

GLOBAL
MOBILIZATION FOR
HIV PREVENTION

A BLUEPRINT
FOR ACTION

GLOBAL HIV PREVENTION WORKING GROUP

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GLOBAL HIV PREVENTION WORKING GROUP

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EXECUTIVE SUMMARY

Projections by a research group led by WHO and UNAIDS, published in *The Lancet* in July 2002, indicate that the global HIV infection rate will continue its rapid pace, producing 45 million new infections between 2002 and 2010. The analysis also states that this scenario is in no way inevitable. In fact, 28 million (63 percent) of these new infections could be prevented if existing HIV prevention strategies are substantially scaled up,¹ and even more could be averted with the advent of new prevention technologies.

The Global HIV Prevention Working Group—composed of leading experts in public health, clinical care, biomedical, behavioral, and social research, and people affected by HIV/AIDS, and convened by the Bill & Melinda Gates Foundation and the Henry J. Kaiser Family Foundation—seeks to generate a greatly expanded commitment to preventing HIV transmission as part of a comprehensive approach to fighting the global epidemic.

The world knows much about how to prevent HIV transmission, and both developed and developing countries have demonstrated that existing prevention strategies can have a major impact. This “blueprint for action”—the first report of the Working Group—provides a road map for rapidly scaling up prevention programs to contain and ultimately reverse the AIDS epidemic. The report reviews the scientific literature on the effectiveness of HIV prevention interventions, identifies obstacles to quickly expanding prevention programs, and makes specific recommendations to prevent millions of infections this decade.

CHALLENGING THE SENSE OF INEVITABILITY

While HIV/AIDS has prompted much compassion and concern, the global community often behaves as if a massive expansion of HIV/AIDS were inevitable, as if the world has little choice but to watch anxiously and hope that the epidemic eventually burns itself out. This sense of inevitability ignores not only the extraordinary resources at the world’s disposal but also the fact that our

knowledge of effective prevention strategies has grown substantially in recent years.

Today, prevention efforts reach fewer than 1 in 5 of those at risk.² To have an impact on the future course of the epidemic, pilot prevention projects must rapidly become comprehensive programs that reach all those at risk, and obstacles to prevention must be swiftly addressed and overcome.

With the immense resources at its disposal, will the world respond to this growing crisis? Having failed to prevent the first wave of the epidemic, will we have the vision and the resolve to prevent the next one?

WHAT WORKS—PROVEN HIV PREVENTION STRATEGIES

HIV prevention has proven remarkably effective in developed and developing countries, for all populations at risk, and in both emerging and mature epidemics. HIV prevention strategies are also extraordinarily cost-effective, helping countries, especially those with limited resources, avoid the future costs of countless new HIV infections.

Extensive scientific research has identified effective prevention interventions for all routes of HIV transmission:

Sexual Transmission. The risk of sexual transmission of HIV can be reduced through a wide range of proven interventions: behavior change programs that encourage people to delay initiation of sex or reduce their number of partners; condom promotion; prevention and treatment of sexually transmitted diseases; and expansion of voluntary counseling and testing. These interventions have been shown to be effective in a wide range of populations, including young people, heterosexual adults, and men who have sex with men.

Parenteral Transmission. Parenteral transmission of HIV can be prevented through implementation of policies to protect blood supplies and to promote safety in health care settings, as well as aggressive investment in strate-

gies to reduce the risk of infection through injection drug use, such as methadone maintenance and other drug treatment programs, peer outreach, and syringe and needle programs.

Mother-to-Child Transmission. The risk of mother-to-child HIV transmission can be reduced by half or more with short courses of antiretroviral drugs, voluntary counseling and testing, and enhanced reproductive health services.

Effective HIV prevention involves a carefully planned combination of these interventions, reinforced by public policies to combat the social factors that facilitate HIV transmission. Just as combination antiretroviral therapy slows HIV replication by attacking the virus from multiple angles, effective prevention strategies must be integrated to address the many behavioral and biomedical susceptibilities of individuals and communities.

OBSTACLES TO SCALING UP HIV PREVENTION

Given the overwhelming evidence demonstrating what works to prevent HIV transmission, the biggest challenge is to scale up effective prevention models to reach millions more people at risk. A number of obstacles stand in the way of bringing prevention programs to scale:

Resources. Ninety-five percent of HIV infections occur in developing countries, where resources are most limited.³ UNAIDS projects that \$4.8 billion annually is needed to mount a comprehensive global effort to prevent new infections in low and middle-income countries,⁴ yet current global spending for prevention programs in these countries amounts to only about \$1.2 billion each year.⁵ As a result, prevention programs have not achieved the depth and breadth needed to have a large-scale impact on the epidemic.

Earlier calls for increased resources for HIV prevention went unheeded. In 1993, the WHO Global Programme on AIDS projected that an investment of \$1.5 billion to \$2.9 billion annually could prevent half of all projected infections in 2000 and save \$90 billion in associated costs.⁶ Having failed to commit these resources, the world now confronts not only an expanding epidemic, but also escalating costs for both HIV prevention and treatment.

Capacity. An effective global prevention effort will need to build local capacity in developing countries to sustain a long-term, high-level effort to prevent new infections.

Stigma. The stigma associated both with HIV/AIDS and with the groups often at highest risk must be boldly attacked—through strong political leadership, enactment of meaningful legal protections, and the active engagement of people living with HIV/AIDS.

Political Commitment. In every country where HIV prevention efforts have succeeded, strong political commitment has been a critical element of success. Although many political leaders are more willing than ever to voice strong support for the fight against HIV/AIDS, the level of political leadership is still inadequate, especially in many countries with emerging epidemics.

Treatment Access. As the world mounts a comprehensive effort to prevent new infections, access to HIV treatments in developing countries must also significantly increase. Treatment is not only a humanitarian imperative—improved access to treatment can support HIV prevention by encouraging early knowledge of HIV status and reducing the stigma associated with the disease.

New Technologies. While the world brings to scale every available prevention strategy, it must also accelerate the search for a preventive vaccine, for an effective microbicide, and for other barrier methods and technologies that reduce the likelihood of transmission.

SUMMARY OF RECOMMENDATIONS

To expand HIV prevention to reach all those at risk, and help prevent millions of new infections this decade, the Global HIV Prevention Working Group makes the following recommendations:

Substantially Increase and Sustain Prevention Funding

- ▶ **Increase international resources.** Annual investment in HIV prevention in low- and middle-income countries should quadruple by 2004—from approximately \$1.2 billion today to \$4.8 billion, as called for by UNAIDS. Annual funding must be sustained at this level through 2010 and well into the next decade.
- ▶ **Enable countries to prioritize resources for HIV/AIDS.** Every effort should be made to give countries the ability to prioritize resources for HIV/AIDS, especially resource-poor countries financially encumbered by debt.

Build Capacity and Scale Up Proven Prevention Strategies

- ▶ **Increase local capacity.** Resources should be devoted to training local personnel and providing necessary technology so that affected countries can rapidly and sustainably scale up prevention programs.
- ▶ **Expand existing prevention strategies.** With additional resources and access to training and prevention tools, countries should rapidly bring to scale key prevention interventions that can work together to achieve maximum prevention impact. In particular, countries should scale up voluntary counseling and testing; mass media campaigns; condom distribution, promotion and social marketing; blood screening; school-based programs; programs for out-of-school youth; workplace programs; STD treatment; and peer counselors for vulnerable populations, such as sex workers, men who have sex with men (MSM), and injection drug users (IDUs).
- ▶ **Focus on vulnerable populations.** Particularly high priority should be given to scale-up of programs to prevent transmission in vulnerable populations, including young people, sex workers, MSM, and IDUs.

Encourage Vocal Political Leadership

- ▶ **Make HIV/AIDS a priority.** Political leaders should speak often and forcefully about the importance of HIV prevention, support policies that effectively fight AIDS and stigma, and make HIV/AIDS a permanent agenda item at important global and regional political gatherings.

Use Prevention Resources More Strategically

- ▶ **Improve tracking of HIV/AIDS.** Developing countries should receive training and financial and technical assistance to enhance their ability to track HIV/AIDS and plan prevention interventions accordingly.
- ▶ **Ensure strategic planning.** By 2003, every country should have a strategic HIV prevention plan.
- ▶ **Coordinate funds.** By 2003, every low-income country should convene annual “donor roundtables,” bringing together all key funders to measure available resources, identify resource gaps, and enhance program coordination.

Expand Access To Key Prevention Tools

- ▶ **Ensure adequate supply of prevention tools.** Donor nations should ensure an adequate global supply of high-quality HIV prevention tools (e.g., condoms and HIV test kits) for use in developing countries.

- ▶ **Increase access to treatment.** Access to HIV treatments, including ARVs, should be dramatically expanded—both to reduce HIV-related sickness and death and to buttress HIV prevention efforts by reducing stigma and encouraging knowledge of HIV status.

Accelerate Research Into New Prevention Technologies

- ▶ **Increase funding.** Public sector funding for research and development should increase by \$1 billion for HIV/AIDS vaccines and by \$1 billion for microbicides by 2007. Substantial new funding is also needed for investigation of female-controlled barrier methods and other new technologies to reduce the risk of transmission.
- ▶ **Provide private sector incentives.** Donor nations should provide financial incentives to private companies to increase their investment in research and development related to HIV/AIDS vaccines, microbicides, and other new prevention technologies.
- ▶ **Coordinate efforts.** Industry, donors, multilateral agencies, and NGOs should work together on an ongoing basis to identify obstacles to acceleration of HIV vaccine and microbicide R&D, and agree on approaches to overcoming such obstacles.
- ▶ **Ensure access.** Donor nations, developing countries, and multilateral agencies should immediately develop and implement strategies to ensure future access to HIV/AIDS vaccines and microbicides.

Confront Social Factors that Facilitate the Spread of HIV

- ▶ **Fight stigma.** Countries should enact HIV-specific human rights protections and implement anti-stigma strategies targeting groups vulnerable to HIV/AIDS, especially injection drug users, men who have sex with men, and people with multiple sex partners (e.g., sex workers). People living with HIV/AIDS should be involved at every stage in planning and implementing HIV prevention programs.
- ▶ **Reduce poverty.** Accelerated efforts are needed to reduce the poverty that facilitates HIV transmission and worsens the social and economic impact of HIV infection.
- ▶ **Empower women.** Global efforts to increase the economic, legal, political and social empowerment of women should be substantially expanded to decrease their vulnerability to HIV.

INTRODUCTION

As HIV continues its relentless spread throughout the globe, the fate of millions and the future of nations hang in the balance. Projections by a research group led by WHO and UNAIDS, published in *The Lancet* in July 2002, indicate that the global HIV infection rate will continue its rapid pace, producing 45 million new infections between 2002 and 2010.⁷

Conservative projections suggest that well over 2 million people in Russia will be infected by 2010 in the absence of effective prevention.⁸

In sub-Saharan Africa, where AIDS has already erased decades of health gains, infection rates continue to rise beyond levels previously thought possible, threatening yet another generation in the world's most impoverished region.

China and India, home to a third of the world's population, stand on the precipice of a potential AIDS catastrophe, as infection migrates from discrete high-risk groups to the broader population.

The importance of immediate mobilization to prevent an acute worsening of the global epidemic is underscored by the experience in South Africa. In a mere decade, HIV prevalence among pregnant women there skyrocketed from less than one percent to 25 percent today.

AIDS has awakened the world to intolerable global inequities. While medical advances have sharply reduced HIV-related death and sickness in industrialized countries, the epidemic continues on as before in developing countries, harming families, burdening the most vulnerable, and robbing entire regions of hope for the future. Even in the world's richest countries, prevention gains

GLOBAL ESTIMATES OF HIV/AIDS EPIDEMIC AS OF END 2001



TOTAL NUMBER OF ADULTS AND CHILDREN LIVING WITH HIV/AIDS—40 MILLION

Source: UNAIDS

PREVENTING HIV WHAT IS AT STAKE

The fight against HIV transmission is a challenge from which the world cannot shrink. In region after region, the HIV/AIDS threat continues to grow.

Sub-Saharan Africa

For years, observers have expected the epidemic in Africa to plateau. Yet, each year, the news grows grimmer, as infection rates exceed levels previously thought possible.

- ▶ In Botswana, the nation with the world's highest infection rate, median HIV prevalence among pregnant women in urban areas increased from 38.5 percent in 1997 to 44.9 percent in 2001. Likewise, in Zimbabwe, Namibia, and Swaziland—where infection rates rival those of Botswana—HIV prevalence continues to increase.⁹
- ▶ After years of relatively slow increases in West Africa, infection rates appear to be rising sharply in Cameroon (from 4.7 percent prevalence in urban populations in 1996 to national prevalence of 11 percent among pregnant women in 2000) and in several districts in Nigeria, the continent's most populous country.¹⁰

Emerging Epidemics

HIV infection is rapidly spreading in several of the world's most populous countries, mimicking the epidemic's early growth in the sub-Saharan region.

- ▶ Conservative projections suggest that over 2 million people in Russia will be infected by 2010 in the absence of effective prevention.¹¹
- ▶ Escalating rates of sexually transmitted diseases could foretell a dramatic expansion of HIV infection in China, where various groups have estimated that more than 10 million people could be living with HIV/AIDS by 2010¹² from as high as 1 million today.¹³
- ▶ In India, HIV prevalence among women in prenatal care already exceeds 2 percent in one state and is more than 1 percent in four others.¹⁴

Other Developing Countries

HIV also continues its relentless assault on the Caribbean, the world's second most affected region, where HIV prevalence in at least two countries already exceeds 4 percent. The number of people infected grew by nearly 20 percent in North Africa and the Middle East last year, leaving close to half a million people with HIV/AIDS.¹⁵

Industrialized Countries

In North America and Europe, where HIV prevention has been most successful, syphilis outbreaks and behavioral surveys indicate an increase in risk behavior, especially among men who have sex with men.¹⁶

and treatment advances have been accompanied by recent increases in risk behavior.

As AIDS advances further into its third decade, the question facing the global community is whether we will have the commitment and resolve to respond effectively. Will our expressions of concern be turned into concrete action? Having failed to prevent the first wave of the epidemic, will we have the courage and vision to prevent the next one?

If we fail to mobilize against AIDS, we will deserve the certain condemnation of history. Effective strategies exist to prevent HIV transmission, and both low- and higher-income countries have the potential to put these strategies in place.

Were the world to bring to scale available prevention strategies, a research team led by WHO/UNAIDS estimates we could prevent 28 million of the 45 million new infections projected by 2010. By slowing the epidemic's projected growth over the next eight years by nearly two-thirds, HIV prevention could effectively break the back of the global epidemic and permit the world to begin contemplating ultimate victory over the disease.

To achieve such results, we must dramatically scale up existing prevention efforts. Pilot prevention projects must rapidly become comprehensive programs that reach all those at risk, and obstacles to prevention must be swiftly overcome.

