

HIV/AIDS
in Central America:
An Overview
of the Epidemic
and Priorities for Prevention

This booklet presents an overview of the HIV/AIDS epidemic in Central America. It then summarizes the results of case studies in Guatemala, Honduras and Panama on where money might best be allocated so that prevention efforts make the greatest possible impact on curbing the epidemic.

Current Situation

The HIV/AIDS epidemic in Central America is serious and is worsening. Four of the six countries in Latin America with the highest estimated HIV prevalence as of end-2001 are in Central America—Belize, Honduras, Panama, and Guatemala. The epidemic is concentrated in high-risk populations—men who have sex with men, commercial sex workers, prisoners, and in Honduras, the Garifunas (Afro-Caribbean descendants). Street children and the security forces (police, military) are probably also high-risk groups, although data are patchy.

Overall, in Central America, HIV is still a concentrated epidemic, but with important exceptions: in Belize, the epidemic is generalized, in Honduras, generalized in some areas, and in Nicaragua, the epidemic can still be categorized as low level, or nascent. Recent projections for El Salvador, Guatemala, and Panama done with the Spectrum Model illustrate how the epidemic could reach adult prevalence levels of close to 2% in these countries by 2010 on current patterns (see Figures 1, 2, and 3).

HIV transmission in Central America is primarily due to heterosexual sex—more similar to

the Caribbean pattern than to South America and Mexico. Although there are more men than women living with AIDS in Central America, the gender gap is closing.

At this stage of the epidemic, **there are many opportunities for policies and programs to limit the current and future impact of HIV/AIDS on households, economies, and health care systems.** Increased funding across the region from the Global Fund to Fight AIDS, TB and Malaria, from USAID, and other sources presents a tremendous opportunity for Central America. The World Bank is committed to providing leadership and technical support to countries in the region to raise awareness of the issue and find more effective solutions to the epidemic. The World Bank will also fill funding gaps for key country and regional HIV/AIDS activities.

Epidemiology

The Central American countries are fairly small and have active trade and migration across borders, but the patterns of the epidemic have marked differences across countries. HIV prevalence in adults appears to be highest in Belize (2.0%), followed by Honduras (1.6%), Panama (1.5%), Guatemala (1%), El Salvador (0.6%), Costa Rica (0.6%), and Nicaragua (0.2%) (Table 2). Surveillance systems in all countries in the region have major problems of coverage, under-diagnosis and underreporting. Testing is not widely available, and upwards of 70% of all cases of HIV are only diagnosed once people become symptomatic. To better assess the extent of the epidemic, the Central American HIV/AIDS Prevention Project (PASCA) recently conducted a multi-country sentinel survey, testing two high-risk populations—commercial sex workers and men who have sex with men—in El Salvador, Guatemala, Honduras, Nicaragua, and Panama. The study is now being carried out in Belize and Costa Rica. The PASCA multi-country study has added a wealth of information about the epidemic in high-risk groups in Central America.

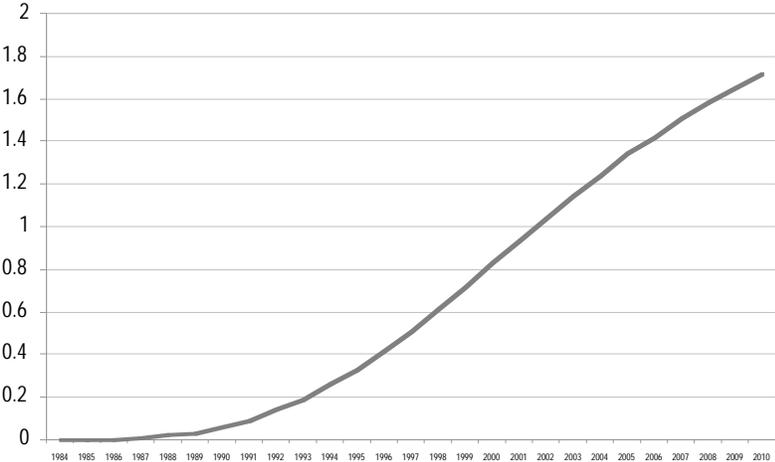
Commercial Sex Workers are at high risk of acquiring and transmitting HIV. Their clients fre-

