lower level of HIV/AIDS burden in 2010 compared with 2000); Chile and Venezuela, B.R., on the other hand, have a positive relation, showing an increase in HIV/AIDS burden and an increase in average years of schooling. Brazil and Colombia present almost no change in burden of HIV/AIDS, despite the increase in years of schooling.

In Argentina, we find a positive relationship between mean level of schooling and HIV incidence at the provincial level. The City of Buenos Aires has the highest level of schooling and the highest incidence of HIV (figure 5.7). Similar results are found in the analysis by sex, where there is a positive relation between mean level of schooling and HIV incidence. The City of Buenos Aires has the highest level of schooling among women and men, and men have a slightly higher educational level (5.39 years for men and 5.34 for women). By contrast, in the national average, women have a little more education than men (4.42 years for women and 4.30 for men). These results reinforce the finding that education has a positive and significant correlation to HIV incidence (see tables 5.3 and 5.4).

Conclusion

The analyses conducted in this section show a negative correlation between education and HIV/AIDS burden in South America and among selected countries. However, higher educational attainment is associated with higher HIV incidence at the provincial level in Argentina.

Figure 5.7 HIV Incidence and Education in Argentina, 2009

Sources: MSN 2009, 2012.

Alcohol and Drug Use

Alcohol and drug use disorders account for 2.89 percent of total DALYs in Argentina, almost twice the global rate of total DALYs, which is 1.52 percent. Alcohol and drug use disorders, respectively, account for 352.72 and 422.23 DALYs per 100,000 people in Argentina. Alcohol and drug use are also risk factors that account for 1,604.43 DALYs per 100,000, which was 5.98 percent of the total DALYs in Argentina in 2010 (IHME 2013). Moreover, alcohol and drug use is the risk factor responsible for 21.5 percent of the HIV/AIDS and tuberculosis burden (67 of 310.4 DALYs per 100,000 people).

Injection drug use is an increasingly important cause of HIV transmission worldwide. Mathers and others (2008) estimate that about three million people, or about 19 percent of those who inject drugs, might be HIV positive. They find the largest numbers of IDUs in China, Russia, and the United States where HIV prevalence among IDUs is estimated at 12, 37, and 16 percent, respectively (Mathers and others 2008). Similarly, (Map Network 1998) finds the HIV epidemic in Eastern Europe is confronted with simultaneous effects of drug use, prostitution, and unsafe sexual behaviors (Map Network 1998). This chapter has shown a negative correlation between habitual alcohol consumption and condom use among men in Argentina. Moving forward, we will unpack the relationship between alcohol and drug use and HIV infection.

Analysis and Results

The following analysis was conducted based on 2010 GBD information on alcohol and drug use as risk factors for diseases, measured in DALYs per 100,000

people. GBD takes into account any amount of alcohol consumption and considers the use of cannabis, opioids, or amphetamines, as well as the use of injection drugs in the drug use risk factor category.² The cross-correlation analysis presented in table 5.2 showed a positive and significant correlation between alcohol and drug use and HIV/AIDS in Africa and selected countries (figure 5.8).

Contrary to what the literature suggests, table 5.4 shows no significant correlation between alcohol and HIV/AIDS in Argentina. However, it may be worth analyzing factors that may not be explained by a simple correlation. Men have higher levels of HIV/AIDS burden than women across all ages, peaking in adulthood (at age 40 years).

When we look at HIV incidence and alcohol consumption at the provincial level in Argentina, we do not find any type of relation (figure 5.9). There is no significant relation between habitual alcohol consumption and HIV incidence or between binge drinking and HIV incidence, reinforcing the insignificant correlation between these variables that we presented in table 5.4.

Conclusion

We do not find a clear relation between alcohol and drug use and HIV/AIDS burden. Alcohol and drug use is positively correlated with HIV/AIDS burden in Africa and selected countries, but that does not seem to be the case in South America. Although injection drug use is a definite route of HIV infection, we restrict the provincial level analysis to habitual alcohol consumption and binge drinking (because of data availability) and we do not find any clear relation between these variables and HIV incidence.

Income Level

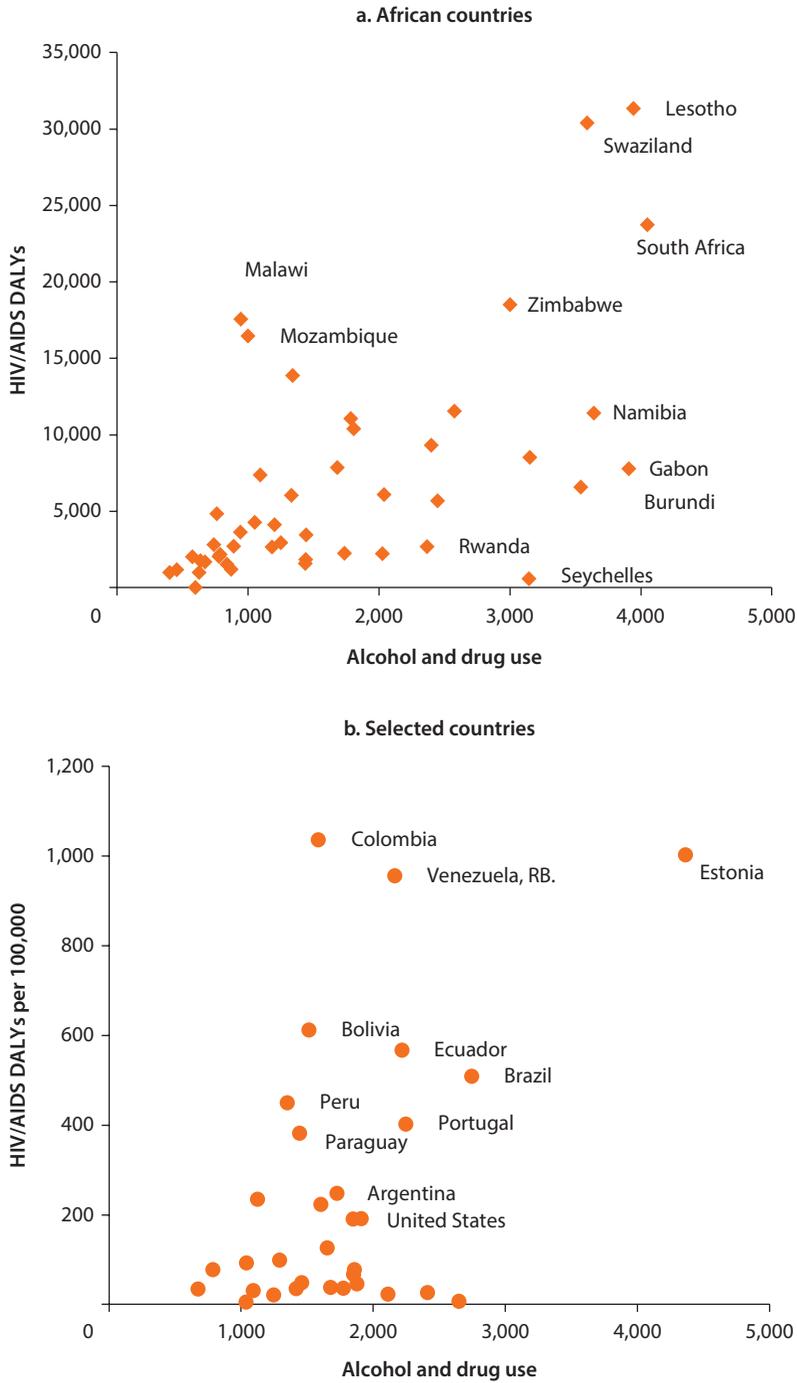
There has been growing interest in the relation between HIV/AIDS and poverty in recent decades. For instance, Fenton (2004) finds that poverty plays an important role in creating an environment in which individuals are particularly susceptible and vulnerable to HIV/AIDS. He concludes that poverty reduction might be the only viable long-term response to the epidemic (Fenton 2004). Kirunga and Ntozi (1997) obtain ambivalent results regarding the association between wealth and positive HIV status in Uganda. The authors find that household wealth is positively associated with HIV/AIDS status at the bivariate level, but the association is negative—although not significant—when taking additional factors into account (Kirunga and Ntozi 1997).

To explore the potential relationship between income level and HIV infection, we conduct analyses at the country and provincial levels in Argentina.

Analysis and Results

We analyze country-level relations in Africa and South America (figures 5.10 and 5.11), showing the relation between the HIV/AIDS burden measured in DALYs per 100,000 people and GDP per capita measured in purchasing power parity. When we analyze all African countries together, there is no significant correlation between GDP and HIV/AIDS burden. As Fenton (2004) suggests,

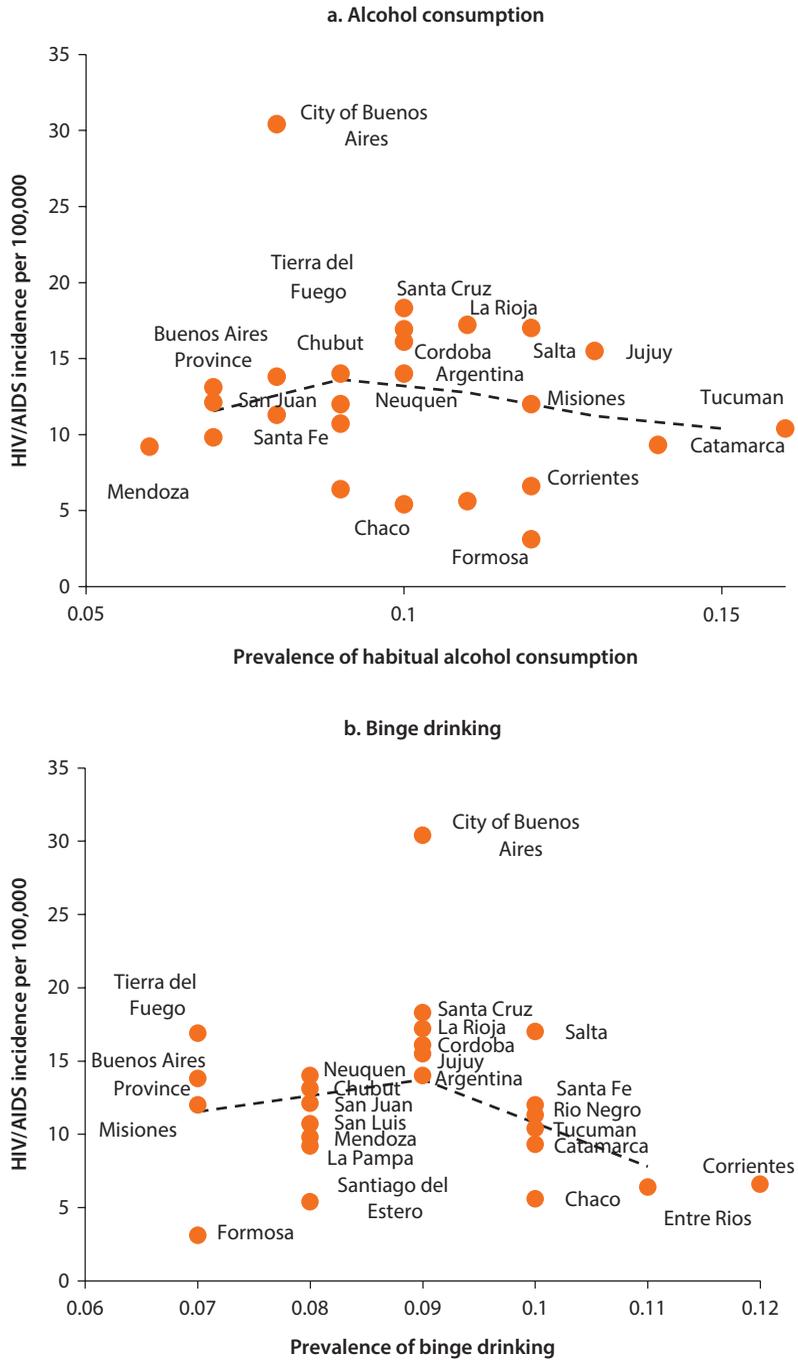
Figure 5.8 HIV/AIDS BoD and Alcohol and Drug Use, 2010
 Per 100,000 people



Source: IHME 2013.

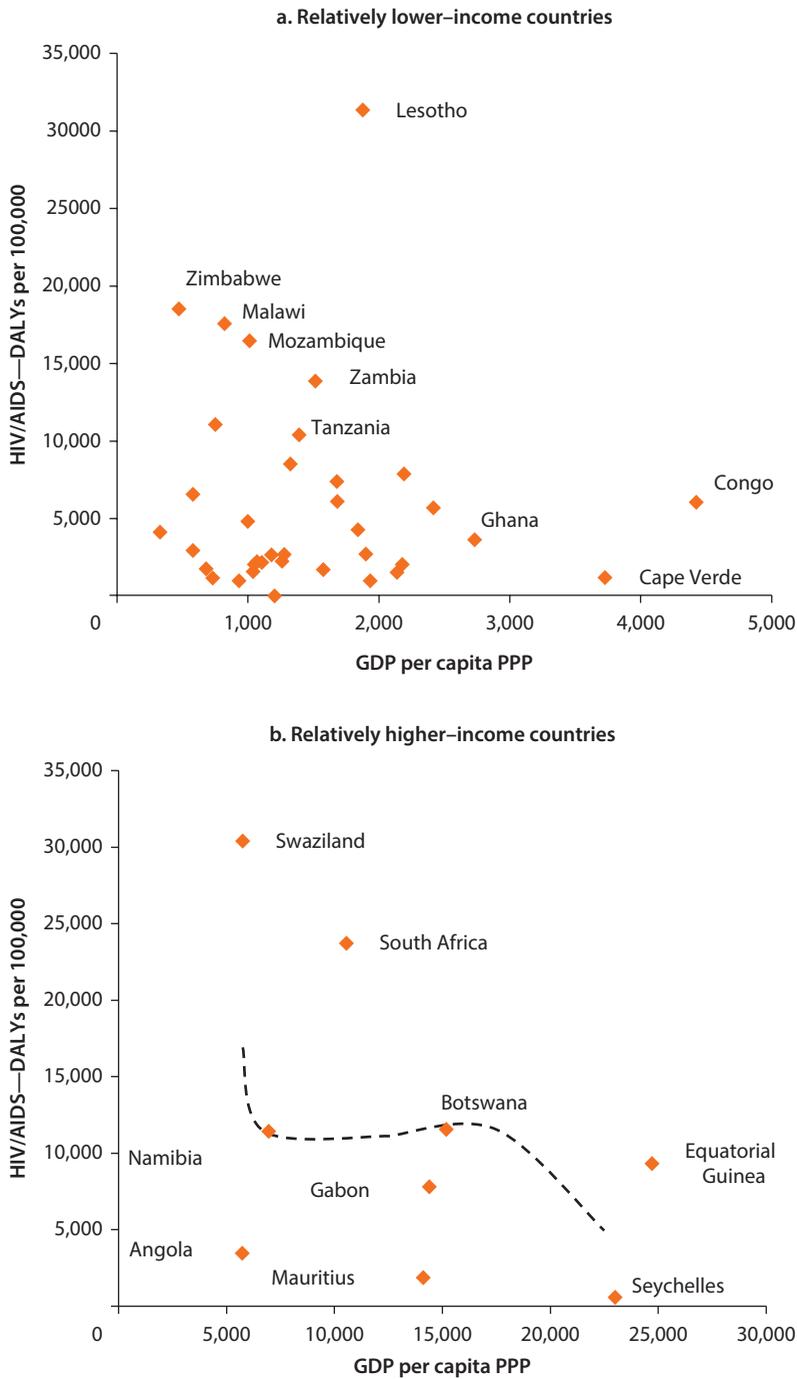
Note: BoD = burden of disease; DALY = disability-adjusted life year.

Figure 5.9 HIV Incidence and Alcohol Consumption in Argentina, 2009



Sources: MSN 2009, 2012.

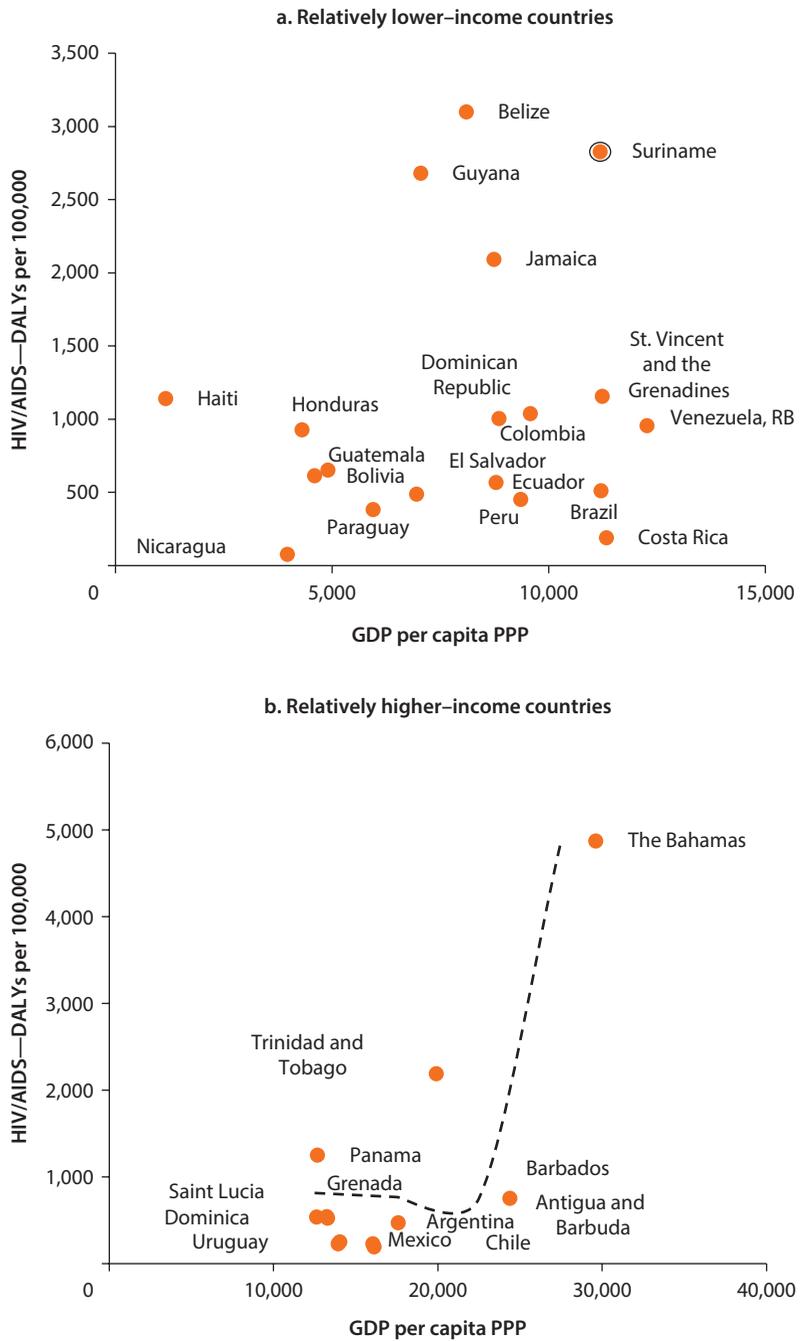
Figure 5.10 HIV/AIDS BoD and GDP per Capita in Africa, 2010



Sources: IHME 2013; World Bank 2013.

Note: The dashed line is built using partial averages. BoD = burden of disease; DALY = disability-adjusted life year; GDP = gross domestic product; PPP = purchasing power parity.