The resources needed annually to bring existing prevention efforts to scale—estimated at \$4.8 billion annually¹⁷—are completely achievable. The annual cost of a global effort to reverse the spread of HIV/AIDS would

PREVENTION AND TREATMENT NATURAL PARTNERS IN THE GLOBAL FIGHT AGAINST HIV/AIDS

This report's call for a dramatic strengthening in HIV prevention efforts occurs at a key turning point in the global response to AIDS. The global community is now confronting inequities in access to HIV therapies, including antiretrovirals (ARVs). A major new effort to prevent HIV infections should be integrated with a comparable expansion in health care access in resource-poor countries.

Prevention and care are essential partners in an effective response to AIDS. HIV prevention supports efforts to expand health care access by keeping the cost of future treatment demands from spiraling ever upwards. Similarly, availability of treatment helps promote effective prevention by encouraging early knowledge of serostatus. By implicitly valuing the

health and well-being of people living with HIV/AIDS, expanded treatment programs also help reduce the stigma associated with the disease.

Moreover, access to treatment is a global humanitarian imperative. Possessing the resources and know-how needed to intervene, the world must act to reduce suffering and death among the 40 million people living with HIV.

The potential impact of improved treatments on HIV risk behaviors should be taken into account when expanding HIV prevention. In industrialized countries, as improved treatments have become readily available, the commitment to HIV prevention has failed to keep pace, and many people at risk of infection have abandoned risk reduction strategies.¹⁸

amount to only about \$5 for each person living in the United States and Europe.

More than money, though, will be required to mount a comprehensive HIV prevention effort. Although developing countries possess the passion, intelligence, and commitment needed to defeat HIV/AIDS, they often lack the human and physical capacity to immediately bring HIV prevention programs to scale. An emergency global effort to transfer HIV prevention know-how and technologies must accompany a rapid increase in HIV prevention spending.

To achieve the needed global mobilization, HIV prevention proponents will need to squarely address lingering skepticism regarding what can realistically be achieved in both developed and developing countries. It is assumed by many policymakers that little can be done to reduce the burden of HIV/AIDS in hard-hit countries, that tens of millions more will die, and that we have little choice but to watch until the epidemic reaches its saturation point and begins to die out on its own.

The prevailing air of inevitability regarding the future of AIDS ignores not only the extraordinary resources at the world's disposal but also the fact that our knowledge base on effective prevention strategies has grown substantially in recent years. Such thinking also defies experience in sub-Saharan Africa, Southeast Asia, and Latin America—where some of the poorest countries in the world have made major progress in stemming the

spread of HIV—as well as the success of industrialized countries in containing the epidemic.

Global political support for HIV prevention, sometimes lacking in the past, is growing notably stronger. Caribbean nations have joined together in a major effort to respond to HIV/AIDS; African leaders vowed at the 2001 Abuja summit to prioritize the fight against the epidemic; heads of government of the 10 ASEAN member countries pledged their leadership in the fight against HIV/AIDS in November 2001; and leaders of the Commonwealth of Independent States in 2002 openly acknowledged the need to wage a vigorous fight against a rapidly growing regional health threat. For the first time in the epidemic's history, nations joined together in June 2001 at the United Nations Special Session on HIV/AIDS to agree on concrete, time-bound targets for reducing the number of new infections, underscoring the conviction that the battle against HIV/AIDS is one that can be won. And the new Global Fund to Fight AIDS, Tuberculosis and Malaria represents an important new avenue for funding of HIV prevention, although funds pledged thus far are only a fraction of what will be needed.

Effective HIV prevention is more than education, and more than a condom, a clean needle, or any other single commodity. Effective HIV prevention involves a thoughtful, planned combination of interventions and policies that work synergistically to reduce overall rates of transmission.

Every moment of delay in invigorating the global prevention effort means lives lost. Each day, nearly 14,000 people become infected with HIV, including more than 1,600 infants.¹⁹ Without sustained progress in preventing new infections, millions will die, key national sectors will collapse, global inequities will grow, and international development will be undermined for generations.²⁰

Enhanced investment in HIV prevention today will yield monumental dividends tomorrow for the entire world—especially for the resource-poor developing countries that have been affected the most. By helping avoid countless infections, current HIV prevention strategies are among the most cost-effective health interventions available for use in low and middle-income countries.

The importance of immediate implementation of a comprehensive HIV prevention effort is apparent from earlier history in the epidemic. In 1993, the WHO Global Programme on AIDS projected that an investment of \$1.5 billion to \$2.9 billion annually could prevent half of all projected infections in 2000 and save \$90 billion in

associated costs. Having failed to intervene effectively, the world confronts not only an expanding epidemic, but also escalating costs for both HIV prevention and treatment.

The Global HIV Prevention Working Group—composed of leading experts in public health, clinical care, and biomedical, behavioral, and social research, and people affected by HIV/AIDS, and convened by the Bill & Melinda Gates Foundation and the Henry J. Kaiser Family Foundation—seeks to generate a dramatically expanded commitment to the global fight against HIV transmission.

This first report by the Working Group addresses a pivotal question confronting global decision-makers—*How do we bring available HIV prevention strategies to scale in order to cripple the global epidemic?*

This report summarizes available evidence on the effectiveness of HIV prevention and identifies logistical obstacles to immediate scale-up. As this report explains, rapid implementation of effective prevention programs is entirely achievable, but only if the world devotes unprecedented resources and attention toward this effort.

WHAT WORKS

PROVEN HIV PREVENTION STRATEGIES

Over the past two decades, available prevention strategies have been repeatedly evaluated in controlled scientific studies and descriptive case analyses, and they have been successfully put to use in multiple populations, in developed and developing countries, and in both early and mature epidemics. In short, we know much about what works.

But to have a significant impact on the future course of the epidemic, proven prevention strategies must be scaled up and multiple prevention approaches must be combined to achieve success. Much as combination anti-retroviral therapy slows viral replication by attacking HIV from multiple angles, “combination prevention”²¹ fights national and local epidemics by adopting multiple strategies to reduce or eliminate the risk of transmission.

Countries that have been most successful in thwarting HIV/AIDS have pursued a “combination prevention” approach. Switzerland, Australia, and other developed countries that effectively contained emerging epidemics in the 1980s combined sound prevention strategies, targeted interventions, sustained efforts to reduce stigma, and broad general awareness campaigns.

Likewise, developing countries that have recorded major prevention successes have promoted condom use, raised general awareness of the AIDS threat, provided sex education in schools, targeted prevention interventions to populations at special risk, expanded access to voluntary counseling and testing, involved multiple sectors (including NGOs and faith communities) in the fight against AIDS, and enacted strong human rights protections for people with HIV/AIDS.²²

Available HIV prevention strategies are extraordinarily cost-effective. Basic HIV prevention interventions cost substantially less per disability-adjusted life year (DALY) saved than the accepted \$50 per DALY cost-effectiveness threshold for health interventions in resource-poor settings—\$1 per DALY for condom distribution to women with multiple partners in sub-Saharan Africa, \$5 for implementation of basic blood safety practices, \$4 to 7 for peer education targeting sex workers, \$5 to 12 for nevirapine to prevent MTCT, and \$12 for STD control.

Indeed, existing tools to reduce HIV transmission appear to be among the more cost-effective standard interventions currently available for health conditions that primarily affect resource-poor countries.²³

PREVENTION OF SEXUAL TRANSMISSION— EVIDENCE OF EFFECTIVENESS

The most frequent mode of HIV infection, sexual transmission, is normally a result of unprotected vaginal or anal intercourse. Worldwide, heterosexual transmission is responsible for the majority of new HIV infections. Estimates of the probability of HIV transmission per act of heterosexual intercourse have varied between different countries and settings. A recent study of a representative sample of heterosexual couples in Uganda found the probability of transmission per act to be 0.1 percent.²⁴

Commercial sex workers represent an especially vulnerable and epidemiologically important population for the sexual transmission of HIV. Because their very job definition mandates exposure to multiple sexual encounters, sex workers are often the first discrete population in emerging epidemics to exhibit noteworthy HIV prevalence. UNAIDS, citing recent experience in Asia, advises, “[I]t is from the comparatively small pool of sex workers first infected by their clients that HIV steadily enters the larger pool of still-uninfected clients who eventually transmit the virus to their wives and partners.”²⁵

Men who have sex with men (MSM) make up 5 to 10 percent of HIV infections globally and up to 70 percent of infections in industrialized countries.²⁶ Official surveillance figures may, however, understate the extent of transmission via sexual contact between men, as such contact may not always be acknowledged by individuals who test positive or by national authorities. Most cases

HIV PREVENTION REAL-WORLD PROOF OF SUCCESS

UNAIDS and others have extensively documented the success of countries and individual programs in promoting safer behaviors and reducing HIV infections.²⁷

- ▶ **Brazil** has combined targeted prevention efforts, general awareness campaigns, universal access to antiretrovirals (ARVs) and other HIV treatments, and supportive policies to enhance the effectiveness of prevention and care initiatives. In addition to marked reductions in HIV-related morbidity and mortality, Brazil has witnessed significant declines in risk behavior, reductions in new infections, and increased demand for voluntary counseling and testing (VCT). National surveys, for example, indicate that condom use among injection drug users increased from 42 percent to 65 percent from 1999 to 2000.²⁸
- ▶ **Cambodia** embarked in the 1990s on a comprehensive national HIV prevention program. As a result, between 1997 and 2000, HIV prevalence among pregnant women declined by almost one-third, and Cambodian males reported an increase in condom use.²⁹
- ▶ **Senegal** avoided the fate of many of its neighbors by implementing a multisectoral HIV prevention effort as its epidemic was only beginning to emerge. Although neighboring countries now have HIV prevalence in excess of 5 percent, Senegal has managed to keep its level of infection under 2 percent. A key element to Senegal's success has been the active involvement of civil society.³⁰
- ▶ **Thailand** has perhaps the best-studied epidemic in a developing country. After experiencing escalating infection rates in the 1980s, Thailand initiated a comprehensive prevention program that included its 100 percent condom program targeting brothels, broad-based awareness efforts, the active involvement of multiple sectors of society, and strong human rights protections. By the end of the 1990s, the number of new infections had fallen by 80 percent from levels reported prior to Thailand's implementation of its national prevention program.³¹
- ▶ **Uganda**, with strong and vocal support from President Yoweri Museveni, implemented a multi-compo-

nent HIV prevention program that includes broad public awareness efforts, extensive condom promotion, and access to free voluntary counseling and testing. NGOs and organizations of people living with HIV/AIDS have played an especially visible role in Uganda's national HIV prevention effort. Thanks to such multi-sectoral efforts to prevent transmission, HIV prevalence among pregnant women in urban areas in Uganda declined by nearly two-thirds between the beginning and end of the 1990s, and national HIV prevalence was cut nearly in half.³²

- ▶ **Zambia** has in recent years initiated a multi-disciplinary national AIDS program in an effort to reduce the number of new infections. The program appears to be bearing fruit, as HIV prevalence among pregnant urban women (ages 15 to 19) fell by nearly 50 percent between 1993 and 1998.³³
- ▶ **Industrialized countries** have recorded important successes in containing their own HIV/AIDS epidemics. In the U.S., for example, a combination of HIV prevention strategies helped reduce the annual number of new infections from 150,000 in the mid-1980s to 40,000 by the early 1990s.³⁴ And by aggressively responding with prevention programs targeting men who have sex with men and injection drug users, Australia contained a potentially serious HIV/AIDS epidemic at a low level.
- ▶ **Individual projects** have shown success within countries. Workers in Zimbabwe factories where peer HIV/AIDS education programs were implemented had a 34 percent lower rate of new infections than individuals employed in factories that had no peer interventions.³⁵ In Côte d'Ivoire, peer education, combined with voluntary counseling and testing, has helped reduce HIV prevalence among sex workers in Abidjan from 89 percent in 1992 to 32 percent in 1998. Community-based prevention services focusing on sex workers in Benin have similarly contributed to an increase in condom use in this population from 6 percent in 1993 to more than 80 percent six years later, as well as a significant decline in incidence of sexually transmitted diseases.³⁶

of HIV transmission among MSM stem from unprotected anal intercourse, although there appears to be a real, but much smaller, risk of transmission from oral sex.³⁷

An important subset of sexually transmitted cases of HIV involves sexual activity that occurs when one or both participants are under the influence of various substances, such as drugs or alcohol. Intoxicants may increase risk for transmission by clouding individual judgment and reducing inhibitions regarding behaviors that facilitate HIV transmission.³⁸

Effective interventions to prevent sexual transmission include behavior change programs, prevention and treatment of sexually transmitted diseases (STDs), and voluntary counseling and testing (VCT). Interventions with theoretically strong, but unproven, potential to reduce sexual transmission of HIV include male circumcision and clinically appropriate antiretroviral (ARV) treatment of sexually active, HIV-infected individuals.

Behavior Change Programs

Programs to encourage safer sexual behaviors are anchored in a wide range of recognized behavioral theories. Theory-based prevention programs include those that attempt to directly alter personal beliefs, attitudes and behaviors, as well as interventions that indirectly seek to influence personal behavior by affecting social networks and community norms.³⁹ Specific behavioral approaches include social marketing, small group interventions, safer sex workshops that provide information and build skills, and popular opinion leader and peer-based interventions, including those that seek to model positive attitudes toward safer sex.⁴⁰ These approaches seek to increase condom use among people who are sexually active, persuade individuals to reduce their number of sexual partners, and encourage young people to remain abstinent or delay initiation of sexual activity.

Safer sex programs have proven effective in a broad range of populations, including school-age youth,⁴¹ heterosexual women,⁴² and men who have sex with men.⁴³ Effective safer sex programs should be carefully tailored to the particular social and economic settings in which they are implemented and to the specific needs and values of the target population. In addition, safer sex initiatives are optimally effective when they are undertaken in combination with broad-based sexuality and HIV/AIDS education. Because vulnerability to HIV is often greatest in groups that are socially marginalized or legally powerless—e.g., women who lack economic power, youth who are dependent on their elders, sex

workers at risk of arrest, or men who have sex with men at risk of ostracism or harassment—it is important to involve members of the target population in the design and implementation of behavior change initiatives in order to ensure the cultural relevance of such programs.

In areas where the virus is present, populations at greatest risk of sexual transmission will be those who have multiple sexual partners, such as sex workers. Thailand's success in promoting condoms in brothels has been rightly hailed as a sentinel prevention success, but the country is not alone in generating safer sexual behaviors among sex workers. In Abidjan, targeted prevention efforts helped raise condom use among sex workers from 20 percent in 1992 to nearly 80 percent six years later, slashing HIV prevalence in this population by nearly two-thirds. UNAIDS has also documented the success of HIV prevention programs targeting sex workers in Papua New Guinea, India, and Bangladesh.⁴⁴

Although the impact of safer sex programs has often been measured by increased rates of condom use, growing information regarding successful national prevention efforts underscores the many factors that may combine to reduce the rate of sexual transmission. In Uganda, for example, critical factors in the country's success in slowing the spread of HIV include a marked reduction in the median number of sexual partners and a delay by two years in young people's initiation of sexual activity. Likewise, in Thailand, while the increase in use of condoms strongly contributed to the decline in new infections, a similarly important development was a reduction in the frequency with which Thai males patronize brothels.

