



## INTRODUCTION

# Learning to Live With HIV

SINCE AIDS FIRST SURFACED IN LOS ANGELES IN 1981, INTERNATIONAL CONCERN HAS moved from the United States, Canada, and Europe to Africa and then to Asia. Now there's a growing appreciation that countries in Latin America and the Caribbean also have devastating HIV/AIDS epidemics, as well as some of the most creative and forceful responses seen anywhere. The following stories provide an in-depth look at both the epidemics and the responses, highlighting the affected communities, clinicians, researchers, and governmental and nongovernmental organizations alike.

Over the course of 9 months, *Science* correspondent Jon Cohen visited 12 countries that together represent the varied contours of the epidemic in this vast region, as well as the overlapping forces that drive HIV's spread. Cohen and photographer Malcolm Linton visited clinics, brothels, laboratories, shooting galleries, ministries of health, gay sex clubs, universities, slums, migrant way stations, prisons, and the homes of many people who struggle to live with the virus.

The Caribbean has been particularly hard hit, although the epidemic in Haiti appears to have peaked (p. 470). Heterosexual sex is the main mode of spread throughout the islands, and sex workers, some of whom cater to tourists (p. 474), often have high infection rates. Poverty and migration also fuel HIV's spread, as is apparent in the shantytowns that abut former sugar plantations in the Dominican Republic (p. 473). Puerto Rico has a staggering problem in injecting drug users (p. 475).

Throughout Mexico and Central America, men who have sex with men play a leading role in HIV's spread, although only the Mexican government has focused research and prevention campaigns on this population (p. 477). Honduras has novel programs to help descendants of African slaves known as Garifunas, who have a particularly high HIV prevalence (p. 481), and Belize is working to slow the spread among gang members (p. 483). Guatemala is struggling both to get a handle on the scale of its epidemic and to rapidly expand anti-HIV treatment to people most in need (p. 480).

Brazil dominates South America in its size, population, and the number of HIV-infected people who live there. The country has pioneered in offering "universal access" to antiretroviral treatment, but the escalating cost of the drugs poses a tremendous challenge (p. 484). In neighboring Argentina, the main mode of transmission has shifted from people injecting cocaine and men having sex with men to heterosexual sex (p. 487). And Peru, unlikely as it may seem, has become a research magnet for cutting-edge treatment and prevention trials (p. 488).

No countries in Latin America and the Caribbean have the double-digit prevalences frequently seen in sub-Saharan Africa, and its total population is not even half that of India, which alone has more infected people. Still, as should become clear at the XVI International AIDS Conference to be held from 13 to 18 August in Toronto, Canada, many opportunities exist to help countries in the region avoid some of the problems experienced elsewhere. And as these stories document, changes are desperately needed in many locales now, as HIV can be counted on to exploit every opportunity it can find.

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—LESLIE ROBERTS AND JON COHEN

## HIV/AIDS: Latin America & Caribbean

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# Science



<< **New page.** Miriam Banks (*right*) was lucky to find quality care that remains inaccessible to many throughout the region.

worst epidemics: Each has a prevalence above 2%. The virus is also moving from high-risk groups to the general population in Honduras, Guatemala, El Salvador, and Panama, where prevalences hover around 1%. “When I look at Latin America, I think Central America is the most vulnerable for the spread of HIV,” says Piot.

Difficult as it is to assess the regional epidemic in Latin America and the Caribbean, HIV is aided and abetted by a few common factors: widespread poverty, massive migration, weak leadership, homophobia, tensions between church and state, and a dearth of research into patterns of transmission. Compounding the problems, HIV-infected people face pervasive stigma and discrimination, sometimes even from doctors and nurses.

As the epidemic varies, so have the responses of governments and nongovernmental organizations (NGOs). In many poor countries such as Honduras, it’s difficult to find free antiretroviral drugs outside the major cities. But Haiti, which has the dual burden of being the poorest country in the region and the one with the highest HIV/AIDS prevalence, offers first-rate care in some very remote areas.

Although *machismo* leads many Latin American countries to play ostrich about homosexuality, Mexico and Peru each openly report that their epidemics are driven mainly by men who have sex with men (MSM)—including many who also have sex with women. The Caribbean, in contrast, largely has a heterosexual epidemic that’s fueled by the popularity of sex workers, who do a thriving business with both locals and tourists. The church, a major cultural force throughout the region, has pressured politicians to block condom promotion in several countries. Yet in other areas, priests and nuns, working side by side with AIDS researchers and activists, run novel efforts to thwart the epidemic.

## OVERVIEW

# The Overlooked Epidemic

As a Bible-toting evangelist moved from patient to patient and dispensed prayers in the women’s AIDS ward at the Instituto Nacional del Tórax in Tegucigalpa, Honduras, Miriam Banks sat on her bed and flipped through an issue of *Vogue*. The magazine was stuffed with photos of impossibly glamorous models adorning stories about what to wear and where to shop. But on World AIDS Day on 1 December 2005, Banks, who had on hospital garb and a hairnet, was barely hanging on to her life. Banks, 24, lives on the island of Roatán, and her trip to the Honduran capital the month before required an airplane flight followed by a 7-hour bus ride, grueling even for the stout. Banks, who learned that she was infected with HIV 4 years earlier, arrived with tuberculosis, hypoplastic anemia, sinusitis, liver problems, and a CD4 cell count of just 33. (600 is the bottom end of normal.) But at the hospital, she had begun receiving anti-HIV drugs and was in a remarkably good mood. “The care is excellent here,” she said in English, the main language of her island, to which she has since returned.

This aging hospital, one of Honduras’s largest providers of HIV/AIDS care, provides a study in contrasts. So does the HIV/AIDS epidemic in Latin America and the Caribbean, which are home to diverse cultures, sexual mores, languages, patterns of drug use, ethnicities, and economic realities. “Living on the other side of the ocean, I used to look at the region as if

it’s all the same, but that’s definitely not true,” says epidemiologist Peter Piot, who heads the Joint United Nations Programme on HIV/AIDS (UNAIDS) in Geneva, Switzerland. “When it comes to AIDS, it’s just not one place.”

The epidemic in Latin America and the Caribbean has largely been overshadowed by the more severe problems in sub-Saharan Africa, the vastly larger population of Asia, and the attention that more developed countries have attracted with high-profile activism, substantial investments in finding solutions, and intense media coverage. But an estimated 2 million people live with HIV/AIDS in the region—more than the United States, Canada, Western Europe, Australia, and Japan combined. Half reside in the four largest countries: Brazil, Mexico, Colombia, and Argentina. Although far less populous, Haiti, the Bahamas, Guyana, Belize, and Trinidad and Tobago have the

**Changing course.** Haiti’s FOSREF teaches sex workers to become dance instructors.



The patterns of the epidemic continue to shift. Early on, for instance, injecting drug users (IDUs) played a prominent role in HIV's spread in the Southern Cone of South America; today IDUs are a major driver along the Mexico–U.S. border and in Puerto Rico and Bermuda. Meanwhile, massive migration both within the region and back and forth to the United States means that as the epidemic matures, the defining features of spread in each country begin to blur—as do the HIV strains that are circulating.

### Subtype casting

Virologist Jean Carr of the Institute of Human Virology in Baltimore, Maryland, has worked with leading investigators throughout Latin America and the Caribbean to identify the subtypes of HIV spreading in different areas. “This tells you where the virus has been and where it’s going,” says Carr.

HIV-1, the main type of the virus responsible for the AIDS epidemic, now divides into nine subtypes. Evidence strongly suggests that subtype B first entered the Americas from Africa, likely coming to Haiti and then spreading to gay men in the United States, Canada, and Western Europe. In most countries of Latin America and the Caribbean, the epidemic emerged a few years later, again in gay men with subtype B, but the picture has since become much more complex.

In the Caribbean, Carr and her co-workers identified a distinctive form of subtype B—designated “B prime”—that has spread in Haiti, the Dominican Republic, Jamaica, and Trinidad and Tobago. Typically, she says, phylogenetic analyses cannot distinguish one subtype B from another. But on these Caribbean islands, B prime is distinct from the garden-variety B found elsewhere. And each of these islands has a predominantly heterosexual epidemic. “Is there a change the virus needs to do to become heterosexually transmitted, and is this phylogenetic analysis picking it up?” asks Carr.

The garden-variety B is the main subtype in Central and much of South America. But there is much more genetic diversity in the countries of the Southern Cone—southern Brazil, Paraguay, Uruguay, Argentina, and Chile.

Subtype F, although not the major player, is prevalent in each of these countries. In Brazil, there’s increasing spread of subtype C, too, which worldwide is the most common—and some researchers contend is also linked to heterosexual spread. Brazilian researchers have shown that this C most likely came from a single introduction from Africa.

Finally, around the globe HIV continues to increase its diversity by fusing subtypes together. Researchers have discovered several B/F recombinants, although only a few of these have spread much in Brazil, Argentina, and Uruguay. Carr notes that these B/F subtypes are mainly found in heterosexuals. “The bridge almost certainly is from IDUs and sex workers, not homosexuals,” says Carr.



**Proper aim.** Prevention programs work with men in this overcrowded Nicaraguan prison, but many countries ignore this and other high-risk populations.

### Mixed response

Across the region, increased political will, cheaper antiretroviral drugs, stronger NGOs, and the generous donations of bilateral and multilateral donors have combined to vastly improve access to treatment in recent years.

According to the World Health Organization (WHO), at the end of 2005, an estimated 315,000 people in Latin America and the Caribbean were receiving antiretroviral drugs. That’s up from 210,000 people 2 years earlier, and it represents an impressive 68% coverage; worldwide, only 20% of the people most in need receive these drugs. “You have access to antiretrovirals in many, many places in Latin America and the Caribbean,” says Brazilian epidemiologist Luiz Loures, who works with UNAIDS. “But it’s a paradox. They are far behind when it comes to prevention for highly vulnerable populations like MSM and IDUs. My conclusion is it looks easier for a government to deal with treatment than prevention.”

Throughout Latin America, MSM have significant epidemics, but in Central America

and the Andean region of South America, in particular, tailored prevention efforts are few and far between. Transvestites, the group most discriminated against, have the highest prevalence of all—up to 45% in one Lima study—and receive the fewest services. A handful of countries have creative prevention programs for sex workers; the Haitian NGO FOSREF, for example, offers professional salsa lessons to women interested in leaving the business to become dance teachers themselves. But this population is often ignored, and female sex workers have double-digit prevalence in Central America, Suriname, Guyana, and on several Caribbean islands. Last in line to receive help in avoiding HIV are prisoners and IDUs, populations that frequently overlap and that are highly vulnerable to infection.

### Tomorrow’s challenge

Back at the Instituto Nacional del Tórax in Tegucigalpa, Elsa Palou, the head of infectious diseases, has witnessed firsthand the remarkable impact of potent antiretroviral drugs. Some 90% of treated patients, including Miriam Banks, responded to the therapy, and the treatment has decreased the annual mortality of AIDS cases from 43% to 9%. (Deaths mainly occurred in people who did not seek treatment until they had fewer than 50 CD4s.) But Palou is worried about the inevitable emergence of drug resistance and toxicities, “maybe in 5 years, maybe more, maybe less,” she says. Brazil, which has treated more people with anti-HIV drugs for longer than any country in the region, already has seen a dramatic increase in the number of people who need to switch from their original drugs to more expensive regimens.

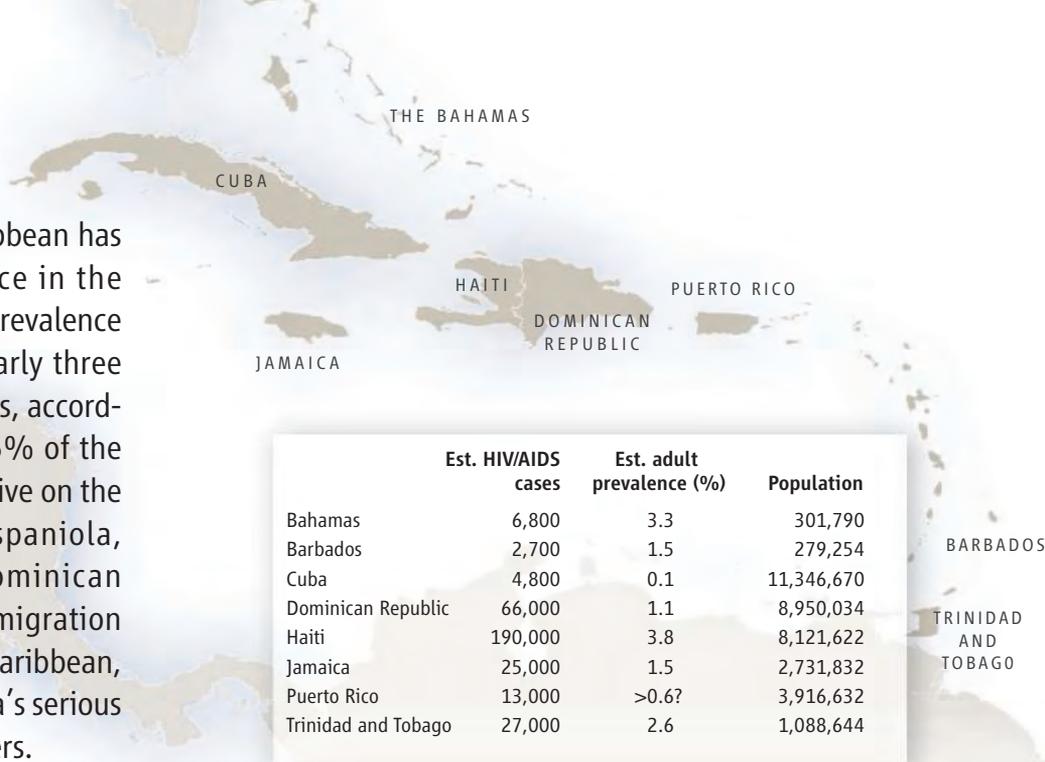
The total number of infected people will also likely continue to rise, although part of that climb is because potent drugs are allowing infected people to live longer. With the exception of Haiti, no country in Latin America or the Caribbean has seen a marked drop in HIV prevalence. By 2015, according to projections from WHO and UNAIDS, the 2 million HIV-infected people in Latin America and the Caribbean today will increase to nearly 3.5 million. Currently, AIDS claims 90,000 lives per year in the region. But between now and 2015, another 1.5 million Latin Americans and Caribbean islanders, at a minimum, are projected to die from the disease.