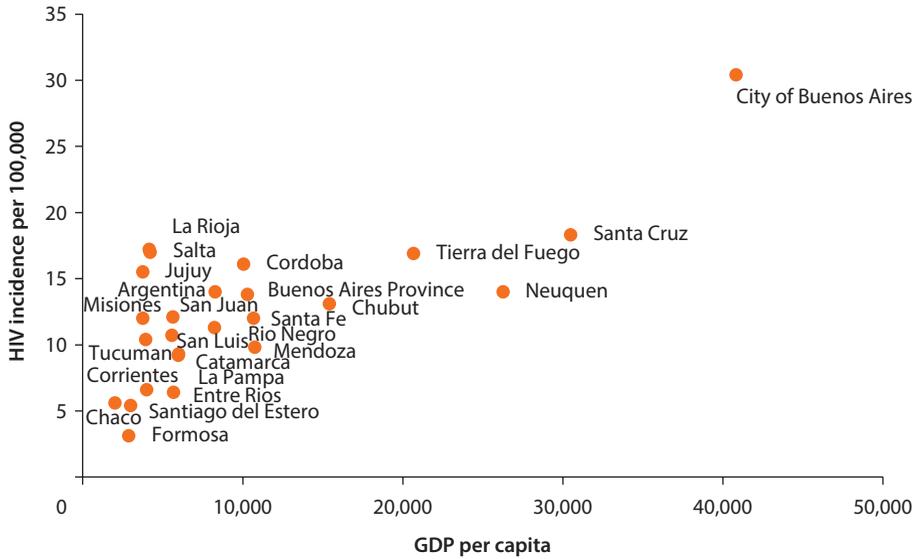
Figure 5.11 HIV/AIDS BoD and GDP per Capita in Latin America and the Caribbean, 2010



Sources: IHME 2013; World Bank 2013.

Note: The dashed line is built using partial averages. BoD = burden of disease; DALY = disability-adjusted life year; GDP = gross domestic product; PPP = purchasing power parity.

Figure 5.12 HIV Incidence and GDP per Capita in Argentina, 2009



Sources: Abeceb Economía Online 2008; MSN 2013.

Note: GDP = gross domestic product.

figure 5.10, panel a, shows an inverse relation in the poorest African countries between HIV/AIDS burden and GDP per capita (i.e., the poorer the country, the higher its HIV/AIDS burden). However, the correlation is insignificant ($p = 0.6306$). Moreover, there is no positive relation between wealth and HIV/AIDS among the richest countries in Africa, as Parkhurst (2010) suggests, even when we compare HIV incidence and GDP per capita.

When conducting a similar analysis for countries in Latin America and the Caribbean (LAC), we find no significant relation between GDP per capita and HIV/AIDS burden. In addition, there is no relation when countries are divided into relatively high- or low-income groups.

In Argentina, there is a clear positive and significant correlation between HIV incidence and GDP per capita, where the City of Buenos Aires is the richest province and has the highest HIV incidence in the country (figure 5.12). The reverse occurs in Chaco, which is the poorest province in Argentina and has the lowest HIV incidence. Nonetheless, table 5.3 shows that GDP per capita explains little of the HIV incidence variation when controlling for factors such as education, violence, and alcohol and drug use.

Conclusion

The analysis shows that income does not explain the HIV/AIDS burden in LAC or in Africa. Nonetheless, GDP per capita is highly correlated with HIV incidence at the provincial level in Argentina. It seems that income level could be associated with a set of behaviors that are risky for HIV infection in Argentina.

However, these findings should be further explored, since the current analysis only allows us to establish correlations.

Conclusion

Since Argentina presents a concentrated epidemic, it is vital to consider the epidemiological characteristics of the country's priority HIV high-risk group—a 25–34 year old sexually active man who has sex with men, with a high school diploma, and who is from the Central provinces of Argentina—when designing policies, specifically for prevention. In the case of men ages 56 and older, 20 percent of transmissions occur through homosexual intercourse and 70 percent of transmissions occur through heterosexual intercourse.

We find no significant correlation between HIV and violence at the provincial level in Argentina, even when violence and HIV incidence are analyzed by sex. The lack of a significant correlation may be because of the concentrated nature of the epidemic in Argentina. As the epidemic concentrates in a subpopulation of relatively young and educated MSM, more information is needed on the social behavior of this and other at-risk subpopulations.

Regarding the use of condoms, the study shows that younger and more educated Argentines are most likely to use condoms when engaging in sexual intercourse. Although binge drinking is positively correlated to condom use for men and women, we found that habitual alcohol consumption negatively relates to condom use among men (but not among women). Moreover, men are more likely to use condoms with casual partners, although having multiple sexual partners does not reduce the risk of HIV infection. Although individual behavior change is central to improving sexual health, there is a need to address broader social determinants and risk factors of safe sexual behavior, including but not limited to the use of condoms.

This study finds that education is positively correlated with HIV incidence at the provincial level in Argentina, a finding that is consistent with the priority HIV high-risk group identified in our analysis. Although education plays an important role in behavioral change HIV reduction strategies, it is important to consider the content of HIV/AIDS prevention education, in addition to years of schooling. Moreover, there is no “one size fits all” approach to HIV prevention education. In the case of Argentina, education programs must be adapted toward more educated groups who are at higher risk of HIV infection. It is also important to consider the need for sexual and reproductive health education for all school age youth, which should be discussed openly in classrooms and in the country's media.

Although there is a positive correlation between drug and alcohol use and the burden of HIV/AIDS in selected countries, we do not find a significant correlation between the use of those substances and HIV incidence in Argentina. These results are partially mediated by the absence of data on the use of injectable drugs—which are a significant form of transmission—at the provincial level within the country. Moreover, although we find that habitual alcohol consumption among men is correlated to decreased condom use, this relationship does not

apply to binge drinking and no relationship is found between either habitual or binge drinking and HIV incidence.

Although income levels and HIV infection rates are not correlated at the regional level in LAC, higher income does correlate with higher HIV incidence at the provincial level in Argentina. Once more, this finding is consistent with the profile of the most at-risk population in Argentina.

The findings of this study reaffirm the need for behavioral interventions tailored to the social, economic, and behavioral characteristics of the groups at highest risk of HIV infection. For instance, although safe sex education is vital, it is important to tailor education to reach the relatively affluent and educated young adults who are most at risk for HIV infection. Similarly, additional data on drug use behavior in Argentina are needed to establish the real impact of IDUs on new HIV infections and potentially to adapt interventions to target drug users better—a population group that has a high prevalence of HIV and poses a substantial global health challenge.

Behavioral interventions have shown there is no general approach to sexual and reproductive health education that will perfectly meet the needs of each high-risk population and country. Therefore, for individual-level programs to promote safe sex, interventions should be comprehensive and consider the social context. This will ultimately help to modify social norms to support behavior change and tackle structural factors that contribute to risky sexual behavior (Wellings and others 2006).

Finally, the law enforcing confidentiality in relation to HIV/AIDS testing, diagnosis, treatment, and results in Argentina makes it difficult to obtain individual-level data to conduct studies on relations between demand-side risk factors and HIV/AIDS burden. Moreover, it is vital to treat HIV/AIDS as a chronic disease, thus highlighting the need for effective advocacy and identifying target audiences, developing key messages, and selecting implementation strategies (WHO 2006). Notifying new HIV cases and priority HIV high-risk groups is also vital in this context. Consequently, the government should consider the possibility of implementing secure data collection schemes that do not infringe on an individual's right to privately seek diagnosis, testing, and care for HIV/AIDS and other sexually transmitted infections.

Notes

1. The Human Development Index (HDI) is a composite statistic of life expectancy, education attainment, and income indices. The HDI is used as a frame of reference for social and economic development.
2. <http://www.healthmetricsandevaluation.org/terms-defined>.

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Is Argentina Spending Too Much on Its HIV/AIDS Program? A Cross-Country Comparative Analysis

Fernando Lavadenz, Carla Pantanali, and Eliana Zeballos
with Nashira Calvo, Lais Miachon, and Verónica Osorio

Introduction

In 2009–11, Argentina's expenditures on HIV/AIDS per disability-adjusted life year (DALY) were the third highest in the region, after Chile and Cuba. Although the average expenditure per DALY of HIV/AIDS in Latin America and the Caribbean (LAC) between 2009 and 2011 was US\$1,052, in Argentina it was three times higher at US\$3,178.¹ Similar results are found when we calculate average expenditure per death caused by AIDS and HIV incidence. To evaluate whether Argentina is overspending on HIV-related programs, it is important to understand domestic HIV/AIDS spending in the context of recent achievements in reducing the HIV/AIDS burden, comparing the results to those of other economies.

The next section in this chapter will provide an overview of Argentina's domestic HIV spending. The chapter then presents a comparison analysis of Argentina's spending performance and that of other similar economies in LAC and the world. The chapter analyzes the viability and sustainability of the HIV/AIDS program in Argentina and concludes by proposing future analyses that could be used to guide better resource allocation to help ensure the sustainability of HIV/AIDS-related programs.

Overview of Argentina's Domestic HIV/AIDS Spending

Total HIV/AIDS domestic spending in Argentina in 2012 was US\$285.95 million. Total health financing for all areas is US\$40.889 billion per year (National Health Accounts, Argentina), 69 percent of which corresponds to general government expenditure on health. Argentina has consistently spent a relatively

high percentage of gross domestic product (eight to nine percent) on total health expenditures. General government expenditure on health fluctuates, generally remaining close to 60 percent of total health expenditures, while private insurance remains a small but significant portion of health spending. In 2012, total HIV domestic spending corresponded to approximately 0.7 percent of the Argentine total health expenditures.

To conduct cross-country comparisons, we use data from 2009 to 2011. Total HIV domestic spending in Argentina in 2009 was US\$287.1 million, a 65.5 percent increase since 2006, when total spending was US\$173.5 million (UNAIDS 2011). Arán-Matero and others (2011) find that total domestic HIV spending among 23 LAC countries grew by 12 percent between 2008 and 2009, with only four countries (Grenada, Mexico, St. Kitts and Nevis, and Trinidad and Tobago) showing declines in spending (Arán-Matero and others 2011). Similarly, the 2012 Joint United Nations Programme on HIV/AIDS (UNAIDS) Global Report data (UNAIDS 2012) show a 12.41 percent growth rate of total domestic HIV spending from 2009 to 2011 among the 11 countries with available information,² among which only Bolivia and República Bolivariana de Venezuela show a decline in spending. Given the increasing trend of HIV spending in Argentina and the region, it is vital to understand the source of funding, allocation of funds between different HIV programs, and cost of treatment.

Sources of Funding

In 2009, external funding for HIV/AIDS in Argentina was only 0.25 percent of total spending on HIV/AIDS, representing an 89.63 percent decrease since 2006 when external funding made up 2.41 percent of the total (UNAIDS 2011). Public sources accounted for the remaining 99.75 percent of the total budget in 2009, with the national government contributing 42.6 percent; subnational governments, 39.5 percent; Social Security, 12.6 percent; and reimbursable funds from development banks, 5.1 percent. Total spending from international funding came from bilateral sources (0.01 percent) and the United Nations (multilateral, 0.24 percent). In 2012, external funding was zero; the national government contributed 65.7 percent; Social Security, 21.6 percent; and reimbursable funds from development banks, 12.7 percent. Table 6.1 shows annual HIV/AIDS funds in Argentina from 2006 to 2012, disaggregated according to funding source.

Arán-Matero and others (2011) find an average 34 percent increase in external funding from 2007 to 2008 among the 23 LAC countries studied, with the exception of Mexico, Peru, and República Bolivariana de Venezuela (Arán-Matero and others 2011). Among the LAC countries reporting 2009 and 2011 information to UNAIDS (2012), we find a seven percent average increase in external funding, with the exception of Bolivia, Cuba, República Bolivariana de Venezuela, and St. Vincent and the Grenadines. In 2009, external dependency in 21 LAC countries reporting to UNAIDS averaged 12 percent, ranging from 0.25 percent (Argentina and Colombia) to 98.8 percent (Haiti) (table 6.2).

Although Argentina has had low dependence on external funding in recent years, the country used to rely more heavily on external support, especially during

Table 6.1 Domestic HIV/AIDS Spending by Funding Source in Argentina, 2006–12*US\$ millions*

<i>Funds for HIV/AIDS</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>	<i>2011</i>	<i>2012</i>
Total spending	173.54	231.03	259.35	287.13	174.89	262.50	285.95
Domestic spending from public sources	169.36	225.55	252.87	286.41	174.89	262.50	285.95
National	81.23	115.51	104.10	122.31	116.09	180.78	187.91
Provincial	65.96	80.86	106.01	113.33	n.a.	n.a.	n.a.
Development banks	2.34	5.43	12.17	14.68	18.89	30.36	36.37
Social security	19.83	23.74	30.59	36.08	39.92	51.37	61.67
Domestic spending from international sources	4.18	5.48	6.48	0.72	n.a.	n.a.	n.a.
Bilateral sources	0.01	0.02	0.03	0.04	n.a.	n.a.	n.a.
Development banks	n.a.						
Global fund	n.a.						
Multilateral	4.16	5.47	6.45	0.68	n.a.	n.a.	n.a.
Other	n.a.						
International fund dependency (%)	2.41	2.37	2.5	0.25	0	0	0

Sources: UNAIDS 2011 and unpublished data from the National HIV/AIDS and STDs Office.

Note: n.a. = not applicable.

Table 6.2 External Funding Dependency in LAC, 2009–11*Percent*

<i>0–5</i>	<i>5–20</i>	<i>20–75</i>	<i>75–100</i>
Brazil	Cuba	Belize	Haiti
Venezuela, RB	Trinidad and Tobago	Peru	St. Vincent and Grenadines
Mexico	Bahamas	Honduras	Dominica
Chile		Suriname	Bolivia
Argentina		Guatemala	Jamaica
Colombia		Antigua and Barbuda	
		Paraguay	

Source: UNAIDS 2012.

Note: LAC = Latin America and the Caribbean.

the major economic crisis that began in the third quarter of 1998 and lasted until the second quarter of 2002. During this period, a political, institutional, socioeconomic, and fiscal crisis led to increased unemployment, poverty, and severe currency devaluation. The health sector was not left unscathed; the sector experienced a reduction in the number of people covered by the public health system. Currency devaluation and high inflation also caused a spike in drug prices, which in turn caused vaccine shortages and a deterioration of living conditions. The following were among the major threats to the health system: (a) interruption of health services, (b) lack of access to health supplies, (c) risk of disease outbreaks, (d) threats to close providers, (e) potential workforce reduction, and (e) increased inequity (National Ministry of Health [MSN] 2004).

Among the main multilateral donors, the World Bank and the Global Fund to Fight AIDS, Malaria, and Tuberculosis (GFATM) have helped Argentina in its fight against HIV/AIDS since 1997 and 2003, respectively. The World Bank has been a partner in Argentina's HIV/AIDS and sexually transmitted disease (STD) program since 1997 when it financed the Argentina AIDS and Sexually Transmitted Diseases Control Project (LUSIDA) and collaborated with the Ministry of Health of Argentina (MSN) to take immediate action and support the National Health Emergency Program (World Bank 2004). The program had several objectives, including the following: (a) reduction of sanitary and epidemiological risks for the entire population, (b) protection of the most disadvantaged groups, and (c) continuity of public health services (MSN 2004).

LUSIDA invested US\$15 million in HIV/AIDS and STI-related health promotion (42 percent of total LUSIDA funds) and disease prevention activities (24 percent). LUSIDA also financed the strengthening of existing diagnostic, treatment, and counseling services (21.7 percent), as well as monitoring, evaluation, and research (5.6 percent) (World Bank 2004).

The World Bank subsequently funded the Public Health Surveillance and Disease Control Project in 1999, with a total committed amount equal to US\$52.5 million to strengthen national, provincial, municipal, and other institutions responsible for public health policy and practice (World Bank 2006). In 2006, the Essential Public Health Functions and Programs Project (EPHFP) (World Bank 2013) (US\$220 million) was approved with the objective to support Argentina's federal health plan (World Bank 2004) and reduce the mortality and morbidity associated with communicable diseases (World Bank 2006).

In addition, in 2013 the GFATM signed US\$15.8 billion in cumulative funding for HIV globally and US\$29,335,432 for Argentina.³ Figure 6.1, panel a, shows cumulative GFATM disbursements to Argentina since 2003, displaying an increase until 2008 and a subsequent leveling off. Figure 6.1, panel b, presents net GFATM disbursements since 2003, with negative net disbursements in 2009 and 2010. In 2013, GFATM net disbursements totaled US\$1.49 million.

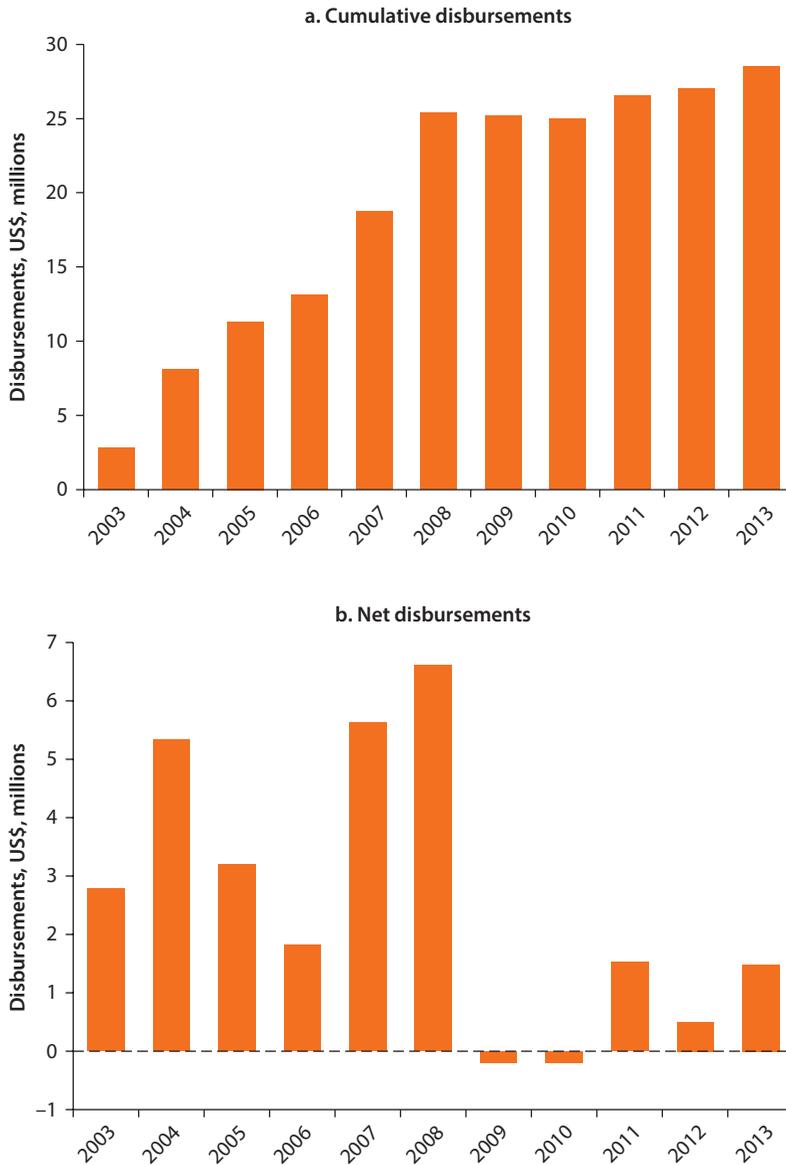
In 2013, 62 percent of the 42 LAC countries and territories with available information reported being independent of external support for antiretroviral treatment (ART) funding, while 10 countries in the region were highly dependent on external sources, as presented in table 6.3 (Pan American Health Organization [PAHO] 2013).