Table 1. Four of the six countries in Latin America with the highest HIV adult prevalence (population aged 15–49) are in Central America

| Countries in Latin America with highest HIV prevalence | Estimated Adult HIV Prevalence, end 2001 |
|--|--|
| Guyana | 2.7% |
| Belize | 2.0 |
| Honduras | 1.6 |
| Panama | 1.5 |
| Suriname | 1.2 |
| Guatemala | 1.0 |

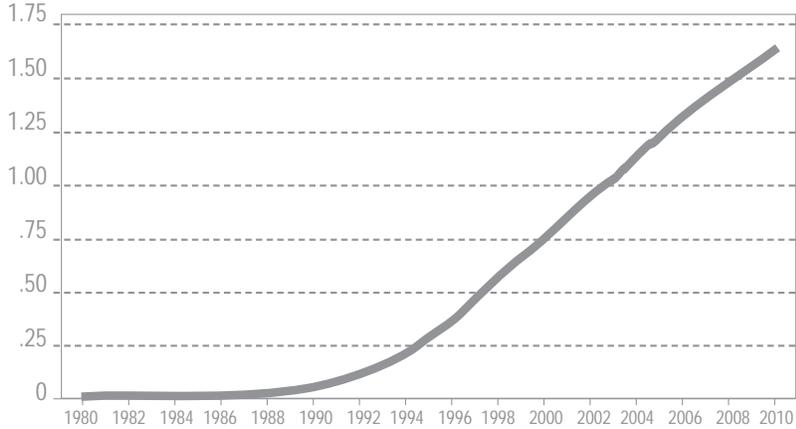
Source: UNAIDS

Figure 1. Estimated and Projected Adult HIV Prevalence, El Salvador, 1980 to 2010



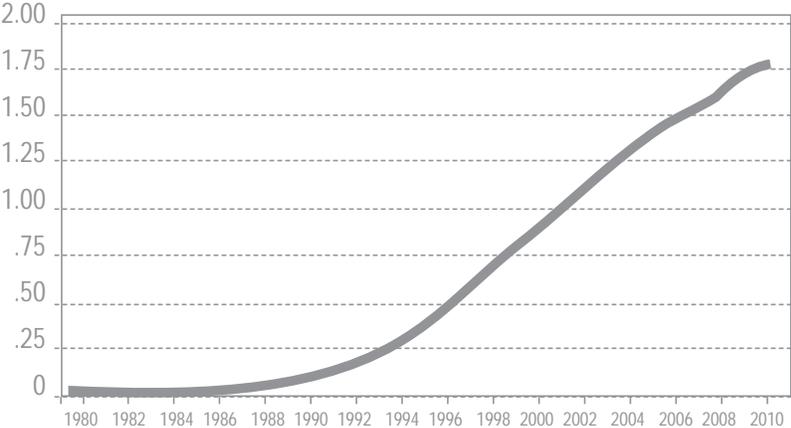
Source: PASCA, Spectrum Model, 2002.

Figure 2. Estimated and Projected Adult HIV Prevalence, Guatemala, 1980 to 2010



Source: PASCA, Spectrum Model, 2002.

Figure 3. Estimated and Projected Adult HIV Prevalence, Panama, 1980 to 2010



Source: PASCA, Spectrum Model, 2002.

Table 2. Epidemiological Information about the HIV/AIDS Epidemic in Central America