While safer sex programs can have an enormous impact on national epidemics, as demonstrated by extensive scientific evidence and real-world experience, even the most effective efforts fall short of achieving 100 percent use of condoms by the target population. When healthy sexual behavior norms are forged, such behaviors are often difficult to sustain over time. To maximize their effectiveness, safer sex messages must be repeated and revised, as well as supplemented by additional prevention interventions. Although safer sex programs often encourage young people to remain abstinent, research indicates that comprehensive programs are more effective in reducing HIV risk than programs that only promote abstinence.⁴⁵

STD Control

Sexually transmitted diseases increase HIV risk by at least two to five times.⁴⁶ Untreated STDs enhance the infectivity of HIV-positive individuals and render uninfected people more susceptible to transmission of the virus.⁴⁷ Experts agree that an integral component of a comprehensive HIV prevention effort is the early detection and treatment of STDs.⁴⁸

In a study in the Mwanza region of Tanzania, continuous provision of STD drugs by trained health care providers reduced HIV incidence in six intervention sites by 38 percent.⁴⁹ By contrast, a study of periodic mass STD treatment in the Rakai district of Uganda found that the intervention significantly reduced the number of STDs but did not reduce HIV incidence.⁵⁰

While the totality of available evidence strongly supports the importance of early detection and treatment of STDs as an essential HIV prevention mechanism—in both mature and early epidemics⁵¹—the questions raised by the Rakai and Mwanza results underscore the need for additional research to identify optimal intervention strategies, especially in established epidemics.⁵² To maximize epidemiologic impact and cost-effectiveness, enhanced STD control efforts should be initiated as early as possible in the course of an epidemic and be targeted toward people at highest risk of acquiring and transmitting HIV and other STDs.⁵³ STD screening episodes should be ideally coupled with client-centered risk reduction counseling, which has been shown to reduce behaviors that may result in transmission of HIV or other STDs.⁵⁴

Viral STDs that are not curable, especially herpes simplex virus (HSV-2), facilitate HIV transmission. Research evaluating the effectiveness of HSV-2 treatment in reducing HIV transmission is urgently needed. At present, treatments for HSV-2 are largely unavailable in low-income countries due to their relatively high cost.

South Africa's loveLife Program:

Empowering Youth to Protect Themselves from HIV

South Africa's national HIV prevention program for youth, known as loveLife, seeks to empower young people in South Africa to protect themselves through a multi-component program that includes saturation of youth-oriented media with HIV awareness messages; expansion of adolescent health services in South Africa's 5,000 public health clinics; creation of a national network of youth centers that provide health services in a non-clinical setting; and mobilization of a national corps of youth peer outreach volunteers. loveLife has been widely embraced by youth in South Africa, and nearly 70 percent of young people who have heard of loveLife say they have reduced their number of sexual partners as a result of the program. loveLife is a partnership between U.S.-based private foundations, leading South African non-governmental organizations, the South African government, and South Africa's largest media corporations.

Voluntary Counseling and Testing

The vast majority of people living with HIV/AIDS in low-income countries are unaware they are infected, a factor that substantially weakens efforts to respond effectively to HIV/AIDS in resource-limited settings. Voluntary counseling and testing (VCT) is not only a gateway to care for people living with HIV but also a critical component of a comprehensive strategy to prevent HIV transmission. Studies have documented that people who test positive tend to reduce behaviors that can transmit HIV.⁵⁵ Data are less conclusive regarding the impact of a negative test result on risk behavior.

Characteristics of Successful National Prevention Programs

UNAIDS and others have studied countries where HIV prevention efforts have been most successful in order to identify common characteristics.⁵⁶ These include:

- ▶ Strong leadership, including visible ownership by national leaders of the fight against the disease.
- ▶ Broad awareness of HIV/AIDS among the general population.
- ▶ Open discussion of sex and a national commitment to sex education for youth.
- ▶ Active involvement of multiple sectors of society (including civil society, religious leaders, and non-governmental organizations) in the response to AIDS.
- ▶ Concerted efforts to reduce AIDS stigma, and policy and legal changes to prevent HIV-related discrimination.
- ▶ Availability of external assistance in the financing, development, and implementation of effective prevention programs.

HIV PREVENTION FOR YOUTH A GLOBAL IMPERATIVE

Young people will determine the future of the HIV/AIDS epidemic. In sub-Saharan Africa—where more than one-half the population is under age 18—the decisions made over the next several years by young people will dictate whether, as projected, three out of four of today's 15-year-olds in Lesotho will be HIV-infected by age 50.⁵⁷

Currently, we are losing the fight to protect the health and well-being of the world's youth. Nearly 12 million people between ages 15 to 24 are living with HIV/AIDS, and young people account for half of all new infections—2.5 million each year, more than 7,000 every day.⁵⁸

To reach youth with effective HIV prevention strategies, it is critical to intervene at an early age, before young people become sexually active.

Why Youth Are Vulnerable to HIV

► **Early Initiation of Sexual Activity.** Substantial percentages of young people become sexually active before their 15th birthday—nearly 1 in 2 boys in Gabon; roughly 1 in 3 boys in Kenya, Malawi, Latvia and Poland; more than 1 in 4 girls in Niger.⁵⁹ In some Eastern European countries, still struggling to find social equilibrium in

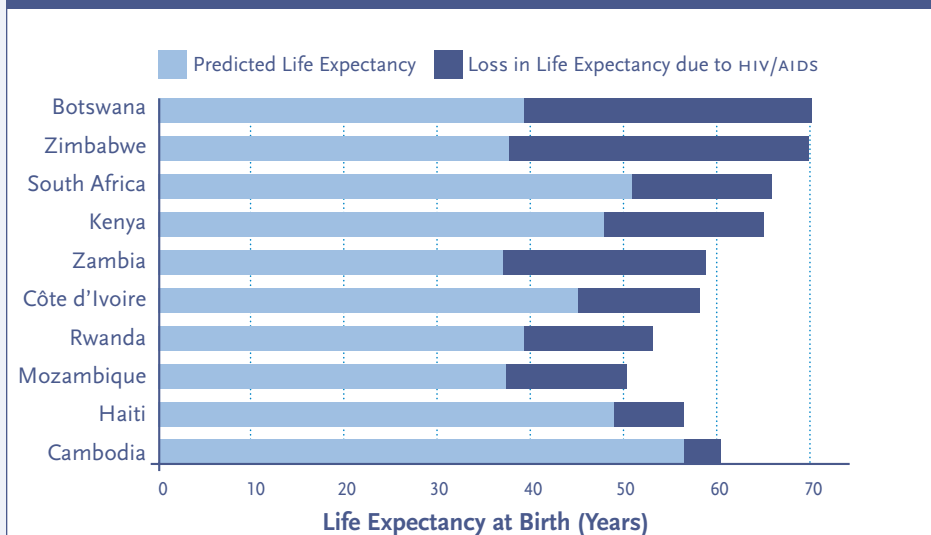
the transition to a market economy, there is evidence that young people are, on average, initiating sexual activity at an increasingly early age.⁶⁰

► **Ignorance of the Dangers of HIV.** Surveys in Central Asia, where HIV infection is on the rise, indicate that 10 percent or fewer of adolescents between ages 15 to 19 have ever heard of AIDS, and only 9 percent of adolescent girls in Ukraine are aware of how to prevent HIV transmission.⁶¹ Likewise, UNICEF reports that, in Mozambique, 74 percent of young women and 62 percent of young men, ages 15 to 19, do not know how to protect themselves from HIV.⁶²

► **Sexually Transmitted Diseases.** In both rich and poor countries, STDs disproportionately affect people between ages 15 to 29, increasing their susceptibility to HIV transmission. Countries in Asia and Eastern Europe, where HIV/AIDS is emerging as a serious threat, have recently experienced disturbing increases in STDs. In addition, studies in the U.S. indicate that African-American adolescent girls are at especially high risk for chlamydia and other STDs.⁶³

► **Young Women.** Not only are adolescent girls more physiologically vulnerable than mature women to HIV infection and other sexually transmitted diseases, but many young girls have sex with older men, who are more likely than young men to be infected with HIV. Condom use is rare among adolescent females, according to studies in sub-Saharan Africa.⁶⁴ As a result of such factors, young women tend to have higher HIV infection rates than young males.⁶⁵ In five sub-Saharan African countries (e.g., Botswana, Lesotho, Namibia, South Africa, Zimbabwe) where at least 1 in 5 females between 15 to 24 are HIV-infected, infection rates for young females are more than twice as high as for males.

PREDICTED LOSS IN LIFE EXPECTANCY DUE TO HIV/AIDS IN CHILDREN BORN IN 2000



Source: U.S. Census Bureau, 2000

► **Powerlessness.** In virtually all cultures, youth lack social and political power, making them vulnerable to sexual exploitation. Many young people (especially girls) are coerced, either physically or economically, into becoming sex workers; UNICEF reports that half of all sex workers in India are under age 18 and 20 percent are under age 15.⁶⁶ Although universal education initiatives help reduce young people's vulnerability, AIDS is undermining such strategies by devastating educational sectors, especially in sub-Saharan Africa.

► **Orphans.** Studies in both rich and poor countries demonstrate that children who are able to discuss HIV/AIDS and other problems with their parents are less likely to become infected. Conventional family supports, however, do not exist for the more than 14 million children who have been orphaned as a result of AIDS,⁶⁷ underscoring the need for targeted programs to assist and educate such young people.

► **Resistance to Speaking Frankly to Young People.**

In most countries, there is strong resistance to speaking frankly to youth about sensitive topics such as sexuality and drugs. Although such resistance derives from powerful cultural traditions, it can have deadly consequences.

Effective Prevention Strategies for Youth

Extensive research has demonstrated that HIV prevention programs can successfully encourage young people to remain abstinent, delay initiation of sexual activity, or, if sexually active, use a condom.

► **Peer Programs.** International experience—in developed and developing countries—demonstrates that peer-based interventions can be powerfully effective in promoting safer sexual behaviors and reducing drug use among young people.⁶⁸ The M-Powerment project, for example—which uses a variety of peer-based, youth-oriented strategies to instill safer sex norms among young men who have sex with men in the United States—has been found to reduce reported risk behaviors.⁶⁹

► **Social Marketing.** Just as makers of consumer products use marketing techniques to entice young people to buy their wares, evidence reveals the effectiveness of “social marketing” in promoting condom use, health service

utilization, and other healthy behaviors among young people.⁷⁰ Efforts to market responsible sexual behaviors frequently focus on key elements of youth culture, including music and sports.

► **School-Based Sex Education.** Inadequate education about human sexuality and HIV/AIDS is having deadly consequences. UNAIDS reports that more than half of all young people in Kenya say they do not believe condoms protect against HIV; nearly two out of three sexually active teenage girls (15 to 19) in Haiti say they are not at risk of HIV infection.⁷¹ Studies indicate that school-based HIV/AIDS programs not only provide young people with potentially life-saving information, but reinforce healthy norms by providing youth with a supportive environment that involves parents and other community members.⁷² Research further indicates that comprehensive sex education is more effective in reducing HIV risk than programs that promote abstinence as the sole means to avoid HIV and other STDs.⁷³

► **Youth-Friendly Services.** Conveniently located, youth-friendly health services that involve young people as peer counselors have been found to increase clinic attendance. Youth-oriented behavior change programs have proven to be especially effective when integrated with other youth services. According to UNAIDS, research in Zimbabwe indicates that membership in a community youth group significantly reduces the chance that young women will become infected with HIV.⁷⁴

► **Real-World Proof.** Even in resource-poor countries, prevention programs that target youth can be powerfully effective. In Uganda, young people's delay in initiating sexual activity has been a critical factor in that country's success in slashing rates of new infections. Strong HIV prevention efforts have also sharply reduced HIV prevalence among young pregnant women in Zambia.⁷⁵

To have maximum impact on the epidemic, programs to reduce sexual transmission must be dramatically expanded. At present, fewer than 1 in 5 people at risk of infection worldwide have access to basic prevention interventions.⁷⁶

In a randomized trial involving more than 3,100 individuals and nearly 600 couples in Kenya, Tanzania and Trinidad, participants who received VCT were significantly more likely to reduce reported risk behaviors than participants who received basic health information. Declines in risk behaviors were notably pronounced for trial participants who tested HIV-positive and for couples who learned that one partner was infected.⁷⁷

Knowledge of serostatus alone, however, is often not sufficient to produce long-lasting behavior change. VCT appears to be most effective and longer-lasting as an HIV prevention tool when testing is combined with intensive counseling and other prevention services.⁷⁸

The ultimate effectiveness of VCT as an HIV prevention strategy depends, of course, on the willingness of people at risk to voluntarily seek this intervention. Social marketing, an approach that uses state-of-the-art product marketing techniques to promote healthy behaviors, has proven effective in encouraging people to take various risk reduction steps, including being voluntarily tested for HIV.⁷⁹

Circumcision

Several studies have found that uncircumcised men have notably higher HIV infection rates than their circumcised counterparts.⁸⁰ Some health experts believe circumcision should become routine for newborn males in high-prevalence settings and should be actively promoted for adolescents and adults.⁸¹

While the bulk of evidence points toward a role for circumcision in reducing male HIV risk, at least one study has called this finding into question.⁸² In particular, some have suggested that circumcision may function

Integrating STD Control and HIV Prevention in India

India targets rural populations for enhanced STD prevention and treatment services during 15- to 20-day “pulse campaigns” every six months. Health care workers and local government representatives make house-to-house visits to increase awareness of STD services, and health camps offer local residents free STD screening and treatment. Started as a pilot project in April 1999, the effort now covers all administrative districts in India. Out of a target population of 326 million people in 2001, 71 million (22 percent) attended the health camps, with 3 million (4.2 percent) actually receiving STD treatments. Sentinel surveillance in 2001 detected declines in HIV prevalence among STD clinic attendees in some high-prevalence states of India.

as a proxy for cultural differences that affect sexual practices and HIV risk.⁸³ Others note that studies linking circumcision with a reduced risk of HIV transmission have focused only on men who were circumcised at birth, and that no studies have linked adult circumcision with a reduction in HIV transmission. Experts convened by UNAIDS and WHO advised in 2000: “[T]he association between male circumcision and HIV/STD transmission remains unclear and further research in this area is necessary before clear recommendations can be made.”⁸⁴

Antiretroviral Therapy

Studies have consistently found that risk of HIV transmission is directly associated with the infected individual’s viral load in plasma.⁸⁵ Recognized combinations of available ARVs reduce viral load in most patients, often to undetectable levels.⁸⁶ Although the proposition remains unproven, some experts have speculated that widespread use of ARVs in accordance with accepted treatment guidelines could have important positive effects on population-wide rates of HIV transmission.

Consensus regarding the advisability of viewing ARVs as a primary prevention tool is lacking for several reasons. While it is plausible that ARV-induced reductions in viral load may decrease the likelihood that individuals with HIV might transmit the virus sexually, no study has demonstrated this to be the case. Researchers report that HIV-infected men with undetected viral RNA in plasma may still harbor the virus in seminal cells and be capable of transmitting HIV to a sexual partner, especially one who has inflamed mucosa.⁸⁷ Moreover, ARV therapy is typically initiated many years after initial infection, potentially limiting any public health impact it might theoretically have.