Since Argentina finances the HIV/AIDS response almost exclusively via domestic sources (over 99 percent), it is necessary to understand the basic programmatic structure to fully grasp the funding structure.

Allocation of Funds

In 2009, Argentina allocated most HIV/AIDS funds toward treatment and care (77 percent, or the equivalent of US\$222.3 million in 2009), followed by HIV research and development (7.8 percent), social protection and social services (6.7 percent), and program management (3.1 percent) (figure 6.2, panel a)

Figure 6.1 GFATM Disbursements in Argentina, 2003–13



Source: “Grant Portfolio,” Global Fund to Fight AIDS, Tuberculosis, and Malaria (accessed October 2013), <http://portfolio.theglobalfund.org/en/Home/Index>.

Note: GFATM = Global Fund to Fight AIDS, Tuberculosis, and Malaria.

(UNAIDS 2011). In 2012, treatment and care were still responsible for most of Argentina’s HIV spending (80 percent, or the equivalent of US\$227.86 million), followed by social protection and social services (10 percent) and program management (five percent) (figure 6.2, panel b). Spending on HIV prevention declined from 3.5 percent of HIV domestic spending in 2006 to 1.7 percent in 2009 and a further decline to 1.2 percent in 2012 (UNAIDS 2011).

Table 6.3 External Funding Dependence for ART in LAC, 2013

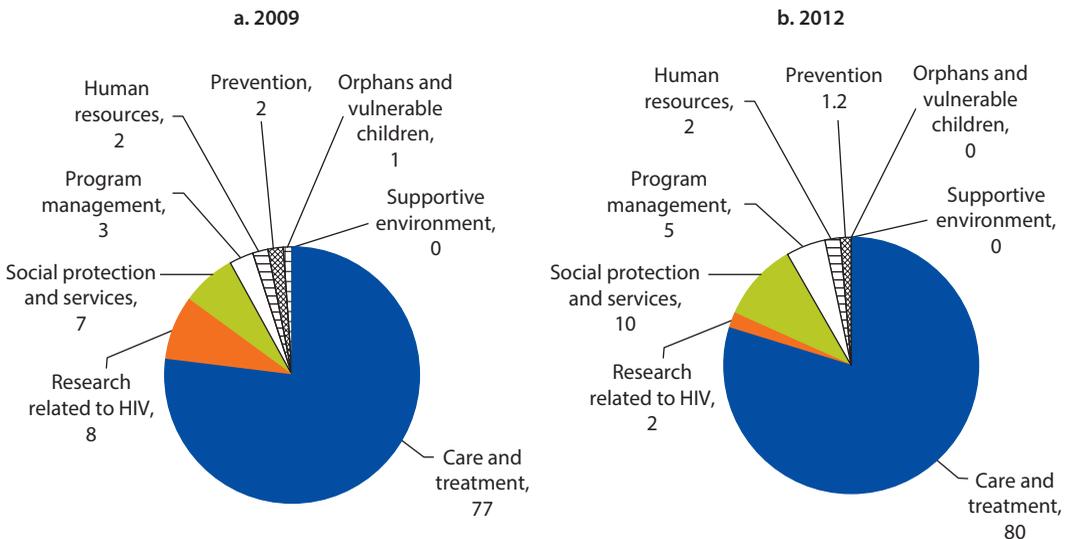
Percent

0-5	5-20	20-75	75-100
Argentina	El Salvador	Cuba	Antigua and Barbuda
Aruba	Paraguay	Dominican Republic	Bolivia
Bahamas		Guatemala	Dominica
Barbados		St. Lucia	Granada
Belize			Guyana
Brazil			Haiti
Chile			Jamaica
Colombia			Nicaragua
Costa Rica			St. Kitts and Nevis
Ecuador			St. Vincent and Grenadines
Honduras			
Mexico			
Panama			
Peru			
Suriname			
Trinidad and Tobago			
Uruguay			
Venezuela, RB			

Source: PAHO 2013.

Note: ART = antiretroviral treatment; LAC = Latin America and the Caribbean.

Figure 6.2 Allocation of Resources (%) for HIV/AIDS in Argentina, 2009 and 2012



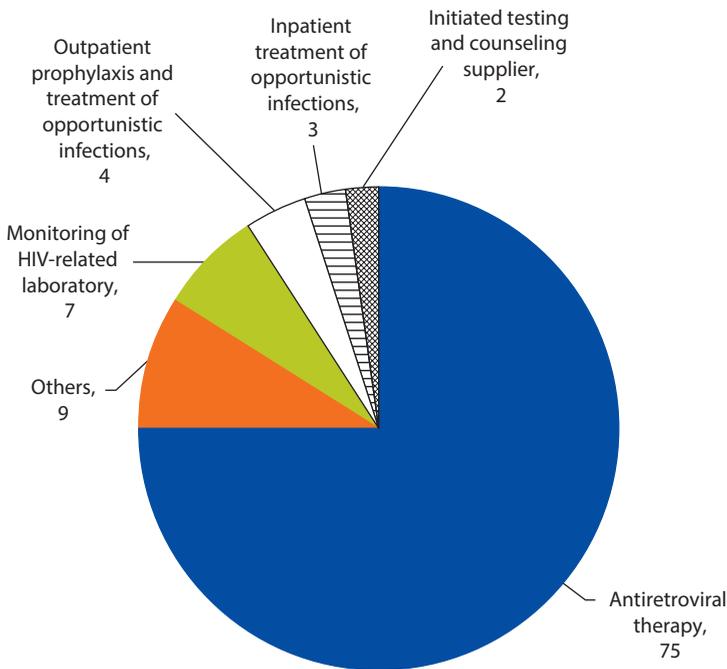
Sources: MSN 2013; UNAIDS 2011.

HIV spending in Argentina by category does not differ greatly from spending in the LAC region, where 75 percent of total spending is allocated to treatment and spending on prevention is insignificant (figure 6.3). Nonetheless, whereas the region spends around 15 percent on prevention efforts, Argentina allocates only 1.2 percent to prevention.

Since the early days of the HIV/AIDS epidemic, there has been debate on resource allocation to treatment versus prevention, a debate that is beginning to create consensus. On the one hand, some argue that money spent on prevention will save the most lives. On the other hand, other activists and researchers in the field argue that money should be spent on medicines to treat those already infected; this view considers HIV treatment as prevention. For instance, two pivotal studies of heterosexual couples where one of the partners has HIV have demonstrated that HIV-positive people who are on ART are about 20 times less likely to transmit the virus to their partners than people who are not taking treatment (NAM 2014).

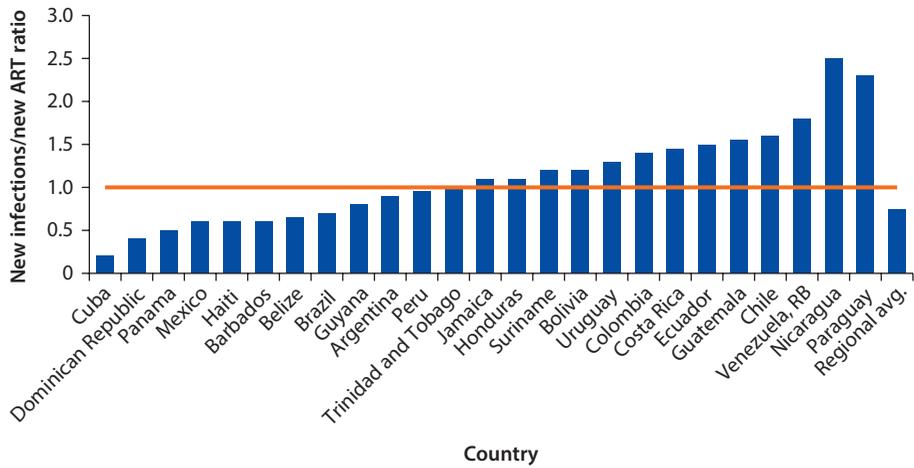
The World Health Organization (WHO) and PAHO believe the expansion of combined HIV prevention and the provision of ART interventions can help achieve an HIV-free generation. The results are showing an important reduction in the burden of disease and incidence based on universal treatment. One way to measure progress in this direction is through the programmatic point

Figure 6.3 Reported Total HIV Spending (%) for 20 Countries in Latin America and the Caribbean



Source: Arán-Matero and others 2011.

Figure 6.4 Programmatic Point of Inflection in the HIV Prevention Response: Rate of New HIV Infections among Patients Initiating ART, 2012



Source: PAHO 2013.

Note: ART = antiretroviral therapy.

of inflection or tipping point, which is calculated as the ratio of the estimated number of new infections in a year divided by the number of people starting ART in that year (PAHO 2013). A ratio less than one indicates a broad expansion of ART and reduction of infectivity and that the response to the epidemic is beginning to advance faster than the epidemic itself (PAHO 2013). The regional turning point in 2012, based on data from 26 countries, was below one (with a value equal to 0.9) (PAHO 2013). Argentina has also passed the inflection point at 0.93 (figure 6.4), indicating progress in the HIV response. Countries that, unlike Argentina, are yet to reach the turning point should continue to strengthen focused preventive responses, expand diagnosis, and increase access to care for HIV-positive patients (figure 6.4).

A closer look at the budget of the National HIV/AIDS and STDs Office (Dirección de SIDA y ETS [DSyETS]) shows a constant increase in nominal terms over the past four years, more than doubling between 2009 and 2012. Table 6.4 shows that over 97.6 percent of the total 2009 budget was used to purchase medicines and other chemical products; the remaining 2.4 percent was used for personnel expenses, services, and consumption of goods. In 2012, the purchase of chemical products remained high at 95.4 percent (table 6.4).

Cost of Treatment

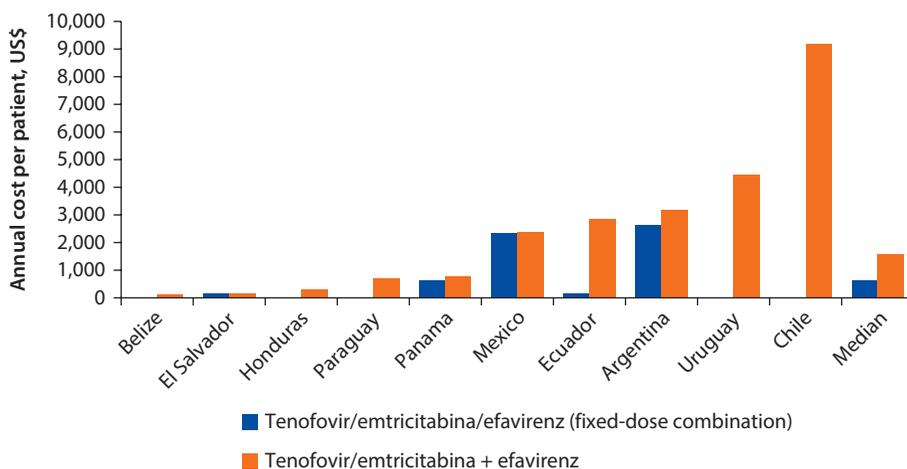
According to WHO and PAHO, the wide range of antiretroviral drug (ARV) prices in LAC presents an opportunity for savings in the acquisition of essential drugs. WHO and PAHO find that cost variability is primarily associated with the unit price of tenofovir/emtricitabine, which is used in first- and second-line ART

Table 6.4 HIV/AIDS Budget per Expense Category, 2009–12

US dollars

Expense category	2009	2010	2011	2012
Personnel expenses	270,988	342,084	385,872	448,638
Chemical products (local funding)	52,825,858	62,228,467	106,753,823	103,689,769
Consumption goods	831,305	445,088	1,596,507	1,892,696
Services	77,742	80,365	338,180	146,502
Other consumption goods	144,643	456,623	451,844	2,775,485
Chemical products (external funding)	1,717,319	651,779	3,842,527	6,544,397
Total budget	55,867,854	64,204,405	113,368,753	115,497,486

Source: Unpublished data from the National HIV/AIDS and STDs Office; exchange rate from the Central Bank of Argentina, www.bcra.gov.ar.

Figure 6.5 Annual Cost per Patient for Tenofovir/Emtricitabine + Efavirenz and Tenofovir/Emtricitabine/Efavirenz in Fixed-Dose Combination, by Country, 2012–13

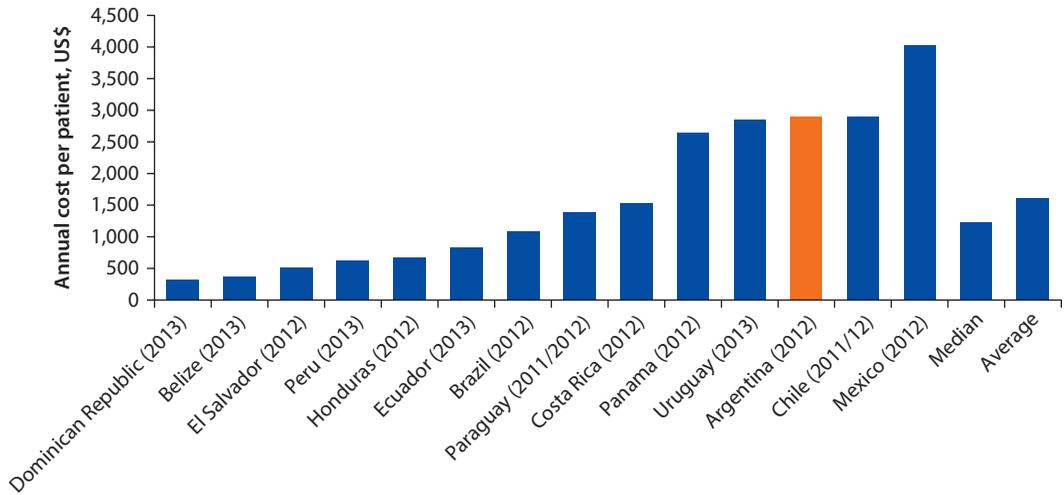
Source: PAHO 2013.

(PAHO 2013). The annual cost for the single tablet fixed-dose combination (tenofovir/emtricitabine/efavirenz [TDF/FTC], EFV) is less than the combined cost of separate TDF/FTC and EFV tablets (figure 6.5). The fixed-dose combination ranges from US\$158 to US\$2,643, with a median of US\$625. In Argentina, the single tablet fixed-dose combination costs US\$2,643; the two-tablet combination is 20 percent more expensive, at US\$3,178.

The second-line treatment (zidovudine/lamivudine tablets + lopinavir/ritonavir tablets) has an annual cost per patient between US\$331 and US\$4,035. Argentina has the third largest cost per patient among the 14 countries analyzed (figure 6.6).

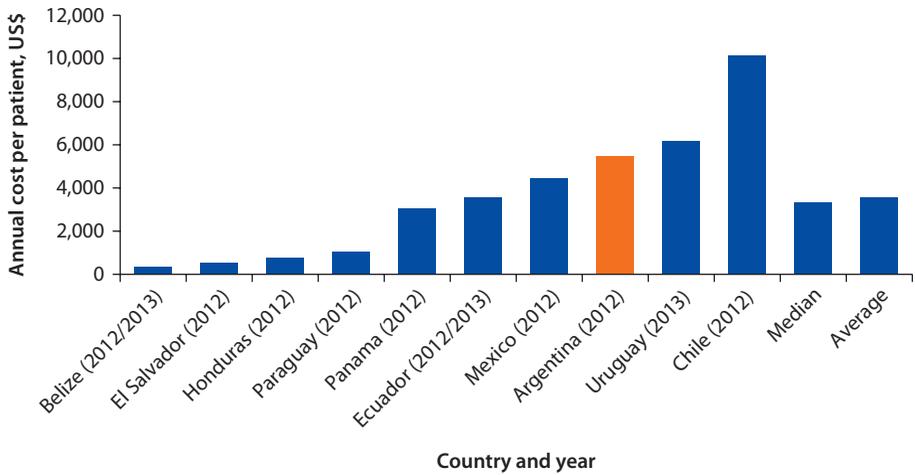
For tenofovir/emtricitabine tablets + lopinavir/ritonavir tablets, the annual cost is between US\$349 and US\$10,124, with a median of US\$3,312. In Argentina, the price is US\$5,457, the third highest among the countries analyzed (figure 6.7).

Figure 6.6 Annual Cost per Patient for Scheme Zidovudine/Lamivudine + Lopinavir/Ritonavir, by Country, 2011–13



Source: PAHO 2013.

Figure 6.7 Annual Cost per Patient for Tenofovir/Emtricitabine + Lopinavir/Ritonavir, by Country, 2012–13



Source: PAHO 2013.

Countries with higher prices of lopinavir/ritonavir are associated with direct purchases and national bidding, while those with lower prices are associated with international competitive bidding. In the case of zidovudine/lamivudine, there is no clear relationship between price and purchase modality.

Market flexibility can be used to improve the efficiency of ART acquisition and reach competitive drug prices. This approach was used in Swaziland (UNAIDS 2013), resulting in internationally competitive prices and high-quality

products through the introduction of price ceilings, use of supplier performance data, and use of more reliable quantification methods. In Argentina, the process of acquiring reagents and medicines has been improved and centralized, resulting in a break of the industry monopoly over retrovirals used for testing.

There are wide differences in ART coverage in LAC (described in chapter 1). While Bolivia and Ecuador cover less than half of HIV patients, Argentina, the Dominican Republic, Venezuela, Mexico, and Cuba cover around or above 80 percent. Given the high proportion of HIV funds allocated to ART and the high variability of treatment costs among countries in the region, there is a pressing need for strategies to reduce costs. Regional and international organizations, such as the World Bank, WHO, and PAHO, may have a crucial role to play in supporting countries in reaching more competitive prices for ART at the regional level.

Cross-Country Comparison of HIV/AIDS Spending

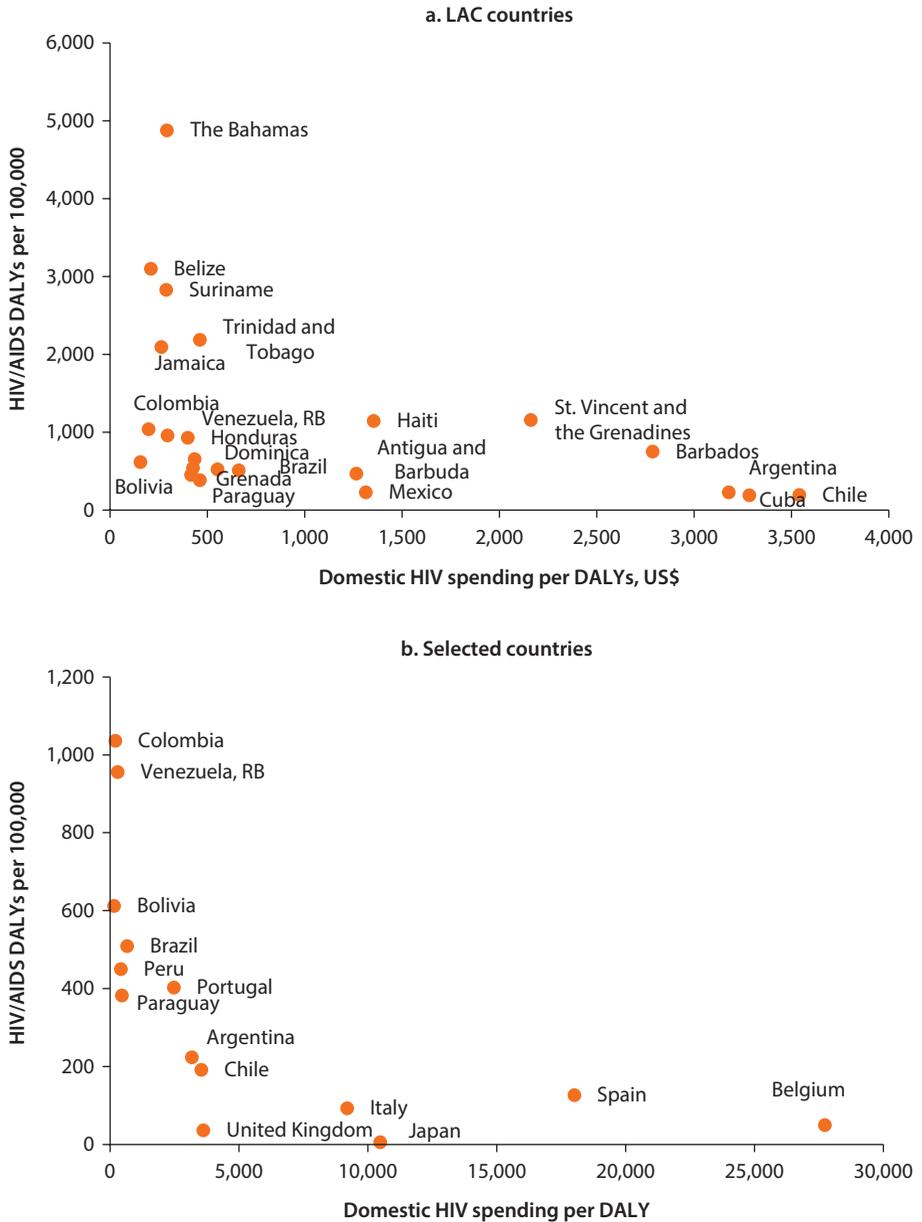
The performance of the Argentine HIV/AIDS program can be compared with that of other economies in and outside the LAC region by calculating cost per DALY based on UNAIDS (2012) and Institute for Health Metrics and Evaluation (IHME 2013) data. To do so, the total domestic HIV/AIDS expenditure (including international and domestic funds) is divided by the number of HIV/AIDS DALYs for each country. HIV incidence and AIDS deaths are also used to explore possible differences in trends.