A surge in attention to HIV/AIDS may prove these projections wrong, and Latin America and the Caribbean will surely receive a boost in 2008 when Mexico becomes the first country in the region to host the massive International AIDS Conference. Then again, it’s a tall order to contain the spread of HIV in any part of the world. But as the Spanish saying goes, *Con paciencia y saliva, el elefante se la metió a la hormiga*: With patience and saliva, the elephant can be put inside the ant.

—JON COHEN

# The Caribbean

After sub-Saharan Africa, the Caribbean has the highest HIV/AIDS prevalence in the world. At the end of 2005, adult prevalence in the Caribbean was 1.6%—nearly three times higher than the United States, according to U.N. figures. More than 85% of the HIV-infected people in the region live on the heavily populated island of Hispaniola, home to both Haiti and the Dominican Republic. Heterosexual sex and migration drive the spread throughout the Caribbean, save for Puerto Rico’s and Bermuda’s serious HIV problems in injecting drug users.



## HAITI

# Making Headway Under Hellacious Circumstances

This impoverished, conflict-ridden country is staging a feisty battle against HIV

PORT-AU-PRINCE, CANGE, AND CHAMBO, HAITI—Banners hang across the main thoroughfares in Port-au-Prince urging residents to report kidnappings. Blue-helmeted U.N. troops patrol the city in armored personnel carriers. The slums that border the once-elegant downtown have names like Cité Soliel and Bel Air that seem to mock their poverty and violence.

At an AIDS clinic called GHESKIO that sits at the edge of two of these slums, Cité L’Eternel and Cité de Dieu, the staff jokingly refers to the neighborhood as Kosovo. But the mood at GHESKIO (pronounced “jess-key-oh”) is anything but hostile. The guards at the gates have no weapons, and as GHESKIO’s founder and leader Jean “Bill” Pape likes to boast, “we have not lost one pencil” in the more than 20 years the clinic has operated there.

Pape climbs the stairs of the main clinic and enters the waiting room. About 100 patients, many spiffily dressed, sit in neat rows.

“Bonjour,” says Pape.

“Bonjour!” the patients reply in unison.

Improbable as it seems, today *is* a good day for many of the people here, who receive anti-retroviral drugs and state-of-the-art care they otherwise couldn’t afford. It’s also in many ways a good moment in the HIV/AIDS struggle in the

country at large. The poorest country in the Western Hemisphere, Haiti has more HIV/AIDS patients per capita than any locale outside sub-Saharan Africa. Yet HIV-infected people here often receive better care than many in the Caribbean and Latin America, thanks largely to GHESKIO and another widely celebrated program, Zanmi Lasante—Creole for “Partners in Health”—started by medical anthropologist Paul Farmer of Harvard Medical School in Boston. And recently, encouraging signs have emerged that the epidemic in Haiti is shrinking.

Then again, combating HIV/AIDS in Haiti, where the ever-changing and crisis-plagued government has largely handed off its responsibilities to GHESKIO and Zanmi Lasante, remains an uphill battle. And it’s a steep hill.

### 4H club

In 1982, a year after AIDS had first been diagnosed but not yet named in a cluster of homosexual American men in Los Angeles, the U.S. Centers

for Disease Control and Prevention in Atlanta, Georgia, reported that a group of recent immigrants from Haiti had the strange opportunistic infections and immune problems that characterized the disease. Fears rose with reports of similar immune deficiencies among Haitians who still lived in that country. Soon, the mysterious ailment was being referred to as “the 4H disease,” as it seemed to single out Haitians, homosexuals, hemophiliacs, and heroin users. “It was a disaster,” says Pape, who at the time ran a rehydration clinic for children in conjunction with colleagues from Weill Medical College of Cornell University in New York City. “The tourism industry died. Nobody



**Political outsider.** GHESKIO’s founder Jean “Bill” Pape strives to remain independent from the country’s revolving door of political leaders. He says that has been a secret to GHESKIO’s success.

TABLE SOURCE: UNAIDS/CIA WORLD FACT BOOK

wanted to come here. Even Haitians in the United States were afraid to come.”

With help from Warren Johnson of Weill Cornell, Pape started GHESKIO (which stands for Groupe Haïtien d’Etude du Sarcome de Kaposi et des Infections Opportunistes). In 1983, Pape, Johnson, and co-workers published a landmark report in *The New England Journal of Medicine (NEJM)* that described how Haitians with AIDS had the same risk factors as Americans: men having sex with men, recipients of blood products, links to sex workers, and high rates of venereal diseases. Still, the notion that Haitians were somehow at a higher risk of contracting the disease persisted; theories flourished about links to voodoo or the predominance of swine flu. Worse yet, speculation surfaced that Haiti was responsible for the spread of AIDS to the United States. “There was all this prejudice against Haiti,” says Pape, who still is visibly riled that epidemiologists pointed a finger at Haitians.

Although both Pape and Farmer have argued that HIV likely came to Haiti from the United States—gay men once flocked to the island as a tourist resort—molecular biological evidence suggests that HIV *did* arrive in Haiti earlier than anywhere else in the hemisphere. Further evidence connects the Haitian isolates to some found in Congo, a French-speaking country that recruited skilled Haitians after it gained independence in 1960. Two independent groups have published studies that date six early HIV isolates from Haitians to 1966–67, whereas the earliest non-Haitian samples in the United States trace back to the following year. “Both give the merest suggestion of Haiti being earlier—but with overlap in the error estimates,” says Bette Korber, whose group at Los Alamos National Laboratory in New Mexico did one of the analyses.

Michael Worobey of the University of Arizona, Tucson, has recently recovered five “fossil” samples of HIV from Haitians diagnosed in the United States in the early 1980s that he says provide “absolutely crystal-clear evidence that the virus was in Haiti first.” Worobey contends that understanding HIV’s evolution may one day help vaccinemakers tailor preparations for specific regions. “All the B-subtype virus outside of Haiti comes from a single introduction that got into the homosexual population in the States and then Europe and went wild. And it required that raging wildfire to be seen.”

Regardless of how HIV came to Haiti, the virus thrived, and by the end of 2001, the Joint United Nations Programme on HIV/AIDS (UNAIDS) estimated that 6.1% of the adults were infected. Studies by Pape and his co-workers in Haiti and at Weill Cornell have demonstrated that the vast majority of GHESKIO patients became infected through heterosexual sex. Disease progressed much more rapidly than in wealthy countries (7.4 years from infection to



**Testing 1, 2, 3.** GHESKIO’s well-equipped labs ran 35,000 HIV tests last year, as well as thousands of CD4 counts, TB stains, and rapid tests for syphilis.

death versus 12 years), TB—which speeds HIV replication and thus immune destruction—was the most common AIDS-defining illness, and 6% of those coinfecting with HIV and TB had dangerous, multidrug-resistant strains of the bacterium.

By the end of 2005, reports UNAIDS, Haiti’s adult prevalence had dropped to 3.8%. Pape contends that behavior change has led to this decline. Annual condom sales, he notes, jumped from less than 1 million in 1992 to more than 15 million a decade later. And GHESKIO studies show that sexually transmitted infections such as chancroid and genital ulcers, which can facilitate HIV transmission, have fallen steeply in their patients.

Analysis of these and other data conducted by Eric Gaillard of the Futures Group, a consulting firm funded by the U.S. government to help Haiti set HIV/AIDS policy, suggests that disease prevalence in the country has indeed dropped. But the researchers note that new infection rates—the incidence as opposed to the prevalence—started to decline about 15 years ago. This means that these behavior changes may have had less to do with the prevalence drop than other factors. “Overall, people died at a faster rate than others became infected,” Gaillard and colleagues write in a paper in the April issue of *Sexually Transmitted Infections*. They also note that the prevalence drop coincides with the country’s effort to prevent HIV transmission through blood transfusions (see graphs, p. 472).

### Town and country

As a psychologist meets with rape victims in one of GHESKIO’s cramped offices, lab techs in a nearby classroom watch a PowerPoint

presentation about how HIV is transmitted. In another office, volunteers offering to join a trial of an experimental AIDS vaccine made by Merck take a test to make sure that their consent is truly informed. Technicians test samples of *Mycobacterium tuberculosis* for drug resistance in a lab outfitted with a special ventilation system. In another, sophisticated machines measure the level of the CD4 white blood cells that HIV preferentially targets and destroys. A long line of people, worried that they may have contracted HIV, syphilis, or another sexually transmitted infection, wait to have their blood drawn.

GHESKIO has slowly grown from a research-oriented AIDS clinic into something of an academic medical center that receives substantial funding from the U.S. National Institutes of Health. Pape ascribes part of GHESKIO’s success to the fact that it’s not part of the government. “If we were part of the Ministry of Health, we would have been dead,” says Pape, explaining that it’s had 24 ministers since 1986.

More than 3000 patients now receive anti-HIV drugs through GHESKIO. One of them is Elizabeth Dumay, a counselor and nurse assistant there. “Look at me,” says an obviously robust Dumay, 42, who came to GHESKIO after losing both her husband and father to AIDS. At the time, her CD4 count was a mere 73 (600 to 1200 is normal). Today, Dumay has 603 CD4s, and virus levels in her blood are undetectable.

As the GHESKIO clinicians described in a December 2005 *NEJM* article, 90% of the 1000 AIDS patients they treated with potent antiretroviral drugs were alive after 1 year. Without the treatment, studies suggest that 70% of them would have died.

## HIV/AIDS: Latin America & Caribbean

Pape has received a slew of accolades, including France's Legion of Honor. So has Farmer, who pioneered AIDS treatment in Haiti's rural Central Plateau. Farmer, who lives part-time in Haiti, is a MacArthur fellow, the subject of a popular biography, and the recipient of generous support from philanthropists. His group, Zanmi Lasante, now also has projects in Peru, Mexico, Guatemala, and Rwanda.

For more than 2 decades, Farmer has focused on improving health care in an impoverished part of the country that is only 56 kilometers from

to make home visits every day to observe patients taking their antiretroviral drugs. If doses aren't missed, they explain, HIV is less likely to develop resistance to the drugs.

Zanmi Lasante spent more than \$10 million in Haiti last year, nearly twice GHESKIO's budget. Principal financial support for AIDS treatment for both groups comes from the Global Fund to Fight AIDS, Tuberculosis, and Malaria and the Bush Administration's President's Emergency Plan for AIDS Relief. Both GHESKIO and Zanmi Lasante also offer extensive training

and builds new homes for people who live in shacks made of corrugated tin or wattle. "We're just using AIDS as our battle horse to get at poverty reduction. If we had the capacity to deliver the same quality of service we do now and do clinical trials, we would. One day, we're going to get there."

### Meeting demand

Shortly before dawn on a March morning at the Zanmi Lasante campus, a few hundred people who have spent the night sleeping on the concrete benches and sidewalks that meander around the hilly grounds begin to rise. Some spent the night at this odd oasis—which features clinics, a hospital with two operating rooms, laboratories, training classrooms, a primary school, a church, and a warehouse filled with pharmaceuticals—because they saw a doctor too late in the day to return home; others wanted a good spot in line this morning. "We're being overwhelmed," says Farmer. "That's been the hardest part of our work."

At a new clinic that Zanmi Lasante recently opened about an hour's drive from Cange in Chambo, patients jam the waiting room all day for a chance to see one of two doctors on staff. Many of the patients are infected with HIV, but most have the same complaint: stomach pains. "I think it's just hunger," says Louise Ivers, a native of Ireland who treats HIV-infected people both in Haiti and at Massachusetts General Hospital in Boston. And her patients don't mince words. "I'm going to die if I don't get food

to take with my medicine," complains an HIV-infected 24-year-old mother with three children in tow. A one-armed boy suddenly barges into the room unannounced. "The doctors told me to talk to you," says the boy, who explains that he lost his arm and his father in a car accident. Ivers refers him to the clinic's social worker. "It's very hard to know what to do," she says.

The inpatient hospital at Cange presents more wrenching dilemmas. The facility has several adults in the late stages of AIDS who are not eligible for anti-HIV drugs because Zanmi Lasante only offers antiretroviral drugs to people who live in areas where the group has *accompagnateurs*. "Until there's good care all across the country, we're going to get people coming from all over—and more from Port-au-Prince, ironically, than anywhere else," says Farmer. Last year, Zanmi Lasante's staff had 1.1 million visits with patients at clinics, and the *accompagnateurs* made 1.4 million more trips to patients' homes.

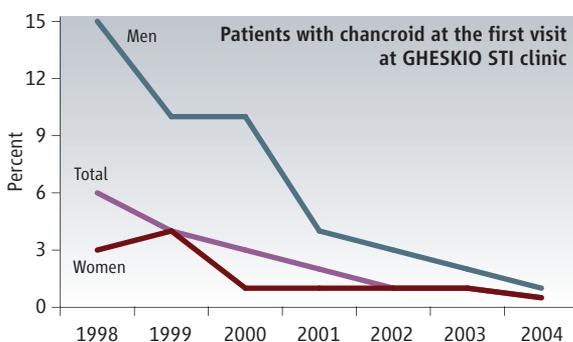
Although Zanmi Lasante has steadily won donor support and attracted local and foreign



**Full house.** Zanmi Lasante's inpatient ward in Cange doesn't have a bed to spare—and unfortunately can offer antiretroviral drugs only to the AIDS patients who live nearby.

Port-au-Prince—but is a 3-hour journey by car on the rutted, mountainous roads. In 1998, Farmer launched an "HIV Equity Initiative" and began to treat poor, HIV-infected Haitians with antiretroviral drugs. When starting Zanmi Lasante, Farmer and his co-workers assailed the then-common wisdom that costs and lack of infrastructure made it impractical to use these medicines in poor countries. And, they wrote, if they can provide antiretroviral drugs "in the devastated Central Plateau of Haiti, it can be implemented anywhere."

Zanmi Lasante today has a sprawling medical campus in the rural town of Cange, which has been visited by the likes of Bill Gates Jr. (who flew in by helicopter). Farmer and his team of Haitian and Harvard doctors now provide antiretroviral treatment to 2000 patients at Cange and seven other sites. Zanmi Lasante also provides inpatient care, which GHESKIO doesn't. And, in an innovation borrowed from TB treatment, Zanmi Lasante assigns *accompagnateurs*



**Dramatic drop.** At GHESKIO's clinic for sexually transmitted diseases, diagnoses of chancroid, which eases transmission of HIV, have steadily declined.

of health care workers, and they perform a combined 75,000 HIV tests each year.