| Country | Adult HIV prevalence, end 2001 | M:F Ratio AIDS Cases (2001) | HIV Seroprevalence in Antenatal Populations in Urban Areas (year) | HIV prevalence in Female Sex Workers by Place of Work 2001/02 (sample size) ¹ | | | HIV prevalence in Men who Have Sex with Men 2001/02 (sample size) ² |
|-------------|--------------------------------|-----------------------------|---|--|------------|-------------|--|
| | | | | Total | Ambulatory | Fixed Sites | |
| Belize | 2.0 | 0.8:1 | 1.0-2.5% (1996) | N/A | N/A | N/A | N/A |
| Honduras | 1.6 | 1.2:1 | 1.5-4.0% (1999) | 10.4 (502) | 14.0 (215) | 7.7 (287) | 13.0 (285) |
| Panama | 1.5 | 3:1 | <1.0% (1996) | 1.9 (416) | 4.7 (64) | 1.4 (352) | 10.6 (235) |
| Guatemala | 1.0 | 2.5:1 | 0.4-0.8% (2000) | 5.2 (521) | 14.9 (74) | 3.6 (447) | 11.5 (165) |
| El Salvador | 0.6 | 3:1 | <1 % (2001) | 3.9 (484) | 16.1 (31) | 3.1 (453) | 17.7 (293) |
| Costa Rica | 0.6 | 7:1 | <0.5% (1996) | N/A | N/A | N/A | N/A |
| Nicaragua | 0.2 | 4:1 | <0.5% (1997) | 0.4 (459) | 1.4 (143) | 0.0 (316) | 9.3 (162) |

1. PASCA Multisite Study on STIs and HIV, probabilistic sample in capital cities, census in port cities.

2. Sample is not representative, but rather drawn from men who volunteered to be tested, after seeing flyers and other promotion about the study, from PASCA Multisite Study on STIs and HIV.

Source: UNAIDS, PASCA.

quently do not use condoms, and sex workers often do not insist on their use, either because they underestimate the risk of infection, do not have access to condoms, or earn more money by providing unprotected sex. Clients of commercial sex workers act as a bridge between high-risk groups and the general population. The PASCA study tested commercial sex workers in capitals and major ports for HIV and sexually transmitted infections (STIs). The commercial sex workers were drawn from a probabilistic sample or a census, depending on location, so the results are considered representative for the areas covered. HIV prevalence was highest in commercial sex workers in Honduras (10.4%), followed by Guatemala (5.2%) and El Salvador (3.9%). Rates were much lower in Panama (1.9%) and Nicaragua (0.4%). In all countries, prevalence rates are much higher—generally two to four or five times higher—for commercial sex workers working on the street, compared to those in fixed sites. Because of their higher HIV prevalence, commercial sex workers in the street should be an even higher target group for prevention activities than commercial sex workers in fixed locations, despite the difficulties in reaching them.

The PASCA study also tested **men who have sex with men** for HIV and sexually transmitted infections. Homosexual behavior accounts for a significant amount of transmission and is particularly important in Costa Rica (note the high

male:female ratio of reported AIDS cases in Costa Rica). The men who have sex with men came forward to participate in the study in response to a variety of selection methods, including advertisements for the study. This makes the results for men who have sex with men less generalizable than the results for commercial sex workers, which used a probabilistic sample. With these caveats in mind, the results still reveal a considerable amount about the epidemic. Prevalence rates ranged from 17.7% in El Salvador to 9.3% in Nicaragua. The study also asked these men to identify their sexual orientation. Interestingly, just about half reported themselves as gay, across all the countries. About 29% reported themselves as bisexual, 11% as heterosexual, 5% as transvestite, and 6% gave no response. The diversity of self-reported sexual orientation could have important implications for outreach strategies to reach this group.

High rates of STIs are documented in some countries and suspected in many others. A person with an STI is at greater risk of HIV infection, both behaviorally and biologically. Since HIV is sexually transmitted, the unsafe sex practices that caused the other STI could permit infection with HIV, and the infection itself causes changes in the urogenital tract that can facilitate HIV's entry into cells. The PASCA study also documented the close association between other STIs and HIV.

Table 3. Spending on HIV/AIDS by Source, 2000

| | Total Spending on HIV/AIDS Per Capita, 2000, US\$ | Share of Financing | | | Spending on HIV/AIDS as Share of Total Health Spending, 2000 | Out of Pocket Spending as Share of total HIV/AIDS Spending, 2000 |
|-------------------|---|--------------------|---------|----------|--|--|
| | | Public | Private | External | | |
| Costa Rica (1999) | \$2.82 | 78% | 22% | 0% | 1.1% | 20% |
| El Salvador | 1.59 | 57 | 26 | 17 | 1.0 | 26 |
| Guatemala | 1.24 | 72 | 18 | 10 | 1.7 | 15 |
| Honduras | 3.91 | 17 | 55 | 28 | 5.0 | 54 |
| Nicaragua | 1.19 | 39 | 23 | 38 | 2.0 | 21 |
| Panama | 3.24 | 89 | 8 | 3 | 1.3 | 6 |

Source: SIDALAC.