The results show a negative relationship between HIV/AIDS spending and HIV/AIDS burden in the LAC region and in selected countries.⁴ Countries with high HIV/AIDS spending (total expenditure per DALY) have lower levels of HIV/AIDS burden, while countries with low domestic spending have higher HIV/AIDS burdens (figure 6.8, panels a and b). Argentina, one of the highest spenders per DALY in LAC, also has one of the lowest HIV burdens (figure 6.8, panel a). Beyond LAC, it is possible to find countries that spend less than Argentina and have an even lower HIV/AIDS burden (figure 6.8, panel b).

In LAC, Argentina spends the most per AIDS death and has the second largest expenditure on HIV/AIDS per person living with HIV after Barbados (figure 6.9, panel a). Countries with high domestic spending per person living with HIV have fewer people with HIV than countries with low domestic spending (figure 6.9, panel a). There is also a negative relation between HIV/AIDS spending and deaths caused by AIDS in the LAC region (i.e., countries with low levels of domestic spending per AIDS deaths have more deaths caused by AIDS) (figure 6.9, panel b).

The analysis of countries with comparable HIV/AIDS spending per DALY (from US\$2,000 to US\$5,000 per HIV/AIDS DALY) finds no clear relation between HIV/AIDS spending and HIV/AIDS burden (figure 6.10). Some countries with a low burden of HIV/AIDS (measured in DALYs, AIDS deaths, or HIV incidence) spend far less than Argentina.

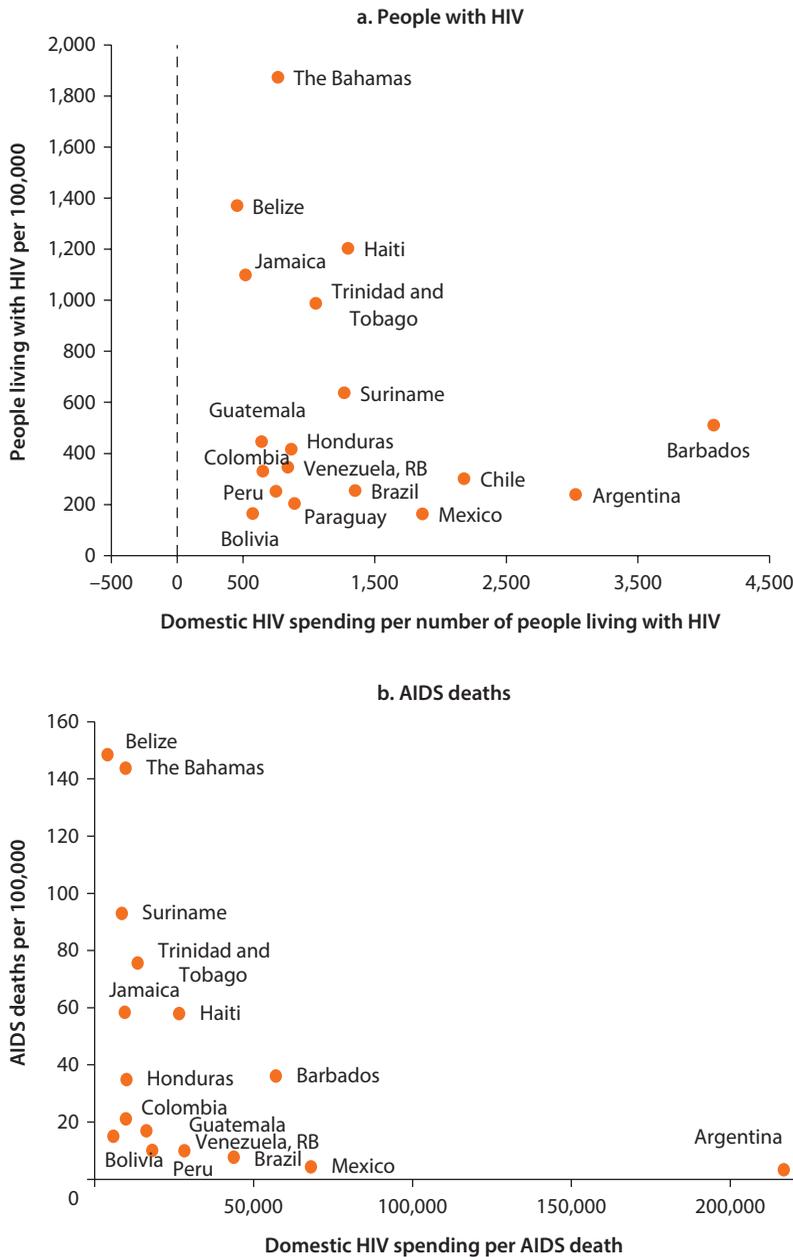
Figure 6.8 HIV/AIDS Spending in LAC and Selected Countries, 2011



Sources: IHME 2013; UNAIDS 2012.
 Note: DALY = disability-adjusted life year; LAC = Latin America and the Caribbean.

In the fight against HIV/AIDS, as in other public health challenges, many of the low-cost or easily implementable interventions have already been used. As such, it is necessary to move beyond the “low-hanging fruit” to continue reducing the HIV/AIDS burden. Therefore, we analyze the percentage change of the HIV/AIDS burden from 2000 to 2010 and the HIV/AIDS burden in 2010

Figure 6.9 HIV/AIDS Spending in Latin America and the Caribbean, 2011



Sources: IHME 2013; UNAIDS 2012.

in economies with HIV spending per HIV/AIDS DALY between US\$2,000 and US\$5,000. Figure 6.11, panel a, shows the change in HIV/AIDS burden from 2000 to 2010, with countries shown in order of less to more money spent per HIV/AIDS DALY. Some economies, like Portugal, St. Vincent and the Grenadines, and Switzerland, show a higher decrease in the HIV/AIDS burden than

Argentina while spending less. However, these economies, except Switzerland, had a higher HIV/AIDS burden in 2010. Argentina, Switzerland, and the United Kingdom were the only countries with a significant reduction in HIV/AIDS burden from 2000 to 2010 that had an HIV/AIDS burden below 300 DALYs lost to HIV/AIDS in 2010 (figure 6.11, panel b).

Figure 6.10 HIV/AIDS Burden in Countries with Comparable HIV/AIDS Spending, 2011

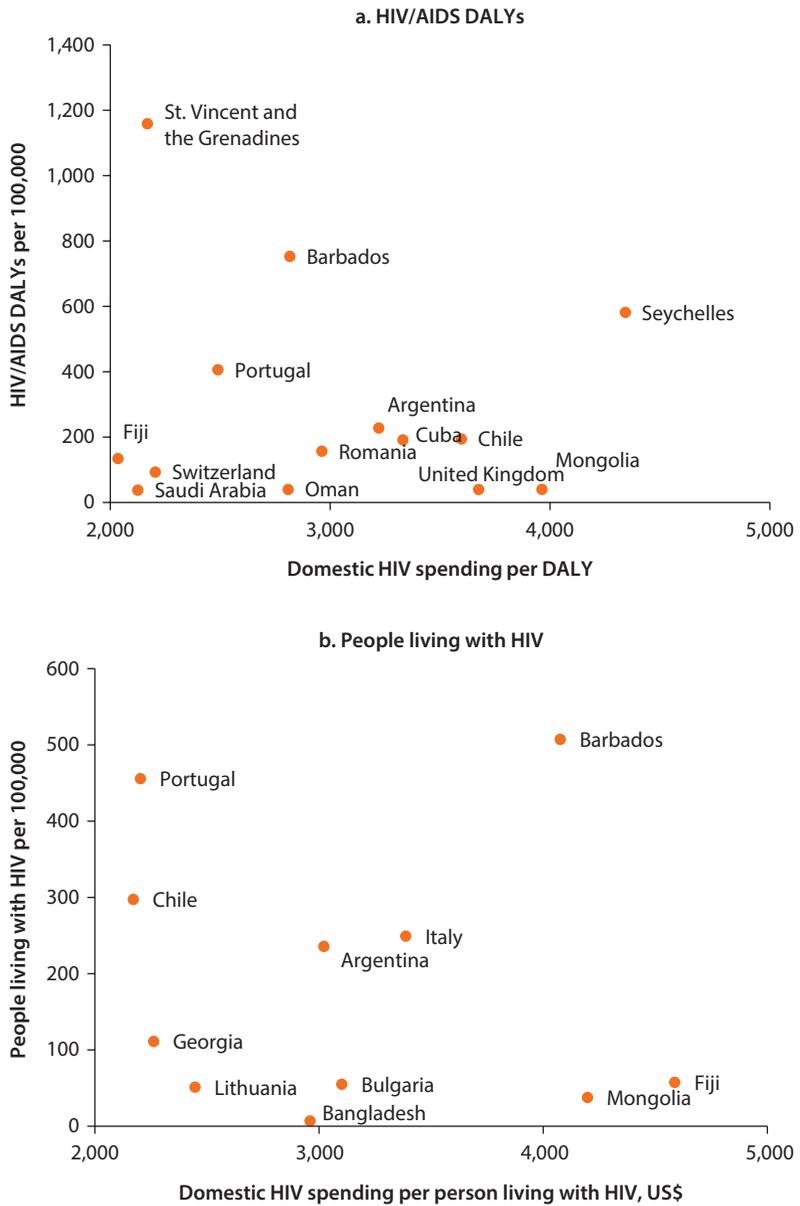
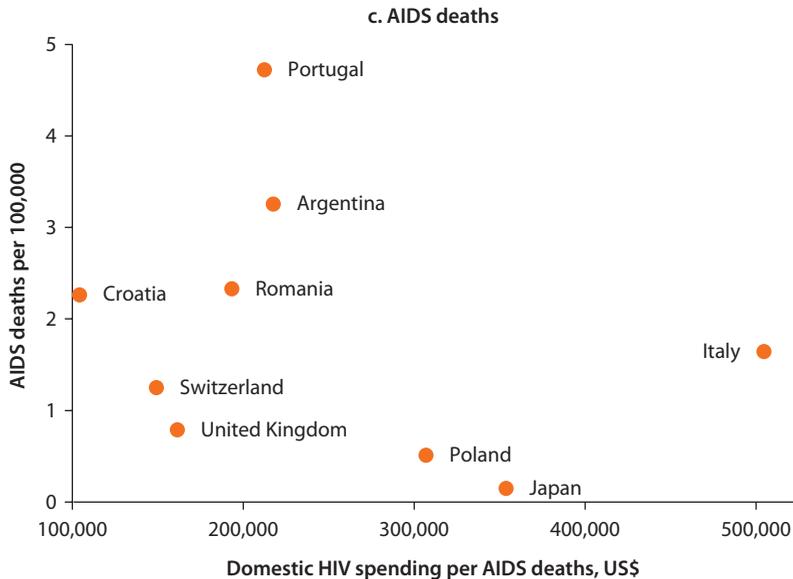


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Figure 6.10 HIV/AIDS Burden in Countries with Comparable HIV/AIDS Spending, 2011 (continued)



Sources: IHME 2013; UNAIDS 2012.

Note: DALY = disability-adjusted life year.

Viability and Sustainability of the HIV/AIDS Program in Argentina

Three aspects of financial sustainability are important when considering the viability of the HIV/AIDS program: (a) availability of adequate funds (especially government funds) for HIV/AIDS project expenditures, (b) potential recovery of some project costs from beneficiaries, and (c) financial incentives necessary to ensure participation in the program (Asian Development Bank 1997).

Since in Argentina treatment and prevention for HIV/AIDS are provided free of charge, and the program has been mostly independent of international funding since 2009 (0.25 percent of funds) (UNAIDS 2012), the annual funding of the program comes as a fiscal requirement. Hence, it is important to calculate the total annual fiscal impact of the project and ensure adequate commitment of government funds for operational purposes.

Although HIV/AIDS prevention, treatment, and care are free at present, cost recovery options should be considered. The basic principle behind user charges is that users should pay the economic cost of services (i.e., treatment and care). The appropriate cost for users is, at most, the marginal cost of providing the service, with no profits being generated from the HIV/AIDS program. However, the government can regulate or set charges so that user fees only cover part of the costs by limiting free treatment and care to those in most financial need or subsidizing treatment for all.

Project sustainability also depends on the benefit for participants. When HIV/AIDS patients receive treatment and care, the whole society benefits from the decreased probability of HIV transmission and therefore lower HIV incidence.

To gain a better understanding of the financing needs of Argentina’s National HIV/AIDS Program, this section estimates the costs of HIV/AIDS treatment for the next six years. The analysis considers only the costs of treatment and care, because they accounted for 77 percent of the total budget for the HIV/AIDS program in 2009 and 80 percent of the total budget for the program in 2012 (UNAIDS 2011).

In 2012, total HIV domestic spending was US\$285.95 million and 80 percent of the funds were allocated toward treatment and care. Of the funds for treatment and care, 48 percent is spent on ART (US\$109.54 million). The Argentine government estimates that about 52,000 people received ART in Argentina in 2013 (35,904 of those from DSyETS, or approximately 69 percent) and 110,000 people are living with HIV, with an average cost per patient per year of US\$1,723.32 (Arg\$10,909.65)² (MSN 2013). An estimated 52.73 percent of

Figure 6.11 HIV/AIDS Burden in Countries with Comparable HIV/AIDS Spending, 2000–10 and 2012

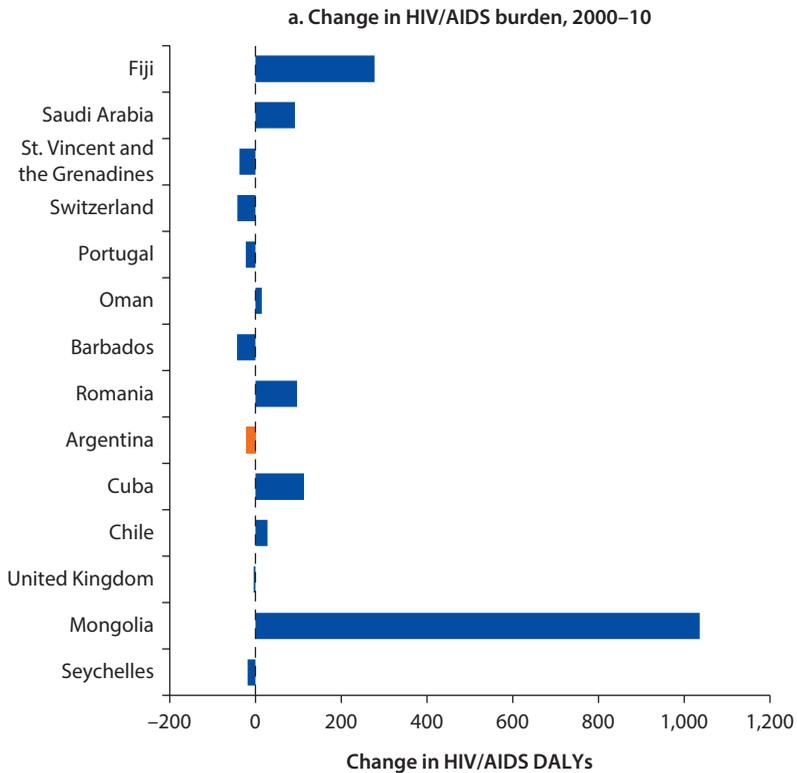
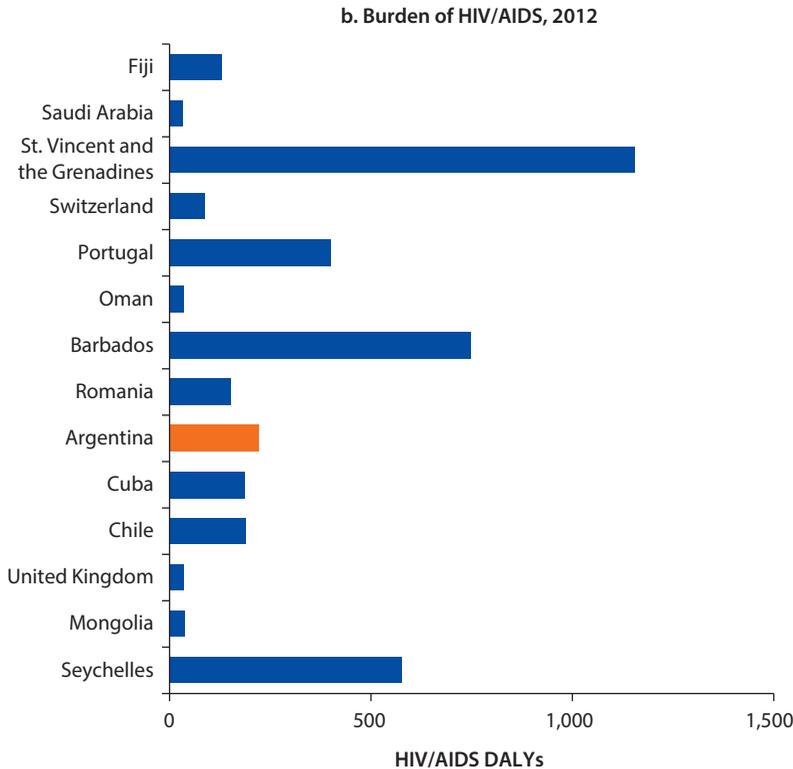


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Figure 6.11 HIV/AIDS Burden in Countries with Comparable HIV/AIDS Spending, 2000–10 and 2012 (continued)



Source: IHME 2013.