Although their agendas overlap and they have much admiration for each other's work, Farmer and Pape have never published a paper together. "They have a research focus and we have a service focus," says Farmer, who has mainly written on issues of social justice and providing quality care in poor settings and whose group also offers comprehensive maternal care



**Patient patients.** Shortly after sunrise at Zanmi Lasante's Cange campus, long lines form at the clinic door.

end," says Farmer. "We went in for the other 's' word: solidarity."

Increasing demand has burdened GHESKIO, too, which in October 2005 opened a second clinic in a less heavily traf-

doctors who want to work in rural Haiti, skeptics question whether the effort can be sustained. "Even if sustainability raises problems in 20 years, we didn't go in for a set timeline or to have projects with a beginning and an

ficked part of Port-au-Prince. The pristine clinic abuts a vast, hardscrabble field, and a guard with a shotgun stands at its gate. "The neighbors don't know us here," shrugs Marie-Marcelle Deschamps, a clinician who helped Pape

build GHESKIO. Already, the clinic is treating 400 HIV-infected people with antiretroviral drugs.

Despite all the progress, Pape estimates that at least 10,000 HIV-infected Haitians who need antiretroviral drugs immediately have yet to receive them. Still, like many other Haitians, he's hopeful that the election of René Préal in February will bring a measure of stability to the country—which should make it easier to combat HIV as vigorously as Pape, Farmer, and others would like. "You have to be an optimist here, despite all the odds," says Pape. "Otherwise, pack your bags and leave."

—JON COHEN

## DOMINICAN REPUBLIC

# A Sour Taste on the Sugar Plantations

Haiti's wealthier next-door neighbor is struggling to provide treatment to many HIV-infected people, and the problem's especially acute on the *bateyes*

SANTO DOMINGO, SAN PEDRO DE MACORÍS, MONTE PLATA, DOMINICAN REPUBLIC—The Dominican Republic shares the island of Hispaniola with Haiti, but the two countries could be across the globe from each other. Dominicans are Latin and pride themselves on their Spanish roots, whereas Haitians speak Creole and are largely descendents of freed African slaves. As tourists flock to the Dominican Republic each year, Haiti has seen its tourist industry evaporate over the past 2 decades. Dominicans have a vastly higher gross domestic product than their Haitian neighbors, whose average life expectancy is nearly 20 years shorter. And it follows that the two countries have starkly different HIV/AIDS epidemics that have attracted dramatically different responses. In an unusual twist, poorer and less stable Haiti is being celebrated for its pathbreaking AIDS efforts, largely led by two prominent nongovernmental organizations (NGOs). The Dominican Republic, on the other hand, is being lambasted for its shortcomings—the result, critics say, of government disinterest and outright obstructionism.

At the end of 2005, the Joint United Nations Programme on HIV/AIDS (UNAIDS) estimated that the virus had infected 1.1% of the adults in the Dominican Republic—a prevalence less than one-third of Haiti's. But according to insiders and

outsiders alike, the Dominican Republic's HIV/AIDS programs in comparison are sorely lacking. "It's 1000 times better in Haiti," says Keith Joseph, a clinician at Columbia University



who has done HIV/AIDS care in both countries. "It's astounding that a place with so much is unable to get things going."

Nowhere is this more evident than in the *bateyes*, where the Dominican epidemic is disproportionately concentrated. Originally built to house workers from Haiti on the sugar cane plantations, *bateyes* have become shantytowns largely filled with descendents of the original migrants or new Haitian immigrants. "People with AIDS in the *bateyes* are just dying without any kind of help," says Sister Concepcion Rivera, a nurse with the Sisters of Charity who runs a mobile health clinic.

The clinic attempts to care for people living in the many *bateyes* near San Pedro de Macoris, a port city on the southeast coast of the Dominican Republic. Although the van is stocked like a minipharmacy, Rivera, who has a master's degree in bioethics, on this March day has no anti-HIV drugs, nor can she treat tuberculosis, one of the biggest killers of people with AIDS. "On paper, the government does things, but in practice, they really provide nothing," says Rivera, adding that for the past 3 months the government has not even paid the small subsidy it promised her group.

Although the Dominican Republic now offers anti-HIV drugs in major cities such as Santo Domingo, Rivera's complaint repeatedly surfaces in the *bateyes*. Government studies showed that adult HIV prevalence was 5% in the *bateyes* in 2002 and jumped as high as 12% in men between 40 and 44 years old. And even where antiretroviral drugs are available, the government has faced intense criticism for moving slowly. UNAIDS estimates that 17,000 Dominicans need anti-HIV drugs, but as of December 2005, only 2500 received them through public programs.

**Critical care.** Sister Rivera provides *bateyes* with some medicines but does not have the anti-HIV or TB drugs that Miguel "Bebo" de Jesus needs.

## The Sun. The Sand. The Sex.

BOCA CHICA, DOMINICAN REPUBLIC—At the Plaza Isla Bonita bar that stretches from the main downtown street to the beach, the cocktail waitresses dress in campy “Ship’s Ahoy” outfits with sailor hats and midriff tops. When not serving high-octane rum drinks, they dance suggestively to the blaring merengue, bachata, and reggaeton music. Tables and bar stools fill with young Dominican women, who flirt aggressively with American, Dutch, German, and Italian men twice if not three times their age. Sanky Pankies—local young men who favor dreadlocks, bling bling, and tank tops—cruise the perimeter looking for foreign women or men.

The waitresses sing along when a popular song comes on by the band Mambo Violento: *Sin gorrito, no hay cumpleaños*—without a little hat, there is no birthday party. But in this case, a little hat is a condom, and the birthday party doesn’t involve cake.

Sex tourism is booming in several of the resorts here, says Antonio de Moya, an epidemiologist and anthropologist who has long studied the subculture and works with the presidential AIDS program COPRESIDA. In the past 15 years, the Dominican Republic has become a tourist magnet, attracting 3.4 million vacationers in 2004, more than double the number who visited in 1991, according to the Caribbean Tourist Organization. And the Caribbean as a whole entertained more than 21 million tourists in 2004. Today, sex tourism and HIV/AIDS have become hot topics in Jamaica, Cuba, Barbados, the Bahamas, St. Lucia, St. Marteen, and Curaçao.

Deanna Kerrigan, an international health specialist at the Johns Hopkins Bloomberg School of Public Health in Baltimore, Maryland, studies sex work in the Dominican Republic. She stresses that outside resorts such as Boca Chica, tourists are not the main clients. “There is a very large local sex-work industry,” says Kerrigan. Sex is sold everywhere, from brothels and rendezvous homes called *casas de citas* to

discos and car washes. HIV prevalence in the country’s estimated 100,000 female sex workers ranges from 2.5% to 12.4%, depending on the locale. Kerrigan says the places with lower prevalence reflect “intensive interventions” by nongovernmental organizations such as the one she collaborates with called the Centro de Orientación e Investigación Integral.

Sex workers of course could have both local and foreign clients, but three women working the main street here this warm winter evening insist that they avoid Dominicans. “A Dominican will pay 300 pesos and be on top of you for 2 hours,” says Aracelis, as the other women laugh and nod their heads. “And they don’t want to use condoms.” Aracelis and her friends insist that *sin gorrito, no hay cumpleaños*, and all say they are HIV-negative. But they still worry. “The first thing I say when I leave the house in the morning is ‘Please, God, take care of me,’” says Aracelis. Then, as though her prayers were answered, she notices an elderly German man. “He’s my boyfriend, not a client,” she says, prancing over to him. “He sends me money every month.”

—J.C.



**Sails job.** The cocktail waitresses at the Plaza Isla Bonita bar attract male tourists, who often then find a sex worker offering her—or his—services.

Still, NGOs have made some headway in both prevention and treatment programs. Family Health International (FHI), which is funded by the U.S. government, supports several of these programs, but its director in Santo Domingo, Judith Timyan, laments that this is necessary. “This country’s relatively rich and has a huge middle class,” says

Timyan, who has since left to do HIV/AIDS work in Haiti. “The Dominican Republic should have grown out of its need for help.”

### Bad blood

In 1821, Haiti invaded the Dominican Republic and ruled for 22 years, creating bad blood that has

yet to disappear. “The Dominican ruling class will tell you everything that’s going wrong with the country is the fault of Haiti,” says Geo Ripley, an ethnographer and artist who is a consultant on *bateyes* to the United Nations.

This bad blood in part explains the government’s limited response to the problem in the *bateyes* and also discourages any attempt to replicate Haiti’s HIV/AIDS successes. “If you say to the Dominican people, ‘We can learn from Haiti,’ they’d say, ‘We don’t have anything to learn from them,’” says Eddy Perez-Then, a clinician who is now completing a Ph.D. dissertation about *bateyes* near the southwestern city of Barahona.

As in Haiti, the Dominican epidemic initially involved men who have sex with men, but it has gradually become more “feminized” and driven

by heterosexual sex. This is reflected in the ratio of men with AIDS to women, which in 1986 was 3.63:1 and today is nearing 1:1. Government researchers estimate that 78% of infections now occur through heterosexual sex, some of which is linked to a booming sex trade (see sidebar, at left): Some sex-worker communities have had documented prevalence above 12%.

Cultural mores regarding promiscuity may partly explain why the *bateyes* and Haiti have similarly high prevalences, but many experts suggest that’s too simplistic a view. Nicomedes “Pepe” Castro, who has worked with *bateyes* for 28 years, notes that in the last century the sugar industry primarily attracted male migrants. “*Bateyes* were the only part of the country where the proportion of men was higher than women: 4 to 1.” This, in turn, created more sharing of partners and a greater market for sex workers. With the demise of the sugar cane industry, Antonio de Moya, an epidemiologist and anthropologist who works with COPRESIDA—the presidential commission on AIDS—says an increasing number of young Haitians who immigrate are becoming sex workers themselves. Finally, and perhaps most important, the rampant poverty in the *bateyes* facilitates HIV’s spread, which is tied to a lack of education and less access to prevention tools such as condoms and treatment of other sexually transmitted diseases.

Epidemiologist William Duke, who works with FHI, says it’s unclear whether the Dominican epidemic is growing, shrinking, or stabilizing. “In general, our surveillance is very weak in the public health sector,” says Duke. “When you go outside of the capital, it’s difficult to catch the data.” Although Haiti’s surveillance surely has gaps, NGOs, government-run prenatal clinics,

and outside consultants have reliably tracked that epidemic.

Whereas Haiti in 2002 marshaled the strong support of then–First Lady Mildred Aristide and became one of the first countries to secure a grant from the Global Fund to Fight AIDS, Tuberculosis, and Malaria to buy anti-HIV drugs, the Dominican Republic did not make a similar deal until 2004. Haiti exceeded its targets for delivering antiretroviral drugs to people in need; the Dominican Republic, in contrast, has repeatedly lowered its sights.

Even today, one NGO in Santo Domingo, the Instituto Dominicano de Estudios Virologicos, provides care for 20% of the people receiving anti-HIV drugs. Ellen Koenig, an American clinician who has lived in the country since 1969 and started the institute, assails the attitude of the government that recently left office. “There were more people in the country living from AIDS than *with* AIDS,” charges Koenig. “It was ridiculous.”

Perez-Then says about 25% of the *bateyes* do have government clinics nearby, but the residents don’t use them much. “They’re afraid to go,” he says. In some cases, they are recent Haitian immigrants who only speak Creole. Others do not have proper documentation or fear discrimination.

Perez-Then worries, too, about the complexity of treating HIV-infected people and the quality of care available at government-run programs. The Dominican Republic has one of the highest rates of drug-resistant tuberculosis in the world, which occurs when people start treatment but then miss doses of their pills. The same could easily happen with antiretroviral drugs, he says.

### Taking it home

Weeds and scrub brush have overgrown the old sugar cane fields near Batey Cinco Casas, located in Monte Plata province a few hours’ drive from Santo Domingo. But there’s some new growth that has thrilled the residents: a clinic built by the Batey Relief Alliance. Similarly, the Christian relief group World Vision has built a clinic in Batey 6 near Barahona. Both clinics have a limited ability to help HIV-infected people, but they do what they can. In March, for instance, the Batey Relief Alliance was regularly transporting 28 HIV-infected people from the Monte Plata area to Santo Domingo to receive anti-HIV drugs. Many more need transportation, says Maria Virtudes Berroa, who runs the relief association’s Santo Domingo office, but the organization doesn’t have enough money. One of those is an emaciated man they recently found dying from late-stage AIDS. Like hundreds of thousands of Haitians before him, Jean-Claude Delinua, 31, moved to the Dominican Republic 11 years ago to cut cane. Delinua now lives on the edge of a fallow sugar cane plantation in a

one-room shack. He rarely leaves his hammock, which is made from a pig-feed sack. He has no job, no family, no possessions beyond the clothes he wears, toiletries, a paperback, and a photograph of himself 8 months earlier when he was buff and hale. Delinua, who speaks in Creole, says he knows about the care offered in his home village in Haiti’s Central Plateau. “I’d like to go back,” says Delinua. “But I don’t

have the money, and I’m not sure my family would receive me.”

Graham Greene, author of the classic novel about Haiti called *The Comedians*, once wrote that it was impossible to exaggerate the country’s poverty. For HIV-infected people like Jean-Claude Delinua, it’s all too easy to exaggerate the prosperity of the Dominican Republic.

—JON COHEN

## PUERTO RICO

# Rich Port, Poor Port

Good HIV/AIDS care and strong research in this U.S. commonwealth often mean little to the island’s many heroin addicts

SAN JUAN, PUERTO RICO—If Viviana Valentin lived on any other Caribbean island, she’d likely be dead by now. Diagnosed with an HIV infection in 1990, Valentin has developed resistance to several antiretroviral drugs and once had a CD4 count of zero, an indicator that HIV had decimated her immune system. She has two children and no job. Yet today, Valentin is receiving T-20, the most expensive anti-HIV drug, which retails for more than \$20,000 a year and requires twice-daily injections. She’s also benefiting from state-of-the-art care at the University of Puerto Rico (UPR), where she is enrolled in a clinical trial studying neurological complications of the disease. “I have the best doctors,” says Valentin, who was born and raised in New York City and moved to Puerto Rico when she was 21. “They’ve done a wonderful job.”

As a commonwealth of the United States, Puerto Rico enjoys one of the strongest economies in the Caribbean, which supports not only the top-notch care many HIV-infected people receive but also a burgeoning research community. But that’s the rosy picture. There are thorns as well. Puerto Rico’s per capita income is lower than that of any state on the mainland. Because it is a U.S. territory, HIV/AIDS prevalence figures are lumped with those on the mainland, a practice that many experts think masks the extent of Puerto Rico’s epidemic. “We’re submerged into the U.S. statistics,” says virologist Edmundo Kraiselburd, who directs both UPR’s NeuroAIDS research program and the Caribbean Primate Research Center.