Country Response

Spending on HIV/AIDS

SIDALAC, the Regional AIDS Initiative for Latin America, has compiled and analyzed country-level spending on HIV/AIDS. The most recent year for which comparative data exist is 2000 (Table 3). Nicaragua had the lowest per capita spending on HIV/AIDS at \$1.19 per capita; Guatemala and El Salvador spent only a little more, despite their much higher HIV prevalence rates. Honduras had the highest spending level, at \$3.91 per capita; more than half of this was out-of-pocket spending. Out-of-pocket spending on care and treatment, combined with loss of wages can be catastrophic and impoverishing for households in which someone

has HIV/AIDS. Honduras and Nicaragua had the highest shares of spending from external finance sources, at 28% and 38% respectively. SIDALAC studies show that most countries devote less than 30% of their HIV/AIDS spending to prevention.

HIV/AIDS expenditures have certainly changed since this snapshot from SIDALAC comparative data in 2000, as almost all countries are increasingly offering treatment, in many cases in response to legal challenges. The major external donor, USAID, has increased its funding for regional activities and country-specific programs, with a planned level of almost \$17 million in 2004. Funds from the Global Fund to Fight AIDS, TB, and Malaria are also starting to disburse in some countries (Figure 4). Honduras and Panama were beneficiaries of the first round of approvals of the

Figure 4. Global Fund to Fight AIDS, TB, and Malaria: Pending and Approved Funding for Central America as of September 2003



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Global Fund—Honduras for a large proposal and Panama for a small one focused on TB/HIV/AIDS. In the second round, Costa Rica, El Salvador, and Nicaragua were approved for HIV/AIDS proposals. Belize, Guatemala and Panama have HIV/AIDS proposals pending for the third round. Funding has been guaranteed for the first two years of all of the approved proposals.

Prevention and Treatment Activities

All countries have a National HIV/AIDS Program except Costa Rica, which has a high-level HIV/AIDS Committee.

NGOs are active in prevention, care, and treatment in all countries in Central America, some with the support of government and some from international agencies. Even when govern-

ments do not support NGO activities, they can facilitate their work, for example, by ensuring that police do not harass NGOs when carrying out outreach activities to high-risk groups.

Condom use is key to prevention. PASMO, the Pan American Social Marketing Organization, has a well established program for social marketing of condoms and behavior change communication. It has been operating in Costa Rica, El Salvador, Guatemala, Belize, Nicaragua, Panama and Honduras since 1996. The program targets groups at high-risk of contracting HIV/AIDS, including men who have sex with men, migrants, truckers, security forces and the Garifuna, as well as sexually active adolescents. Condom use in Central America more than doubled from 8.1 million in 1999 to 18.1 million in 2001, but this

The World Bank's HIV/AIDS Program at a Glance

The HIV/AIDS epidemic is reversing the hard-fought development gains of previous decades. To meet the challenge of the HIV/AIDS crisis, and reduce poverty, the World Bank is committed to building a substantially stronger and more effective global response. Experience with HIV/AIDS shows that careful development planning today can avert health and development catastrophes tomorrow.

In the past few years, the World Bank has committed US \$1.6 billion in loans, credits, and grants for HIV/AIDS activities worldwide. Prevention activities have had and continue to have a strong focus in Bank work; now, with falling prices for antiretroviral drugs in developing countries, the Bank and its partners are increasing support for treatment for people infected and affected by HIV/AIDS. Experience with pilot projects in resource-poor settings indicates that rates of adherence to anti-retroviral therapy are at least as high (and typically higher) in developing countries than in industrialized countries. The World Bank also works with UNAIDS to provide strategic analysis, policy advice, and other technical expertise at the country level, and serves as trustee for the Global Fund to Fight AIDS, Tuberculosis, and Malaria.