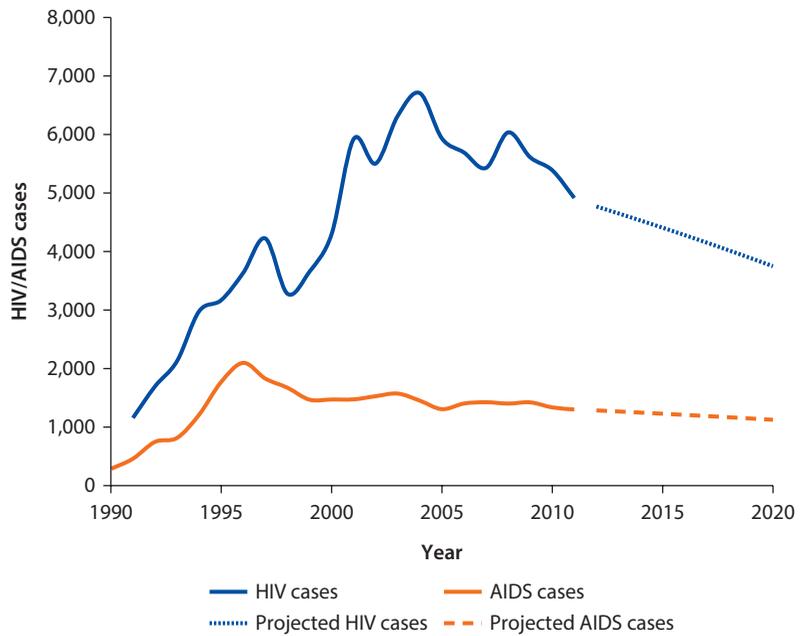
Note: DALY = disability-adjusted life year.

those 110,000 people living with HIV/AIDS (PLWHA) do not receive any type of treatment.

To calculate future HIV incidence and AIDS deaths, we use information from the 2013 AIDS Bulletin and United Nations population growth estimation data to make estimations based on historical HIV incidence and AIDS deaths, assuming a constant growth rate over time.⁶ There were 32,442 registered HIV cases until 2000 (MSN 2008) and 63,453 HIV cases from 2001 to 2011, for a total of 95,895 registered HIV cases in Argentina. There were also 29,460 registered deaths caused by AIDS since 1990.

Assuming all AIDS deaths were registered first as HIV patients and that HIV patients only died because of AIDS, there are at most 66,435 registered people with HIV alive in Argentina.⁷ However, the Argentine government estimates that there were 110,000 PLWHA in 2013 (MSN 2013). We calculate growth rates of deaths caused by AIDS and HIV incidence using information from 2001 to 2012. Assuming these growth rates remain constant until 2020, we estimate there will be a maximum of 94,012 registered PLWHA in Argentina in 2020

Figure 6.12 Estimated Number of New HIV Cases and Deaths Caused by AIDS in Argentina, 1990–2020



Sources: Author's calculations based on MSN 2008, 2013.

(134,340 cumulative registered cases of HIV and 40,328 deaths caused by AIDS by 2020) (figure 6.12).

DSyETS estimates that 35,904 HIV patients were receiving ART in 2012 (MSN 2013), which is 70 percent of the 52,000 estimated HIV patients. The remaining 30 percent are assumed to be receiving treatment through private health services, although also free of cost as mandated by law. We calculate there will be 94,012 registered PLWHA in Argentina in 2020. Assuming that 70 percent or 65,808 receive treatment from the public sector and the cost of treatment per patient per year remains the same (at US\$1,723.32), public expenditure on treatment will increase by 83.3 percent.

Growth of 83.3 percent in treatment costs over 18 years is significant; therefore, the government must analyze whether it will still be able to cover these expenses. If the government's estimations are correct, there were 110,000 people living with HIV in 2013, of which only about 52,000 were estimated to be receiving treatment in 2012. If this number is indeed stable, as mentioned in the latest HIV Bulletin, it represents 17 percent more than the estimated number of patients in need of treatment—pointing to an even greater future financial need. Moreover, we are assuming that the cost per patient per year will remain stable, but policy makers need to assess the likelihood of increases in cost. Furthermore, there is a need to analyze potential mechanisms that will allow the

government to reduce the cost per patient through reduction of ARV costs or possibly through future cost recovery schemes.

Conclusion

Argentina had the third highest expenditures on HIV/AIDS per DALY in the region after Chile and Cuba in 2009–11. Although the average HIV/AIDS expenditure per DALY in LAC between 2009 and 2011 was US\$1,052, in Argentina it was three times higher, at US\$3,178. Furthermore, Argentina's total domestic HIV spending in 2009 was US\$287.13 million, a 65.5 percent increase since 2006, making the country's spending the third highest in the region after Mexico and Brazil. In 2012, total domestic HIV spending was slightly less, at US\$285.95 million (0.41 percent decrease).

Argentina allocates HIV funds in a similar manner to the LAC region, where treatment and care in Argentina represents 80 percent of total HIV spending (75 percent in LAC). Moreover, a wide variation in ART cost in LAC is associated with the unit price of tenofovir/emtricitabine. Argentina has one of the highest costs of the fixed-dose combination (four times higher than the median for LAC) and the two-tablet combination (two times higher than the LAC median). These differences may partly explain why Argentina's expenditure on HIV/AIDS per DALY is three times higher than for LAC as a whole. Since a high portion of HIV spending is allocated to treatment and given the wide variation in ARV prices among LAC countries, there are definite opportunities for reducing cost per patient while increasing ART coverage. Nonetheless, the Argentine government should improve competitively in the procurement of medicines. Regional and international organizations such as the World Bank, WHO, and PAHO may have a crucial role to play in supporting countries to reach more competitive prices for ART at the regional level. It is also important to maintain strict monitoring of inputs and clinical management of medicines, as well as to implement rigorous, targeted prevention management.

The cross-country comparison of Argentina's HIV spending found that Argentina has one of the lowest burdens in the region. Some countries spend more than Argentina and have even lower HIV/AIDS burdens, reinforcing the negative relation between the cost per DALY and the HIV/AIDS burden found in the LAC region. Nonetheless, some other countries have lower burdens of HIV and smaller expenditures, showing room for improvement in total domestic spending on HIV/AIDS.

However, the results are not as clear for countries with similar HIV/AIDS burdens. Some countries spend more than Argentina and have more DALYs per 100,000; others spend less and have lower DALYs per 100,000. Thus, although Argentina's spending is comparatively high, it is the only country, besides Switzerland, that had a significant reduction in HIV/AIDS burden from 2000 to 2010 while having a relatively low HIV/AIDS burden in 2010.

We analyzed whether the HIV/AIDS program in Argentina will remain viable over time. We estimated the costs of HIV/AIDS treatment for the next six years

(to 2020) using historic information on HIV incidence, deaths caused by AIDS, and current cost per patient, to have a better idea of the HIV/AIDS program's financial needs. We found that treatment expenditures will increase by 83.3 percent, assuming the growth rates of HIV incidence and deaths caused by AIDS remain the same.

If the government's estimations are correct, there were 110,000 people living with HIV in 2013. If this number is indeed stable, as mentioned in the latest HIV Bulletin, it represents 17 percent more HIV-positive people in need of treatment, making the future financial need even greater. We also assumed stable cost per patient per year over time, which may not be a likely scenario. Although HIV/AIDS prevention, treatment, and care are free in Argentina at the present time, it is important to consider whether some cost recovery would be possible. These are some questions that policy makers need to address.

Despite Argentina's notable performance compared with economies with similar HIV burdens (in and outside the LAC region), Argentina could further reduce its HIV burden by spending more in a more cost-efficient manner. Therefore, we propose conducting a cost-effectiveness analysis (CEA), an economic evaluation in which the costs and consequences of alternative interventions are expressed in cost per unit of health outcome. CEA is used to determine technical efficiency (i.e., comparison of the costs and consequences of competing interventions for a given patient group in a given budget) (National Institutes of Health 2013). The CEA is expressed in terms of a ratio in which the denominator is the gain in health—in this case, DALYs—and the numerator is the cost associated with the health gain (Gold and others 1996).

The transformation of outputs into health outcomes poses the greatest challenge when developing a CEA. On the one hand, detailed information on the costs (variable and fixed) of the different HIV-related programs is needed. On the other hand, it is difficult to estimate and independently assess the health outcome of each program (i.e., link causation) with a comparable measurement (such as change in DALYs per 100,000 people), because of the correlations among programs. For example, it is difficult to assess the change in DALYs because of prevention while holding other interventions, such as treatment and care, constant. To overcome these challenges, we suggest the use of a dynamic, compartmental mathematical model of HIV transmission and disease progression to conduct a CEA, thus allowing the government to project effective allocation of resources to meet the objectives set by various stakeholders.

Notes

1. Calculated with information from UNAIDS (2012).
2. LAC countries with available HIV spending information for 2009 and 2011 are Bolivia, Chile, Colombia, Cuba, Dominica, Grenada, Haiti, Paraguay, República Bolivariana de Venezuela, St. Vincent and the Grenadines, and Suriname.
3. "Grant Portfolio," Global Fund to Fight AIDS, Tuberculosis, and Malaria (accessed October 2013), <http://portfolio.theglobalfund.org/en/Home/Index>.

4. We compare South American countries with selected developed countries (European Union and G7 countries) to serve as a reference because of some similarities in the behavior of the HIV epidemics in Europe and Argentina, although European and G7 countries have lower average HIV/AIDS burdens than countries in South America.
5. This cost per patient per year is estimated based on DSyETS information and this may not reflect the actual cost per patient per year from private or public parties outside DSyETS.
6. United Nations growth estimation data are from the Department of Economic and Social Affairs, United Nations (accessed March 14, 2014), <http://www.un.org/en/development/desa/population/>.
7. If 52,000 people receive treatment of the 66,435 estimated registered number of people with HIV alive in Argentina, ART coverage is about 78 percent, which is close to what UNAIDS estimates for 2012.

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Cost-Benefit Analysis of the HIV/AIDS Program in Argentina

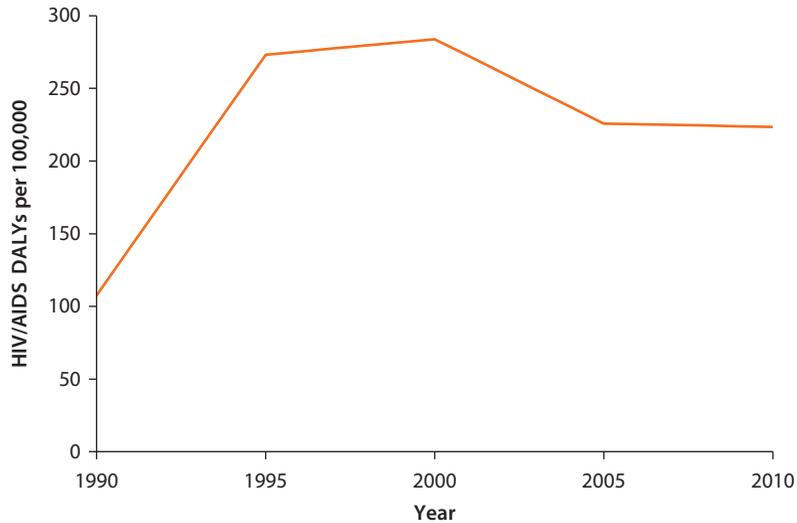
Fernando Lavadenz, Carla Pantanali, and Eliana Zeballos
with Nashira Calvo, Lais Miachon, and Verónica Osorio

Introduction

HIV/AIDS is the fourth leading cause of Argentina's burden of disease (BoD) among communicable, maternal, neonatal, and nutritional disorders,¹ a category that accounts for almost 13 percent of total disability-adjusted life years (DALYs). Between 1990 and 2000, there was a 164 percent increase in the HIV/AIDS burden in Argentina.² At the peak of the epidemic, in 2000, HIV/AIDS accounted for 1.01 percent of total DALYs (equivalent to 104,818 DALYs and 283 DALYs per 100,000 people), followed by a 21 percent decrease between 2000 and 2010 (figure 7.1).

In 1990, as described in the first chapter, the Argentine government declared its commitment to fighting HIV/AIDS with the adoption of the National AIDS Law 23798. In 1997, the National HIV/AIDS Program began to expand significantly, introducing a comprehensive set of six key delivery solutions: (a) universal access to modern antiretroviral treatment (ART); (b) HIV/AIDS prevention and health promotion, including public policies such as reproductive health education at schools to reduce the negative impacts of social determinants on health; (c) comprehensive epidemiological surveillance and health monitoring systems; (d) clinical governance and high-quality program monitoring, including well-defined protocols and quality reviews of the treatment system; (e) an online supply and medicine tracking and monitoring system; and (f) social mobilizations and enactment of laws that protect people living with HIV/AIDS to create a legal human rights framework for preventing and fighting AIDS, including the 2010 law allowing same-sex marriage and the 2012 Gender Identity Law.³

Over the past five years, the government has improved and innovated the HIV/AIDS program by adding two service solutions: (a) an online monitoring

Figure 7.1 Burden of HIV/AIDS in Argentina, 1990–2010

Source: IHME 2013.

Note: DALY = disability-adjusted life year.

system that tracks efficient use and distribution of HIV/AIDS medicines and supplies, and (b) results-based financing applied to an output-based system, which encourages intermediate results while improving efficiency and expanding preventive and quality health care services.

As a result of these efforts, Argentina reduced HIV incidence by 25 percent and attained control over the epidemic (National Ministry of Health [MSN] 2012, 2013). Furthermore, the HIV/AIDS BoD in Argentina decreased by 21 percent between 2000 and 2010 (a reduction equivalent to 14,467 DALYs), constituting the second highest reduction in South America during that time-frame, after Peru (Institute for Health Metrics and Evaluation [IHME] 2013). In 2000, Peru had an HIV/AIDS BoD 2.8 times higher than Argentina (794 compared with 284 DALYs per 100,000 people), which likely contributed to a sharper decline. Similar to infant mortality, the lower the burden is, the more difficult it is to reduce further the burden of HIV/AIDS. Argentina also appears among the countries with the lowest burden in 2010 after Chile (figure 7.2).⁴ Although Chile still has the lowest burden in South America, its HIV/AIDS BoD increased during the period analyzed. This may be because Chile gradually introduced universal access to treatment, unlike Argentina's simultaneous rollout of large-scale universal and comprehensive HIV interventions.

Argentina's expenditures on HIV/AIDS per DALY in 2009–11 were the third highest in the region after Cuba and Chile. While the average HIV/AIDS expenditure per DALY in Latin America and the Caribbean (LAC) between 2009 and 2011 was nearly US\$1,052, in Argentina it was US\$3,178, almost three times larger. Similar results are found when averaging expenditure per deaths caused by AIDS and HIV incidence.

This chapter aims to assess whether the benefits derived from the reduction of Argentina’s HIV/AIDS burden between 2001 and 2010 outweigh the total costs of the HIV/AIDS program during the same timeframe. We use a cost-benefit analysis (CBA) framework to determine whether the country’s expenditures are consistent with its HIV BoD reduction (i.e., cost-beneficial), and whether or not the National HIV/AIDS Program should maintain current spending levels.

The next section describes the methodology of the CBA and the estimation of benefits and costs per DALY. The following section presents the results, and the final section presents conclusions.

Cost-Benefit Analysis

CBA judges an intervention to be cost-beneficial if the present value of all benefits exceeds the present value of all costs. CBA can be reduced to a simple formula, where discounted benefits are compared against discounted costs. The benefit-to-cost ratio is calculated as economic benefits divided

Figure 7.2 HIV/AIDS in South America

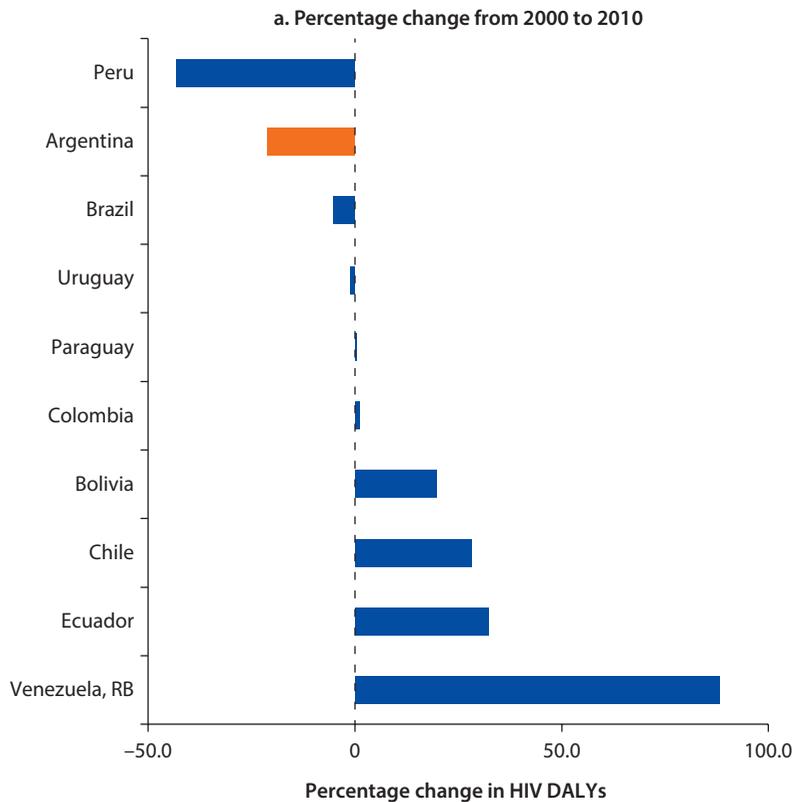
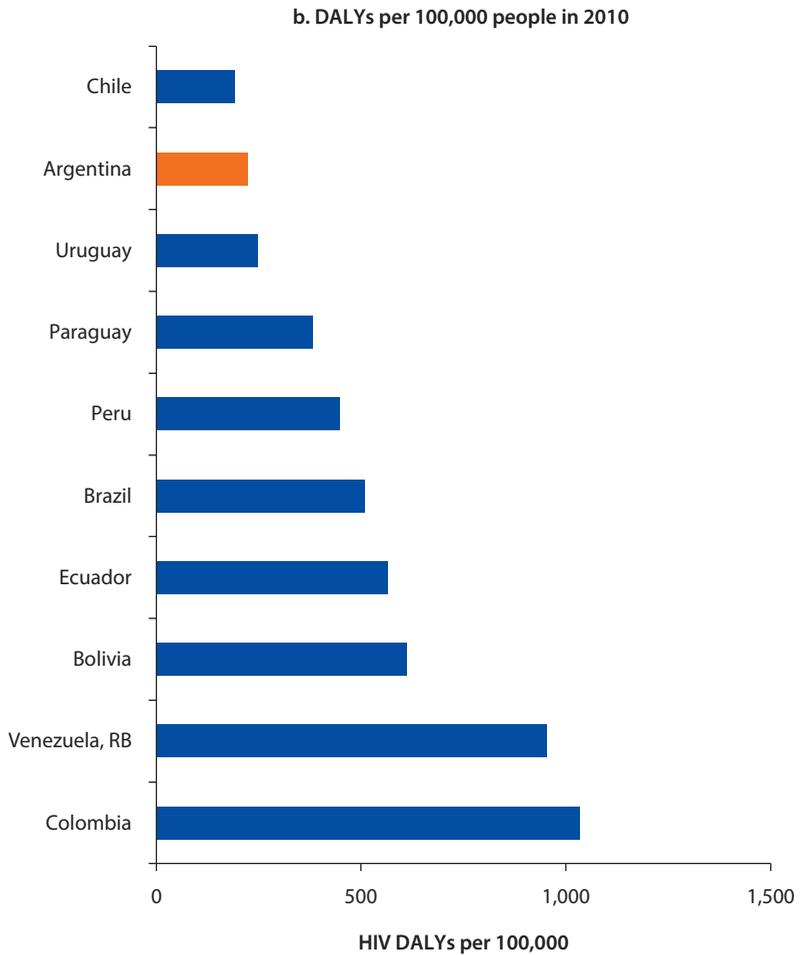


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Figure 7.2 HIV/AIDS in South America (continued)



Source: IHME 2013.
 Note: DALY = disability-adjusted life year.

by economic net costs of the intervention and it is expressed in relative terms as follows:

$$B/C = \frac{\sum_{i=0}^n B_i(1+i)^n}{\sum_{i=0}^n C_i(1+i)^n}$$

where B_i are the benefits in each year, C_i are the yearly estimated costs, n is the number of periods, and i is the interest rate.