Caution is further merited by the possibility that any prevention benefit from ARVs might be offset by an overall increase in risk behavior stemming from optimism over therapeutic advances. Indeed, there is some evidence that this may already be the case in North America and Europe.⁸⁸

Other Barrier Methods

Although the bulk of attention has been directed toward the male condom as the key prevention tool for sexually active people, the female condom has been proven effective in reducing the risk of transmission.⁸⁹ Surveys also indicate the product would be used by many sexually active women were it more widely accessible.⁹⁰ Substan-

Promoting Voluntary Counseling and Testing In Uganda

Access to, and promotion of, voluntary counseling and testing (VCT) has been a key component of Uganda's successful effort to reverse a potentially catastrophic HIV/AIDS epidemic. Uganda has made VCT available since 1990 and has closely coordinated its testing program with counseling services provided by The AIDS Service Organization (TASO), a community-based, non-governmental organization.

In Kampala alone, more than 380,000 people had been tested by 1999.⁹¹ Studies in Uganda have documented marked positive changes in sexual behavior following VCT, with reported condom use among testers increasing from 10 percent to 89 percent with steady partners and from 28 percent to 100 percent for non-steady partners.⁹² Uganda also offers VCT free of charge in various rural settings, and evaluations have similarly documented positive behavior changes among rural residents following VCT.⁹³

tially greater efforts are needed to increase access to this potentially important prevention tool.

Some experts have also theorized that the female diaphragm may reduce risk of HIV transmission during vaginal intercourse because it covers the cervix, an important target for HIV infection. Studies are presently being developed to assess the effectiveness of the female diaphragm as an HIV prevention tool.

PREVENTION OF PARENTERAL TRANSMISSION— EVIDENCE OF EFFECTIVENESS

Direct exposure to the virus through the bloodstream is the most efficient route of HIV transmission. Most cases of parenteral transmission occur as a result of the sharing of needles during injection drug use, but a notable percentage also stem from improper blood collection and transfusion practices.

Injection drug use accounts for an estimated 10 percent of the world's HIV infections, although it is the cause of a majority of infections in certain Asian and European countries.⁹⁴ The potential for an increase in drug-related HIV transmission is considerable. Whereas

only 80 countries reported to the United Nations in 1992 that injection drug use had been documented within their borders, by 1998 the number had grown to 136.⁹⁵

Although injection drug use is distinct from sexual intercourse as a mode of transmission, the two routes are frequently linked epidemiologically. Injection drug users are often young and sexually active, potentially exposing their sexual partners to the virus. In addition, injection drug users disproportionately work in the commercial sex industry.

The transfusion of HIV-infected blood or blood products is believed to be responsible for 5 to 10 percent of cumulative infections worldwide.⁹⁶ Substandard hygienic practices in health care settings—including improper sterilization and the reuse of medical equipment—also pose a risk of HIV transmission, although the precise contribution of such practices to the spread of HIV/AIDS is unclear.

HIV Prevention Among Injection Drug Users

More than 20 years' experience in responding to AIDS has helped identify a variety of cost-effective interventions that significantly reduce the risk of HIV transmission through needle sharing:

Needle and Syringe Projects

Needle exchange projects have been shown to reduce the risk of transmission without contributing to an increase in drug use.⁹⁷ Indeed, extensive research points to early implementation of needle and syringe projects as a critical factor in helping several cities avoid a serious HIV outbreak among IDUs.⁹⁸ An international analysis of available data found that HIV prevalence decreased 5.8 percent in 29 cities with needle and syringe projects, while HIV infection increased nearly 6 percent in 51 cities without such programs.⁹⁹

Evidence of the effectiveness of needle and syringe projects is well illustrated by experience in New York City, which is perhaps home to more IDUs than any other municipality in the world. Following tens of thousands of HIV infections among New York IDUs in the 1980s, several needle and syringe projects were initiated in neighborhoods frequented by IDUs. Between 1991 and 1996, HIV incidence among the city's IDUs declined by more than 40 percent.¹⁰⁰ More recently, public health officials determined that HIV prevalence among first-time testers at drug treatment centers dropped from 33.6 percent in 1990 to 4.3 percent in 1998.¹⁰¹

In addition to providing clean injection equipment, needle and syringe projects link users with other

programs that promote risk reduction. As the National Institute on Drug Abuse concluded following a comprehensive survey of available evidence, needle exchange and syringe projects “serve as a bridge to active and out-of-treatment drug users by providing them with HIV/AIDS information and materials (e.g., bleach kits and condoms) to reduce their risks, by offering opportunities for HIV testing and counseling, and by providing referrals for drug abuse treatment and other social services.”¹⁰²

Needle and syringe projects are often hampered by law enforcement agencies and the communities in which such programs are situated. Numerous programs in both developed and developing countries have managed to overcome such obstacles to reach IDUs at risk of infection, underscoring the importance of enhanced technical assistance to fledgling programs. Policy and legal obstacles to needle and syringe projects have also been successfully overcome in both developed and developing countries.

Drug Treatment

Methadone maintenance and other forms of substance abuse treatment are effective in preventing HIV transmission.¹⁰³ Not only does drug treatment reduce drug use and therefore help prevent practices that can lead to HIV transmission,¹⁰⁴ but initiation of drug treatment often produces significant reductions in HIV-related sexual risk behaviors.¹⁰⁵

Behavior Change Programs

Small group interventions, individual counseling, and other psychosocial programs have also proven effective in encouraging many IDUs to reduce the frequency with which they inject drugs or have unprotected sex.¹⁰⁶ Community-based outreach has been shown to be especially effective in encouraging IDUs to access available prevention options.¹⁰⁷

Psychosocial interventions for IDUs appear most effective when they are intensive and long-lasting,¹⁰⁸ but not all people are willing to make such an extended personal investment. Moreover, behavior change programs for IDUs seem to have been more successful in encouraging safer injection practices than safer sex.¹⁰⁹

Improving the Safety of the Blood Supply

Development in the 1980s of a test to detect antibodies to HIV enabled developed nations to routinely screen blood donations for antibodies to the virus, and donor restrictions further reduced the likelihood of transfusion-related HIV transmission. By the end of the epidemic’s first

Overcoming Potential Obstacles to Needle and Syringe Projects in India

In recent years, HIV infection among IDUs in the Manipur state of India skyrocketed, striking an estimated 60 percent of users. Evidence suggested that needle sharing was abetted in part by the fears of IDUs that they would be arrested if found with needles and syringes.

When the Society for HIV/AIDS and Lifelines Operation established a needle and syringe project in Churachandpur township, the group consulted local police and persuaded them not to harass participants or staff who might possess injection equipment. Between 1997 and 2001, HIV incidence among IDUs in Manipur dropped from 77 percent to 59 percent. Although the rate of infection remains high, the success of the program in reaching a highly vulnerable population with important health promotion services convinced the minister of health to integrate needle exchange into the State’s official HIV/AIDS strategy.

Prevention of HIV Transmission Among Injection Drug Users in Eastern Europe

The Open Society Institute has played an important role in expanding prevention services for injection drug users, with particular emphasis on emerging epidemics in Eastern Europe and Central Asia.

OSI’s International Harm Reduction Development Program and associated foundation partners provide funding and other support to 162 harm reduction projects in 22 countries. These projects—which seek to reduce drug-related harm and promote human rights—serve more than 50,000 clients each month. OSI projects support harm reduction efforts for prisoners, sex workers, and homeless youth.

decade, the risk that HIV would be transmitted through donated blood had been virtually eliminated in developed countries.¹¹⁰

To extend these benefits to developing countries, public health experts recommend implementation of a range of policies and procedures, including creation of a national blood service, use of low-risk donors, routine screening of blood donations, and reduction of unnecessary transfusions.¹¹¹ Significant financial and technical support is needed to permit developing countries to implement such policies and practices to protect blood supplies.

Expanding Efforts to Protect Blood Safety

Today, simple procedures and technology exist that can effectively eradicate the risk of transfusing potentially tainted blood.

In recent years, many countries have acted to protect the safety of blood supplies. Countries in sub-Saharan Africa have integrated blood safety measures into national AIDS strategies, and UNAIDS reports that Cambodia has similarly initiated efforts to prevent HIV transmission as a result of blood transfusions.

To improve the safety of the blood supply, India has encouraged voluntary blood donations. This approach has reduced the number of transfusion-related infections from 8 percent of total infections in 1992 to 3 percent of total infections in 2001. During this period, the proportion of all blood donations that are voluntary increased from 30 percent to 46 percent.

Improving the Safety of Health Care Settings

Industrialized and many middle-income countries have long required workers to take “universal precautions” in health care settings to prevent transmission of HIV and other bloodborne pathogens. This approach, which treats each patient as potentially infectious, requires that workers routinely wear gloves, masks, goggles, and other protective gear, as well as properly sterilize equipment, devices, and surfaces. Health care institutions should be designed to promote safety (such as having repositories for the disposal of needles and other sharp devices), and workers should have access to the safest possible syringes and other devices. Although universal precautions cannot prevent all possible exposures to blood, this approach has succeeded in making transmission extraordinarily rare in health care settings in industrialized countries.¹¹²

To achieve similar success in resource-limited countries, health care facilities require access to safer technologies, workplace training in infection control, and assistance in developing and implementing policies and practices to promote universal precautions.

PREVENTION OF MOTHER-TO-CHILD TRANSMISSION— EVIDENCE OF EFFECTIVENESS

Each year, an estimated 2.5 million HIV-infected pregnant women give birth. As a direct result, nearly 800,000 newborns contract HIV each year from their mothers, accounting for 16 percent of all new infections.

HIV transmission from mother to child may occur during pregnancy, labor, or delivery, or as a result of breastfeeding. Children exposed to HIV—either before or during delivery, or through breastfeeding—currently stand a roughly 3-in-10 chance of becoming infected, with the risk of transmission greater for infants who are breastfed.¹¹³

While the best strategy for prevention of mother-to-child transmission (PMTCT) is prevention of HIV infection in women, important advances also make it possible to prevent most cases of HIV transmission to newborns when the mother is already infected. After researchers reported in 1994 that a three-part regimen of AZT reduced the risk of vertical transmission by two-thirds,¹¹⁴ developed countries adopted a PMTCT package consisting of VCT, reproductive counseling and planning, antiretroviral therapy, and use of elective caesarean delivery. This approach has rendered vertical transmission a rare event in the industrialized world.¹¹⁵

Hopes for preventing mother-to-child transmission in resource-poor countries gained momentum with the release of research findings demonstrating the efficacy of a short regimen of AZT in reducing the likelihood of infection.¹¹⁶ Momentum accelerated in September 1999, when researchers from HIVNET 012 reported that separate single doses of oral nevirapine to mother (at onset of labor) and to newborn (within 72 hours of birth) lowered the probability of HIV transmission (at 14 to 16 weeks) by almost 50 percent.¹¹⁷

HIVNET 012 gave rise to hopes that, for less than \$5 per birth, the risk of transmission could be cut in half—hopes that were further strengthened when Boehringer Ingelheim, the maker of nevirapine, indicated it would provide the drug free for PMTCT in developing countries. In South Africa alone, an estimated 110,000 HIV infections in infants could be prevented by 2005 were the HIVNET 012 intervention used for all deliveries.¹¹⁸

Efforts to scale up PMTCT projects have revealed, however, that drug price is only one factor in ensuring the access of pregnant women to effective prevention

interventions. Challenges to rapid scale-up of PMTCT include lack of access to voluntary counseling and testing, inadequate human capacity, obstacles to caesarean delivery, and the risk of transmission via breastfeeding.

Voluntary Counseling and Testing. Insufficient access to voluntary counseling and testing leaves many pregnant women unaware of their HIV status at the time of delivery, although PMTCT programs may provide a starting point to spur expanded counseling and testing services. Some strategies not dependent on HIV testing have been considered, such as universal treatment with nevirapine in high-prevalence settings. As experience in expanding prevention of mother-to-child transmission programs develops, such strategies should be further explored.

Capacity. In many parts of sub-Saharan Africa, where most cases of mother-to-child transmission occur, the human capacity required to expand and sustain PMTCT projects is presently inadequate. Lack of coordinated record-keeping between antenatal and maternity settings, as well as the fact that many women in some countries give birth at home, have complicated efforts to ensure timely delivery of ARVs to women and their newborns. In addition, effective scale-up of PMTCT will require substantial efforts to ensure access to treatment for HIV-infected mothers.

Caesarean Delivery. Caesarean delivery prior to labor and membrane rupture, and in the absence of ARVs, also reduces the risk of vertical transmission.¹¹⁹ Although this finding has influenced practice in richer countries, where it has contributed to the declines in rates of vertical transmission, applicability in poor countries remains unclear, given the enhanced possibility in resource-poor settings of post-operative complications,¹²⁰ and lack of access to hospital birthing facilities.

Breastfeeding. Although studies have demonstrated the public health utility of PMTCT even in settings where breastfeeding is the norm, its public health potential is nevertheless diminished by the contribution of breastfeeding to transmission. The postnatal risk of transmission to the child increases the longer breastfeeding is continued.¹²¹ Ideally, HIV-infected mothers should have access to alternatives to breastfeeding and receive counseling on infant feeding during prenatal care.¹²²

Scaling Up Efforts to Prevent Mother-to-Child Transmission

The high prevalence of HIV among childbearing women prompted Thailand to initiate in 2000 a nationwide program to promote prevention of mother-to-child transmission. Components of the program include promotion of routine VCT in prenatal settings; AZT for pregnant women beginning at 34 weeks' gestation, with more intensive AZT during labor; a short AZT regimen for newborns; use of formula instead of breastfeeding; and proper health care for mothers and children.

Hospital records demonstrate rapid success in implementation of Thailand's national prevention strategy. Among more than 570,000 women who gave birth in Thailand from October 2000 through September 2001, 97 percent received antenatal care—of whom 93 percent were tested for HIV. Of the more than 6,600 HIV-positive women giving birth, 69 percent received AZT prior to delivery. Nearly 90 percent of infants born to HIV-infected women received AZT prophylaxis, and 83 percent received infant formula.¹²³

Although Thailand's success is not automatically transferable to other settings, especially in least developed countries with more limited access to antenatal care and formula feeding, it underscores the possibility of rapid scale-up of PMTCT, especially when such initiatives receive strong support from political leaders.

In resource-poor situations where substitutes for breastfeeding are either not available or inadvisable (due to lack of clean water), early cessation of breastfeeding or heat-treating of breast milk may help minimize postnatal risk of transmission. Cultural practices and the stigma associated with failure to breastfeed, however, may deter some women from using alternatives to breastfeeding.¹²⁴ In light of evidence indicating a higher risk of transmission from mixed feeding (breastmilk and formula or other substance) than exclusive breastfeeding,¹²⁵ mothers should be counseled on the superiority of early weaning over mixed feeding.¹²⁶

Although every effort should be made to help mothers protect their newborns from transmission through breastfeeding, the alternatives to breastfeeding are likely to remain unfeasible for some time in many low-income countries. Accelerated research into strategies to reduce the risk of transmission from breastfeeding is an urgent global health necessity.