And unlike the epidemics in the rest of the Caribbean, Puerto Rico’s is driven primarily by



**Prickly issues.** Injecting drug users at this San Juan shooting gallery have severely limited access to health care and drug substitutes such as methadone.

## Ample Monkeys and Money Nurture Robust Research

SAN JUAN AND CAYO SANTIAGO, PUERTO RICO—This country's close ties to the United States, combined with its large colony of rhesus macaques of Indian origin, have spawned several collaborations with leading AIDS researchers from the mainland—a rarity in much of the Caribbean.

Rhesus macaques are the main model used to test AIDS vaccines, but they're in short supply. Cayo Santiago, a 15-hectare island off Puerto Rico that has been home to Indian macaques since 1938, has a surplus and must cull about 120 animals each year. Over the past 4 years, Edmundo Kraiselburd of the University of Puerto Rico estimates that UPR has shipped some 600 monkeys to various U.S. researchers, most of them studying AIDS. Some of these



**Monkey business.** UPR's Edmundo Kraiselburd runs a primate center and is helping to build an internationally recognized HIV/AIDS research community.

monkeys have also now been moved to the UPR campus, where Puerto Rican investigators, in collaboration with a group led by Thomas Folks of the U.S. Centers for Disease Control and Prevention in Atlanta, Georgia, are conducting AIDS vaccine studies.

Kraiselburd also heads the NeuroAIDS Program, which teams Puerto Rican clinicians and basic researchers with neuroAIDS specialists on the mainland. The project, which began in 2001 with a \$6 million grant from the U.S. National Institutes of Health (NIH), has several novel studies

under way. One, led by Carlos Luciano, is comparing HIV-infected children and adults to try to unravel the link between HIV and peripheral neuropathy, the most common nerve complication of AIDS. In a separate study, neurologist Valerie Wojna and immunologist Loyda Meléndez are using proteomics to investigate the causes of HIV dementia.

With NIH support, Puerto Rican researchers have long participated in clinical trials of AIDS drugs. For instance, UPR's Carmen Zorrilla was a co-investigator of the landmark multisite study that in 1994 first proved that antiretroviral drugs could prevent HIV transmission from mother to infant. (UPR's medical center has had only one case of mother-to-child transmission since.) And recently, again with NIH backing, Puerto Rico joined the HIV Vaccine Trials Network and, separately, started an HIV/AIDS research collaboration among the country's three medical schools. Zorrilla, who is helping to lead both projects, is particularly excited about bringing together young researchers from institutions that have long competed with one another. "This is a small island," says Zorrilla. "These young investigators will inherit this AIDS problem, and they need to find the solutions."

—J.C.

injecting drug users (IDUs), who are often discriminated against at clinics or emergency rooms. "The doctors don't want them," says José "Chaco" Vargas Vidot, a clinician who in 1990 started an outreach program for IDUs called *Iniciativa Comunitaria*. Vargas Vidot complains that the country has too few methadone treatment clinics and needle-exchange programs, which elsewhere have proven key to lowering transmission rates. "The government is ignoring our AIDS epidemic," he charges.

So although Puerto Rico is indeed a rich port for patients such as Viviana Valentin and

many HIV/AIDS researchers, IDUs often have a starkly different vantage.

### Heroin hub

On an early weekday afternoon in a barrio outside San Juan called *La Colectora*, a dozen men and one woman pay \$1 each to enter a shooting gallery, a small house where users inject and then typically collapse into a chair. Out front, two outreach workers and a doctor from *Iniciativa Comunitaria* set up a needle-exchange program. Julio, a 33-year-old heroin addict, shuffles up and lays eight syringes on the ground, receiving an equal number in

exchange. Julio, who is homeless, does not shuffle because he is high: Injecting has left him with bloody and blackened abscesses on his calves that may be gangrenous, says Angel González, a clinician with the program.

Julio says the stench coming from his legs makes a bad situation even worse. He couldn't make it to his methadone treatment program, he says, because "they started to refuse to let me on the bus. ... The smell was bad, and people would complain." He says an emergency room also sent him away without care.

González says Julio is one of many addicts the system has failed. "Patients have to go through so many obstacles to get treatments," says González. "We need big changes here." UPR's Carmen Albizu-García, who is conducting a small drug-substitution program with addicted prisoners, is also deeply frustrated by the official resistance to proven HIV prevention methods. "In Puerto Rico, we've been very, very hesitant to do what we have to do to control the epidemic," she says.

Heroin's popularity on the island has many roots, but it's clearly tied to its strategic location for South American traffickers. The Puerto Rican Department of Health says that half of the AIDS cases reported to date are heterosexual IDUs, while another 7% are IDU males who have sex with men. UPR obstetrician/gynecologist Carmen Zorrilla says that roughly two-thirds of 2000 HIV-infected women she is following were infected by having sex with men who were IDUs. The HIV/IDU situation in Puerto Rico is "a public health emergency," says Sherry Deren, director of the Center for Drug Use and HIV Research in New York City.

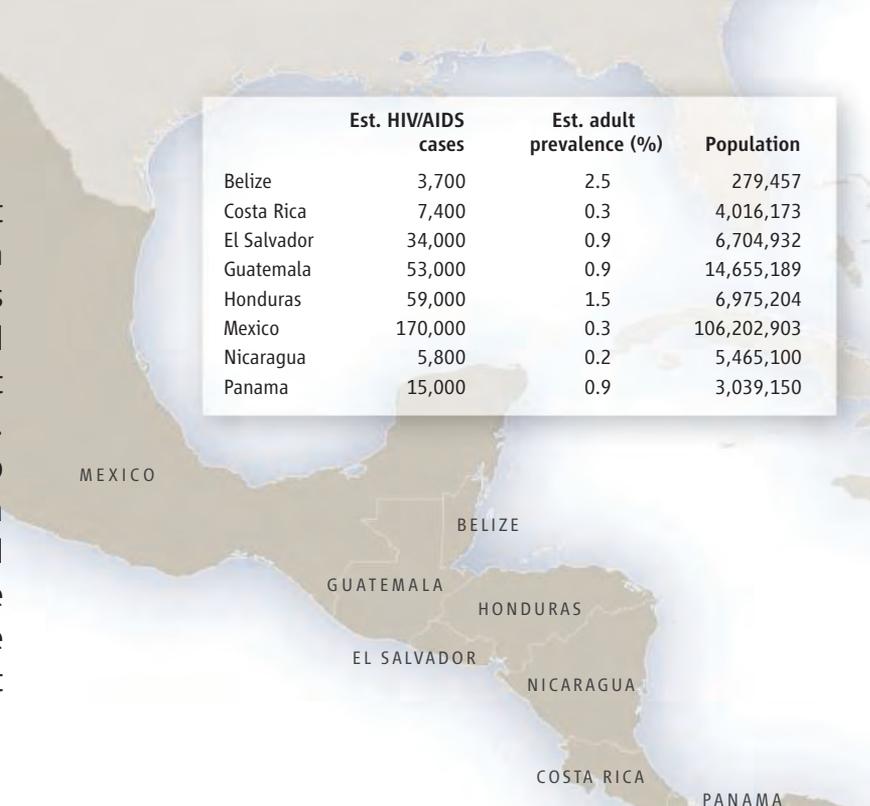
Deren, along with sociologist Rafaela Robles and epidemiologist Héctor Colón of the Central University of the Caribbean in Bayamón, Puerto Rico, led a provocative study comparing 399 IDUs in San Juan to 800 Puerto Rican IDUs living in New York City. Between 1996 and 2004, the researchers found, users in Puerto Rico injected nearly twice as frequently, favored mixtures of heroin and cocaine known as speedballs, and were more than three times as likely to share needles. Between 20% and 25% of the IDUs were infected in both locales, but the new infection rate in Puerto Rico (3.4% per year) was nearly four times higher. The study also found significantly fewer needle-exchange and methadone programs in Puerto Rico, and twice as many HIV-infected participants in New York were receiving antiretroviral drugs. Not surprisingly, the mortality rate in Puerto Rico was almost three times higher. If a city or state on the mainland had these statistics, says Deren, "I think there'd be much more attention given to the problem." Colón points a finger at policymakers who "still believe that treating drug users is a waste of money."

—JON COHEN

## Mexico & Central America

HIV/AIDS relentlessly exploits the gaps that still separate the haves from the have-nots in this region. Free antiretroviral treatment is widely available, but it's often hard to find the drugs outside of major cities. Without money, it's even harder to find quality care. Epidemiological data suggest that men who have sex with men, rampant migration, a thriving sex-worker industry, gangs, and crowded prisons are all contributing to the spread of HIV. Honduras and Belize are the hardest hit; Nicaragua and Mexico are at the other end of the spectrum.

	Est. HIV/AIDS cases	Est. adult prevalence (%)	Population
Belize	3,700	2.5	279,457
Costa Rica	7,400	0.3	4,016,173
El Salvador	34,000	0.9	6,704,932
Guatemala	53,000	0.9	14,655,189
Honduras	59,000	1.5	6,975,204
Mexico	170,000	0.3	106,202,903
Nicaragua	5,800	0.2	5,465,100
Panama	15,000	0.9	3,039,150



### MEXICO

## Land of Extremes: Prevention and Care Range From Bold to Bleak

With a population more than twice as large as all of Central America combined, the country has the most HIV/AIDS cases in the region yet a relatively low prevalence

MEXICO CITY AND TIJUANA, MEXICO—In 2003, when the Mexican government appointed Jorge Saavedra to head CENSIDA, its top AIDS agency, the messages were unmistakable. Saavedra, an articulate spokesperson, is an openly gay and HIV-infected clinician in a country where—as in much of Latin America—an abundance of machismo causes serious cases of homophobia. He's also a prime example of the power of modern anti-HIV drugs. “He was dying from AIDS,” says sociologist Mario Bronfman, a former top health official who hired Saavedra at the Ministry of Health years ago when no good anti-HIV drugs existed. “It's very symbolic that he's the head,” says Bronfman, who now works with the Ford Foundation in Mexico City. “And not just because he's HIV-positive and gay. No one can understand the problem from the inside the way that Jorge can.”

The choice of Saavedra was surprising even to those doing AIDS clinical care and research. “I could not believe that they chose him,” says Luis Soto-Ramírez, one of Mexico's leading HIV/AIDS researchers, who welcomed the move. “It was amazing.” But it's not the only unusual aspect of Mexico's epidemic—or the country's response to it.

In contrast to other countries in Latin America and the Caribbean, which tend to downplay the

extent of the spread of HIV among men, Mexico candidly reports that the primary driver of its epidemic is men who have sex with men—many of whom do not consider themselves gay or bisexual. Since 2003, the government has also had a policy of universal access to antiretroviral

drugs, and this year the government reported that everyone who has been identified with advanced disease is receiving treatment. In another sign of the country's progressiveness, activists, sex workers, and researchers have organized innovative efforts to combat the spread of HIV, as has Saavedra, who last year launched a provocative antihomophobia campaign.

Although Mexico has made big strides in tackling HIV/AIDS, there are still some glaring gaps, says Carlos del Rio of Emory University in Atlanta, Georgia, who headed AIDS policy for the Mexican government from 1992 to 1996. The epidemic has not grown as much as he and others once feared it would, but del Rio says the heterosexual spread in rural communities “is much more difficult to control.” Research is often



**Innovative approach.** As part of its HIV prevention efforts for sex workers, the NGO Aproase discreetly oversees the transactions on Sullivan Boulevard all night long.

## HIV/AIDS: Latin America & Caribbean

“primitive,” he says—in particular, prevalence data are thin—and collaborations remain rare. And although antiretroviral drugs may be widely available, many people who need them do not know they are infected, and pharmacies often run out of drugs. The training of clinicians, and thus the quality of care, is also spotty, del Rio says: “The lofty goal of universal access is not being fully realized.”

### Prevalence puzzles

If you believe the official figure—and many experts don’t—only 0.3% of the adults in Mexico are infected with HIV. That’s half the U.S. prevalence. “It’s very difficult to say what’s happening in Mexico,” says Soto-Ramírez, who runs an HIV/AIDS lab and clinic at the National Institute of Nutrition in Mexico City. “The numbers say very different things from what I think.” From his vantage point, the prevalence must be higher—and increasing. “I’m seeing many more women and many more rural cases,” he says.

Epidemiologist Carlos Magis-Rodríguez, CENSIDA’s research director, has found a surprising degree of heterosexual spread in rural Mexican communities and disturbing new evidence that migration is a major factor. “We find a lot of at-risk behavior in these little towns,” says Magis-Rodríguez. In collaboration with the Uni-

versity of California’s Universitywide AIDS Research Program (UARP), Magis-Rodríguez’s team is comparing 1500 people from five Mexican states who in the past year migrated to California for seasonal work to some 1200 who did not. Preliminary data suggest that the migrants have more sexual partners, use drugs and alcohol more frequently, and hire sex workers more often.

A second study suggests that migrants are becoming infected in California and bringing the virus back to rural communities in Mexico at high rates. The researchers compared the prevalence of HIV in 800 Mexican migrants temporarily living in California (0.6%) to 1500 who migrated and then returned home to Mexico (1.1%). “Is it possible that a low-prevalence country like Mexico could take off like India and China?” asks epidemiologist George Lemp, who heads UARP in Oakland, California. “That’s of great concern.”

A separate collaboration between clinicians at Tijuana General Hospital (TGH) and researchers at the University of California, San Diego (UCSD), published in the January *Journal of Acquired Immune Deficiency Syndromes*, suggests that the prevalence among pregnant women—generally considered an indicator of spread in the population at large—may also be significantly higher than official estimates. CENSIDA reported in 1997 that only 0.09%

pregnant women in Mexico were infected with HIV. In the new work, UCSD’s Rolando Viani and co-workers tested more than 2500 pregnant women at

TGH in 2003 who were either receiving prenatal care or who came to the hospital for the first time during labor. The group receiving prenatal care had a prevalence of 0.33%—nearly four times higher than earlier estimates. And in the group that only showed up in labor, which reported more frequent use of injecting drugs and more sexual partners, prevalence jumped to 1.12%.