As expressed by the benefit-to-cost ratio formula, all relevant costs and benefits are brought to a common temporal footing using time value of money

calculations. Instead of discounting the benefit and cost values to 2001, we compound them to use 2010 as the reference year. Mercosur guidelines for economic evaluation of health programs recommend standardizing the discount rates at three to five percent (MSN 2009); thus, we use an interest rate of three percent.

Conducting the CBA involves a two-stage process that is developed in the next two subsections: (a) estimation of the benefits derived from the reduction of the HIV/AIDS burden between 2001 and 2010, using DALYs as the unit of measure, multiplied by the price of a DALY; and (b) estimation of the costs using data from the Ministry of Health of Argentina (MSN) and the Joint United Nations Programme on HIV/AIDS (UNAIDS).

Estimation of Benefits

To calculate the benefits side of the equation, we must find the monetary value of the change in the HIV/AIDS burden between 2001 and 2010, which is measured in DALYs. Conducting a health-related CBA can be difficult because of obvious ethical concerns related to assigning monetary values to health outcomes when dealing with human lives, although the calculation is necessary to estimate benefits.

In this subsection, we discuss three methods that can be used to calculate the price of a DALY from HIV/AIDS: (a) individuals' value, (b) productive capacity, and (c) implicit value.

After obtaining the price of a DALY from HIV/AIDS, we estimate the number of DALYs potentially saved by constructing three counterfactuals based on different epidemiological growth scenarios for the HIV/AIDS epidemic: maximum, intermediate, and minimum. The counterfactuals allow us to compare what would have happened in the absence of a programmatic intervention and the actual values of total DALYs from HIV/AIDS.

Price of a DALY

As ethical concerns make it impossible to put a standard value on a human life, we calculate the Value of a Statistical Life (VSL), a statistical term used in circumstances of saving lives as opposed to taking lives or "producing" lives. VSL is the value that individuals place on a marginal change in their likelihood of death. We consider three methods to estimate the value of a human life, as described by Card and Mooney (1977).

Individuals' Value

Some argue that the value of a life should be self-determined. In that case, the VSL is estimated by simply asking people how much they would be willing to pay for a reduction in the likelihood of death, perhaps by purchasing safety improvements. These types of studies are referred to as stated preference or willingness-to-pay studies. One commonly occurring problem with this method is the hypothetical bias, whereby people tend to overstate the valuation of goods and services, making it very difficult to obtain accurate information for determining

the price of a DALY. Therefore, in this specific case, the individuals' value approach is not ideal.

Productive Capacity

Alternatively, VSL can be calculated based on the productive contributions an individual makes to society, equated to his or her earnings. The average societal production capacity can be equated to gross domestic product (GDP) per capita at the higher end and to the yearly minimum salary and average personal consumption expenditure as a proxy for disposable income at the lower end. Table 7.1 presents a simple average of the value of these options for Africa, LAC, and Argentina.

General Implicit Value

This method operates based on the assumption that health service implicitly places value on lives. VSL is estimated by observing the risks people are voluntarily willing to take and how much they pay for taking them. These types of studies, which look at people's actual choices, are known as revealed preference studies. It is possible to calculate a range of implied values of a life distributed about a mean. Then, it is possible to estimate how much money is spent on a particular disease and divide that by the number of DALYs. Table 7.2 presents average public spending on HIV per DALY from UNAIDS and the average amount of grants committed for HIV/AIDS by the Global Fund to Fight AIDS, Tuberculosis, and Malaria (GFATM). However, using these values in the calculation of benefits can potentially create problems, since this information is also used to calculate costs.

Table 7.1 Productive Capacity

US dollars

<i>Measure</i>	<i>Africa</i>	<i>LAC</i>	<i>Argentina</i>
Yearly minimum salary	1,190	3,977	9,449 ^a
Consumption (PPP) per capita	2,097	7,549	9,600
GDP (PPP) per capita	4,258	11,396	16,062

Sources: IMF 2013; Wageindicator 2014; World Bank.

Note: GDP = gross domestic product; LAC = Latin America and the Caribbean; PPP = purchasing power parity.
a. The yearly minimum salary in Argentina was calculated by multiplying the 2013 monthly minimum wage (Arg\$3,300) by 13 and converting to US\$ using the World Bank's official exchange rate website for the 2009–13 period (Arg\$4.54 per US\$).

Table 7.2 General Implicit Value

US\$ dollars

<i>Measure</i>	<i>Africa</i>	<i>LAC</i>	<i>Argentina</i>
Public expenditure on HIV per DALY	272	1,052	3,178
GFATM—HIV per DALY	7,614	1,565	408

Sources: GFATM; UNAIDS 2012.

Note: DALY = disability-adjusted life year; GFATM = Global Fund to Fight AIDS, Tuberculosis, and Malaria; LAC = Latin America and the Caribbean; UNAIDS = Joint United Nations Programme on HIV/AIDS.

The methodology developed by Brent (2011) uses the revealed preference approach to estimate the price of a DALY, taking into account grant decisions made by GFATM,⁵ which channels 82 percent of the international financing for tuberculosis, 50 percent for malaria, and 21 percent for AIDS. By the end of 2013, GFATM signed US\$15.8 billion in cumulative funding for HIV globally and US\$29,335,432 for Argentina (GFATM). Using information from GFATM, Brent (2011) calculated that the price of a DALY from HIV/AIDS in 2005 in Africa was US\$11,871. We replicated that method for LAC to estimate the price of a DALY from HIV/AIDS in Argentina. According to Brent's theory, the price of a DALY is equal to:

$$P_D = \frac{\partial U / \partial D_i}{\partial U / \partial Y_i} = - \frac{\beta_D}{\beta_Y}$$

where $U = G_i = \beta_0 + \beta_D D_i + \beta_Y Y_i + \beta_Z Z_i + \varepsilon_i$ and equal to the expenditure decisions for grants. The price function is linear in three variables measured in per capita terms (Brent 2011).

This method is based on the performance-based funding principle used by GFATM to allocate resources. According to that principle, GFATM allocates initial funding based on the strength of a country's proposed programs and the magnitude of impact a grant can make in that country. Continued funding is contingent on each country's ability to demonstrate proven results in fighting HIV/AIDS. As such, countries with a large HIV epidemic may not always obtain comparable grants if they are unable to demonstrate the results that were or will be achieved with that money.

In this way, the dependent variable is equal to the total grant amount committed by GFATM to each country over the past 10 years in per capita terms. Since this methodology is guided by GFATM principles, it is important to note that we base calculations on commitments and not on disbursements, which can differ for a variety of reasons beyond the scope of this study. Therefore, we use the cumulative total grant amount committed for HIV/AIDS, tuberculosis, and malaria through 2013 as the dependent variable, for which data are available for 49 African countries and 22 countries in the LAC region.

To obtain the estimated price of a DALY based on income, both DALY and income must appear as independent variables in the estimation equation (i.e., D_i and Y_i respectively). Income is measured in purchasing power parity international dollars; hence Y_i is expressed in the same currency unit for all countries.

To complete the specifications of the independent variables, Z_i equals public spending on HIV using data from UNAIDS for each country in per capita terms. These individual expenditures are thus treated as proxies for determining whether a country is committed to dealing with its domestic HIV/AIDS epidemic.

Table 7.3 Summary Statistics

<i>Statistic</i>	<i>Africa</i>	<i>LAC</i>	<i>Argentina</i>
<i>Global burden of disease</i>			
DALYs per capita—all	0.144	0.013	0.003
DALYs per capita—HIV	0.062	0.010	0.002
DALYs—HIV	1,078,600	96,003	90,351
<i>IMF/HDI (US\$)</i>			
GDP (PPP) per capita	4,258.30	11,396.37	16,061.65
Expenditure on health per capita	136.75	462.94	706.71
<i>GFATM (US\$)</i>			
All grants approved per capita	45.33	13.20	0.92
HIV grants approved per capita	25.51	10.38	0.92
HIV grants approved per DALY	7,614.17	1,564.76	408.43
<i>UNAIDS (US\$)</i>			
Public HIV spending per capita	7.94	4.30	7.14
Public HIV spending per DALY	168.12	815.45	3,169.55
Percentage of international funds for AIDS	46.41	13.03	0.25

Sources: GFATM; IHME 2013; IMF 2013; UNAIDS 2012.

Note: DALY = disability-adjusted life year; GDP = gross domestic product; GFATM = Global Fund to Fight AIDS, Tuberculosis, and Malaria; HDI = Human Development Index; IMF = International Monetary Fund; PPP = purchasing power parity; UNAIDS = Joint United Nations Programme on HIV/AIDS.

In the following analysis, we use information gathered from the Global Burden of Disease, Injuries, and Risk Factors Study (GBD) (IHME 2013), the International Monetary Fund (IMF), GFATM, and UNAIDS. We use data from 2010 for all independent variables and accumulated grants committed until 2013 as the dependent variable. Table 7.3 summarizes the variables used to estimate the value of a DALY (i.e., grants approved for HIV, malaria, and tuberculosis, D_i , Y_i , and Z_i , respectively). We present information for Africa, LAC, and Argentina (Brent 2011).

The burden of HIV/AIDS in Argentina, measured as DALYs per capita, is five times lower than the regional average and 31 times lower than the African average. Nonetheless, while international funds for HIV/AIDS represent 0.25 percent of total expenditures in Argentina, these are approximately 46 percent of total expenditures in Africa and 13 percent in LAC. Public spending on HIV per DALY from HIV is 19 times greater in Argentina than in Africa and about four times greater than the LAC regional average.

Following Brent's (2011) methodology, we run an ordinary least squares (OLS) calculation to estimate the price of a DALY from HIV/AIDS. Since we use grant commitment data from GFATM up to 2013 and the data on all the independent variables are measured as of 2010 or earlier, the OLS estimation technique is suitable in this case.

We present the estimations for the price of HIV for Africa and LAC in table 7.4. Since we use a per capita measure, the estimated price of a DALY is

Table 7.4 Ordinary Least Squares Regression

<i>Variable</i>	<i>Africa</i>	<i>LAC</i>
DALYs per capita—HIV	410.323** (183.26)	1,019.638*** (223.40)
DALYs per capita—tuberculosis	76.949 (1,338.42)	-88.099 (1,579.97)
DALYs per capita—malaria	-73.560 (171.69)	3,272.443 (5,745.79)
GDP (PPP) per capita (\$US)	-0.001 (0.00)	-0.001 (0.00)
Public expenditure on HIV per capita (\$US)	-0.185 (0.41)	1.884 (1.75)
Observations	37	14
R ²	0.22	0.85
Calculated price for a DALY from HIV	18,870.63	9,556.82

Sources: GFATM; IHME 2013; IMF 2013; UNAIDS 2012.

Note: The dependent variable is committed GFATM grants per capita. DALY = disability-adjusted life year; GDP = gross domestic product; GFATM = Global Fund to Fight AIDS, Tuberculosis, and Malaria; LAC = Latin America and the Caribbean; PPP = purchasing power parity; UNAIDS = Joint United Nations Programme on HIV/AIDS.

** $p < 0.5$, *** $p < 0.01$.

also in per capita terms. To monetize this value, we multiply the initial estimated price of a DALY by DALY from HIV per capita.

The results show that the value of an average DALY in LAC is US\$9,557, which is almost half the estimated price in Africa. The difference in the estimation of this implicit value of a DALY between LAC and Africa may be because of two fundamental differences in the calculation of the dependent variable:

- (a) The percentage of HIV spending that comes from GFATM is almost twice as large in Africa as in LAC.
- (b) The DALY per capita caused by HIV is six times higher in Africa than in LAC.

In both cases, the estimated coefficient of D_i is statistically significant at the one percent level and the coefficient of Y_i is negative, as expected (i.e., the richer the country is, the fewer international funds it receives). The regressions were based on data from 37 African countries and 14 LAC countries; some observations may have been lost because of missing data.

Regarding the implicit value calculations, it is important to clarify that this methodology controls for GDP and public spending on HIV/AIDS (i.e., dependent variables). Although Argentina did not receive a significant percentage of HIV/AIDS funds from international sources in recent years, the dependent variables allow control over country-specific characteristics, thus producing a more precise estimation of implicit value. The presented estimated

price accounts for cumulative commitments since 2002 for each country in LAC, including Argentina, which received some funding from GFATM during the period analyzed. Finally, the implicit value of HIV calculated for LAC allows for regionwide comparisons.

DALYs Saved

To estimate the benefits in terms of DALYs saved, we compare actual values with what would have happened in the absence of any interventions. To do so, it is necessary to predict the number of DALYs during the past decade, using different trends to simulate the first two stages of the HIV/AIDS epidemic, as presented by Levin, Bull, and Steward (2001). The two stages are as follows: (a) during the first years of contact between HIV and a human population, the epidemic is driven by early transmissions that possibly occur before donors seroconvert to HIV-positive status; and (b) the number of new HIV infections in any given subpopulation may decline or stabilize because of the saturation of the susceptible hosts rather than because of the natural evolution of the virus or the efficacy of public health measures.

The first trend we construct shows what would have happened if the HIV/AIDS pandemic had remained in the first stage (i.e., high rate of attack and expansion of the epidemic without any intervention). We use data from 1990 to 1995, when the increasing rate was 12,011 DALYs per year (Delta 1). We calculate the logarithmic growth rate for the first trend. The second trend shows the transition from stage 1 to stage 2 (i.e., lower rate of attack, first interventions implemented, 1997). We use data from 1995 to 2000, when the BoD increased by 1,923 DALYs per year (Delta 2). Finally, a third trend simulates the second stage when there is complete saturation or stabilization of the epidemic, assuming that no additional interventions took place. The increasing rate in this case (Delta 3) was calculated so that the rate of decline from the first to the second trend is equal to that from the second to the third trend, as follows:

$$\frac{(\text{Delta}2 - \text{Delta}1)}{\text{Delta}1} = \frac{(\text{Delta}3 - \text{Delta}2)}{\text{Delta}2}$$

where the BOD increased by 308 DALYs per year.

Figure 7.3, panel a, shows the total number of DALYs, deaths, years of life lost (YLLs), and years lived with disability (YLDs) in Argentina between 1990 and 2010. Three clear trends can be identified: (a) rapid expansion of the epidemic before 1995, (b) decline in expansion of the epidemic between 1995 and 2000, and (c) decline in burden of HIV after 2000—the data point that is closest in time to the start of large-scale HIV interventions in Argentina. Figure 7.3, panel b, shows the three trend lines calculated with predicted values for DALYs. Hereafter, we will refer to these trends as cases 1, 2, and 3, respectively.

Estimated DALYs saved from 2001 to 2010 are calculated by accounting for the difference between the calculated trends (shown in figure 7.3,

panel b) and the actual value of total DALYs for every year during the period 2001–10.

Table 7.5 shows the potential total DALYs, deaths, YLDs, and YLLs saved in 2001 and 2010, and the total amount during the past decade in Argentina. DALYs saved are calculated using the three trends presented and deaths, YLDs and YLLs are calculated using the second trend (case 2).

Estimated Benefits

Benefits result from multiplying the amount of DALYs potentially saved by their price. Table 7.6 presents the current benefits in 2010 using the second and third methods to calculate the value of a DALY under the three epidemiological scenarios.

Estimation of Costs

According to UNAIDS, the total 2009 HIV expenditure in Argentina was US\$287,100,480, following an upward trend since 2005. As Argentina’s yearly

Figure 7.3 Predicted Burden of HIV/AIDS, 1990–2010

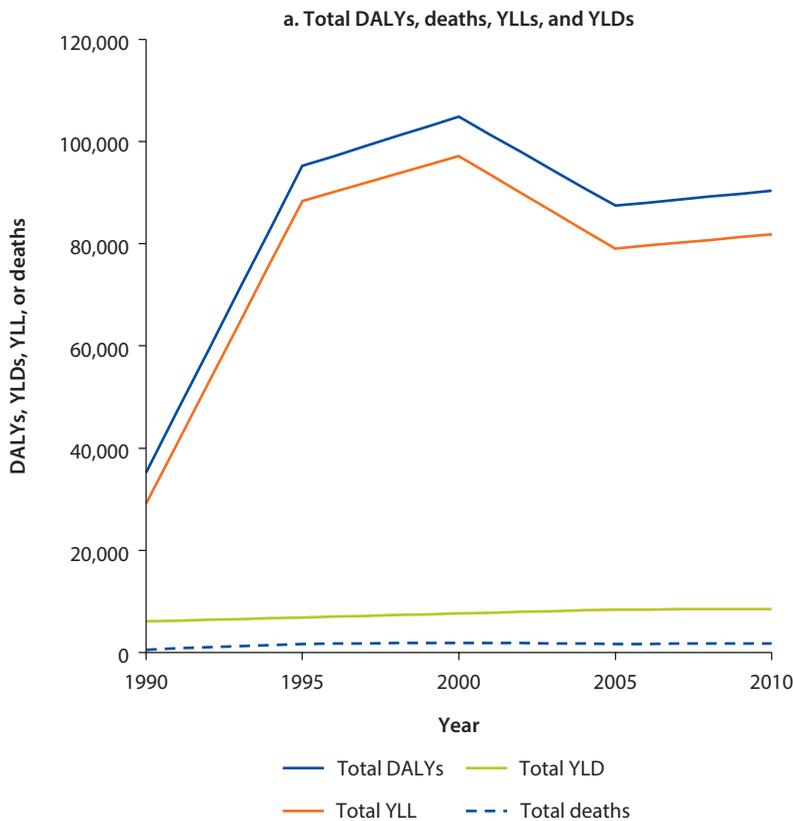
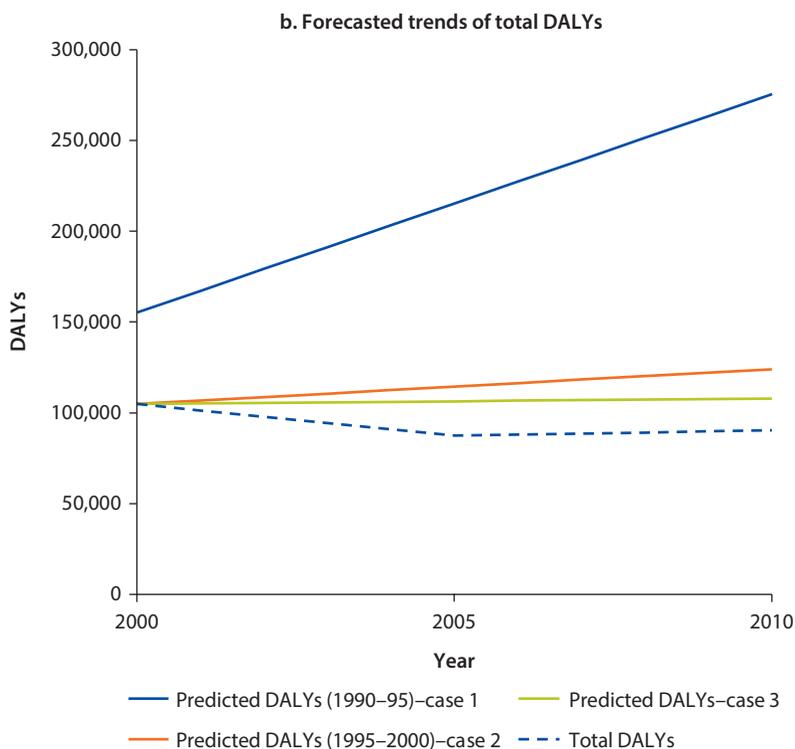


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Figure 7.3 Predicted Burden of HIV/AIDS, 1990–2010 (continued)

Source: IHME 2013.