Latin America and the Caribbean. Over \$550 million has been committed by September 2003 in Latin America and the Caribbean to help finance the implementation of HIV/AIDS prevention and control programs in Argentina, Barbados, Brazil, the Dominican Republic, El Salvador, Grenada, Haiti, Honduras, Jamaica, Mexico, Trinidad and Tobago, St. Kitts and Nevis, and Venezuela. The Bank's longest involvement in Latin America has been in Brazil, where the Bank has financed three large HIV/AIDS projects.

Given that the Caribbean has the highest epidemic outside of Sub-Saharan Africa, this area is a major focus of Bank support in Latin America and the Caribbean. The World Bank's Board approved a US\$ 155 million Multi-Country HIV/AIDS Prevention and Control Program for the Caribbean in June 2001. Under this facility, loans have been extended to Barbados (2001), Dominican Republic (2001), Jamaica (2002), Grenada (2002), and St Kitts and Nevis (2003). These projects are under implementation.

Central America. In Central America, financing for HIV/AIDS activities is planned under Bank-financed projects in Honduras and El Salvador. The Bank stands ready to work with countries throughout Central America to complement their financing for HIV/AIDS programs through loans and grants, and to carry out policy work on HIV/AIDS. The workshops on the optimal allocation of resources for HIV prevention in Guatemala, Honduras, and Panama are examples of policy analysis and advice. A similar workshop is planned for Costa Rica. In addition, the Bank is at the early stages in work with partners to develop a regional HIV/AIDS project for Central America to finance activities that are best carried out at regional level, such as coordinated surveillance activities and a regional reference laboratory.

is still low given that the region's total population over 15 years of age is over 20 million.

Some governments are active in free condom distribution to high-risk groups (primarily commercial sex workers), but this is an area that needs to be scaled up. Confidential testing and counseling services are not widely available in Central America, and this is another area in need of investment. Mass media campaigns have dominated IEC efforts, although some countries have supported efforts to target IEC to high-risk groups, often using NGOs. Syndromic treatment of STIs also needs more investment in Central America to reduce this HIV risk factor. Programs to prevent mother-to-child transmission of HIV are being scaled up slowly in all countries.

The social security systems of Costa Rica, El Salvador, Guatemala, and Panama are the main sources of publicly-financed anti-retroviral (ARV) treatment in Central America. Ministries of Health, with the exception of Nicaragua, are also slowly increasing the number of people covered by ARVs and the social security system of Honduras is scaling up treatment.

Deciding How Best to Allocate Resources for HIV/AIDS

The World Bank developed a tool in early 2002 to help countries in Central America better understand which prevention activities should be well funded if the epidemic is truly to be reversed as soon as possible. The Allocation By Cost-effectiveness (ABC) Model is the result of this work. The ABC model helps policymakers determine the resource allocation that will prevent the maximum number of new HIV infections at any given budget level.¹ The model can also be used to simulate the effect of alternative resource allocations and generate consensus around the HIV prevention interventions that have the greatest impact on the epidemic.

The ABC Model has the following characteristics: first, it focuses on prevention programs only, and thus does not consider tradeoffs between funding care and treatment instead of prevention. It supposes that the policymaker has already earmarked funds for prevention and treatment. Sec-

ond, it analyzes alternative resource allocations differentiated by strategy and target population group, as defined by risk behavior, sexual orientation, gender, language, location, etc. Third, it enables other allocation criteria such as equity or socio-political constraints to be valued explicitly in comparison to the optimal allocation. For example, if a certain amount of funding were to be reserved for a particular group or program, the resulting impact on the number of infections averted can be measured.

The population groups and set of interventions to be considered for the analysis are first defined. Then some key parameters are entered in the model. These include the epidemiology of HIV in the country (i.e. the number of new infections expected by population group), and the relative cost and effectiveness of each prevention intervention. However, policymakers have limited information on some of these parameters, making it difficult for example, to estimate program effectiveness and baseline infection rates by subgroup. In the absence of national or comparable international data, the exercise uses estimation by consensus as an acceptable second-best. This means that many of the model inputs are estimated subjectively by a group of national and international stakeholders, using their best (informed) judgment.