OBSTACLES

TO SCALING UP PROVEN PREVENTION STRATEGIES

To take effective HIV prevention interventions to scale, countries must overcome a range of logistical challenges. Money must be found to support the intervention itself, sufficient physical infrastructure and human capacity must exist, and social, legal, cultural, or political factors that would inhibit success must be addressed. These challenges, although real, can usually be overcome, even in the poorest countries of the world.

Consider the case of Cambodia, a country where per capita income is among the world's lowest. Soon after emerging from a brutal civil war that claimed hundreds of thousands of lives, the country faced spiraling rates of HIV infection. Despite lacking the resources available in wealthier countries, Cambodia nevertheless mobilized to fight the growth of HIV/AIDS, using an array of standard prevention strategies to promote safer behaviors. Today, as HIV infection rates continue to decline, Cambodia appears poised to contain what threatened to be a devastating epidemic.

Key impediments to rapid scale-up include:

- ▶ A lack of resources for effective HIV prevention programs
- ▶ Systemic obstacles that inhibit programmatic scale-up
- ▶ Inadequate political support for an energetic response to HIV/AIDS
- ▶ The need for additional prevention tools
- ▶ Societal factors, such as stigma and gender inequality, that impede effective prevention

Lack of Resources

Many of the limitations of existing strategies stem not from deficiencies in the interventions themselves but from a failure of political will. Global commitment to HIV prevention remains timid in the face of escalating need, and insufficient efforts have been directed toward the

social, economic, and physical conditions that increase vulnerability to the virus.

Ninety-five percent of HIV infections are in the developing world, where resources are most limited.¹²⁷ UNAIDS estimates that \$4.8 billion annually is needed to implement an effective HIV prevention effort in low- and middle-income countries, yet only about \$800 million was spent on HIV prevention interventions in those countries in 2001¹²⁸ and estimates indicate that approximately \$1.2 billion will be spent in 2002.¹²⁹ Due to inadequate funding, current prevention efforts effectively reach only a small fraction of those who are at risk of infection.¹³⁰ Today prevention strategies have only 10 to 20 percent global coverage; even in some hard-hit countries in Africa, many teenagers don't know how to protect themselves from HIV infection; and fewer than 5 percent of HIV-infected pregnant women worldwide receive appropriate strategies to reduce mother-to-child transmission.

Even where grants are provided to developing countries to underwrite HIV prevention efforts, future funding for these or related efforts is often uncertain. Many grants are time-limited, meaning that countries are unable to count on availability of grant funding beyond 2 to 3 years.

Scaling up to meet the global HIV prevention challenge requires vastly greater resources and the maintenance of such elevated expenditure levels for a decade or more.

Systemic Obstacles to Effective HIV Prevention Scale-Up

Money alone, however, will not generate the appropriate escalation in effective HIV prevention services. To equip developing countries with the tools they require to scale up to meet the HIV prevention challenge, assistance should be provided to address a range of systemic or political barriers to program implementation.

Building Capacity

Although low-income countries have received extensive HIV/AIDS assistance from donors since the epidemic's inception, there has been little investment in building local capacity to sustain a long-term, high-level effort to prevent new infections. Capacity limitations in developing countries have been accentuated even further by the epidemic itself, which has also eroded human capital. Although many prevention programs could be largely self-sustaining with sufficient local human capacity, the lack of attention to capacity-building has left many countries heavily dependent on external assistance for HIV prevention.

Facing acute shortages in human capacity, low-income countries lack the means to implement or scale up potentially effective programs. Personnel in developing countries must urgently receive training in a range of disciplines, and extensive technical assistance must be provided to assist countries in developing systems capable of delivering effective prevention programs.

Ensuring Access to Key Technologies

Inexpensive technologies that are available in industrialized countries—male and female condoms, clean syringes, HIV test kits, STD treatments, substitution therapies for drug addicts, ARVs for short-course PMTCT regimens—are often unavailable in low and middle-income countries. Mechanisms to purchase and transfer essential prevention technologies should be substantially strengthened and streamlined.

As demand for condoms has grown in response to HIV prevention efforts, the world has begun to face a possible shortage in high-quality, favorably priced condoms. UNAIDS says the current condom supply represents perhaps one-quarter of what the world would need to mount an effective global prevention effort.¹³¹ Innovative public-private strategies to enhance industrial capacity to manufacture condoms, as well as the development of effective global purchasing mechanisms, are needed to ensure that the condom supply will meet the demand created by HIV prevention scale-up.

Improving Access to Care

Limited access to care inhibits many crucial prevention approaches. Individuals with little prospect of obtaining effective care and treatment are likely to perceive little incentive in learning their serostatus. Similarly, the lack of health care access for HIV-infected mothers represents a major barrier to scale-up of projects to prevent mother-to-child transmission. For these reasons, effective expansion of HIV prevention efforts will benefit from greater

access to care, treatment, and support. Treatment also helps promote effective prevention by encouraging early knowledge of serostatus, and helps reduce HIV/AIDS stigma by underscoring the public value placed on the health and well-being of people living with HIV/AIDS.

Improving Coordination and Strategic Planning

Ideally, donors and program planners would prioritize especially cost-effective strategies, intervene at key points in the transition from a localized to a generalized epidemic, and use a combination of proven strategies to contain emerging epidemics. Although international donors presently underwrite a wide range of effective prevention programs in developing countries, such initiatives are seldom part of a comprehensive national plan to coordinate and maximize HIV prevention efforts. While UNAIDS and others have provided invaluable assistance to national authorities for the development of strategic AIDS plans, 1 in 4 countries have no national AIDS strategy, including some in heavily-affected Africa and many others with emerging epidemics. Fewer than one-third of AIDS strategies in Asia, and less than half in the Caribbean and Latin America, have been costed.¹³²

Improving Surveillance Systems

Effective intervention to reduce an epidemic's future burden depends in large part on the quality and timeliness of data regarding risk behaviors, rates of STDs, and new HIV infections in key populations. Unfortunately, in countries where per capita spending on health services of any kind amounts to \$20 or less, little infrastructure typically exists to collect such information. At best, health agencies may be able to gauge HIV prevalence in easy-to-access populations, yet prevalence data may mask significant changes in HIV incidence, and sentinel populations may not be representative of the groups that will determine the future course of the epidemic.¹³³

Cost-effective strategies exist to improve surveillance even in resource-poor countries¹³⁴— and WHO, UNAIDS, CDC, and others have many initiatives to improve the ability of low- and middle-income countries to monitor the HIV/AIDS epidemic. Additional capacity-building is needed in many countries, however, to enable national authorities to collect the information needed to deploy limited prevention resources in the most strategic manner possible.

The Need for Enhanced Political Will

In every country where prevention has turned the tide against HIV/AIDS, prevention efforts have received the strong, vocal support of political leaders.

Political support has often been lacking in countries most affected by HIV/AIDS. This, however, is changing, as leaders of low- and middle-income countries are now placing strong priority on an effective response to HIV/AIDS. The 2001 Abuja declaration reflected the determination of African leaders to wage an effective fight against HIV/AIDS; in the Caribbean and Latin America, leaders have banded together to promote cross-border collaboration to prevent the spread of HIV; heads of government of the 10 ASEAN member countries pledged their leadership in the fight against HIV/AIDS in November 2001; and leaders of the Commonwealth of Independent States recently affirmed their support for an aggressive response to the emerging epidemic in that region. The UN Declaration of Commitment on HIV/AIDS, unanimously agreed to by 189 member nations of the UN, outlines for the first time time-bound targets for the reduction of new infections. And the new Global Fund to Fight AIDS, Tuberculosis and Malaria represents an important new avenue for funding of HIV prevention, although funds pledged thus far are only a fraction of what will be needed.

Although political support is growing for an energetic response to the epidemic, renewed efforts are required in many countries where HIV/AIDS is now emerging as a major threat. Many countries in Central Asia and Eastern Europe have no national plan to fight HIV/AIDS, and some political leaders in the region remain in denial about the threat posed by the disease. In Europe and the U.S., where HIV prevention has not kept pace with changes in the epidemic, a renewed commitment to effective prevention is needed to prevent a resurgence of HIV/AIDS. Encouraging strong political support for effective HIV prevention measures must become a high-priority global political issue and a point of emphasis in diplomatic relations.

The Need for New Prevention Tools

Although existing technologies (e.g., condoms, sterile injection equipment, STD treatments, PMTCT) are highly effective in reducing the risk of HIV transmission, additional HIV prevention technologies are badly needed. Progress has been made in accelerating clinical research on promising vaccine and microbicide candidates and funding for such research has recently increased, but the search for new and better prevention technologies still

PREVENTIVE AIDS VACCINE APPROACHES CURRENTLY IN HUMAN TESTING

Principal Research Partners	Vaccine Approach	Subtype	Ongoing Trials
IAVI/University of Oxford; U.K. Medical Research Council; University of Nairobi; Kenya AIDS Vaccine Initiative; Imperial College of Science, Technology and Medicine; Cobra Therapeutic Ltd.; IDT GmbH	HIV A (DNA-MVA)	A	Phase I/II: U.K., Kenya
Merck & Co. Inc.	DNA-Adeno	B	Phase I: U.S.
GlaxoSmithKline plc; HIV Vaccine Trials Network	Gp120 nef-tat	B	Phase I: U.S.
U.S. National Institutes of Allergy and Infectious Disease, Vaccine Research Center, Vical Inc.	DNA	B	Phase I: U.S.
Agence Nationale de Recherche sur le VIH/SIDA (France), Biovector Therapeutics SA	Lipopeptides	B	Phase I: France
VaxGen Inc.	AIDSVAX (gp120)	B, E	Phase III: U.S., Canada, Netherlands, Thailand
VaxGen Inc., Aventis Pasteur SA, U.S. National Institutes of Health, Walter Reed Army Institute of Research, Thailand Ministry of Health	ALVAC-AIDSVAX (canarypox-gp120)	B, E	Phase III: Thailand, scheduled to commence late 2002 Phase II finishing in Thailand, Haiti, Trinidad and Tobago, U.S.
Source: International AIDS Vaccine Initiative			

confronts a range of obstacles. Most HIV research has been geared to developed countries; UNAIDS reports that the study of HIV vaccines in Africa accounts for a mere 1.6 percent of all global AIDS research spending and that Africa has been home to only two of the 30 vaccine trials that have occurred since 1987.¹³⁵

Scientific Challenges

On the scientific front, the search for a vaccine has been slowed by uncertainty regarding the correlates of immunity, questions regarding the importance of global viral diversity on vaccination efforts, lack of a clearly appropriate animal model, and historic under-investment in vaccines generally (and in HIV vaccines, specifically).¹³⁶ More than 20 years since the first case of AIDS was reported, only one vaccine candidate has entered Phase III trials, and numerous promising approaches to HIV vaccination are not being aggressively pursued.

The global search for effective vaginal and rectal microbicides faces challenges similar to those in the vaccine field, including important scientific uncertainties, methodological complexities in mounting clinical trials, and limited public and private sector support for microbicide R&D.¹³⁷ Early trial results in the microbicide field underscore the challenge of developing new, safe and effective prevention technologies. Studies indicate that nonoxynol 9, an early microbicide candidate, appears to offer no protection against HIV and may, in fact, increase the risk of transmission.¹³⁸

In recent years, however, the microbicide field has generated a rich pipeline of more than 50 candidate

products that span a wide array of potential mechanisms for preventing HIV transmission. Six of these products are poised to begin large-scale effectiveness trials in the near future. In addition, new scientific approaches are being used to develop novel methods that, with appropriate resources, may ultimately become second- and third-generation microbicides.

Ensuring Access

Ensuring actual delivery of safe and effective vaccines or microbicides as soon as they emerge may be an even greater challenge than developing and testing such products. The International AIDS Vaccine Initiative explains:

“Because vaccine development is a risky, privately financed enterprise, vaccines are almost always initially marketed exclusively in industrialized countries that have the ability to pay full price. As years pass and the manufacturer’s production capacity and efficiency increase, the price of the vaccine slowly declines. Eventually, the price becomes sufficiently low to permit external aid donors and selected developing country governments to purchase the vaccine. Over time—a substantial period of time—the vaccine is introduced piecemeal into poorer countries, with many years passing before optimal vaccination levels are achieved.”¹³⁹

To ensure meaningful access to new prevention technologies, the global community should develop appropriate purchase mechanisms, enhance delivery systems, ensure sufficient manufacturing capacity to meet worldwide demand (which itself must be accurately projected), and remove potential barriers stemming from

SUMMARY OF MICROBICIDE MARKET EVOLUTION SCENARIOS

	First Generation	Second Generation	Third Generation
Expected launch	2007	2012	2017
Formulation	vaginal only	vaginal and rectal	vaginal and rectal
Indications	HIV, possibly other STDS, possibly contraceptive	HIV, herpes, gonorrhea HPV, chlamydia; choice of contraceptive or non-contraceptive	HIV, herpes, gonorrhea HPV, chlamydia; choice of contraceptive or non-contraceptive
HIV effectiveness	50 percent to 60 percent	70 percent to 90 percent	85 percent to 97 percent
Contraceptive effectiveness	75 percent to 85 percent	80 percent to 90 percent	90 percent to 97 percent
Use instructions	w/condom or device	stand alone	stand alone
SALES CHANNEL			
Industrialized countries	Prescription only	Over the counter	Over the counter
Developing countries	Over the counter	Over the counter	Over the counter
Source: The Rockefeller Foundation			

INVOLVING PEOPLE WITH HIV/AIDS IN HIV PREVENTION EFFORTS FOR U.S. MEN WHO HAVE SEX WITH MEN

An estimated 17,000 people with HIV/AIDS in the United States (more than 90 percent of whom are men who have sex with men (MSM)) live in San Francisco. In recent years, sexual risk behaviors among MSM in the city have increased, and evidence has emerged suggesting an upturn in HIV incidence, as well.

In 2000, HIV-positive MSM asked the city to initiate an HIV prevention campaign targeting MSM living with HIV/AIDS. Using funding provided from the U.S. Centers for Disease Control and Prevention, the San Francisco Department of Public Health decided to develop a comprehensive prevention effort targeting MSM living with HIV/AIDS. One component of the program was a social marketing campaign entitled “HIV Stops with Me.”

MSM living with HIV were actively involved in the conception and development of the project, which

included television commercials, newspaper advertisements, postcards, and an internet campaign. HIV-positive men also served as spokespeople for the campaign, which sought to reduce the number of new infections and to increase the sense of community among MSM and transgender individuals living with HIV/AIDS.