Note: DALY = disability-adjusted life year; YLDs = years lived with disability; YLLs = years of life lost.

Table 7.5 Potential Years Saved, 2001–10

Measure	2001	2010	Average	Total
DALYs potentially saved (case 1)	65,928	185,023	129,532	1,295,320
DALYs potentially saved (case 2)	5,398	33,698	23,604	236,044
DALYs potentially saved (case 3)	3,783	17,546	14,721	147,209
Deaths potentially saved (case 1)	1,124	3,204	2,232	22,324
Deaths potentially saved (case 2)	98	640	438	4,379
Deaths potentially saved (case 3)	60	255	226	2,258
YLDs potentially saved	0	667	200	2,003
YLLs potentially saved	5,398	33,031	23,404	234,038

Source: Authors' calculations.

Note: DALY = disability-adjusted life year; YLDs = years lived with disability; YLLs = years of life lost.

total HIV spending is not available for each of the years analyzed,⁶ we constructed a fitted line to calculate costs (figure 7.4).

According to the estimations, total HIV expenditure in 2000 was US\$177 million, and reached an estimated US\$330 million in 2010—an increase of 85.6 percent during the period.

Table 7.6 Benefits in Argentina, 2010

US dollars

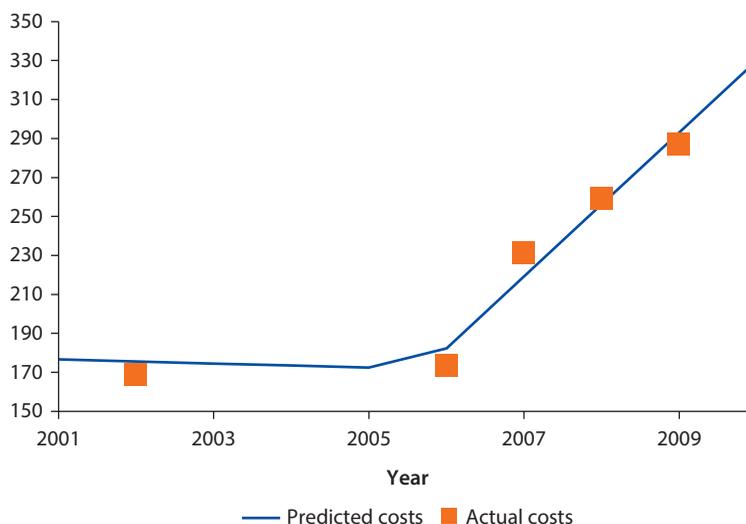
Measure	Case 1	Case 2	Case 3
Second methodology			
Yearly minimum salary	1,748,282,327	318,412,416	148,519,376
Consumption (PPP) per capita	1,776,220,800	323,497,664	150,891,344
GDP (PPP) per capita	2,971,839,426	541,245,376	252,456,960
Third methodology			
Estimated price for a DALY from HIV	1,768,231,507	322,045,664	150,214,064

Source: Authors' calculations.

Note: DALY = disability-adjusted life year; GDP = gross domestic product; PPP = purchasing power parity.

Figure 7.4 Estimated Costs of HIV Spending in Argentina, 2001–10

US\$ millions

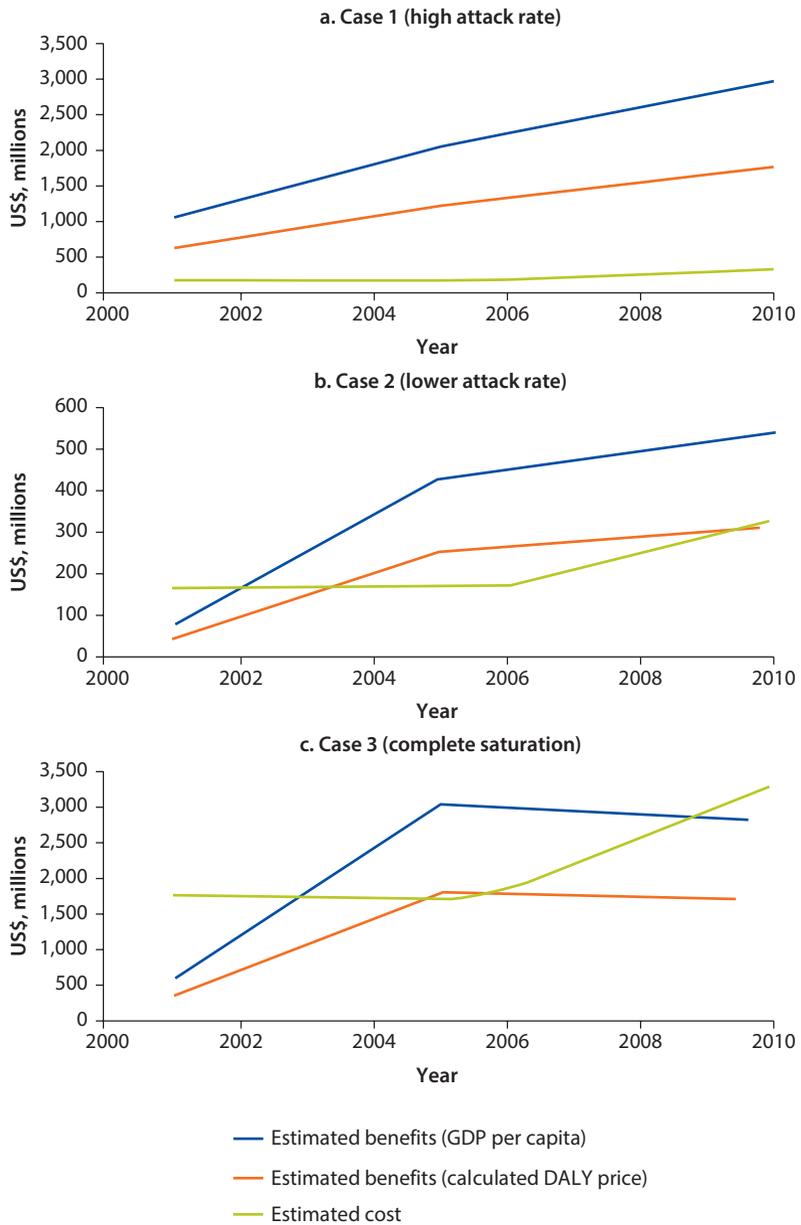


Sources: Authors' calculations based on UNAIDS 2011, 2012; Valeria and others 2000.

Results

The estimated benefits and costs in each of the three scenarios discussed are presented in figure 7.5. Figure 7.5, panel a, shows the estimated benefits using case 1 (i.e., high attack rate and expansion of the epidemic without intervention). The dashed line is calculated using GDP per capita as the price of a DALY and the solid line is estimated using the price of a DALY from HIV/AIDS for the LAC region. Figure 7.5, panel b, shows the estimated benefits using case 2 (i.e., a lower rate of attack or an intermediate epidemiologic scenario). Figure 7.5, panel c, shows the estimated benefits using case 3 (i.e., complete saturation or an epidemic control situation).

Figure 7.5 Benefits and Costs in Argentina, 2000–10



Source: Authors' calculations.
 Note: DALY = disability-adjusted life year; GDP = gross domestic product.

When considering the graph of a CBA, a net benefit occurs if the area between benefits and costs where benefits surpass costs is greater than the area where costs surpass benefits. Figure 7.5, panels a and b, shows that using cases 1 and 2 to price a DALY yields a benefit-to-cost ratio higher than 1.

Compounded benefits from 2001 to 2010 were calculated using the estimated price of a DALY for LAC in 2010 and the GDP per capita in

Table 7.7 Cost-Benefit Analysis from 2001 to 2010 in Argentina*US\$ millions*

<i>Measure</i>	<i>Price of a DALY</i>	<i>GDP per capita</i>
Compounded estimated benefits	2,503.38	4,207.40
Compounded estimated costs	2,423.48	2,423.48
Net average benefits	79.91	1,783.92
Benefit-cost ratio (case 1)	5.71	9.60
Benefit-cost ratio (case 2)	1.03	1.74
Benefit-cost ratio (case 3)	0.65	1.09

Source: Authors' calculations.*Note:* DALY = disability-adjusted life year; GDP = gross domestic product.

Argentina. We also calculated compounded costs using the estimated costs during this period and obtained a net benefit and a benefit-to-cost ratio of 1.03 and 1.74, respectively (case 2).⁷ Similarly, case 1 produces very high benefit-to-cost ratios (5.71 and 9.60). These ratios are similar to estimated returns on investment in health for low-income countries (Jamison and others 2013) and are consistent with the visual analysis. In the case 3, we obtain a net cost using the price of a DALY and the net benefit using GDP per capita, with benefit-to-cost ratios of 0.65 and 1.09, respectively (table 7.7). In short, these results suggest that the HIV/AIDS health programs implemented in Argentina during the past decade had an overall net benefit.

Conclusion

As a result of the implementation and expansion of a comprehensive and evidence-based program to reduce the HIV/AIDS epidemic in Argentina, which includes state of the art universal access to treatment, prevention, and health surveillance, the HIV/AIDS burden has declined by 21 percent in Argentina since 1997. This reduction is the second highest in South America and is estimated to have saved 4,379 lives during the past decade under a conservative scenario (case 2), 22,324 lives under case 1, and 2,258 lives under case 3. Although Argentina's expenditures on HIV/AIDS per DALY were the third highest in the region, our calculations show the state saved more than US\$748 million from 2001 to 2010 in addition to potentially preventing 236,044 DALYs over the 10 years analyzed under the intermediate scenario (table 7.5, case 2).⁸

The main objective of this chapter was to assess whether the benefits derived from the reduction of Argentina's HIV/AIDS burden between 2001 and 2010 outweigh the total costs of the HIV/AIDS program during the same period of time. We conducted a CBA to determine whether Argentina's level of expenditure is consistent with its HIV burden reduction and whether Argentina should maintain current spending on its HIV/AIDS program. In the

process, three methods to price a DALY from HIV were used: (a) individuals' value, (b) productive capacity, and (c) implicit value. Because of severe measurement difficulties, we discarded the first method and focused on the remaining two. For the productive capacity method, we used Argentina's GDP per capita as the price of a DALY. For the implicit value method, we estimated the price of a DALY from HIV/AIDS for LAC using the methodology presented by Brent (2011).

After obtaining the price of a DALY from HIV/AIDS using these two methods, we estimated the number of DALYs potentially saved. This was done with counterfactuals based on three epidemiological growth scenarios for the HIV/AIDS epidemic: maximum, intermediate, and minimum. The counterfactuals allow us to compare what would have happened in the absence of a programmatic intervention during the time period in Argentina with the actual values of total DALYs from HIV/AIDS.

The results show a net benefit when using GDP per capita as the value of a DALY under the three counterfactuals considered. This results in a benefit-to-cost ratio of 9.6 for case 1, 1.74 for case 2, and 1.09 for case 3. When using the implicit value method to calculate the price of a DALY from HIV/AIDS in LAC, we obtain a net benefit in the first two cases and a net cost in the last case. The benefit-to-cost ratios are 5.71 for case 1, 1.03 for case 2, and 0.65 for case 3 (table 7.7).

The first case (i.e., high rate of attack) likely overestimates the benefits for two reasons: (a) there was possible underreporting before the implementation of the HIV/AIDS program in Argentina; and (b) it is unlikely that DALYs from HIV in Argentina would have continued growing at the same high rate because of implicit epidemiological saturation of cases in the population affected, since Argentina had a concentrated HIV/AIDS epidemic, which is not the case in other parts of the world. The third case (i.e., complete saturation of the epidemic) likely underestimates the benefits, since it is unlikely that the HIV epidemic would have reached complete saturation in the affected population in such a short period of time in the absence of interventions (MSN 2012, 2013). The second case (i.e., lower rate of attack) presents a counterfactual that is closest to a natural evolution of the HIV/AIDS trend given no interventions, and includes a lower rate of attack because of the partial saturation of the epidemic.

As long as the benefits outweigh the costs of further reducing the HIV burden, HIV/AIDS health policies should continue to be implemented. We conclude that HIV/AIDS interventions in Argentina were worthwhile, since the present value of all benefits exceeds the present value of all costs under the scenarios analyzed. In particular, the CBA for case 2 shows evidence that the country should maintain and expand the National HIV/AIDS Program while simultaneously seeking savings and more programmatic efficiencies. Argentina's current program is continuing to reduce the epidemic, especially with the introduction of universal access to prevention and treatment, which have the potential to further reduce the HIV/AIDS burden.

Notes

1. Murray and others (2012) divide the BOD into three main categories: (a) communicable, maternal, neonatal, and nutritional disorders; (b) noncommunicable diseases; and (c) injuries.
2. The largest increase experienced was between 1990 and 1995 (154 percent). However, data from 1990 may be underestimated because of misreporting of HIV/AIDS cases and therefore this increment may be overestimated.
3. Argentina passed a law allowing same-sex marriage in 2010, becoming the first country in LAC and the second in the Americas to allow same-sex marriage.
4. Although Guyana is not an island, it is considered part of the Anglophone Caribbean and therefore is not included in the analysis.
5. GFATM was established in January 2002 and soon became the main multilateral funder in global health. It assists in the fight against AIDS, tuberculosis, and malaria, working with partners to support the most effective prevention and treatment. It also funds health systems, as inadequate health systems are one of the main obstacles to scaling up interventions to secure better health outcomes for HIV, tuberculosis, and malaria.
6. Argentina's total HIV spending is available for years 2000, 2002, 2006, 2007, 2008, and 2009.
7. For these calculations, we use the formula and information presented in the second section of the chapter.
8. This is calculated by multiplying the potential DALYs saved by the cost per DALY in 2010.

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Conclusions

Over the past 30 years, HIV/AIDS has joined the selected group of the world's health threats that challenge and will continue to challenge humanity. Almost three decades after the first case of HIV/AIDS, the disease continues to be the fifth leading cause of global disability-adjusted life years (DALYs). However, the past decade has seen significant efforts to reduce the HIV/AIDS burden in many countries in the Latin America and Caribbean (LAC) region, resulting in the highest regional reduction of HIV/AIDS in the world. Although rates are decreasing in LAC, Sub-Saharan Africa, the European Union, and European Free Trade Association countries, the incidence of HIV/AIDS is increasing in the rest of the world. Despite the improvement the LAC region has made, from being the region with the second highest HIV/AIDS burden in the world in 2000 to being the region with the fourth highest HIV/AIDS burden in 2010, the epidemic remains heterogeneous within LAC.

Thirty years after its first case, Argentina is currently among the five countries in LAC with the lowest HIV incidence and prevalence rates; HIV incidence decreased by 25 percent from 2001 to 2011. Moreover, the burden of HIV/AIDS in Argentina declined by 21 percent from 2000 to 2010, when it reached the second lowest reduction in burden in South America.

Throughout the studies compiled in this report, we have presented a comprehensive analysis of the HIV/AIDS response in Argentina during the past 30 years, including an analysis of the financial and programmatic policies of the past decade. We presented up-to-date information on the HIV/AIDS epidemiological situation, as well as a chronological account of key strategies, public policies, and laws implemented in response to the epidemic since 1990. Moreover, we analyzed the HIV/AIDS burden of disease (BoD) in Argentina, comparing it with other economies in and outside LAC, and providing BoD analysis at the subnational level to show current provincial differences, inequalities, and trends.

We also presented an analysis of the comparison between the supply of services surveys completed by the Argentine government in 2007 and 2011. And an analysis of the demand-side factors of HIV/AIDS identified Argentina's priority

HIV high-risk group, leading demand-side risk factors, and demand-side challenges.

At the financial level, we conducted an economic and financial analysis of the National HIV/AIDS Program in Argentina and cross-country comparisons of HIV spending performances that explore the viability and sustainability of the National HIV/AIDS Program over time. Finally, we presented a cost-benefit analysis (CBA) to assess whether the benefits derived from the reduction in the HIV/AIDS burden from 2001 to 2010 outweighed the total costs of Argentina's National HIV/AIDS Program.

In the following paragraphs, we highlight the key innovations and strengths of the National HIV/AIDS Program, as well as key challenges that are yet to be tackled.

Key Advances

Argentina is a world leader on HIV/AIDS. In the past 30 years, and particularly during the past 10 years, Argentina has been a leader in the fight against HIV/AIDS, outperforming several other economies with similar HIV/AIDS burden in and outside LAC. Argentina has made continued innovations in the legal framework to reduce stigma and improve human rights, as well as innovations in the quality and service delivery of the National HIV/AIDS Program, making it possible to reduce an already low-level HIV/AIDS epidemic.

Argentina has substantially reduced its HIV/AIDS burden in the past 10 years. Argentina has the second lowest HIV/AIDS burden in South America after Chile, with 2.9 percent of the total regional HIV/AIDS DALYs, equivalent to 223 DALYs per 100,000 in 2010. This is less than half the regional average of 519 HIV/AIDS DALYs per 100,000. Colombia, a country with a similar gross domestic product (GDP) and population size, has 15.7 percent of the region's total HIV/AIDS burden in DALYs. In addition, while Chile showed a 28 percent increase in the HIV/AIDS burden from 2000 to 2010, Argentina further reduced its already low burden by 21.2 percent, the seventh largest reduction in LAC during that time. Between 2000 and 2010, the HIV incidence rate (identified cases) decreased by 25 percent. In addition, Argentina reduced the mother-to-child vertical transmission rate from 13.7 per 100,000 live births in 2000 to 5.2 in 2011, a reduction of almost 62 percent. Currently, there are an estimated 110,000 people living with HIV/AIDS (PLWHA), and approximately 5,500 new HIV cases per year or 15 new cases per day.

Argentina and Brazil have provided evidence that universal access to treatment with financial protection for the poorest is a key intervention for prevention. Over the past 20 years, Argentina has felt the impact of the HIV/AIDS epidemic, with HIV cases increasing from 1,000 in 1990 to 4,223 in 1997, and peaking at more than 6,700 new infections per year in 2004. Despite the exponential growth of new HIV cases, early financial coverage of antiretroviral treatment (ART), beginning in 1997, has been essential in keeping the number of AIDS cases under control. Argentina has shown that free provision of HIV

treatment can help reduce the number of new infections, and Brazil and Argentina have shown that universal access to HIV/AIDS treatment with financial protection from the state to those affected and in need is a key to reducing the HIV/AIDS burden. Argentina nearly achieved universal coverage of ART in 2012, with 79 percent coverage (universal coverage on HIV/AIDS was defined by the World Health Organization [WHO] as over 80 percent ART coverage). Both countries made an early decision to convert HIV/AIDS access to treatment to a public good, creating evidence of success.

Argentina has shown that a comprehensive legal framework for sexual and reproductive rights matters for reducing stigma and discrimination. Although Argentina did not have a sexual and reproductive family health program until 2002, the country has gone from being one of the most backward countries in LAC regarding sexual and reproductive rights to becoming a leader in the field during the past decade. In 2002, the law on Sexual Health and Responsible Parenthood (Law 25673) mandated the provision of contraceptive methods and free family planning counseling in primary health care centers and public hospitals. In 2010, the Marriage Equality Law (26618) recognized unions between persons of the same sex. And most recently, in 2012, the Gender Identity Law (26743) allowed transgender and transsexual persons, who carry a disproportionate burden of HIV/AIDS in the country (34 percent HIV prevalence among transgender people in Argentina) to change their gender. This new legal framework has created a positive environment for human and sexual rights, and built acceptability and a mandate in the society to reduce stigma and discrimination that prevents diverse populations from accessing health services.