Gynecologist Jorge Ruiz-Calderon, a co-author at TGH, says the initial reaction to the study from colleagues and officials alike was anger and denial. “They wanted to cut our heads off,” he says. “Most of my colleagues don’t want to know anything about the problem.” Many critics also viewed TGH, which Ruiz-Calderon notes sees “the poorest of the poor” in a border town that attracts people from other locales, as an aberration. “They see these pregnant women as outcasts,” says Viani. And he says that’s a serious mistake: “Eventually,” he predicts, “miniepidemics like this one will interchange with the general population.”

### Quality of care

Although TGH may not represent Mexico at large, it does illustrate the serious limitations that exist even in middle-income countries that have universal-access policies. Anti-HIV drugs can dramatically lower a pregnant woman’s risk of transmitting the virus to her baby. But at TGH—a well-equipped hospital in a large city that likely offers a higher standard of care than many other facilities in Mexico—screening of pregnant women is far from routine. Ruiz-Calderon says the residents and nurses are “not offering HIV tests to every pregnant woman, or they’re doing it after delivery.”



<< **On the move.** Tapachula’s Casa del Migrante provides temporary shelter—and HIV prevention education—to 7000 migrants each year.

at large. “In the beginning, it wasn’t easy to convey the message that migration has something to do with HIV/AIDS,” says sociologist Mario Bronfman, an Argentinean native who in the 1990s led groundbreaking studies that looked at migrants in Tecún Umán and 10 other “transit stations” in Central America and Mexico. Bronfman, who works with the Ford Foundation in Mexico City, says, “Now that we have hard data, it’s very clear there is a problem.”

Bronfman’s studies assessed knowledge and opinions about HIV/AIDS at each transit station. As Bronfman and his colleagues reported in the journal *AIDS* in 2002, a long list of factors puts migrants at higher risk of HIV infection: poverty, violence, few available health services, increased risk-taking, rape, loneliness, and large numbers of sex workers—all of which aptly characterize Tecún Umán today. They also found women to be more vulnerable because of “transactional” and “survival” sex that they had in exchange for food or protection during their travels.

Educavida, a nongovernmental organization sponsored by the United Nations Population Fund to do HIV/AIDS education and prevention, targets the wide array of migrants who temporarily call this town home. “Some stop here because they’re thinking of the American dream, and this is a place along the route,” says Educavida’s director, psychologist Brigida García.

### Prevention Programs Target Migrants

TECÚN UMÁN, GUATEMALA, AND TAPACHULA, MEXICO—In late November 2005, more than a month after Hurricane Stan walloped Guatemala and southern Mexico, the border in Tecún Umán was still closed because of damage to the bridge that connects the two countries. But the unofficial border crossing remained open for business. From daybreak until sundown, rafts fashioned from truck tires and wood planks shuttled people across the Suchiate River that separates this spicy border town from Mexico. A policeman stood watch much of the time, gladly ignoring the illegal migration for a small fee.

HIV negotiates the border with similar ease, carried by the constant flow of people. And this border in particular has helped clarify the theory that migration is a significant driver of the AIDS epidemics in this region—and the world



**Confronting homophobia.** CENSIDA head Jorge Saavedra launched a provocative campaign against discrimination against men who have sex with men.

Viani notes that UCSD has not had a case of mother-to-child transmission of HIV since 1994; TGH documented seven infected babies last year alone. TGH also routinely runs out of pediatric formulations of the anti-HIV drugs used to treat infected children. “We’re 20 minutes away from San Diego, but things are so different,” says co-author Patricia Hubbard, who coordinates the binational research program.

To Nuar Luna, a prominent AIDS activist, the biggest challenge Mexico faces is unequal access to quality care. “If you have influence and you have money, you have access,” says Luna, who has struggled to find competent care for his own HIV infection. “This is Mexico—and this is Latin America. It’s a region with a lot of racism and classism and social issues. You can hear Jorge Saavedra say, ‘Here in Mexico, we have full access.’ But we have to analyze what kind of access we have. The good services are for the rich ones, and the bad services are for the poor.”

### Reaching out

Despite the many concerns that people at the front have about Mexico’s response to HIV/AIDS, nongovernmental organizations (NGOs) and the government itself have launched several innovative prevention efforts. One takes place each evening in a Mexico City “dark room,” a club where men meet to have sex. The HIV-prevention service offered by the NGO Ave de México gives new meaning to the word outreach.

Not only do workers from Ave de México pass out condoms and lubricants, but they also put their hands between men in flagrante delicto to make sure that they’re using protection. Dentist Carlos García de León, who in his off hours runs the organization, says their studies found that nearly half of the men were not using condoms. “Most people accept it very well and are thankful,” says García de León. “They say, ‘I wasn’t thinking.’” He notes that in a gay sex club in, say, the United States, this type of intervention wouldn’t fly. “They’d kill you,” he laughs.

Late at night on the city’s Sullivan Boulevard, Alejandra Gil and her group Aproase offer another uniquely Mexican approach to prevention. Gil, a former sex worker, provides a comprehensive program to protect the women who line the street and try to catch the eyes of men driving by. In addition to providing counseling and a clinic that offers testing for sexually transmitted infections such as HIV, Gil and her adult son sit in cars all night long and oversee each transaction, transporting the women

to nearby hotels for their rendezvous—and even going to the room if they take longer than usual. “If the women don’t have security, we can’t help them with their health issues,” says Gil.

Another creative project has stepped up prevention efforts for injecting drug users in Tijuana, two-thirds of whom report never having been tested for HIV. A mobile health clinic travels around the city to areas that health care workers typically avoid, providing tests, clean syringes, and limited treatment. Delivering care at shooting galleries “takes away the stigma” that often prevents users from seeking help, says UCSD epidemiologist Steffanie Strathdee, who is running the project with Remedios Lozada, an AIDS clinician in Tijuana.

On the national front, Saavedra has spearheaded an antihomophobia campaign of radio and TV ads—so provocative that two Mexican states refused to run them—and posters, including one that shows a man and a woman both leaning their heads against the archetypal macho Mexican man dressed in revolutionary garb. “The anti-homophobia campaign really has opened a lot of discussion on this issue,” Saavedra says.

Saavedra agrees that the country has a long way to go in its prevention efforts. And he also concedes that the government’s quick launch of a universal access program meant that many health care workers and clinics were not as well trained in using the drugs as he would have liked. “We needed to do that first step in order to stop a lot of people from dying,” says Saavedra. “But I understand the way people feel and what they need. I’m part of them.”

—JON COHEN

(No solid figures exist on how many Mexicans and Central Americans migrate to the United States each year, but experts estimate that they number more than 1 million.) Today’s clients include a Nicaraguan mother of three who sells sex in one of the town’s many brothel/bars, an Ecuadorian man en route to the United States, and an HIV-infected woman who was a U.S. resident for 12 years and returned to her hometown a few years ago. Educavida does HIV testing, but Hugo Rivera, a clinician who works with the group, says he has little to offer people who test positive other than a referral to other locales that have antiretroviral drugs. “You do the examinations, and then they leave,” says Rivera.

And migration shows no sign of abating. Annelise Hirschmann, head of Guatemala’s National AIDS Program, says the country’s long-standing civil war that ended in 1996 still spurs migration, as families try to reunite. “The secondary issues that surround the war definitely feed the epidemic,” she says. Studies have shown that Mayans, who constitute about half of the country’s population, are also at high risk

because they travel frequently for agricultural work. And Hurricane Stan is just the latest natural disaster to drive Guatemalans from their homes. “There’s a mass exodus of young people going to the States right now because of Hurricane Stan,” says Dee Smith, a Maryknoll sister in Coatepeque who runs the HIV/AIDS-oriented Proyecto Vida. “They had few opportunities *before* Stan.”



**No visa necessary.** Migrants freely cross the Suchiate River between Guatemala and Mexico.

At the Casa del Migrante in Tapachula, Mexico—the closest big city and the first stop for many who cross at Tecún Umán—there is more hard evidence that migrants face an increased risk for HIV infection. This church-run lodging, which offers HIV/AIDS education, distributes a questionnaire to the 7000 people who pass through each year about their sexual lives during the journey. In 2004, fewer than 20% of the men reported having used condoms, and about 8% of the women said they had been raped. “Amigo Migrante,” reads a poster near the entrance. “For HIV/AIDS, no border exists.” —J.C.

### GUATEMALA

# Struggling to Deliver on Promises And Assess HIV's Spread

Epidemiological data are scarce, and outside of the capital, so are antiretroviral drugs

COATEPEQUE, QUETZALTENANGO, AND GUATEMALA CITY, GUATEMALA—Over the past 7 years, Luz Imelda Lucas, 31, has become entirely too intimate with despair. First, HIV took the life of her husband, who she says also infected her. His parents were certain she had become infected first. “They told me I killed him and that I was going to die and my children were going to die,” says Lucas, who lives in the southwestern town of Coatepeque. Lucas’s youngest child died when she was 28 months old, she says. In 2002, Lucas’s own days seemed numbered as her immune system bottomed out.

continue living,” says Lucas, who has a new boyfriend, too.

By the end of 2005, some 5500 HIV-infected people in Guatemala were receiving antiretroviral drugs, says Annelise Hirschmann, director of the country’s National AIDS Program. Five years earlier, the only people being treated were the wealthy minority who could buy their own drugs, the small percentage protected by the country’s social security system, and the few who enrolled in clinical trials. Roughly half of the drugs today come from MSF; the rest are purchased by the government

One obstacle is that outside Guatemala City, free drugs are available at relatively few centers. “Most everything is centralized in this city,” complains Eduardo Arathoon, who runs the Luis Angel Garcia family clinic at Hospital San Juan de Dios in the capital. Arathoon points to an HIV-infected couple with their little girl. “The couple gets up at 3 a.m. and takes three buses to get here,” he says. The centralization particularly hurts Mayans, who make up about half the population and often live in remote areas.

These problems will soon be compounded: MSF is leaving the country, which has Lucas and many other patients worrying about their futures once again.

### Guesstimations

The Joint United Nations Programme on HIV/AIDS estimated at the end of 2005 that Guatemala had 71,000 HIV-infected people and an adult prevalence of 0.9%. But as in the rest of Central American, a dearth of surveillance makes it hard to get a good fix on the extent of the HIV/AIDS epidemic there—and thus how best to target prevention efforts. “Epidemiology is not seen as that important,” says César Núñez, an epidemiologist based in Guatemala City who led the only in-depth studies of HIV’s spread in Guatemala and other countries for the Central American HIV/AIDS Prevention Project (PASCA). “Countries and ministries of health are concerned that they have treatment for people in these countries. But we can’t forget prevention either.”

Funded mostly by the U.S. Agency for International Development, PASCA worked in 2001 and 2002 with the Guatemalan health ministry to measure HIV prevalence in high-risk groups. In men who have sex with men, the study found a prevalence of 11.5%. Nearly half of those men considered themselves bisexual or heterosexual rather than gay, putting their female partners at high risk, too. Female sex workers overall had a relatively low prevalence of 4.5%, but that figure jumped to 14.9% in women who worked the streets rather than in brothels, discos, or other “fixed” establishments.

PASCA had hoped that Guatemala and other countries would continue and expand the studies. “We were not an epidemiological surveillance system; we’re the spark,” says Núñez. But, says Edgar Monterroso, who heads the Guatemala City office of the U.S. Centers for Disease Control and Prevention (CDC), “none of the countries was able to pick up and do their own surveillance.” CDC is now attempting to help Guatemala do these studies.

In particular, no one has properly evaluated HIV’s spread among the Mayans, says Monterroso. But a small study conducted at the Luis Angel García clinic suggests that incidence may be three times higher in



**Arduous commutes.** Eduardo Arathoon says the centralization of HIV/AIDS care at clinics like his in Guatemala City is badly hurting many Mayans who live in remote areas and must travel long distances.

Then, in a stroke of great fortune, Médecins Sans Frontières (MSF) launched a new program in Coatepeque that offered free anti-HIV drugs. Lucas was selected as one of the first nine people in town to receive the medicines, and her health rebounded. Maryknoll sisters, Catholic missionaries who work in many countries, also hired her at their Proyecto Vida, which offers HIV/AIDS testing, counseling, and health care for infected people. Lucas officially is a nutritionist but is also something of a counselor. “I like to make it clear to people that having the virus, you can still be productive and

or through a \$40 million, 5-year grant awarded to the country in October 2004 by the Global Fund to Fight AIDS, Tuberculosis, and Malaria. Hirschmann says many people who were once selling their homes and preparing to die are now looking for jobs. But she acknowledges that there are far too many people who either don’t know they are infected or have no access to the drugs, and “there are a lot of people dying from AIDS.” Many sharply criticize the government for this because it passed a law in 2000 that said all Guatemalans had the right to treatment.



**Worried.** Luz Imelda Lucas fears that she'll lose access to the anti-HIV drugs that have saved her life.

Mayans, who are often treated as second-class citizens, than in *ladinos*. "We think that group's more vulnerable," says Arathoon. Not only do many Mayans have trouble with Spanish, complicating prevention efforts, but they also have less access to health care in general. "We think that's where the epidemic will move," says Arathoon.

A study of patients at the government-run Rodolfo Robles tuberculosis hospital in

Quetzaltenango supports that assertion. Between 1995 and 2002, HIV prevalence in TB patients at the hospital—74% of whom were Mayan—jumped from 4.2% to 12%. As of May 2005, no antiretroviral drugs were available in Quetzaltenango, the country's second-largest city.

### Tough transitions

No one knows how many people are dying because they do not have access to antiretroviral drugs, says the National AIDS Program's Hirschmann. And even some of those taking the drugs are concerned about their continued supply because MSF announced in July 2005 that it was phasing out its program in Coatepeque, which now treats 500 people. Lucas is worried that the government will not respond adequately, and some Guatemalan AIDS clinicians and government AIDS officials share those concerns. "MSF obviously did something really good

because they brought treatment to a country that wasn't offering it," says Hirschmann. "But they have created somewhat of a panic in patients on treatment. ... I would be very afraid if I were a patient living with HIV and had to cross over to receive treatment from the government."

Frank Doerner, MSF's chief of mission in Guatemala, says those fears were unfounded. "It was calculated pressure, but it was not playing with the lives of the people," Doerner says of the charity's announcement that it would shut down its program. MSF earlier had successfully handed over a program in Guatemala City, Doerner notes, and MSF says it will stay longer in Coatepeque if the transition is not going smoothly. "After 5 years of being here and treating thousands of people, we showed how it was possible," says Doerner. "Now it's really up to the state to show that it's interested in taking over the responsibility that belongs to them."