The ABC model was applied in Honduras, Panama, and Guatemala between May 2002 and August 2003 in country-level workshops. First, all the relevant data that could be obtained from each country's surveillance system, national statistics, and from local and international studies were collected. Second, in each country, the corresponding initial estimates were reviewed during a 3-day workshop by a large group of national and international experts who reached agreement on consensus estimates for all input values. This highly participatory approach helped generate ownership and confidence in the results from the Model.

Results

Given the nature of the epidemic in the three Central American countries, workshop partici-

Table 4. Target Population Groups

| Honduras | Panama | Guatemala |
|---|--|------------------------------------|
| Commercial Sex Workers (CSW) | | |
| Men who have sex with Men (MSM) | | |
| Prisoners | | |
| Adolescents | | |
| Pregnant Women / Newborns from HIV+ women | | |
| Blood Transfusion Recipients | | |
| Garifunas | Kunas | |
| Workers in their Workplace | | Workers in their Workplace |
| | Security Forces (police, guards, military) | |
| | | Men and Women presenting with STIs |
| | | Youth at risk / on the street |

pants chose similar target population groups and prevention interventions, as presented in Tables 4 and 5.

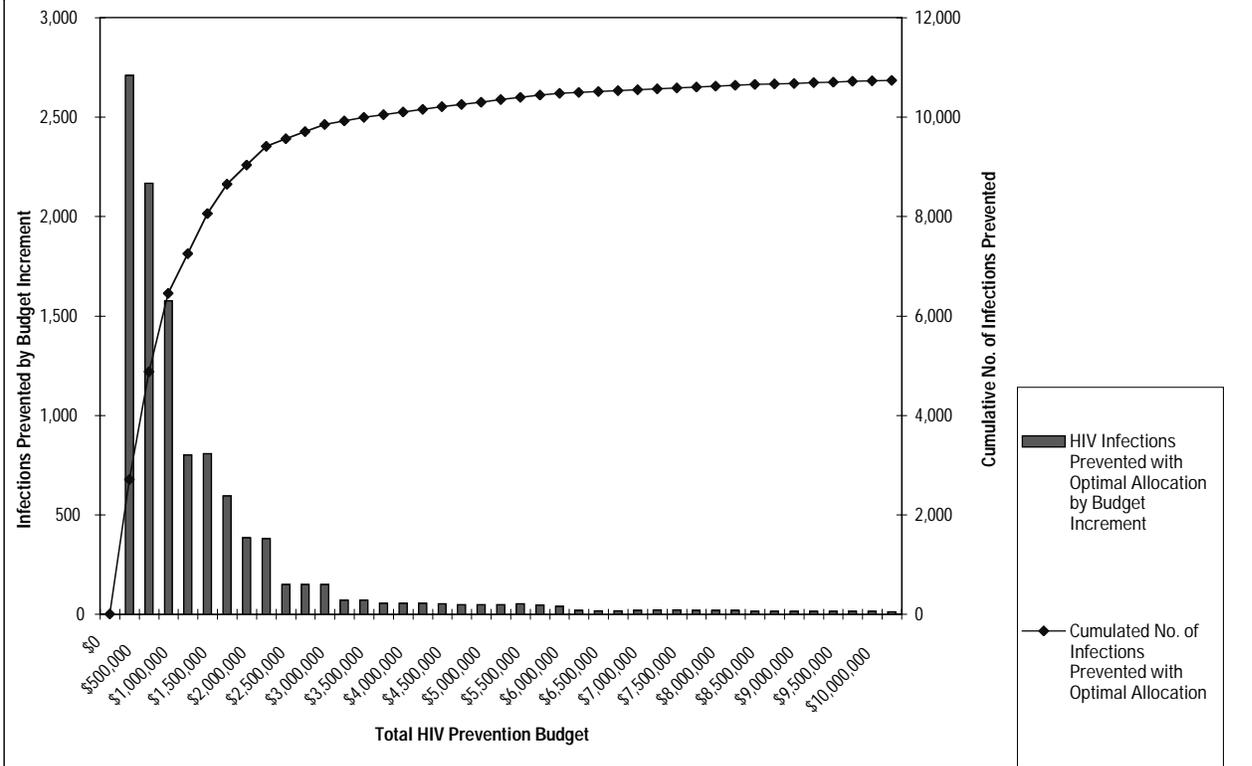
The first key common finding is that **a substantial impact on the epidemic can be achieved even with limited resources**, provided these are channeled to the most cost-effective interventions (see Figure 5 for an example from Panama). In all three countries, the most cost-effective interventions were: (i) condom social marketing, (ii) free condom distribution targeted to high risk groups, (iii) information, education and communication