Argentina has an effective and comprehensive sex education program in schools to improve prevention knowledge among the youth. In 2006, another law (26150) established the creation of the National Comprehensive Sexual Education Program, which is part of the federal and state school curricula across the country and seeks to expand knowledge on safe sexual practices. Since the passage of this law, Argentina implemented a renovated sexual health education program in public schools. Recently, a Pan American Health Organization (PAHO)/WHO evaluation showed that Argentine youth have the highest knowledge about HIV transmission and prevention in the region, with 84 percent of young men and 89 percent of young women (ages 15–24) accurately identifying prevention methods and major misconceptions about HIV transmission, followed by Chile with 78 and 85 percent of young men and women, respectively.

Argentina has transformed the HIV/AIDS health care line. By considering the demand and supply sides, the country has made health care more efficient, of higher quality, and with better governance than it had been before.

On the demand side, Argentina developed a comprehensive prevention policy for HIV/AIDS with four key measures: (a) inclusion of sexual and reproductive health education in schools nationwide, (b) media campaigns with national and external financing, (c) use of a 0–800 confidential helpline phone, and (d) widespread distribution of condoms. The data gathered in the study through

surveys showed a substantial increase in the procurement and distribution of condoms throughout the country, as well as the installation of fixed delivery points that ensured systematic distribution and improved accessibility. The distribution of condoms increased 250 percent over four years, jumping from 8,550,780 units distributed in 2007 to 29,841,880 in 2011. The main condom supplier in 2007 was the Global Fund to Fight AIDS, Tuberculosis, and Malaria (GFATM), which funded the purchase of approximately 50 percent of the condoms distributed. By 2011, 100 percent of jurisdictions received condoms financed by the National HIV/AIDS and STDs Office (Dirección de SIDA y ETS [DSyETS]), and 41.2 percent also received condoms from the National Program for Sexual and Reproductive Health. Currently, 81 percent of males and females ages 15–65 report having used a condom during their last intercourse with a casual partner.

There has also been an increase in communication materials, including print as well as audiovisual and other promotional materials. The 34 jurisdictions and 18 municipal programs reported having used the 0–800 HIV/AIDS helpline, and a large majority of them had consulted the DSyETS website.

On the supply side, Argentina has used surveys for strategic planning and evaluation of the health delivery model. Argentina conducted two surveys of the supply of services, in 2007 and 2011. The use of surveys for evaluating current status and informing strategic planning is a good practice. The comparison study of the results from the supply of services surveys shows that 90 percent of National HIV/AIDS Program heads reported an improvement in the supply of and access to preventive, diagnostic, and health care services for PLWHA between 2007 and 2011. In addition, jurisdictions and providers demonstrated a greater commitment to the creation of dedicated budgets for purchasing preventive and diagnostic supplies. Furthermore, the study observed some positive signs of improvement in the care of PLWHA (such as greater availability of testing for monitoring disease progression, ART medications, infant formula, lactation inhibitors, and pill and syrup form zidovudine [AZT]).

Argentina formed strategic alliances in service delivery, which helped to reduce mother-to-child transmission. Argentina has reduced its mother-to-child transmission rate by 62 percent, from 13.7 per 100,000 live births in 2000 to 5.2 in 2011. This success was possible thanks to (a) a strategic alliance with the safe blood program, creating a comprehensive system for integrated prenatal testing of HIV/AIDS, sexually transmitted diseases, and other diseases, and (b) a strategic alliance with the public health surveillance system for the creation of epidemiological monitoring of health events for seropositive pregnant women and to analyze related data.

Argentina has proved that incentives and results-based financing (RBF) can boost the effectiveness of HIV/AIDS programs. The use of RBF by the National HIV/AIDS Program has increased overall systemic accountability and improved program performance. Under the Essential Public Health Functions Project (EPHFP), a package of guaranteed public health services was created with the use of RBF in six public health programs for the

following conditions: vaccine preventable diseases, vector-borne diseases, tuberculosis (TB), noncommunicable diseases, blood services, and HIV/AIDS. In each of the programs, intermediate results were identified as outputs. In the case of the National HIV/AIDS Program, a third-party external auditor verifies the completion of six outputs prior to authorizing payments to provinces. The use of RBF has since been expanded, and the use of outputs has been consolidated throughout the country.

Online monitoring systems for HIV/AIDS supplies can eliminate duplication and boost efficiency. In 2009, the Ministry of Health (MSN) introduced an online monitoring system that tracks the use and distribution of HIV/AIDS supplies. The system was designed to avoid loss and duplication of HIV/AIDS medications and supplies and to improve efficiency in the logistics of procurement, shipment, and accountability. Currently, implementation of the online monitoring system has been extended to half the country's provinces.

Clinical governance systems have increased the quality of health service provision. The National HIV/AIDS Program developed and implemented a patient case-management system. The system allows for online registration of patients, online requests for authorizations, monitoring of patients' viral load and other tests, as well as monitoring of drug regimens and treatment protocols. The case-management software introduced in 2011 allows for assessment of treatment quality, adherence, and resistance to treatment. All provinces are linked into the system, which, by the end of 2012, included more than 30,000 patients. The HIV monitoring system for patients increased the efficiency of prescription and delivery of ART, as well as patient follow-up. The system is supported by EPHFP.

The costs of Argentina's National HIV/AIDS Program are higher than the average for LAC, but the program is cost-beneficial and the savings are remarkable. HIV/AIDS expenditures per DALY in Argentina were the third highest in the region after Cuba and Chile (2009–11). Argentina spends US\$3,178 per DALY, with domestic spending in 2012 of US\$285.95 million, which was less than in 2009 when it was US\$287.1 million. A cross-country comparison of HIV spending showed that Argentina's spending is comparatively high, but it is the only country among countries with comparable HIV/AIDS spending that had a significant reduction in HIV/AIDS burden from 2000 to 2010, while having a relatively low HIV/AIDS burden.

A CBA that used GDP per capita as the value of a DALY was done under three counterfactuals (i.e., high rate of attack, low rate of attack, and complete saturation of the epidemic). When the analysis used the implicit value method to calculate the price of a DALY of HIV/AIDS in LAC, a net benefit was obtained in the first two counterfactuals and a net cost in the last. The analysis leads to the conclusion that the government saved more than US\$748 million between 2001 and 2010, in addition to preventing as many as 236,044 DALYs over the 10 years analyzed under the conservative scenario. The DALYs prevented represent 4,379 lives saved under the most likely epidemiological scenario (approximately 440 lives per year). This is a direct consequence of all

the measures implemented as part of the National HIV/AIDS Program for combating the HIV/AIDS epidemic.

Challenges

Despite the positive strides Argentina has made, there are still areas that need improvement and upcoming challenges that must be addressed to sustain the decline in the HIV/AIDS burden and achieve the new goals for universal health coverage defined by the region: 90/90/90 (90 percent of people with HIV diagnosed, 90 percent of those treated, and 90 percent of patients treated being virally suppressed). In the following, we describe the key challenges.

Argentina needs to reduce subnational inequalities. From 2001 to 2012, the provinces with the most HIV cases were Buenos Aires, with 42.8 percent of the cases, followed by the Autonomous City of Buenos Aires, with 16.7 percent; Córdoba, with 7.9 percent; and Santa Fe, with 5.5 percent. At the provincial level, the burden of HIV/AIDS varies from 12 DALYs per 100,000 inhabitants in Catamarca to 433 and 444 per 100,000 in Salta (Northwest region [NOA]) and Tierra del Fuego (Patagonia Region), respectively, with a national average of 194 per 100,000 in 2010. There are two tendencies that should be considered: the increase in incidence and BoD in most provinces, with the exception of Buenos Aires and the Autonomous City of Buenos Aires, and the continued reduction of BoD and incidence in both provinces. Using current information, there is a need to revisit the focus of reduction in the most affected provinces with a greater burden of DALYs per 100,000, and reinforce prevention and treatment efforts across all provinces.

Knowledge about the use of condoms is not sufficient as prevention. There is a need to consider other key factors for improving behavioral change. Although young people in Argentina report some of the highest knowledge on HIV prevention in LAC, this knowledge does not seem to be translated into a practice of prevention among young males, given that 41.1 percent of new HIV infections among males between 2010 and 2012 occurred through same-sex intercourse and 47.9 percent through sex with women. Therefore, there is a need for renewed and better targeted HIV prevention efforts. For instance, we found that younger and more educated Argentines are most likely to use condoms when engaging in sexual intercourse. Although binge drinking is positively correlated with condom use for men and women, we found that habitual alcohol consumption negatively relates to condom use among men (but not among women). Moreover, men are more likely to use condoms with casual partners, although having multiple sexual partners does not reduce the risk of HIV infection. Although individual behavior change is central to improving sexual health, there is a need to address broader social determinants and risk factors of safe sexual behavior, including but not limited to the use of condoms. In this area, further research is needed.

In particular, behavioral interventions should be linked to specific social determinants. Our results reaffirm the need for behavioral interventions tailored to

the social, economic, and behavioral characteristics of the groups at highest risk of HIV infection. Behavioral interventions have shown there is no approach to sexual and reproductive health education that will perfectly meet the needs of each high-risk population and country. Therefore, when implementing individual-level programs to promote safe sex, interventions should be comprehensive and consider the social context. This will ultimately help to modify social norms to support behavior change and tackle structural factors that contribute to risky sexual behavior. Although education plays an important role in behavioral change, it is important to consider the content of HIV/AIDS prevention education, in addition to the number of years of schooling. In Argentina, education programs must be adapted toward the more educated groups who are at higher risk of HIV infection.

Although Argentina has developed a comprehensive legal framework for reducing stigma and discrimination, there is a need to continue measuring, evaluating, and monitoring stigma against the lesbian, gay, bisexual, transvestite, and transsexual population in health facilities. The 2011 survey showed that discriminatory attitudes toward HIV/AIDS patients persist throughout the health personnel of some hospitals and provinces. Ensuring that there is zero discrimination in health facilities is the first step to combat inequitable access to health services for the priority populations. More research, monitoring, and education of selected health personnel is needed in the health facilities and provinces.

Argentina needs to restructure prevention to address the masculinization of the epidemic. The male-to-female ratio of new HIV infections increased from 1.8 in 2001 to 2.0 in 2011. While in many countries the male-to-female ratio of HIV prevalence has been declining over recent years, in Argentina the ratio had a slight increase. This means that HIV has become even more concentrated in the male population.

In Argentina, men who have sex with men (MSM) should be considered as the priority HIV high-risk group for prevention. Because the HIV/AIDS epidemic in Argentina is concentrated, it is vital to consider the epidemiological characteristics of the country's priority HIV high-risk group when designing policies. The priority high-risk group is males ages 25–34 years who are sexually active, have sex with men, have a high school diploma, and are from the central provinces of the country. Moreover, when analyzing the demand-side factors of HIV/AIDS, we found that education is positively correlated with HIV incidence at the provincial level. Similarly, our findings showed that higher income correlates to higher HIV incidence at the provincial level. Nonetheless, we found no significant correlation between violence and HIV incidence at the provincial level. Specific studies about knowledge, attitudes, and practices in the priority high-risk group (young MSM) are needed for better understanding the mechanisms and strategies needed for improving prevention.

Argentina needs additional budgetary efforts on prevention. Prevention should be treated as a key pillar of the National HIV/AIDS Program in Argentina, at least from a budgetary perspective, since HIV spending on prevention

currently represents only 1.2 percent of total HIV spending, after a 30 percent reduction from 2009 to 2012. Prevention should be focused on the priority high-risk group.

Argentina needs to improve the treatment of patients in the health delivery chain. Despite the fact that all general hospitals are expected to care for PLWHA, 17 percent of PLWHA are still transferred to other health facilities to receive care, making it difficult to track these patients through the health system or health networks. Other institutional barriers remain, such as delays in shifts and delivery of test results.

The government needs to improve the diagnosis and treatment of coinfections in TB and HIV/AIDS patients. Although the number of new and relapse cases of TB in Argentina has remained stable since 2006, the high risk of death from TB among PLWHA makes it necessary to strengthen HIV/AIDS testing on people receiving TB treatment and vice versa. Currently, only a small proportion of people with TB are screened for HIV (11 percent in 2012). Of these, 53 percent tested positive, resulting in 559 TB-HIV coinfecting patients.¹ As such, there is a need to increase coverage of HIV testing among TB patients, which could lead to an increase in the number of cases of HIV among TB patients.

In addition, the country requires a substantial expansion of HIV/AIDS testing among the general population, but in particular for pregnant women. Although the number of people diagnosed with HIV has increased, there is still a need to improve diagnosis in light of the recent regional 90/90/90 goals. In addition, there is evidence that shows that from 2009 to 2010, 47 percent of all newly diagnosed HIV/AIDS-positive women were diagnosed in the context of pregnancy, underlining the need for early HIV testing among women of all ages.

Argentina should revisit the procurement of HIV/AIDS medicines. A wide variation in treatment cost in LAC is associated with the unit price of tenofovir/emtricitabine, and Argentina has one of the highest costs of the fixed-dose combination and the two-tablet form. This may partially explain why Argentina's HIV expenditure on HIV/AIDS per DALY is three times higher than the LAC average. Since a high portion of HIV spending is allocated to treatment, and given the wide variation in antiretroviral drug (ARV) prices among LAC countries, there are opportunities for reducing the cost per patient while increasing ARV coverage. As such, the Argentine government should revise its procurement of medicines. Regional organizations may have a role to play in achieving more competitive prices for ARV treatment at the regional level.

It is also important to maintain and expand the strict monitoring of medicines and supplies and the clinical management of patients, through the implementation of rigorous management systems to track supplies and medicines. Recently implemented software can be used for managing patients and clinical governance for improvements in the quality of care, and cost containment, all while improving efficiency and effectiveness.

In search of sustainability, it is time to be more efficient. Argentina no longer seeks external resources to finance its National HIV/AIDS Program, since the

program has been almost completely funded by national resources since 2011. However, Argentina still needs to improve its allocative efficiency to the National HIV/AIDS Program. Argentina's total domestic HIV spending in 2012 was US\$285.95 million, an increase of 65.5 percent since 2006, constituting the third largest HIV spending in LAC in absolute terms, after Mexico and Brazil. In this study, we estimated that the government expenditure costs of HIV/AIDS treatment for the next six years (until 2020) will increase 83.3 percent, considering trends similar to those of the past five years in incidence and prevalence. Growth of 83.3 percent in treatment costs will challenge the government to analyze whether it will still be able to cover these expenses, or whether it will be possible to reduce expenditures on medicines through more strategic procurement, or to use savings made on costs of medicines, for example, to reduce incidence.

Should Argentina focus on cost recovery or reducing subsidies? There is a need to analyze potential mechanisms to reduce cross subsidies to high-income beneficiaries, which could allow the government to reduce unit costs per patient on ARV costs, or potentially through cost recovery schemes to patients who have the means to pay, under public subsidies. A cost-effectiveness analysis (CEA) is needed. The analysis should use a dynamic, compartmental, mathematical model of HIV transmission and disease progression to assess HIV epidemic trends, resource needs, cost effectiveness of past programs, potential impact of possible future programs, and optimal allocation of resources.

The prevalence and incidence of HIV/AIDS could be reduced through incentives at the subnational level. A continued reduction in the HIV/AIDS burden at the subnational level may require actions such as a framework of clear incentives to homogenize policies in the country, correcting current trends of an increase in HIV/AIDS in some provinces.

The country will face additional costs to increase diagnosis. An estimated 30 percent of people with HIV/AIDS are unaware of their status in Argentina, which implies the need to expand diagnosis and early detection, as well as ART, to the population that has been recently identified. In addition, Argentina could still make improvements that are cost effective and continue implementing "clinical governance" and coverage in the country's interior.

Finally, there are challenges in epidemiology and confidentiality. Argentina's law of confidentiality of HIV/AIDS testing, diagnosis, treatment, and results makes it difficult to obtain individual-level data to conduct studies on existing relations between demand-side risk factors and the HIV/AIDS burden. The government should consider the possibility of implementing secure data collection schemes that do not infringe on an individual's right to privately seek diagnosis, testing, and care for HIV/AIDS, but that simultaneously provide valuable information for surveillance and control of HIV/AIDS and other sexually transmitted infections.

Note

1. UNAIDS. *AIDSinfo* (accessed March, 2014), <http://www.unaids.org/es/dataanalysis/datatools/aidsinfo>.

Glossary

- Allocative efficiency** Occurs when there is an optimal distribution of goods and services, taking into account consumers' preferences. A more precise definition of allocative efficiency is at an output level where the price equals the marginal cost (MC) of production. This is because the price that consumers are willing to pay is equivalent to the marginal utility that they get. Therefore the optimal distribution is achieved when the marginal utility of the good equals the MC.¹
- Burden of disease** Measuring burden of disease (BoD) allows for a better understanding of years of life lost due to premature death and disability as a consequence of disease. Disability-adjusted life years (DALYs) includes both the number of years lost due to premature death and years lived with various types and severity of disabilities. Therefore, one DALY is one healthy year of life lost. In order to calculate a DALY for a given illness, one must estimate (a) the number of years lost, and (b) the number of years lived with disability of specific duration and severity associated with the illness. These two calculations are combined to obtain the DALYs for a given disease.
- Cost-benefit analysis** The cost-benefit analysis (CBA) judges an intervention to be cost beneficial if the present value of all benefits exceeds the present value of all costs. The CBA can be reduced to a simple formula, where discounted benefits are compared against discounted costs. The benefit-to-cost ratio is calculated as economic benefits divided by economic net costs of the intervention and it is expressed in relative terms.

- Cost-effectiveness analysis** A cost-effectiveness analysis (CEA) is an economic evaluation in which the costs and consequences of alternative interventions are expressed in cost per unit of health outcome. CEA is used to determine technical efficiency (i.e., comparison of costs and consequences of competing interventions for a given patient group within a given budget)
- Results-based financing** Results-based financing (RBF) is defined as a cash payment of non-monetary transfer made to national or sub-national government, manager, provider, payer, or consumer of health services after predefined results have been achieved and independently verified.

Note

1. <http://www.economicshelp.org/blog/glossary/allocative-efficiency/>.

Environmental Benefits Statement

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Thirty Years of the HIV/AIDS Epidemic in Argentina: An Assessment of the National Health Response delves into the combination of factors that make Argentina a success story in combating HIV/AIDS. It analyzes the national and inter-provincial burden of disease, the demographics of new HIV cases, the demand and supply sides of service delivery, and conducts a cost-benefit analysis of the Argentine National HIV/AIDS Program from 2000 to 2010.

This book will be of interest to those who wish to examine key programmatic innovations that have been essential to Argentina's success in the fight against HIV/AIDS, such as the introduction of universal free antiretroviral treatment, a comprehensive legal framework for sexual and reproductive rights, the introduction of incentives and results-based financing in the HIV/AIDS program, electronic monitoring of supplies and medicines, and implementation of an electronic clinical governance system for improving the quality of care and patient follow-up.

The 1992 creation of the National HIV/AIDS Program was a fundamental step for Argentina to reach the second lowest burden of HIV/AIDS in South America in 2010. Despite these successes, the fight against the HIV/AIDS epidemic in Argentina still poses continuous challenges, including a high number of new infections among young men who have sex with men, inequalities in HIV/AIDS rates between provinces, insufficient coverage of HIV diagnostic testing, relatively low expenditure on HIV prevention, and poses the question regarding the long-term financial sustainability of the program, considering the increasing number of patients in treatment and the high comparative cost of antiretroviral treatment.