—JON COHEN

## HONDURAS

# Why So High? A Knotty Story

SAMBO CREEK, TEGUCIGALPA, AND LA CEIBA, HONDURAS—As a small group of men and women from this impoverished fishing village watch intently, Daniel Martínez holds up a placard that shows horrific photos of diseased female and male genitals. "Syphilis!" he yells, and the group, which is sitting under a thatched-roof shelter on the beach, looks down at what amount to bingo cards that Martínez has given them. Those who have a syphilis square mark it with an uncooked bean. The HIV/AIDS education game, *Lotería Vive*, continues with pictures of other sexually transmitted diseases and cartoons of transvestites, a drunken man, and then the Grim Reaper. "Oh!" groans the crowd at the last card, but one man has bingo and yells, "*Lotería!*" Martínez, who works with the Pan American Social Marketing Organization (PASMO), hands the winner a baseball cap and two condoms.

The residents of this village are Garifuna, so-called Black Caribs who are descendants of shipwrecked Nigerian slaves and who have maintained a distinct culture for more than 200 years. The best HIV studies done in this and three other Garifuna communities—which were conducted by the Ministry of Health more than 7 years ago—found that the adult prevalence was an astonishing 8.4%. Martínez plays *Lotería Vive* in this and other Garifuna villages in the region several times each week.

Garifuna culture, discrimination against gay men, massive migration, the Cold War, and ignored prisoners all are theories that attempt to explain this country's serious epidemic

In 2005, Honduras in general had an adult prevalence of 1.5%, according to the Joint United Nations Programme on HIV/AIDS. That makes it the hardest-hit country in Central America other than relatively tiny Belize (see p. 483). The spread is mainly through heterosexual sex, which

is reflected by a nearly 1:1 ratio of male to female AIDS cases. Yet the virus has also spread widely through the community of gay men, who have a prevalence of 13%—even higher than that of female sex workers, at 9.7%. By November 2005, almost 4500 people were receiving anti-HIV



**Game theory.** PASMO dispatches Daniel Martínez to Garifuna communities to teach HIV prevention through the bingo-like *Lotería Vive*.

## HIV/AIDS: Latin America & Caribbean

### Mission Possible: Integrating The Church With HIV/AIDS Efforts

TEGUCIGALPA AND JUTICALPA, HONDURAS—Throughout heavily Catholic Latin America, few topics have riled those working to slow the spread of HIV more than the Vatican's opposition to condoms. Many HIV/AIDS workers have also decried what they see as the tendency by many denominations to treat as outcasts the two groups especially hard hit by the epidemic: homosexuals and sex workers. But in Honduras especially, church leaders are now trying to become part of the solution with stepped-up efforts that aim to slow HIV's spread and help the infected.

These church representatives are not, by any means, advocating the use of condoms, as Maryknoll sisters in Guatemala do with sex workers and other at-risk people they help (see p. 480). But representatives from four denominations are working with the United Nations Population Fund (UNFPA), which is famous for promoting family planning, in the year-old Interreligious Committee to contribute to Honduras's national strategic plan for confronting its HIV/AIDS epidemic. "This is the first time we've worked with faith-based organizations, and the nice thing is we put our position on the table," says Alanna Armitage, who heads the UNFPA office here. "We would not work with them if we couldn't talk about condoms or they said they weren't effective. There's no more time to fight on this."

The representatives from the Episcopal, Evangelical, Adventist, and Catholic churches do not speak with one voice about condoms; some think, for example, that they should be promoted if one partner in a marriage is HIV-infected. Nor do they exactly embrace homosexuality. "We don't have a specific program with homosexuals, but where we work, there are people with HIV/AIDS, and we treat them like anyone else," says Elvia María Galindo, a committee member speaking for the Episcopal church. "We're all sinners."

But Javier Medina, a gay activist here, charges that the religious community—particularly Evangelicals—have fanned the rampant



**Crossing the divide.** Padre Alberto Gauci provides many HIV/AIDS prevention and care services in Juticalpa.

homophobia in the country. He points to marches held by Evangelicals that protested the government's decision in 2004 to officially recognize his group, called Kukulcán, and two other gay organiza-

tions. "This created more hatred toward us," says Medina, adding that a few dozen gay men have recently been killed in hate crimes and that his group has received death threats. This does not reflect the opinion of other denominations, however, says Carmen Molina, the committee's Catholic representative.

Although Padre Alberto Gauci, a Franciscan, does not condone homosexuality, he's fervently trying to help thwart HIV at a men's prison in Juticalpa, 3 hours from the capital. Gauci, who favors flip-flops, jeans, and T-shirts and looks more like an aging hippie than a clergyman, is on a somewhat quixotic quest to build a new prison in Juticalpa, where he runs an HIV/AIDS orphanage and hospice. The prison, built more than 100 years ago for 90 inmates, currently holds more than 400 men who sleep at least two to a bunk. More than 5% are known to have AIDS. In December 2005, no HIV tests or anti-HIV drugs were available. "The church has to play a role because people have lost all hope with politicians here," says Gauci, a native of Malta. "Illness is spreading in the prison in a very accelerated way."

Gauci supports his efforts by running a bakery and occasionally staging horseraces and dogfights on the grounds of his compound. "Gambling is not a sin if you're raising the money for good things," shrugs Gauci. Now that's working in mysterious ways.

—J.C.

drugs, up from 200 three years earlier. But the national AIDS committee, CONASIDA, estimates that the drugs are reaching only about one-third of those with advanced disease.

No convincing studies explain how the virus made so much headway in Honduras, but theo-

ries abound. Epidemiologist Manuel Sierra, who headed the Ministry of Health study of the Garifuna and now works at the National Autonomous University, says in most countries in the region, the virus entered through gay men and then "incubated," which means it took a long time

to bridge into other communities. The first AIDS cases in Honduras were also gay men, he says, but HIV quickly spread through heterosexual sex, both in the Garifuna community and the country at large. "The main difference between Honduras and the rest of Central America is the incubation period," posits Sierra.

A key distinguishing factor in Honduras, he contends, was the country's role during

the Cold War. Sierra notes that when the first AIDS cases were detected in the early 1980s, the Cold War was raging, and U.S. military personnel were flooding into Honduras in an attempt to influence the civil wars in neighboring Nicaragua, El Salvador, and Guatemala. "Honduras was the center used by the United States to fight all the countries," says Sierra. The influx of soldiers—including Nicaraguan contras who staged attacks from Honduras—led to a boom in sex workers, which in turn played a "major role," he says. César Núñez, a Honduran epidemiologist who heads the multicountry PASCA study of HIV prevalence in high-risk groups in Central America (see p. 480), says this is "a good hypothesis."

As in other countries, prisoners are another driver of the epidemic in Honduras. A Ministry of Health study found a prevalence of 7.6% in prisons. "That's the ideal population to spread the virus," says Sierra. "You have spouse visits, lots of homosexual sex, low access to condoms, and lots of HIV." Núñez and Sierra say rampant migration has also played a central role. In particular, the country has a large num-



**Above and beyond.** Honduras has more HIV-infected patients than any country in Central America. They frequently fill the beds at Tegucigalpa's Torax Hospital.

ber of merchant seamen, many of whom travel to Asia and Africa.

Although the Garifuna do not explain the country's high prevalence—they only number about 100,000 out of a population of 7.3 million—they are an important part of a complex story, says Sierra. When he tried to tease out why Garifuna have such a high prevalence, he found no evidence that they were more promiscuous than the *ladinos* who make up the majority in the country. Yet this has become a common belief, in part because Garifuna more openly discuss their sexual habits. “Garifuna as a group are more innocent, and they’ll give you a

straight answer,” says Sierra. “We *ladinos* have learned how to lie.”

Garifuna, some of whom make their livings as merchant seamen, also frequently migrate to the United States and other countries for work. Sierra notes that many shuttle between the large Garifuna community in New York City, which itself has a high HIV infection rate.

Garifuna have other risk factors, including widespread poverty and less access to health services. The culture also has many myths that make it more difficult for HIV-prevention educators. “They believe a spirit can enter a person and therefore that HIV is an inherited thing,” says PASMO’s

Martínez, who is half Garifuna himself. “And when a person is showing symptoms, they think it’s an ancestor asking for a religious ceremony.”

Sergio Flores, the top HIV/AIDS doctor in La Ceiba—the nearest city to Sambo Creek—wonders about highlighting the high prevalence in the Garifuna, because the population already suffers so much stigma and discrimination. “The community was essentially forgotten about, but when HIV arrived, we put our eyes on them,” says Flores. “It doesn’t seem right to me. And if you go to the street and ask the people about AIDS issues, many of them think ‘AIDS, it’s not in my house—it’s the house of the Garifuna.’” —JON COHEN

## BELIZE

# Taking It to the Streets

An unusual prevention program targets gang members, who are seen as particularly vulnerable to HIV

BELIZE CITY, BELIZE—Shortly after Douglas Hyde started working 4 years ago doing HIV/AIDS prevention work with gang members, he was welcomed with a “pint bottle” to his face that left a nasty scar above one eye. Today, Hyde, a former gang member, continues the work through a multipronged government program called Youth for the Future that attempts to link violence reduction with HIV/AIDS education.

As Hyde drives around the rough South Side streets where he grew up, he repeatedly toots the horn of his van at gang members. “What’s up, fam?” he asks a group of men and boys hanging out on one street who don’t exactly look like his family. The group gives a warm “Ya ya” to “Dougie,” who has o-n-e l-o-v-e inked across his fingers and barbed wire tattooed on a bicep. Several of the men wonder whether he has leads on any jobs. “I have become the job god in the street,” says Hyde.

This is Blood territory, the gang that Hyde used to run with until a showdown with the rival Crips scared him straight, and he notices the finer details of the street. The pile of used clothing for sale on the sidewalk is a front for dealing drugs. Most of the guys in this group are “strapped” with pistols. “Scopes” at second-story windows of the incongruously colorful clapboard homes are monitoring his every move. And he sees something else that may be less than obvious to outsiders: a strong link between the gang lifestyle and Belize’s high prevalence of HIV, which at the end of 2005 had infected 2.5% of adults. That’s why Youth for the Future believes that finding people legitimate jobs and encouraging them to quit gangs is a potentially powerful HIV prevention strategy.

Although many Latin American countries have problems with gangs, a 2005 report by the nonpartisan U.S. Congressional Research Service

said “the largest and most violent” ones are in Central America and Mexico. According to the report, several factors have led to an increase in gangs: weapons left over from the many civil wars in the region, the stepped-up U.S. deportation of law-breaking immigrants, and staggering

Supported by the United Nations Population Fund and a grant from the OPEC Fund, Youth for the Future maintains a resource center that’s essentially a hangout for anyone, and gang members are welcome. It stages frequent HIV/AIDS prevention education sessions and has a big bowl

filled with free male and female condoms, free pamphlets on HIV/AIDS prevention, and Internet access for a small fee (free to students). “They have done tremendous work,” says epidemiologist Paul Edwards, head of the Ministry of Health’s National AIDS Program. “These kids have a lack of education and don’t make the best decisions possible.”

No study has ever assessed HIV prevalence in gang members in Belize, which

has a tiny population of 280,000 people. A study done in the country’s one prison—which almost every longtime gang member knows intimately—found an HIV prevalence of 4.6%. Youth for the Future plans to start offering HIV counseling and testing, and Hyde hopes to recruit gang members to participate in a prevalence study. Meanwhile, he’s become increasingly cautious about how he conducts his business. “I’m good with everyone,” says Hyde. “But I’m very smart now to recognize when I shouldn’t be around.”

—JON COHEN



**Ganging up on HIV.** Youth for the Future’s Douglas Hyde (right) found these former gang members jobs with a company that’s clearing this junkyard.

income inequalities in Belize and its neighbors. Youth for the Future is one of the few efforts that explicitly targets gang members as “at-risk youths” for HIV infection.

Not only do gang members often share one woman, Hyde says, but “transactional sex” for a meal or protection is also the norm. “Give some, get some,” says Hyde. Condom use is also low. “And some guys in the street, especially the leaders, believe that they don’t need to take the HIV test,” says Hyde. “They believe they just need to send their girls or wives to take the test to know their status. We’re telling them that’s not true.”

## South America

With its bold 1996 policy to offer top-of-the-line AIDS drugs to everyone in need, Brazil catalyzed the “universal access” movement. Spurred by AIDS activists and donors, many governments in South America have followed suit. Although prevention has stumbled in many countries, Brazil, Peru, and Argentina each have had innovative campaigns, and they have also supported cutting-edge HIV/AIDS research. In part because of these efforts, the epidemic has not spread far beyond high-risk groups, although there’s increasing evidence of “bridging” to the general population.

### BRAZIL

## Ten Years After

RIO DE JANEIRO AND SÃO PAULO, BRAZIL—In 1996, when it first became clear that potent cocktails of anti-HIV drugs could dramatically extend the life of an infected person, the \$15,000-a-year price tag seemed out of reach to all but the world’s wealthiest people. Brazil, which already had a progressive prevention program, said to hell with that. A middle-income country with more HIV-infected people than any other in Latin America or the Caribbean, Brazil declared that it would provide the treatment, at no charge, to every resident who needed it. And the government would bankroll this seemingly outlandish promise in part by having Brazil’s own drugmakers produce copies of antiretroviral drugs that major pharmaceutical companies had patented.

Brazil soon became a poster child for the access movement, which argues that everyone, everywhere can have antiretroviral drugs by purchasing knockoffs—outside Brazil, mostly made by generic drug companies in Asia—and by hard bargaining with Big Pharmas. By the end of 2005, 1.3 million HIV-infected people in poor and middle-income countries were receiving steeply discounted drugs, up from 240,000 in 2001. Brazil today has 180,000 people

on antiretroviral drugs; 20% are made in the country, and the rest are purchased from Big Pharmas—typically after the government stages heated, much publicized, negotiations to exact price breaks.

As aggressive as Brazil has been about confronting Big Pharma, a growing number of insiders are criticizing the country for going soft and too readily acceding to Big Pharma’s wishes. Brazil manufactures only eight antiretroviral drugs, all of them older preparations. Fourteen newer drugs offer many advantages, such as fewer side effects, more potency, and effectiveness against many drug-resistant viruses. Although Brazil has repeatedly threatened to break patents and make copies of these newer drugs, each time push has come to shove, government officials have backed down and cut deals with the Big Pharmas that have made some leading Brazilian AIDS researchers and activists blanch. “This has been a huge disappointment for us,” says Pedro Chequer, who twice headed Brazil’s national AIDS program and now works for the Joint United Nations Programme on HIV/AIDS (UNAIDS). Alexandre Granjeiro, another former head of the AIDS program, says Brazil must

violate patents and risk incurring the wrath of Big Pharma and other industries that hold fast to intellectual-property regulations. “It’s important to the world,” says Granjeiro, who is director of the São Paulo State Health Institute. “If we make this ball roll here, it will make the ball roll everywhere.”