(IEC) for high-risk groups including men who have sex with men, commercial sex workers and prisoners, and (iv) voluntary counseling and testing. According to the optimal allocation given in Table 6, US\$ 1 million invested in these interventions would prevent between 5,100 and 12,000 infections, which corresponds to between 11% and 19% of expected primary and secondary² infections. The corresponding cost per infection prevented would be between \$84 and \$196, depending on the country. By comparison, if these resources were distributed among the other inter-

Table 5. HIV Prevention Interventions

| Honduras | Panama | Guatemala |
|--|----------------------|--|
| Counseling and Access to Rapid Testing | | |
| IEC for Adolescents (including peer education + targeted media channels) | | |
| IEC targeted at High-Risk Groups (CSW, MSM, Prisoners & Security Forces), including peer education + targeted media channels | | |
| Prevention of Mother-to-Child Transmission | | |
| Syndromic Management of STIs | | |
| Free Condom Distribution to Targeted Groups | | |
| Condom Social Marketing | | |
| Blood Safety | | |
| Promotion and Defense of Human Rights of People Living with HIV/AIDS | | |
| IEC for Garifunas / Kunas | | |
| IEC for Pregnant Women | | |
| Interventions in the Workplace | | Interventions in the Workplace |
| | Mass Media Campaigns | |
| | | Comprehensive intervention for People Living with HIV/AIDS |

Figure 5. HIV Infections Prevented with Optimal Allocation, Panama – 2003



Source: ABC Model, Panama 2003.

ventions in each country, only a few hundred infections would be prevented at a cost of several thousand US dollars per infection prevented.

A second key finding is that even with a budget of US\$10 million, only about 25% of all primary and secondary infections can be prevented. This is because it is difficult to reach the population groups that are at highest risk. For example, workshop participants in the three countries estimated that between 40% and 70% of commercial sex workers and only around

25% of men who have sex with men can be reached with any given intervention. If these constraints were relaxed to assume that 100% of key risk groups (CSW, MSM and prisoners) could be reached by prevention interventions, the number of infections prevented with US\$10 million more than doubles in Honduras and reaches 60% of all expected primary and secondary infections in Panama and Guatemala. This means that **after a certain budget level, the government should not only fund traditional**

Table 6. HIV Prevention Budget of US\$ 1 Million

| Allocation by Intervention | Honduras | Panama | Guatemala |
|--|--------------|--------------|---------------|
| Condom Social Marketing | \$250,000 | \$250,000 | \$250,000 |
| Free Condom Distribution to High-Risk Groups | \$250,000 | \$250,000 | \$250,000 |
| IEC for High-Risk Groups (CSW, MSM and Prisoners / Security Forces) | \$500,000 | \$250,000 | \$500,000* |
| HIV Counseling and Access to Rapid Testing | | \$250,000 | |
| <i>Number of primary and secondary infections prevented with this allocation</i> | <i>5,100</i> | <i>7,250</i> | <i>12,000</i> |
| <i>Cost per infection prevented</i> | <i>\$196</i> | <i>\$138</i> | <i>\$84</i> |

*In Guatemala the IEC strategy to reach these groups was disaggregated and this budget refers only to peer education.
 Source: ABC Model, Honduras (2002), Panama (2003), Guatemala (2003).

prevention interventions, but also develop strategies to reach a greater percentage of high risk groups (e.g. decriminalization, reduction of stigma, increased service coverage, etc.).