An evaluation of the project found that 19 percent of HIV-positive MSM surveyed said they were more likely after seeing the campaign to use a condom with a partner who is uninfected or has unknown serostatus. A similar percentage indicated they were more likely to disclose their HIV status to a partner before having sex. Nearly 1 in 4 of those surveyed said the campaign had increased their belief in the responsibility of HIV-positive individuals to help keep their partners uninfected.¹⁴⁰

the lack of harmony among the many national regulatory authorities that must register new products.

Although new prevention technologies are badly needed, the world will continue to need an integrated approach to prevention even after the emergence of new vaccines and microbicides. Not only are first- and second-generation prevention technologies likely to have somewhat limited efficacy, but even well-developed vaccination campaigns usually require substantial time before optimal vaccination levels are achieved.

Societal Factors

Although HIV transmission occurs through clearly defined biological routes, HIV risk is profoundly affected by the social environment in which human behavior occurs. To maximize our ability to prevent new infections, science-proven interventions should be supported with dramatically greater efforts to reduce stigma, diminish growing global economic inequities, and promote human rights.

Reducing Stigma

HIV infection is often heavily stigmatized, abetted in large measure by its perceived association with sexual promiscuity, homosexuality, and drug use.¹⁴¹ In many countries, people with HIV are subject to violence and social ostracism, as well as discrimination in employment, housing, and education.

Individuals who fear being ridiculed, ostracized, or subjected to violence will generally not seek VCT or make themselves available for HIV prevention services. In addition, a climate of stigma perpetuates the denial that inhibits individual, community and national mobilization to fight the disease.

Stigma is not immutable but rather can be alleviated through strong political commitment, enactment of meaningful anti-discrimination laws, and greater public awareness. The Declaration of Commitment on HIV/AIDS agreed to by 189 member states of the United Nations obligates nations by 2003 to enact, strengthen or enforce legal measures to eradicate HIV-related discrimination and to protect the human rights of people living with HIV/AIDS.

Essential to the reduction of HIV-related stigma is the visibility and openness of people living with HIV/AIDS. Organizations of people with HIV/AIDS require both financial support and technical assistance to enable them to undertake their courageous efforts to alter attitudes toward people living with the disease.

Empowering Women and Girls

Women's lack of economic, social, legal and political equality in many parts of the world seriously hinders HIV prevention efforts. In particular, gender inequality often makes it difficult for women to negotiate condom use and safer sex with their sexual partners or to leave abusive relationships. Women's social and economic disadvantages

also make them less likely to obtain needed services, such as VCT, STD screening and treatment, reproductive health services, and HIV prevention counseling.

Strengthened microfinance programs, enhancement of women's opportunities to generate income, universal education for girls and initiatives to keep girls in school, and enactment and enforcement of laws to prevent violence and other forms of abuse against women are critically necessary to reduce women's vulnerability to HIV infection.

In addition, young people, most typically girls, are often forced (physically or by economic circumstances) to engage in sex work. They frequently lack the social power to protect themselves from violence, HIV infection and other STDs. Effective HIV prevention requires the pursuit of multiple strategies to reduce vulnerability to sexual coercion, including enhanced law enforcement, universal education, and international support for the framework set forth in the Yokohama Global Commitment adopted in 2001 at the 2nd World Congress Against Commercial Exploitation of Children.

At the same time that countries pursue strategies to empower women and girls, they should also target men and boys with efforts designed to alter their own attitudes about women. In many countries, prevailing gender relations, as reflected in the systematic disempowerment of women, are also placing men at greater risk of infection.

Reducing Risk in Emergency Situations

Civil strife, natural disasters and other emergencies have driven an estimated 40 million people from their homes, significantly increasing HIV vulnerability. According to UNAIDS: "People displaced by conflict and other emergencies live through chaotic conditions, during which HIV/AIDS is not likely to be seen as a priority. Yet HIV spreads fastest in conditions of poverty, powerlessness and social instability, the conditions that are at their extreme in complex emergencies."¹⁴² In particular, the chaos and poverty experienced by refugees and internally displaced people often coerce individuals into using sex to obtain basic needs such as food, shelter and personal security.¹⁴³ Effective prevention requires international efforts to prevent or ameliorate instances of conflict or civil unrest, as well as enhanced health education efforts targeted to refugees and other individuals affected by such conditions.

HIV PREVENTION OBJECTIVES Declaration of Commitment on HIV/AIDS

UN Special Session on HIV/AIDS, June 2001

- ▶ Ensure by 2005 access in all countries to a broad array of prevention programs.
- ▶ Ensure by 2005 that at least 90 percent of young people (15 to 24)—and 95 percent of such people by 2010—have meaningful access to the information, education and services needed to protect themselves from HIV infection.
- ▶ Reduce by 2005 the rate of HIV infection among young people by 25 percent, and reach this target globally by 2010.
- ▶ Reduce the proportion of infants born with HIV by 20 percent by 2005 and by 50 percent by 2010.
- ▶ Strengthen HIV prevention efforts by enacting or strengthening anti-discrimination and other human rights laws, by empowering women, and by taking steps to reduce the vulnerability of key populations to HIV.

RECOMMENDATIONS

Overwhelming scientific evidence and more than 20 years' experience clearly demonstrate how to prevent HIV transmission. The challenge currently facing the world is taking proven prevention strategies to scale, reaching those in need, and reversing the epidemic's projected course. Scaling up to meet the global HIV prevention challenge requires:

- ▶ Significantly greater resources
- ▶ Increasing local capacity and expanding proven prevention strategies
- ▶ Vocal political support
- ▶ Better strategic planning
- ▶ Ensuring access to existing prevention tools
- ▶ Accelerating research into new prevention technologies
- ▶ Confronting social factors that facilitate the spread of HIV

Substantially Increase and Sustain Prevention Funding

Increase international resources. Annual investment in HIV prevention in low- and middle-income countries should quadruple by 2004—from approximately \$1.2 billion in 2002 to \$4.8 billion in 2004, as called for by UNAIDS.

- ▶ After 2004, global expenditure for HIV prevention should be sustained at this level well into the next decade in order to reverse the AIDS epidemic.
- ▶ Although unprecedented, such sums are entirely achievable, amounting to approximately \$5 annually for every person living in the U.S. and Europe.

Enable countries to prioritize resources for HIV/AIDS. Every effort should be made to give countries the ability to prioritize resources for HIV/AIDS, especially resource-poor countries financially encumbered by debt.

- ▶ Urgently needed resources for social services and HIV prevention cannot be appropriately harnessed in the face of high debt burdens.

- ▶ Donor nations should provide new targeted funding to the World Bank and UNAIDS to assist heavily-indebted countries to integrate HIV/AIDS into the poverty reduction strategies required to ease debt burden.

Build Capacity and Scale Up Proven Prevention Strategies

Increase local capacity. Resources should be devoted to training local personnel and providing necessary technology so that affected countries can rapidly and sustainably scale up prevention programs.

- ▶ Due to limited support for capacity-building, a shortage in critical skills, and the loss of personnel due to the epidemic itself, many low-income countries lack the human capacity to scale up effective interventions.
- ▶ Developed and developing countries should work together to create a costed, comprehensive plan to enhance sustainable human capacity for rapid prevention program scale-up.
- ▶ Professionals, providers and academic experts with relevant expertise—drawn from both developed and developing countries that have achieved success in reducing new infections—should provide training in all areas relevant to HIV prevention, including laboratory skills, surveillance and epidemiology, STD control, HIV clinical practice, counseling, social marketing, and implementation of needle and syringe projects.
- ▶ Donor nations should finance this effort, which should be carefully coordinated with UNAIDS, WHO, UNICEF, and UNDCP.

Expand existing prevention strategies. With additional resources and access to training and prevention tools, countries should rapidly bring to scale key prevention interventions that can work together to achieve maximum prevention impact.

- ▶ In particular, countries should scale up VCT; mass media campaigns; condom distribution, promotion and social marketing; blood screening; school-based

programs; programs for out-of-school youth; workplace programs; STD treatment; and peer counselors for vulnerable populations, such as sex workers, men who have sex with men (MSM), and injection drug users (IDUs).

- ▶ Particularly high priority should be given to scale-up of programs that prevent transmission in vulnerable populations, including young people, sex workers and their clients, MSM, and IDUs.

Encourage Vocal Political Leadership

Make HIV/AIDS a priority. Political leaders should speak often and forcefully about the importance of HIV prevention, support policies that effectively fight AIDS and stigma, and make HIV/AIDS a permanent agenda item at important global and regional political gatherings.

- ▶ HIV/AIDS should become a permanent agenda item at important international gatherings, including the G-8 summit, the World Economic Forum, regular sessions of the UN General Assembly and Security Council, other major UN gatherings such as the World Health Assembly, and regional political gatherings.
- ▶ Political leaders should become vocal advocates of national HIV prevention efforts. This is especially important in many countries with emerging epidemics, where AIDS has not yet become an urgent item on national agendas.
- ▶ Political leaders should avoid embracing strategies that lack scientific support, such as mandatory HIV testing, isolation of people with HIV/AIDS, or other coercive measures.

Use Prevention Resources More Strategically

Improve tracking of HIV/AIDS. Developing countries should receive training and financial and technical assistance to enhance their ability to track HIV/AIDS and plan prevention interventions accordingly.

- ▶ Effective surveillance is the cornerstone of strategic health planning. Monitoring of HIV infections and risk behaviors not only highlights opportunities for intervention but also provides quick feedback on the success of prevention strategies.
- ▶ Donor nations should provide targeted funding to WHO to help developing countries strengthen their public health surveillance systems.

- ▶ Particular attention should be given to the transfer of important epidemiologic tools, including cost-effective strategies and technologies that assist in clarifying emerging infection trends.

Ensure strategic planning. By 2003, every country should have a strategic HIV prevention plan.

- ▶ Nearly one in four low- and middle-income countries has no strategic plan for AIDS, and those that have strategies often have no plans for implementation.
- ▶ UNAIDS should continue its important assistance to countries in the development of strategic plans.
- ▶ Priority should be given to regions with emerging epidemics, such as Central Asia and Eastern Europe, where many countries currently lack strategic AIDS plans.
- ▶ Development or revision of strategic plans should, where possible, be informed by comprehensive epidemic “maps” of each national epidemic. Donor nations should provide expertise to assist countries in analyzing all available data (e.g., HIV/AIDS surveillance, STD surveillance, population surveys, etc.) to identify key target populations, epidemic “hot spots,” potential epidemiologic bridges to other populations, and factors that may be accelerating transmission. Experts should assist countries in identifying cost-effective strategies that address key factors revealed in this epidemic “mapping” process.

Coordinate funds. By 2003, all low-income countries should convene annual “donor roundtables,” bringing together all key funders to measure available resources, identify resource gaps, and enhance program coordination.

- ▶ With assistance from WHO/UNAIDS, roundtables should use the Country Coordination Mechanisms (CCMs) mandated by the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM), or the expanded UN Theme Groups on HIV/AIDS where CCMs do not exist. Roundtables should identify resource gaps, improve coordination, and inform national strategic prevention planning.

Expand Access to Key Prevention Tools

Ensure an adequate supply of prevention tools. Donor nations should ensure an adequate global supply of high-quality HIV prevention tools (e.g., condoms and HIV test kits) for use in developing countries.

- ▶ Donor nations should collaborate with WHO, UNAIDS, World Bank, the World Economic Forum, UNICEF, and

others to develop by the end of 2002 a comprehensive public-private strategy to ensure a sufficient global supply of key prevention commodities (e.g., male and female condoms, HIV test kits, etc.). Tax credits, subsidies, or direct public sector ownership of new manufacturing facilities should be considered.

- ▶ In collaboration with WHO, UNAIDS, UNICEF, and the World Bank, the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) should identify by the end of 2002 feasible, efficient purchase mechanisms for all key HIV prevention commodities (e.g., HIV test kits, STD diagnostics and treatments, ARVs, etc.). Where possible, strong preference should be given to existing channels for the purchase of key commodities.
- ▶ Purchase mechanisms should include capacity to ensure that commodities bought for use in developing countries are of the highest quality.
- ▶ GFATM should work with donor nations to provide targeted funding to strengthen purchase mechanisms or, where necessary, to establish such mechanisms.

Increase access to treatment. Access to HIV treatments, including ARVs, should be dramatically expanded—both to reduce HIV-related sickness and death and to buttress HIV prevention efforts by reducing stigma and encouraging knowledge of HIV status.

- ▶ Donor nations, developing countries and UNAIDS/WHO should work together to meet WHO's goal of ensuring the provision of ARVs to at least 3 million people with HIV/AIDS by 2005, or an estimated 50 percent of all who need them.
- ▶ Strategies to facilitate greater access to ARVs should address the cost of the drugs, training needs for clinical staff, access to technologies to monitor patients, and other infrastructure needs.

Accelerate Research Into New Prevention Technologies

Increase funding. Public sector funding for research and development should increase by \$1 billion for HIV/AIDS vaccines and by \$1 billion for microbicides by 2007, and grow substantially for other new prevention technologies.

- ▶ Funding should support both basic science research and efforts to accelerate research and development on potential candidate vaccines and microbicides.
- ▶ Additional public sector support is also needed for research into other new HIV prevention technologies, such as female-controlled barrier methods.

- ▶ Provide private sector incentives. Donor nations should provide financial incentives to private companies to increase their investment in research and development related to HIV/AIDS vaccines, microbicides, and other new prevention technologies.
- ▶ In particular, donor nations should consider enactment of tax incentives for companies that invest in such R&D.
- ▶ Because early candidates are often developed by small biotech companies, such laws should permit tax credits to be passed along to any subsequent purchaser of such companies.

Coordinate efforts. Industry, donors, multilateral agencies, and NGOs should work together on an ongoing basis to identify obstacles to acceleration of HIV vaccine and microbicide R&D, and agree on approaches to overcoming such obstacles.

- ▶ Goals for such collaboration should include enhancement of clinical trial infrastructure; joint assessment of potential clinical trial cohorts; identification of potentially promising scientific approaches that are not presently being pursued; and agreement on key milestones in the search for safe and effective prevention technologies.

Ensure access. Donor nations, developing countries, and multilateral agencies should immediately develop and implement strategies to ensure future access to HIV/AIDS vaccines and microbicides.

- ▶ By its summit meeting in 2003, the G-8 should publicly commit that accessible and adequately funded public sector mechanisms will exist to ensure the purchase and distribution of safe and effective vaccines and microbicides as soon as such products are available.
- ▶ Funding for enhancement of delivery systems relevant to vaccines or microbicides should be available from bilateral donors, the World Bank, and the GFATM, with every effort made to ensure that such enhancements have immediate benefits to developing countries by focusing on existing underdeveloped infrastructure (e.g., health care sites, family planning sites, schools, etc.).

Confront Social Factors that Facilitate the Spread of HIV

Fight stigma. Countries should enact HIV-specific human rights protections, and people living with HIV/AIDS should be involved at every stage in the planning and implementation of HIV prevention programs.

- ▶ Countries should implement enforceable policies to promote and protect the human rights of populations that are especially vulnerable to HIV/AIDS, including sex workers, IDUs, and men who have sex with men.
- ▶ Countries should also enact strong measures to prevent discrimination against people with HIV/AIDS, as respect for people with HIV/AIDS is essential to reduce the stigma associated with the disease.
- ▶ In countries where HIV prevention efforts have succeeded, people living with HIV/AIDS have made major contributions to HIV prevention efforts.