### Turnaround?

In 1992, the World Bank predicted that Brazil would have 1.2 million infected people by 2000. But because Brazil meshed aggressive prevention efforts with its pioneering treatment program, this dire prediction has not come true. According to UNAIDS estimates, at the end of 2005, 620,000 Brazilians were infected with HIV. The adult HIV prevalence in the country is a modest 0.5%, but because it is the most populous country in Latin America with 188 million residents, Brazil still accounts for more than one-third of the HIV/AIDS cases in the region.

As in North America and Europe, AIDS first surfaced in Brazil in upper-middle-class gay men, many of whom were politically active in the democracy movements that blossomed when 2 decades of military rule



After stunning the world by offering antiretroviral drugs to all in need, this country is struggling with the escalating costs of providing free HIV/AIDS care

ended in 1985. “The community movement became extremely well organized, more than in the United States,” says Ezio Tavora dos Santos Filho, a prominent AIDS activist who learned of his infection that year. In 1988, when Brazil rewrote its constitution, it declared that health care was a right, and 3 years later, the country offered HIV-infected people free AZT—then the only antiretroviral drug on the market.

By 1992, the virus had spread far and wide, with equal numbers of AIDS cases that year occurring in gay and bisexual men, heterosexuals, and people who injected cocaine—but still, it did not take off to the degree once feared. It’s difficult to untangle precisely why, although Chris Beyrer, an AIDS epidemiologist at Johns Hopkins Bloomberg School of Public Health in Baltimore, Maryland, and co-author of a 2005 World Bank case study of Brazil, credits aggressive prevention campaigns. The Ministry of Health alone tripled the number of condoms it distributed between 2000 and 2003, the report notes, and government and nongovernmental organizations alike boldly reached out to gay men, sex workers, and injecting drug users.

Other factors contributed as well, says Beyrer. Antiretroviral treatment lowers the level of virus, likely making recipients less infectious. And the availability of treatment encouraged people to undergo HIV tests, which in turn can lead those who are infected to take more precautions. A change in drug-use trends—injecting cocaine largely fell out of fashion as many users switched to smoking the drug—contributed to the declining spread of HIV, too. “Brazilians hold on to how severe their epidemic is, but the bottom line is it could have been much worse,” says Beyrer. And because Brazil controlled HIV’s spread early on, he says, it made offering state-of-the-art treatment to everyone in need much more feasible.



**Provocative prevention.** Gabriela Leite heads Davida, an NGO for sex workers that launched a clothing line to raise money to fight the spread of HIV.



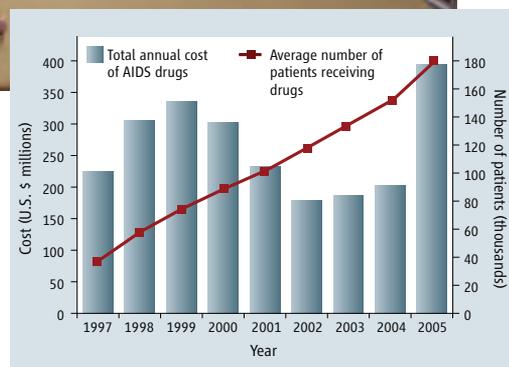
**State pharma.** Farmanguinhos head Eduardo Costa hopes to ramp up production of antiretroviral drugs at the company’s new high-tech plant.

### Rights and wrongs

Brazil became an icon for HIV-infected poor people everywhere—and a punching bag for critics—following its 1996 decision to offer its residents cocktails of three antiretroviral drugs that had just become available. One of the strongest naysayers was the World Bank, which by then had committed a whopping \$750 million to help Brazil combat its AIDS epidemic. “We received a lot of pressure to not implement combination therapy,” remembers Valdiléa Veloso, who now directs the Evandro Chagas Clinical Research Institute at Fundação Oswaldo Cruz (Fiocruz), a biomedical research center run by the Ministry of Health. Formerly with the national AIDS program,

Veloso says bank representatives urged them to put more money into prevention instead. “They all argued it was a crazy decision to offer triple therapy in Brazil because of the complexity, the cost,” she says.

Objections came from within the country, too. “I was very skeptical,” acknowledges Mauro Schechter, a leading AIDS researcher at Federal University in Rio de Janeiro. Because of limitations in the country’s health care infrastructure and clinician training, Schechter worried that many infected people would not adhere to the complicated treatment regimens, leading to widespread drug resistance. “I was obviously wrong,” says Schechter now. Brazil’s Ministry of Health reports



that between 1996 and 2002, AIDS mortality dropped 50%, and an estimated 90,000 deaths were averted. The government says it saved \$1.2 billion that would have been spent on hospital admissions and treating the opportunistic infections of AIDS.

Nor have the disaster scenarios of the rapid spread of drug-resistant strains come to pass. “We don’t have any evidence of primary resistance increasing,” says Amilcar Tanuri, who runs a molecular biology lab at Fundação Isla in Rio, a branch of the Federal University, referring to the spread of resistant strains between individuals. Yet Tanuri notes that “secondary” drug resistance, which develops while on treatment, is becoming more widespread, requiring many to change their medicines. “There’s no way around it,” he says. Combine that with the growing number of people on treatment, and Brazil is now faced with importing an increasing quantity of ever-more-expensive drugs. “The cost of treatment is going up and up and up,” says Tanuri. More people on treatment also means more work for already-overstretched clinics. “Brazil has not done the homework over the past 10 years,” complains Schechter, who would like to have seen the government use research to assess how best to use its limited resources. “I’m really concerned about the sustainability of the program.”

## Free Drugs ≠ Quality Care

RIO DE JANEIRO, BRAZIL—Thanks to the persistence of a niece, Luis Silva, 50, made his way to the highly regarded AIDS clinic at the Evandro Chagas Clinical Research Institute one morning in June. After suffering persistent fevers and night sweats, Silva in August 2005 had sought medical care at a clinic near the poor neighborhood where he lives. An HIV test indicated that he had been infected, but Brazilian regulations require a second, confirmatory test before doctors order expensive immune tests, which in turn are needed before they can prescribe antiretroviral drugs. The doctors treated what they thought was a pulmonary infection, and for a time Silva's condition improved, so he skipped the second test. But then the slightly built man lost 20 kilos and developed a hacking cough, which led him to several other doctors, who offered little help. Finally, his niece, who is a nurse, brought him here.

A chest x-ray taken that day showed strong evidence of tuberculosis, and Silva's doctor said she was all but certain that he has AIDS. Still, even she had to wait 10 days for the lab to determine his HIV status, as only pregnant women have access to the rapid test that can give results in a few hours. The clinic's director, Valdiléa Veloso, notes that many other facilities in Brazil routinely run out of HIV test kits. "It's crazy," says Veloso. "It would have been much better for the government to have made the decision about rapid tests years ago."

As progressive a stance as Brazil has taken on HIV/AIDS prevention and care, it remains a middle-income country offering uneven health care services. "In Rio, it's not uncommon to receive in the emergency room HIV-infected people who were not treated," says Pedro Chequer, who twice headed the country's national AIDS program and now works for the Joint United Nations Programme on HIV/AIDS. "The health care system here is collapsing."

Activist Ezio Tavora dos Santos Filho recently completed a report of the tuberculosis care offered in Brazil, which he notes is in the "shameful position" of being 15th on the World Health Organization's list of 22 countries that have a high TB burden. "It's indefensible," says Tavora. According to his report, federal, state, and city TB programs are only now beginning to work together, as officials recognize that 12% of HIV-infected people are coinfecting with TB.

Solange Cesar Cavalcante, who heads the TB program for Rio, notes that unlike HIV/AIDS, TB is not a "sexy" topic and so far has not mobilized affected communities. Says Cavalcante, "Tuberculosis is trying to learn from the AIDS program." —J.C.



**Delayed reactions.** Luis Silva (*left*) had to jump through many hoops to see whether he was HIV infected and eligible for treatment.

## Tripping on TRIPS

Between 1997 and 2004, the average annual cost of antiretroviral therapy in Brazil dropped from \$6240 per patient to \$1336. That decline allowed the country to treat more people without increasing its budget for AIDS drugs. But because Brazil has steadily purchased more imported drugs, in 2005 the per-patient annual cost jumped to \$2500 (see graph, p. 485). Forecasts suggest that costs will continue to climb unless the country violates patents or negotiates better deals with Big Pharma.

At the crux of Brazil's current dilemma are the World Trade Organization's patent rules, known as the Trade-Related Aspects of Intellectual

Property Rights (TRIPS). In 1996, when Brazil decided to offer HIV cocktails, it passed a law that enforced the TRIPS agreement. The new regulation meant that Brazil could legally produce anti-HIV drugs patented before the signing—but not the improved antiretroviral drugs and new classes of drugs that have come to market over the past 10 years. Today, Brazil's Ministry of Health spends 80% of its \$445 million annual budget on imported antiretroviral drugs. And the ministry estimates that between 2006 and 2011, the annual cost of purchasing just three of these drugs—Merck's efavirenz, Abbott's lopinavir/ritonavir, and Gilead's tenofovir—will jump from \$145 million to \$248 million.

If the government instead made the drugs at the state-owned pharmaceutical company Farmanguinhos, the ministry says the country would save \$769 million over that period. "If there's no change in the price of second-line drugs, no country like Brazil will be able to afford them," says Luiz Loures, a Brazilian epidemiologist who works at UNAIDS.

"Brazil has the technical capacity to produce all of the drugs," says Paolo Teixeira, who ran Brazil's AIDS program from 2000 to 2003 and now works as a consultant for São Paulo's AIDS program. And he says that gives the country a strong negotiating tool when purchasing antiretroviral drugs in bulk from Big Pharmas. Essentially, the government has said, "If we don't like your price, we'll violate the patent and make the drug ourselves." This is allowed under the TRIPS agreement, which says signatories can invoke what is known as a "compulsory license" to address public health emergencies. No country has yet done so, however, because of fear of damaging international trade relations. Brazilian President Luis Inácio Lula da Silva twice has promised to use the compulsory-license clause for anti-HIV drugs but has backpedaled both times, complains former AIDS program head Chequer. "They were cowards by not doing that," says activist Tavora. "That could be very useful to all of us, to the whole world."

David Greeley, Merck & Co.'s spokesperson for Latin America, says if Brazil invokes compulsory licensing, it will ultimately harm the people the government is trying to help. "We've tried to convey to our counterparts in Brazil that it's not in the long-term interest for Brazil to adopt this stance," says Greeley. As with other Big Pharmas, Merck invests in research and development of new products because intellectual-property regulations exist, he says. "Intellectual property is an incentive to innovation, not a barrier to access," he maintains.

## Retaining the lead

In the Rio suburb of Jacarepaguá, there are clear signs that the government once again wants Brazil to lead the charge against Big Pharma with more than rhetoric. Jacarepaguá's Estrada dos Bandeirantes has long housed the gleaming offices of international giants such as Abbott and Roche, both of which have crossed swords with Brazil over pricing of their anti-HIV drugs. In August 2005, a new resident moved into the neighborhood: Farmanguinhos, the government-owned drugmaker.

Farmanguinhos's new factory, once owned by GlaxoSmithKline, has five times the pro-

**Patently absurd.** Not invoking compulsory licenses is deadly, says Pedro Chequer.



duction capacity of its old plant on the other side of the city. Company Director Eduardo de Azeredo Costa has ambitions beyond just manufacturing more antiretroviral drugs. He says Brazil needs to start producing the active pharmaceutical ingredients used to make the drugs, which it

now purchases from India and China. Costa says these are often of inferior quality, so by making its own, Farmanguinhos can both reduce costs and avoid expensive delays in production.

But even with these changes, making the new generation of antiretroviral drugs will be challenging for Brazil. “It’s a lie that if we had no patents, we just can from right today produce generic medicines for all drugs,” says epidemiologist Francisco Basto, a leading AIDS researcher at Fiocruz. “This

will be a very, very complicated issue for the coming few years.”

Costa agrees but says Farmanguinhos and other drugmakers must rise to the occasion, for the sake of Brazil and other cash-strapped countries. As Costa walks around the plant’s new high-tech machines—several of which are still wrapped in plastic—he notes that representatives from two dozen countries have toured the facility in hope of following in the Brazilian government’s footsteps. “People of the world want us to be much better than we are,” says Costa. “We have to answer to this demand.”

—JON COHEN

## ARGENTINA

# Up in Smoke: Epidemic Changes Course

Over the past few years, HIV infections of heterosexuals have eclipsed those of injecting drug users and gay men

BUENOS AIRES, ARGENTINA—Stella Maris Todaro is part of a battalion of *promotorios* hired by the government to educate their communities about HIV/AIDS. “I started this work 15 years ago because I saw my children were addicted, shooting drugs,” says Maris, who lives in a poor neighborhood called a *villa miseria*. Whereas most countries in Latin America then had AIDS epidemics concentrated in homosexual men, Argentina, like its neighbors in the Southern Cone of South America, had an equally large problem in injecting drug users (IDUs) who shot

cocaine. As it turned out, Maris’s two sons both became infected by sharing syringes and died from AIDS. Although she was not an IDU herself, a sometime partner was, and in 1995, Maris learned that she, too, was HIV-positive.

Today, Maris, 52 and a grandmother, better characterizes the average HIV-infected person in Argentina than do her sons. In a dramatic shift seen across the Southern Cone, IDUs largely have either died from AIDS or stopped injecting cocaine and switched to smoking the much cheaper *pasta base de cocaine*, or *paco*,

a low-grade paste. “We have a great change of the use of drugs in Argentina,” says epidemiologist Claudio Bloch, head of the HIV/AIDS program for the city of Buenos Aires. Bloch, like many other experts, contends that *paco*’s rise in popularity is a result of “the crisis,” the sharp devaluation of the peso that occurred in 2001 and 2002, although the same shift has occurred in other Southern Cone countries that did not suffer an economic collapse.

By December 2005, HIV had infected 130,000 people in Argentina, or 0.6% of all adults, a percentage that has remained steady for several years. Ministry of Health figures from 2004 show that 50.7% of the people with AIDS had been infected through heterosexual sex, whereas men who have sex with men (MSM) accounted for only 18%, and IDUs were at 16.6%. A similar analysis from 1982 to 2001 shows that 40.1% of the AIDS cases were IDUs—more than either MSM or heterosexuals. In Buenos Aires, the evidence is more telling still: IDUs accounted for only 5.2% of the new infections between 2003 and 2005. Now, says Bloch, the new infection rate in men and women is almost the same. “The heterosexualization of the epidemic is so strong,” he says.