Third, as the budget for HIV prevention increases, some interventions are still left out of the optimal allocation. For example, at a budget of US\$ 5 million for prevention (see Table 7), the optimal allocation does not include blood safety or the prevention of mother to child transmission in Honduras and Guatemala. But cost-effectiveness is obviously not the sole criterion for making resource allocation decisions. The Ministry of Health may want to invest in ensuring that all blood units are HIV-free whether or not this is very cost-effective. Similarly, policymakers may want to invest further in preventing mother-to-child transmissions for ethical reasons even though it may not be cost-effective when the epidemic is still concentrated, and so not within the model's recommendations.

Implications

The results of the application of the ABC Model to Honduras, Panama and Guatemala point to **a minimum package of key interventions that must be carried out because of their potential impact on the epidemic**. One option would be to use the results from this exercise to

ensure reserved spending for the most cost-effective measures.

In the case of the three countries analyzed, a minimum package would include the following interventions: condom distribution, condom social marketing, IEC for high risk populations (CSW, MSM prisoners and security forces) and voluntary counseling and testing. Once funding for these strategies has been assured, the remaining amount from the HIV prevention budget can then be used to address equity and socio-political considerations and to fund strategies with medium to long term impact.

Second, the results from the exercise suggest that current funding for prevention of HIV in Central America is far from adequate. **At least US\$1 million annually should be invested in each country solely on the highly cost-effective interventions** to avoid between 10% and 20% of new infections. This does not include financing for blood safety and prevention of mother-to-child transmission, among others, which are complementary activities the government would need to continue funding. In 2000, total funding (both public and private) of HIV-related public health and prevention activities was US\$6 million in Honduras, US\$ 800,000 in Panama and US\$2.8 million in Guatemala. But these resources were not well targeted towards the interventions iden-

Table 7. HIV Prevention Budget of US\$ 5 Million

| Allocation by Intervention | Honduras | Panama | Guatemala |
|---|-----------|-----------|-----------|
| HIV Counseling and Access to Rapid Testing | 1,250,000 | 750,000 | 1,250,000 |
| IEC for the Garifunas | 750,000 | | |
| IEC for High-Risk Groups (CSW, MSM and Prisoners / Security Forces) | 500,000 | 500,000 | 750,000* |
| Syndromic Management of STIs | 1,000,000 | 750,000 | — |
| Condom Distribution in High-Risk Groups | 500,000 | 250,000 | 250,000 |
| Condom Social Marketing | 500,000 | 250,000 | 750,000 |
| Promotion and Defense of Human Rights | 500,000 | 1,750,000 | 500,000 |
| IEC for adolescents through targeted media channels | — | — | 250,000 |
| Mass media campaigns | — | 250,000 | 750,000 |
| Prevention of vertical transmission of HIV | — | 500,000 | — |
| Comprehensive intervention in People Living with HIV/AIDS | | | 500,000 |

*In Guatemala the IEC strategy to reach these groups was disaggregated between peer education (\$500,000) and targeted media channels (\$250,000).

Source: ABC Model, Honduras (2002), Panama (2003), Guatemala (2003).

tified in this exercise as those that would have the greatest impact on the epidemic.

Finally, the exercise generates a framework for policymakers to engage constructively with the various stakeholders involved in HIV prevention, including external donors and the Global Fund for AIDS, TB and Malaria, and guide investment decisions in such a way as to ensure that the priority interventions are covered adequately. Explicit comparisons of the number of infections averted can be made between alternative combinations of prevention strategies, and the effect of departures from the optimal allocation for social, ethical, and political reasons can be seen. In addition, the framework sets out clearly the interventions and their key components, the population groups that will be targeted, the expected effectiveness and unit cost of each intervention, the number of people that they aim to reach, and the expected impact. These provide ready indicators that can be monitored and updated as the prevention strategy is implemented and new data are collected, giving rise to a dynamic and transparent framework for guiding HIV prevention decisions.

Notes

1. The Model draws on the techniques elaborated in *No Time to Lose*. Institute of Medicine (2001).

2. Secondary infections refer to the infections that arise from one HIV+ person. Their inclusion allows us to take into account the multiplier effects of prevention in some subgroups. For example, consistent use of condoms by commercial sex workers prevents infections among CSW (primary infections) but also among their clients and clients' partners (secondary infections).

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