Reduce poverty. Accelerated efforts are needed to reduce the poverty that facilitates HIV transmission and worsens the social and economic impact of HIV infection.

- ▶ Donor nations should, consistent with the Declaration of Commitment on HIV/AIDS adopted at the UN Special Session on the epidemic in 2001, ensure that official development assistance equals at least 0.7 percent of GNP.
- ▶ In addition to increasing direct assistance to devel-

oping countries, donor nations should actively explore additional strategies to reduce poverty, such as promoting trade with developing countries and increasing educational opportunities.

Empower women. Global efforts to empower women must be dramatically expanded.

- ▶ Donor nations must significantly increase support for microfinance programs, girls' education initiatives, mechanisms to enforce laws against sexual trafficking and commercial exploitation of children, and other strategies to increase the economic, legal, political, and social power of women.
- ▶ Countries should enact enforceable laws ensuring women's full human rights.
- ▶ Efforts to empower women should also explicitly address male attitudes toward sexual and gender relations, encouraging men to play a more active role in preventing HIV transmission.
- ▶ Increased efforts must be made to channel debt relief toward programs that empower women.

REFERENCES

1. J. Stover et al., Can we reverse the HIV/AIDS pandemic with an expanded response? *Lancet* 2002;35.
2. P. Jha et al., Improving the Health of the Global Poor, *Science* 2002;295:2036-39.
3. UNAIDS, *Patent Situation of HIV/AIDS-Related Drugs in 80 Countries*, 2000.
4. B. Schwartlander et al., Resource needs for HIV/AIDS, *Science* 2001;292:2434-36.
5. See UNAIDS, Report on the State of HIV/AIDS Financing, Presented at the 12th Meeting of the UNAIDS Programme Coordinating Board, Geneva, May 29-31, 2002 ("UNAIDS Financing Report"); *ibid.*, B. Schwartlander et al. According to the analysis by Schwartlander et al., global spending on HIV prevention in low- and middle-income countries in 2001 was approximately \$800 million. UNAIDS' financing report estimates that in 2002 all HIV/AIDS funding (prevention and care) increased by slightly more than 50%. On the basis of these estimates, the Global HIV Prevention Working Group estimates that total global spending in 2002 on HIV prevention in low- and middle-income countries will equal between \$1.2 billion and \$1.3 billion ("Working Group estimate").
6. M.H. Merson et al., Effectiveness of HIV prevention interventions in developing countries, *AIDS* 2000;14(Suppl. 2):S68-84.
7. *Ibid.*, J. Stover et al.
8. C. Rühl et al., *The economic consequences of HIV in Russia*, 2002.
9. UNAIDS, *Report on the global HIV/AIDS epidemic*, 2002 ("2002 UNAIDS Report").
10. *Id.*
11. *Ibid.*, C. Rühl et al.
12. Unpublished data provided by the Ministry of Public Health, China (2002): Projection of HIV/AIDS Epidemic in China.
13. UNAIDS, *Report on the global HIV/AIDS epidemic*, 2001 ("2001 UNAIDS Report").
14. *Ibid.*, 2002 UNAIDS Report.
15. *Id.*
16. Centers for Disease Control and Prevention, Outbreak of Syphilis Among Men Who Have Sex With Men—Southern California, 2000, *MMWR* 2001;50:117-120; C. Gomez & Seropositive Urban Men's Study Team, Sexual HIV Transmission Risk Behaviors Among HIV-Seropositive (HIV+) Injection Drug Users and HIV+ Men Who Have Sex With Men: Implications for Interventions, Abstract No. 180, National HIV Prevention Conference, Atlanta, 1999. See *ibid.*, 2002 UNAIDS Report; R. Wolitski et al., Are We Headed for a Resurgence in the HIV Epidemic Among Men Who Have Sex with Men? *Am J Public Health* 2001;91:31-36; M.H. Katz et al., Impact of highly active retroviral treatment on HIV seroconversion among men who have sex with men: San Francisco, *Am. J. Public Health* 2002;92(3):388-94; R.S. Hoggs et al., Increasing incidence of HIV infection among young gay and bisexual men in Vancouver, *AIDS* 2001;15(10):1321-2; J. del Romero et al., Time trend in incidence of HIV seroconversion among homosexual men repeatedly tested in Madrid, 1988-2000, *AIDS* 2001;15(10):1319-21.
17. *Ibid.*, B. Schwartlander et al.
18. J. Kelly et al., Protease Inhibitor Combination Therapies and Perceptions of Gay Men Regarding AIDS Severity and the Need to Maintain Safer Sex, *AIDS* 1998;12:F91-F95. See J. Dilley et al., Are Advances in Treatment Changing Views About High Risk Sex? *New Eng J Med* 1997;337:501-502.
19. *Ibid.*, 2001 UNAIDS Report.
20. See U.S. National Intelligence Council, *The Global Infectious Disease Threat and Its Implications for the United States*, 2000 ("National Intelligence Council").
21. J. Auerbach & T. Coates, HIV Prevention Research: Accomplishments and Challenges for the Third Decade of AIDS, *Am J Public Health* 2000;90:1029-32.
22. UNAIDS, *HIV Prevention Needs and Successes: A Tale of Three Countries*, UNAIDS Best Practice Collection, 2001 ("UNAIDS Prevention Successes").
23. See A. Creese et al., Cost-effectiveness of HIV/AIDS interventions in Africa: A systematic review of the evidence, *Lancet* 2002(359); M. Sweat et al., Cost-effectiveness of voluntary HIV-1 counselling and testing in reducing sexual transmission of HIV-1 in Kenya and Tanzania, *Lancet* 2000;356:113-21; E. Marseille et al., Cost effectiveness of single-dose nevirapine regimen for mothers and babies to decrease vertical HIV-1 transmission in sub-Saharan Africa, *Lancet* 1999;354:803-09; L. Gibson et al., Cost-effectiveness of improved treatment services for sexually transmitted diseases in preventing HIV-1 infection in Mwanza Region, Tanzania, *Lancet* 1997;350:1809-09; S. Pinkerton et al., Cost-effectiveness of HIV-prevention skills training for men who have sex with men, *AIDS* 1997;11:347-357.
24. R. Gray et al., Probability of HIV-1 transmission per coital act in monogamous, heterosexual, HIV-1-discordant couples in Rakai, Uganda, *Lancet* 2001;357:1149-1153.
25. *Ibid.*, 2001 UNAIDS Report.
26. UNAIDS, *AIDS and men who have sex with men*, Technical Update, 2001.
27. See *ibid.*, 2002 UNAIDS Report; *ibid.*, UNAIDS Prevention Successes. See also M. Merson et al., Effectiveness of HIV Prevention Interventions in Developing Countries, *AIDS* 2000;14(Suppl. 2):S68-84.
28. *Ibid.*, 2002 UNAIDS Report.
29. *Ibid.*, 2001 UNAIDS Report.
30. *Ibid.*, 2002 UNAIDS Report; *ibid.*, UNAIDS Prevention Successes.
31. *Ibid.*, 2001 UNAIDS Report; *ibid.*, UNAIDS Prevention Successes.
32. *Ibid.*, 2001 UNAIDS Report; *ibid.*, UNAIDS Prevention Successes.
33. *Ibid.*, 2002 UNAIDS Report.
34. Centers for Disease Control and Prevention, *HIV Prevention Saves Lives*, 2001.
35. D. Katzenstein et al., Peer education among factory workers in Zimbabwe; providing a sustainable HIV prevention intervention, Abstract No. 33514, XII International Conference on AIDS, Geneva, 1998.
36. *Ibid.*, 2002 UNAIDS Report.
37. B. Dillion et al., Primary HIV infections associated with oral transmission, 7th Conference on Retroviruses and Opportunistic Infections, Abstract 473, San Francisco, 2000.
38. National Institute of Drug Abuse, *Principles of HIV Prevention in Drug-Using Populations: A Research-Based Guide*, 2002 ("2002 NIDA Principles"); T. Rhodes et al., Drug Injecting and Sexual Safety: Cross-National Comparisons Among Cocaine and Opioid Injectors, in *Drug Injecting and HIV Infection* (G. Stimson et al., eds.), 1998.
39. UNAIDS, *Sexual Behavior Change for HIV: Where Have Theories Taken Us?*, UNAIDS Best Practices Collection, 1999 ("UNAIDS Behavioral Theory Report").
40. Efforts to review and assess the scholarly literature on HIV prevention effectiveness include the following: AIDS Research Institute, University of California San Francisco, HIV Prevention in the Developing World, Policy Brief, 2000; E. Sogolow et al., Effects of US-based HIV interventions on safer sex: Meta-analyses, overall and for populations, age groups, and settings, Abstract No. 14283, XII International AIDS Conference, Geneva, 1998; N. Janz et al., Evaluation of 37 AIDS Prevention Projects: Successful Approaches and Barriers to Program Effectiveness, *Health Education Quarterly* 1996;23:80-97.
41. J. Jermott et al., Reductions in HIV Risk-Associated Sexual Behaviors Among Black Male Adolescents: Effects of an AIDS Prevention Initiative, *Am J Public Health* 1992;83:372-77.
42. R. DiClemente & G. Wingood, Randomized Controlled Trial in an HIV Sexual Risk-Reduction Intervention for Young African-American Women, *JAMA* 1995;274:1271-76; S. Hobboll et al., Reducing Inner-City Women's AIDS Risk Activities: A Study of Single Pregnant Women, *Health Psychology* 1994;13:397-403.
43. J. Kelly et al., Community AIDS/HIV Risk Reduction: The Effects of Endorsement by Popular People in Three Cities, *Am J Public Health* 1992;82:1483-89; R. Valdiserri et al., AIDS Prevention in Homosexual and Bisexual Men: Results of a Randomized Trial Evaluating Two Risk-Reduction Interventions, *AIDS* 1989;3:21-26.
44. UNAIDS, *Female sex worker HIV prevention projects: lessons learnt from Papua New Guinea, India, and Bangladesh*, UNAIDS Best Practice Collection, 2000.
45. *Ibid.*, J. Jemmott et al.
46. S. Mehendale et al., Incidence and predictors of human immunodeficiency virus type 1 seroconversion in patients attending sexually transmitted disease clinics in India, *J Infect Dis* 1995;172:1486-91; M. Laga et al., Condom promotion, sexually transmitted diseases treatment, and declining incidence of HIV-1 infection in female Zairian sex workers, *Lancet* 1994;344:246-28; I. De Vincenzi et al., A longitudinal study of human immunodeficiency virus transmission by heterosexual partners, *New Eng J Med* 1994;331:341-46; M. Otten et al., High rate of HIV seroconversion among patients attending urban sexually transmitted disease clinics, *AIDS* 1994;8:549-53; E. Telzak et al., HIV-1 seroconversion in patients with and without genital ulcer disease: A prospective study, *Ann Intern Med* 1993;119:1181-86; F. Plummer et al., Cofactors in male-female sexual transmission of human immunodeficiency virus type 1, *J. Infect Dis* 1991;163:233-29; D. Cameron et al., Female to male transmission of human immunodeficiency virus type 1: risk factors for seroconversion in men, *Lancet* 1989;403-7. See Centers for Disease Control and Prevention, HIV Prevention Through Early Detection and Treatment of Other Sexually Transmitted Diseases - United States, Recommendations of the Advisory Committee for HIV and STD Prevention, *MMWR* 1998;47:No. RR-12 (CDC STD Recommendations); Institute of Medicine, *The Hidden Epidemic: Confronting Sexually Transmitted Diseases*, 1997 ("IOM") (including studies cited therein).
47. UNAIDS/WHO, *Consultation on STD Interventions for Preventing HIV: What is the Evidence?*, UNAIDS Best Practice Collection, 2001 ("UNAIDS/WHO STD Consultation"); CDC STD Recommendations.
48. *Ibid.*, UNAIDS/WHO STD Consultation; *Ibid.*, CDC STD Recommendations; P. Hitchcock & L. Fransen, Preventing HIV Infection: Lessons from Mwanza and Rakai, *Lancet* 1999;353:513-15; *Ibid.*, IOM, *The Hidden Epidemic*.
49. H. Grosskuth et al., Impact of improved treatment of sexually transmitted diseases on HIV infection in rural Tanzania: randomized controlled trial, *Lancet* 1995;346:530-36.
50. M. Wawer et al., Control of sexually transmitted diseases for AIDS prevention in Uganda: a randomized community trial, *Lancet* 1999;353:525-35.
51. See *ibid.*, P. Hitchcock & L. Fransen.
52. *Id.*
53. N. Robinson et al., Proportion of HIV infections attributable to other sexually transmitted diseases in a rural Ugandan population: simulation model estimates, *Int J Epidemiol* 1997;26:180-89; G. Garnett et al., Strategies for limiting the spread of HIV in developing countries: conclusions based on studies of the transmission dynamics of the virus, *J Acquir Immune Defic Syndr Hum Retrovirol* 1995;9:500-13; M. Over & P. Piot, Human immunodeficiency virus infection and other sexually transmitted diseases in developing countries: public health importance and priorities for resource allocation, *J Infect Dis* 1996;174:suppl 2:162-75. See *ibid.*, CDC STD Recommendations.
54. M. Kamb et al., Efficacy of Risk-Reduction Counseling to Prevent Human Immunodeficiency Virus and Sexually Transmitted Diseases: A Randomized Controlled Trial, *JAMA* 1998;280:1161-67.
55. See Voluntary HIV-1 Counseling and Testing Efficacy Study Group, Efficacy of voluntary HIV-1 counseling and testing in individuals and couples in Kenya, Tanzania, and Trinidad: a randomised trial, *Lancet* 2000;356:1103-12; Centers for Disease Control and Prevention, Adoption of Protective Behaviors Among Persons with Recent HIV Infection and Diagnosis—Alabama, New Jersey, and Tennessee, 1997-1998, *MMWR* 2000;49:512-15.
56. *Ibid.*, UNAIDS Prevention Successes.
57. *Ibid.*, 2002 UNAIDS Report.
58. *Id.*
59. *Ibid.*, 2002 UNAIDS Report (citing data provided by Measure DHS+ and UNICEF).
60. *Ibid.*, 2002 UNAIDS Report.
61. *Ibid.*, 2002 UNAIDS Report.
62. UNICEF/UNAIDS, *Children and young people in a time of AIDS*, 2001 ("UNICEF Children's Report").
63. Centers for Disease Control and Prevention, *Sexually Transmitted Disease Surveillance 2000*, 2001.
64. UNAIDS, *The impact of voluntary counseling and testing: A global review of the benefits and challenges*, UNAIDS Best Practice Collection, 2001 (citing data provided by national authorities in Zambia, Tanzania, and Kenya).
65. *Ibid.*, 2002 UNAIDS Report.
66. *Ibid.*, UNICEF Children's Report.
67. *Ibid.*, 2002 UNAIDS Report.
68. M. Bianco et al., Evaluation of an intervention in training adolescents as peer educators in Argentina, Abstract No. 33539, XII International Conference on AIDS, Geneva, 1998; A. Boontan, Strong youth, strong barriers to HIV, Abstract No. 33561, XII International Conference on AIDS, Geneva, 1998; A. Ter-Hoyakmyan et al., Peculiarities of anti-AIDS program aimed at teenagers in Armenia, Abstract No. 33554, XII International Conference on AIDS, Geneva, 1998.
69. S. Kegeles et al., The M-Powerment Project: A Community-Level HIV Prevention Intervention for Young Gay Men, *Am J Public Health* 1996;86:1129-1136.