As more women become infected, Maris’s services become increasingly valued. “I’ve learned a lot of things from Stella,” says Sara Tapia, 33, a mother of four who also works as a *promotorio*, lives in a *villa miseria*, and is HIV-positive. “In life, we have to be what we are. We mustn’t pretend. We’re always going to be that.” One of Tapia’s most difficult challenges, she says, is that her husband refuses to get tested: “It’s not something he



**Cold truth.** HIV/AIDS in Argentina is increasingly a disease of poor women such as Sara Tapia (left), a mother of four who lives in this *villa miseria*.

wants to talk about, and it's obviously painful for him, so we don't dwell on it."

### Great expectations

Argentina was one of the first countries in Latin America to offer antiretroviral drugs to everyone in need, but it has not received the worldwide praise that's been poured onto neighboring Brazil for making a similar commitment. "People talk about Brazil because the Brazilians have done a very good job of marketing what a very good job they've done," says Pedro Cahn, a leading AIDS researcher in Buenos Aires who heads the Fundación Huesped and is chief of infectious diseases at Hospital Juan Fernández. But he also stresses that Brazil has a "more consistent" national program in many ways.

Both of Maris's boys became sick before potent cocktails of anti-HIV drugs had come to market, but she was luckier. Today, the virus is not detectable in her blood, and her immune system is robust. Tapia similarly is doing well on a cocktail of drugs.

Some 30,000 infected people in Argentina are currently receiving treatment, which the government says is 100% of those with advanced disease. Mother-to-child transmission, which anti-HIV drugs can prevent, has dropped to 3%. "It's similar to Paris," notes Bloch.

Yet many AIDS researchers and patients complain that the government program has many shortcomings compared to wealthy countries. That is a central dilemma for Argentina, which long has seen itself as the most European country in Latin America, yet frequently—especially since the crisis—finds itself with rich-country expectations but poor-country limitations.

One of the biggest problems is that government clinics and hospitals are short staffed. "You have to wait for everything," says Roxana González Montaner, a clinician who works in a poor part of the city. She notes that there are long lines every morning, and that many doctors here work in both public and private practice to make ends meet. Lab tests require more long waits, and the results often do not arrive back at clinics for weeks or even months. "We can make many things happen for [some people] but not for everyone," says González.

Pharmacies all too frequently run out of anti-HIV drugs. "This morning, we didn't have abacavir at my hospital," says Cahn, referring to an increasingly popular drug for people starting treatment. "Ask me why, we don't know."



**Drug drop.** Claudio Bloch's group has documented a steep decline in HIV spread via shared needles.

Carlos Zala, an AIDS clinician and researcher at Hospital Juan Fernández, says the government needs to spend more money on monitoring treatment. "HIV [care] is much more than just providing antiretroviral drugs," says Zala, noting that it's often difficult for people to learn their

immune status or the levels of HIV in their blood. He also faults the government for not monitoring the treatment program itself, which his team is now starting to do by carefully following a cohort of treated people to gauge the emergence of drug resistance and health problems. "This is typically Argentina: a good thing, a good action, that no one is controlling," says Zala. "We will provide medication, but no one will see whether it works."

—JON COHEN

## PERU

# A New Nexus for HIV/AIDS Research

Talented investigators and explosive spread in men who have sex with men have made this country a hot spot for clinical studies

LIMA, IQUITOS, AND NAUTA, PERU—On a Friday night this June at a gay disco in Iquitos, a jungle city that's the jump-off point for touring the Amazon rainforest, drag queens danced to the thump of "*Voulez-vous coucher avec moi?*" in a Miss Adonis contest. The event, staged by the Asociación Civil Selva Amazónica, was part entertainment, part HIV prevention, and part recruitment for an AIDS vaccine trial.

Welcome to Peru, a somewhat incongruous hotbed of HIV/AIDS research. "Everyone's going to Peru, and it's not because they have a huge epidemic," says Robert Grant, a virologist at the University of California, San Francisco (UCSF), who runs one of many collaborative projects now under way. "It's because of the research climate."

Intensive efforts are now under way to understand the country's perplexing epidemi-



**Recruiting station.** "Lashmi" leads a teach-in about drag queens that doubles as an attempt to find volunteers for an AIDS vaccine trial.

ology—the epidemic is concentrated among men who have sex with men (MSM) and has not “bridged” much to other groups—and to evaluate new treatment and prevention strategies. The scope and scale of the research enterprise is especially remarkable given the government’s foot-dragging when it comes to offering anti-HIV drugs to people who need them (see sidebar, right).

Only 0.6% of Peruvian adults were infected with HIV by the end of 2005, according to the Joint United Nations Programme on HIV/AIDS (UNAIDS). But studies suggest that the prevalence in Peruvian MSM—a group that includes many bisexuals who consider themselves heterosexual—is 10% in Iquitos and the surrounding area and more than twice as high in Lima. It’s on this group that researchers have focused their attention. “It’s a very concentrated epidemic, and we have a very good relationship with the community,” explains epidemiologist Jorge Sánchez, who runs Asociación Civil Impacta Salud y Educación (Impacta), a nongovernmental organization based in Lima.

Similarly, Carlos Cáceres, an epidemiologist at the Universidad Peruana Cayetano Heredia in Lima, has a team of AIDS researchers working closely with high-risk communities to evaluate behavioral interventions, viral spread, and strategies to reduce stigma and discrimination. “There’s a lot to be studied here,” says Cáceres.

Both Sánchez’s and Cáceres’s groups have strong ties to U.S. academics, participate in international multisite studies, and receive substantial funding from the U.S. National Institutes of Health (NIH). A challenge, says Cáceres, is ensuring that such collaborations serve both Peru’s own interests and those of the funder.

### Why Peru?

Many factors have contributed to Peru becoming a nexus of collaborative HIV/AIDS research, but explanations usually return to Sánchez and Cáceres. “There are great people here,” says Rubén Mayorga, the Lima-based UNAIDS country coordinator. “And there’s an acknowledgment that HIV is a big problem among gay men or men who have sex with men.”

Sánchez and Cáceres—who, to the frustration of many, have a strained relationship—command wide respect from colleagues around the world. Sánchez was the first of some 40 Peruvian researchers who were funded by NIH’s Fogarty International Center to train at the University of Washington (UW), Seattle, with King Holmes, a renowned expert on sexually transmitted diseases. Sánchez then headed Peru’s national AIDS program within the Ministry of Health. When he left, he took many members of his team and started Impacta. His group now collaborates with both UW and Grant’s lab at UCSF. Cáceres has a doctorate in public health from UC Berkeley and

works closely with Thomas Coates’s AIDS research team at UC Los Angeles.

Mayorga says Sánchez and Cáceres have a deep understanding of the communities that they are studying because they are both part of them. “I know exactly what it means to have a partner who weighs 40 kilos and you need to take him to shower because he cannot shower himself,” says Sánchez, who had a partner die of AIDS in 1990. “I cannot take my personal life out of my thinking.” Cáceres, too, says his per-



**Late stage.** Milton Ramírez needs antiretroviral drugs, but he must wait for test results before he’s eligible.

to about 70% of the infected people in the country, the problem is especially acute.

Take Iquitos, a jungle city in the north of the country that has a high HIV prevalence in men who have sex with men. The main hospital has repeatedly run out of anti-HIV drugs for the 110 people receiving the treatment. “The last 2 months, we didn’t have enough drugs to support our patients,” says Cesar Ramal Sayag, head of infectious diseases at the Regional Hospital of Loreto. Sayag says he also has to wait several weeks to receive results of tests for CD4 white blood cells—which must be air-shipped to Lima—and that government rules do not allow him to start patients on treatment without that information. “The national program will continue this way for 10 years, and they won’t change,” says a frustrated Sayag.

Across town at the Hogar Algo Bello, a hospice run by a Catholic priest, a 22-year-old gay man named Milton Ramírez is suffering from untreated late-stage AIDS. Ramírez has been ill for 2 years. And although two separate tests have confirmed his HIV infection, his blood was drawn to measure his CD4 cells just a few weeks ago, and his doctors are still waiting for results before they can treat him.

Marco Calixtro, a doctor in town at Asociación Civil Selva Amazónica, is part of the team that cares for Ramírez and other patients at the hospice. “It’s pathetic,” Calixtro says. Calixtro of course knows all about the government’s promise to provide antiretroviral drugs to everyone in need. But, he says, “when we look at a problem like Milton, it seems like all this stuff we hear isn’t actually real.”

—J.C.

sonal links to the community shape the way he does epidemiology. “It’s public health and prevention mixed with sexual rights and human rights and empowering the community,” he says.

Epidemiologist Javier Lama, a co-investigator with the NIH-sponsored HIV Vaccine Trials Network, says Peru is particularly poised to do prevention studies because of the high incidence, or rate of new infections, in MSM. Such high incidence rates, ranging from 3.5% in Iquitos to 6.2% in Lima, enable researchers to discern whether a prevention intervention works with relatively smaller, shorter trials

## Universal Access: More Goal Than Reality

LIMA AND IQUITOS, PERU—As much as Peru has taken a leading role in conducting HIV/AIDS research, the government has lagged when it comes to offering antiretroviral treatment to infected people. Peru didn’t begin providing free antiretroviral treatment to all in need until 2004—8 years after neighboring Brazil—and did so only after being prodded by a grant from the Global Fund to Treat AIDS, Tuberculosis, and Malaria. “They have pushed us to work faster,” acknowledges Pilar Mazzetti, the minister of health. “We’ve taken a long time to have a response.”

Some 7000 people now receive anti-HIV drugs in Peru, up from 2000 a mere 2 years ago. Robinson Cabello, who runs the Via Libre clinic in Lima and in years past helped his patients sue the government for access to anti-HIV drugs, says up to 20% of people who need antiretroviral drugs immediately still do not receive them. And outside Lima, which is home

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than would be needed in locales with, say, 1% incidence.

Grant is now working with Lama, Sánchez, and other *Impacta* researchers to launch one of the most ambitious—and contentious—prevention studies in the world: an evaluation of whether antiretroviral drugs used to treat infection can lower transmission rates if *uninfected* people take them each day. Four studies of so-called pre-exposure prophylaxis (PrEP) have been blocked or aborted in Africa and Asia because of community protests about trial designs as well as problems with data quality. But Grant is confident that the placebo-controlled trial—which is slated to start in November and will test a combination of the anti-HIV drugs tenofovir and FTC in 1400 Peruvian and Ecuadorian MSM—will fly. “The advantage of working here is they have a mobilized population,” says Grant. He says Peru also has a proven track record of quickly enrolling volunteers.

In addition to the PrEP study and trials of experimental AIDS vaccines, *Impacta* is also playing a leading role in two multicountry studies that are evaluating whether the drug acyclovir can help people infected with herpes simplex virus 2 avoid acquiring or transmitting HIV. *Impacta* is part of an NIH network that tests new HIV treatments, too.

Cáceres and his co-workers spend about half their effort on a multicountry behavioral study funded by the U.S. National Institute of Mental Health that’s testing “diffusion of innovation” theory. The researchers identify popular opinion leaders in various poor neighborhoods, educate them about HIV prevention, and then assess whether that intervention helps lower HIV incidence in the community. This team also has a study under way to gauge whether art can reduce stigma and discrimination against HIV-infected people. On World AIDS Day last year, they distributed T-shirts made by artists to all the staff and patients at three Lima hospitals. The T-shirts had messages on them that, roughly translated, said all of us are living with HIV.

### Why mainly MSM?

Although all Peruvians may be living with the HIV epidemic, the virus has not made many inroads outside the MSM population. Female sex workers, for example, have a prevalence of less than 2% in Lima, and a 2002 study of nearly 4500 sex workers from 24 smaller cities found a prevalence of only 0.62%. The prevalence in women in general is a mere 0.2%

These findings might suggest that few MSM have sex with women, but that’s not the case. “A big part of the MSM community is married,”



**Leading lights.** Carlos Cáceres (left) and Jorge Sánchez run two separate HIV/AIDS research programs in collaboration with U.S. research teams.

says UNAIDS’s Mayorga. Indeed, a survey, now in press, of more than 4000 MSM between 1996 and 2002 in Peru found that in one year, 47% of the men reported having had sex with a woman.

Cáceres suggests that the heterosexual epidemic has not taken off in part because monogamy is the norm in the Peruvian women who become infected by bisexual partners. Says Cáceres, “The epidemic stops in them and doesn’t spread.” He notes, too, that Peru has no injecting drug use, which in other countries is another way that the epidemic commonly bridges into heterosexual women. Sánchez says “of course it surprises me” that more women are not infected, but his work suggests that bisexual men, because of their sexual practices (typically “insertive” rather than “receptive” in anal sex), have a lower HIV prevalence than that of men who exclusively have male partners.



**Net gain.** Volleyball games like this one in Nauta are popular hangouts for gay men, making them key sites for HIV/AIDS researchers who do prevention work and stage clinical trials.

### Net gains

A team from Selva Amazónica recently drove a few hours to the town of Nauta to attend a volleyball game. In Peru, volleyball has long had the reputation of being a sport for gay men—macho men play soccer—and the Selva Amazónica team wanted to see whether they might recruit volunteers for one of *Impacta*’s prevention trials.

Although gay men once feared playing volleyball in public, onlookers filled the town square in Nauta to watch two teams spike the net in the sweltering Amazonian sun. “The environment for gay people in Peru has markedly changed in the last 5 years, and it’s really because of the way the AIDS epidemic has been addressed,” said Grant, who had come along for the ride. So far, in Nauta, however, AIDS has not had much impact: The head of the town’s gay organization says he does not know anyone here who has died from the disease or is even infected.

Then again, Nauta has all the ingredients needed for HIV to take off. The only place to buy condoms this day is the town’s hospital, which gives them away for family planning but charges everyone else. No one offers HIV tests. And judging by the turnout at the volleyball game, there’s a substantial MSM population.

All of which explains why Selva Amazónica came here—and why Peru is so enthusiastic about research. Anyone who joins the group’s studies receives free condoms, HIV tests, counseling, checkups, and education. And that means that the abundance of HIV/AIDS research here may have a huge payoff, regardless of whether the trials ultimately yield positive results.

—JON COHEN