70. Y. Kim et al., Promoting Sexual Responsibility Among Young People in Zimbabwe, *Family Planning Perspectives* 2001;27:11-19. See PSI, *Annotated Catalogue of Recent Social Marketing Research and Evaluation*, 1998 (cited in UNAIDS, *Sexual Behavior Change for HIV: Where Have Theories Taken Us?*, UNAIDS Best Practice Collection, 1999).
71. UNAIDS, *Preventing HIV/AIDS among young people*, Fact Sheet, UN Special Session on HIV/AIDS, 2001.
72. Centers for Disease Control and Prevention, Youth Risk Behavior Surveillance—United States, 1999, *MMWR* 2000;49:SS-5; G. Peersman & J. Levy, Focus and effectiveness of HIV-prevention efforts for young people, *AIDS* 1998;12 (Supp. A):S191-96. See *Ibid.*, UNAIDS Behavioral Theory Report.
73. J. Jemmott et al., Abstinence and Safer Sex HIV Risk-Reduction Interventions for African American Adolescents: A Randomized Controlled Trial, *JAMA* 1998;279:1529-1536.
74. *Ibid.*, 2002 UNAIDS Report.
75. *Id.*
76. *Ibid.*, P. Jha et al.
77. *Ibid.*, Voluntary HIV-1 Counseling and Testing Efficacy Study Group.
78. *Ibid.*, M. Kamb et al.; S. Allen et al., Effect of serotesting with counseling on condom use and seroconversion among HIV discordant couples in Africa, *Brit Med J* 1992;304:1605-09; M. Kamenga et al., Evidence of marked sexual behavior change associated with low HIV-1 seroconversion in 149 married couples with discordant HIV-1 serostatus: experience at an HIV counseling centre in Zaire, *AIDS* 1991;5:61-67; N. Padian et al., Male-to-Female Transmission of HIV, *JAMA* 1987;258:758-70; J. Goedert et al., Heterosexual transmission of human immunodeficiency virus, *AIDS Research and Human Retroviruses* 1987;4:355-61.
79. P. Lampthey & J. Price, Social Marketing Sexually Transmitted Disease and HIV Prevention: A Consumer-Centered Approach to Achieving Behavior Change. *AIDS* 1998;12(supp.2):S1-S9.
80. D. Cameron et al., Female to male transmission of human immunodeficiency virus type 1: risk factors for seroconversion in men, *Lancet* 1998;2:403-07. See *ibid.*, UNAIDS/WHO STD Consultation. According to UNAIDS and WHO: "Studies conducted have pointed out four potential explanations as to why circumcised males may be more or less likely to acquire HIV/STD, including: (1) Exposed glans penis may develop a protective layer of keratin; (2) The foreskin may be especially susceptible to minor balanitis and trauma during intercourse, allowing movement of HIV through dermatologic intercourse; (3) Warm microclimate under the foreskin may permit microorganism survival, increasing exposure to potential infections; (4) Lack of circumcision may predispose to a co-infection with other STDs known to facilitate heterosexual HIV-1 transmission." UNAIDS/WHO STD Consultation.
81. See D. Halperin & R. Bailey, Male circumcision and HIV infection: 10 years and counting, *Lancet* 1999;354:1813-15; M. Potts, Male circumcision and HIV infection (letter), *Lancet* 2000:355.
82. See *ibid.*, UNAIDS/WHO STD Consultation.
83. A. Buvé et al., Ethics of mass STD treatment (letter), *Lancet* 2000:356.
84. *Id.*
85. R. Gray et al., Probability of HIV-1 transmission per coital act in monogamous, heterosexual, HIV-1-discordant couples in Rakai, Uganda, *Lancet* 2001;357:1149-53.
86. F. Palella et al., Declining Morbidity and Mortality Among Patients with Advanced Human Immunodeficiency Virus Infections, *New Eng J Med* 1998;338:853-60; R. Gulick et al., Treatment with Indinavir, Zidovudine, and Lamivudine in Adults with Human Immunodeficiency Virus Infection and Prior Antiretroviral Therapy, *New Eng J Med* 1997;337:734-39.
87. H. Zhang et al., Human Immunodeficiency Virus Type 1 in the Semen of Men Receiving Highly Active Antiretroviral Therapy, *New Eng J Med* 1998;339:1803-09. See A. Haase & T. Schacker, Potential for the Transmission of HIV-1 Despite Highly Active Antiretroviral Therapy, *New Eng J Med* 1998;339:1846-48.
88. See S. Kravcik et al., Effect of Antiretroviral Therapy and Viral Load on the Perceived Risk of HIV Transmission and the Need for Safer Sexual Practices, *J Acquir Immune Defic Syndr Hum Retrovirology* 1998;19:124-29.
89. J. Trussel et al., Comparative contraceptive efficacy of the female condom and other barrier methods, *Family Planning Perspectives* 1994;26(2):66-72.
90. *Ibid.*, 2002 UNAIDS Report.
91. UNAIDS, *Knowledge is power: voluntary HIV counseling and testing in Uganda*, UNAIDS Best Practice Collection, 1999.
92. M. Moore et al., Impact of HIV Counseling and Testing in Uganda, Abstract No. ws-C16-4, ix International Conference on AIDS, Berlin, 1993.
93. L. Nyblade et al., HIV Risk-Behavior Change Subsequent to Participation in Voluntary Counseling and Testing, Abstract No. D4731, xiii International Conference on HIV/AIDS, Durban, 2000; T. Lutalo et al., Contraceptive Use and HIV Testing and Counseling in Rural Rakai District, sw Uganda, Abstract No. C246, xiii International Conference on HIV/AIDS, Durban, 2000; M. Kama, HIV/AIDS Counseling in Butege Community of Masaka District from 1993-1998, Abstract 13419, Geneva, 1998.
94. UNAIDS, *Drug use and HIV/AIDS*, Fact Sheet, United Nations Special Session on HIV/AIDS, 2001.
95. United Nations System, *Preventing the Transmission of HIV Among Drug Abusers: A Position Paper of the United Nations System*, 2000.
96. UNAIDS, *Blood Safety and HIV*, UNAIDS Best Practice Collection, 1997 ("UNAIDS Blood Safety Recommendations").
97. D. Vlahov & B. Junge, The Role of Needle Exchange Programs in HIV Prevention, *Public Health Reports* 1998(Supp. 1):75-80; D. Des Jarlais et al., HIV Incidence Among Injecting Drug Users in New York City Syringe-Exchange Programmes, *Lancet* 1996;348:987-991; P. Lurie et al., *The Public Health Impact of Needle Exchange Programs in the United States and Abroad*, Vol. 1, University of California, San Francisco, 1993; U.S. General Accounting Office, *Needle Exchange Programs: Research Suggests Promise as an AIDS Prevention Strategy*, Report No. GAO/HRD-93-60, 1993.
98. D. Des Jarlais et al., Maintaining Low HIV Seroprevalence in Populations of Injecting Drug Users, *JAMA* 1995;274:1226-1231. See National Research Council and Institute of Medicine, *Preventing HIV Transmission: The Role of Sterile Needles and Bleach*, 1995.
99. S. Hurley et al., Effectiveness of needle exchange programmes for prevention of HIV infection, *Lancet* 1997;349:1797-1800.
100. D. Des Jarlais et al., Declining Seroprevalence in a Very Large HIV Epidemic: Injecting Drug Users in New York City, 1991 to 1996, *Am J Pub Health* 1998;88:1801-1806.
101. M. Rotham & Tesoriero, Implementing HIV Prevention Programs in Substance Abuse Treatment Facilities as Part of a Comprehensive HIV Service Model—Eight-Year Retrospective, National HIV Prevention Conference, Centers for Disease Control and Prevention, Atlanta, Georgia, USA, Abstract No. 325, 1999.
102. *Ibid.*, 2002 NIDA Principles.
103. R. Needle et al., HIV Prevention with Drug-Using Populations—Current Status and Future Prospects: Introduction and Overview, *Public Health Reports* 1998;113(Supp. 1):4-18; D. Metzger et al., Drug Abuse Treatment as AIDS Prevention, *Public Health Reports* 1998(Supp. 1):97-106.
104. *Id.*
105. D. Metzger, Drug Abuse Treatment as AIDS Prevention, in *Interventions to Prevent HIV Risk Behaviors: Program & Abstracts*, National Institutes of Health, Consensus Development Conference, 1997.
106. D. Gibson et al., Effectiveness of psychosocial interventions in preventing HIV risk behavior in injecting drug users, *AIDS* 1998; 12:919-29; D. Des Jarlais et al., AIDS and the Transition to Illicit Drug Injection—Results of a Randomized Trial Prevention Program, *British J Addiction* 1992;87:493-98; N. El-Bassel & R. Schilling, 15-Month Followup of Women Methadone Patients Taught Skills to Reduce Heterosexual HIV Transmission, *Public Health Reports* 1992;107:500-04; J. McCusker et al., AIDS Education for Drug Abusers, *Am J Pub Health* 1992;82:533-40.
107. *Ibid.*, 2002 NIDA Principles.
108. *Ibid.*, D Gibson et al.
109. *Ibid.*, 2002 NIDA Principles.
110. See E. Sloan et al., Safety of the Blood Supply, *JAMA* 1995;274:1368-73.
111. *Ibid.*, UNAIDS Blood Safety Recommendations.
112. E. Wong, Are Universal Precautions Effective in Reducing the Number of Occupational Exposures Among Health Care Workers? *JAMA* 1991;265:1123. See J. Gerberding, Surgery and AIDS—Reducing the Risk, *JAMA* 1991;265:1572.
113. UNAIDS/UNICEF/WHO, *Large-Scale Implementation for the Prevention of Mother to Child Transmission of HIV: Issues for South East Asia and the Pacific*, 1999, available at www.unaids.org.
114. E. Connor et al., Reduction of maternal-infant transmission of human immunodeficiency virus type 1 with zidovudine treatment, *New Eng J Med* 1994;331:1173-80.
115. See L. Mofenson & J. McIntyre, Advances and research directions in the prevention of mother-to-child transmission, *Lancet* 2000;355:237-44.
116. N. Shaffer et al., Short-course zidovudine for perinatal HIV-1 transmission in Bangkok, Thailand: a randomized controlled trial, *Lancet* 1999;353:773-780.
117. L. Guay et al., Intrapartum and neonatal single-dose nevirapine compared with zidovudine for prevention of mother-to-child transmission of HIV-1 in Kampala, Uganda: HIVNET 012 randomised trial, *Lancet* 1999;354:795-802.
118. E. Wood et al., Extent to which low-level use of anti-retroviral treatment could curb the AIDS epidemic in sub-Saharan Africa, *Lancet* 2000;355:2095-00.
119. International Perinatal HIV Group, The Mode of Delivery and the Risk of Vertical Transmission of Human Immunodeficiency Virus Type 1: A Meta-Analysis of 15 Prospective Cohort Studies, *New Eng J Med* 1999;340:977-87; European Mode of Delivery Collaboration, Elective caesarean-section versus vaginal delivery in prevention of vertical HIV-1 transmission: a randomised controlled trial, *Lancet* 1999;353:1035-39.
120. See *ibid.*, Mofenson & McIntyre.
121. P. Miotti et al., HIV Transmission Through Breast-feeding: A Study in Malawi, *JAMA* 1999;282:744-49.
122. See *ibid.*, UNAIDS/UNICEF/WHO.
123. R. J. Simonds et al., Preventing mother-to-child HIV transmission: results from the first year of Thailand's national program, *JAMA* 2002;288.
124. *Ibid.*, UNAIDS/UNICEF/WHO.
125. A. Coutoudis et al., Influence of infant-feeding patterns on early mother-to-child transmission of HIV-1 in Durban, South Africa: a prospective cohort study, *Lancet* 1999;354:471-76.
126. *Id.*
127. UNAIDS, *Patent Situation of HIV/AIDS-Related Drugs in 80 Countries*, 2000.
128. *Ibid.*, B. Schwartzlander et al.
129. *Ibid.*, Working Group estimate.
130. *Ibid.*, P. Jha et al.
131. UNAIDS, *Preventing HIV/AIDS*, United Nations Special Session on HIV/AIDS, Fact Sheet, 2001.
132. UNAIDS, *National Responses to HIV/AIDS: Country Implementation Readiness Profile*, 2002.
133. See UNAIDS, *Reaching Regional Consensus on Improved Behavioral and Serosurveillance for HIV: Report from a Regional Conference in East Africa*, UNAIDS Best Practice Collection, 1998.
134. *Id.*
135. UNAIDS/WHO, African AIDS Vaccine Program Needs US \$233 Million, Press Release, May 30, 2002.
136. G. Nabel, Challenges and opportunities for development of an AIDS vaccine, *Nature* 2001;410:1002-07; International AIDS Vaccine Initiative, *Scientific Blueprint 2000: Accelerating Global Efforts in AIDS Vaccine Development*, 2000 ("IAVI Scientific Blueprint 2000").
137. See Rockefeller Foundation Microbicide Initiative, *Mobilization for Microbicides: The Decisive Decade*, 2001 ("Rockefeller Initiative").
138. D. Wilkinson, Nonoxynol-9 Spermicide for Prevention of HIV and Other Sexually Transmitted Infections: Systematic Review and Meta-Analysis of Randomized Controlled Trial, Abstract No. P-285, Microbicides 2002 Conference, Antwerp, 2002; R. Roddy et al., A Controlled Trial of Nonoxynol 9 Film to Reduce Male-to-Female Transmission of Sexually Transmitted Diseases, *New Eng J Med* 1998;339:504-10.
139. *Id.*
140. Better World Advertising, "HIV Stops With Me" Prevention for Positives Social Marketing Campaign, Year One Evaluation Results, 2000.
141. See UNAIDS, *HIV and AIDS-related stigmatization, discrimination and denial: forms, contexts and determinants, Research studies from Uganda and India*, UNAIDS Best Practice Collection, 2000; Q. Karim et al., Reducing the stigma of HIV infection among South African sex workers: socioeconomic and gender barriers, *Am J Public Health* 1995;85:1521-55; G. Herek & J. Capitanio, Public Reactions to AIDS in the United States: A Second Decade of Stigma, *Am. J Pub Health* 1993;83:574-577.
142. UNAIDS, *Population Mobility and AIDS*, UNAIDS Best Practice Collection, 2001.
143. *Id.*; UNAIDS, *Refugees and AIDS*, UNAIDS Best Practice Collection, 1997.

