HIV PREVENTION

IN THE ERA OF

EXPANDED TREATMENT ACCESS

GLOBAL HIV PREVENTION WORKING GROUP

JUNE 2004

GLOBAL HIV PREVENTION WORKING GROUP

CO-CHAIRS

Helene Gayle, Bill & Melinda Gates Foundation, USA

David Serwadda, Makerere University, Uganda

Meenakshi Datta Ghosh,
National AIDS Control Organization, India

CO-CONVENERS

Helene Gayle, Bill & Melinda Gates Foundation, USA

Drew Altman,
Henry J. Kaiser Family Foundation, USA

MEMBERS

David Alnwick
UNICEF, Kenya

Judith D. Auerbach
American Foundation for AIDS Research, USA

Mary Bassett
New York City Department of Health
and Mental Hygiene, USA

Seth Berkley
International AIDS Vaccine Initiative, USA

Jordi Casabona i Barbarà
Centre d'Estudis Epidemiològics sobre
l'HIV/SIDA de Catalunya (CEESCAT),
Catalan Health Department, Spain

Thomas J. Coates
David Geffen School of Medicine at UCLA,
USA

Awa Marie Coll-Seck
Roll Back Malaria, Geneva

Isabelle de Zoysa
World Health Organization, Geneva

J. Peter Figueroa
Ministry of Health, Jamaica

Lieve Fransen
European Commission, Belgium

Geeta Rao Gupta
International Center for Research on
Women, USA

Catherine Hankins
UNAIDS, Geneva

Shen Jie
Centers for Disease Control
and Prevention, China

Margaret Johnston
National Institute of Allergy and
Infectious Diseases, USA

Salim Abdool Karim
University of Natal, South Africa

Milly Katana
Health Rights Action Group, Uganda

Jim Yong Kim
World Health Organization,
Geneva

Susan Kippax
University of New South Wales,
Australia

Peter Lamptey
Family Health International, USA

Julian Lob-Levyt
UK Department for
International Development,
United Kingdom

Kgapa Mabusela
loveLife, South Africa

Marina Mahathir
Malaysian AIDS Council, Malaysia

William Makgoba
University of Natal, South Africa

Rafael Mazin
Pan American Health
Organization, USA

Peter McDermott
UNICEF, New York

Suman Mehta
United Nations Population Fund, USA

Michael Merson
Yale School of Medicine, USA

Phillip Nieburg
Center for Strategic and
International Studies, USA

Jeffrey O'Malley
International HIV/AIDS Alliance,
United Kingdom

Peter Piot
UNAIDS, Geneva

Vadim Pokrovsky
Russian Center for AIDS Prevention
and Control, Russia

J.V.R. Prasada Rao
Ministry of Health and
Family Welfare,
India

Tim Rhodes
Imperial College,
University of London,
United Kingdom

Zeda Rosenberg
International Partnership for
Microbicides, USA

Bernhard Schwartlander
Global Fund to Fight AIDS, TB,
and Malaria, Geneva

Yiming Shao
National Center for AIDS/STD
Prevention and Control,
China

Donald Sutherland
World Health Organization,
Geneva

Paulo Teixeira
World Health Organization,
Geneva

Ronald O. Valdiserri
Centers for Disease Control
and Prevention, USA

Mechai Viravaidya
Population and Community
Development Association,
Thailand

Catherine Wilfert
Elizabeth Glaser
Pediatric AIDS Foundation, USA

Debrework Zewdie
World Bank,
Washington, DC

Organizational affiliations are provided for identification purposes only, and do not indicate organizational endorsement.

HIV PREVENTION
IN THE ERA OF
EXPANDED TREATMENT ACCESS

- EXECUTIVE SUMMARY.....1
- INTRODUCTION.....4
- INTEGRATING HIV PREVENTION IN HEALTH CARE SETTINGS.....5
- HIV PREVENTION FOR PEOPLE LIVING WITH HIV.....12
- HIV PREVENTION FOR PEOPLE WHO ARE UNINFECTED OR UNTESTED.....14
- FUNDING A COMPREHENSIVE RESPONSE.....15
- RECOMMENDATIONS.....17
- REFERENCES.....21

FEATURES

Bringing Comprehensive HIV Prevention to Scale.....3

HIV Testing: Expanding Opportunities to Deliver Prevention and HIV Treatment.....5

The Prevention-Treatment Dynamic.....6

Early Experience with Coordinated Prevention and Treatment Programs.....10

Unique Needs of Key Populations.....13

Industrialized Countries: A Cautionary Tale.....16

CHARTS AND GRAPHS

Figure 1. Effect of Treatment News on Condom Use Among Commercial Sex Workers in Kenya.....6

Figure 2. Potential Impact of Risk Behavior on Future Epidemic in India with Expanded Treatment Access.....7

Figure 3. Effect of Risk Behavior on the Future Course of the Epidemic with Expanded ART Access.....7

Figure 4. Opportunities for HIV Prevention in the Health Care System.....9

Figure 5. Simultaneous Increase in Use of ART and VCT in Brazil, 1997–2003.....10

Figure 6. Global HIV/AIDS Resource Needs.....15

Figure 7. Increase in Infections Among Men Who Have Sex with Men, United States, 1999–2002.....16

ABOUT THIS REPORT

As access to antiretroviral therapy expands in the developing world, millions of people will be drawn into health care settings, providing critical new opportunities to simultaneously expand access to HIV prevention.

This report by the Global HIV Prevention Working Group makes detailed recommendations on how to effectively integrate HIV prevention into expanding HIV treatment programs. The report also provides recommendations on new approaches to HIV prevention that will be required as treatment access expands — including programs that take into account the different needs of people who are HIV-positive and HIV-negative.

THE GLOBAL HIV PREVENTION WORKING GROUP

The Global HIV Prevention Working Group is a panel of nearly 50 leading public health experts, clinicians, biomedical and behavioral researchers, and people affected by HIV/AIDS, convened by the Bill & Melinda Gates Foundation and the Henry J. Kaiser Family Foundation. The Working Group seeks to inform global policy-making, program planning, and donor decisions on HIV prevention, and to advocate for a comprehensive response to HIV/AIDS that integrates prevention and care. In July 2002, the Working Group issued its first report, *Global Mobilization for HIV Prevention: A Blueprint for Action*. In May 2003 it released *Access to HIV Prevention: Closing the Gap*. Both are available at www.gatesfoundation.org and www.kaisernetwork.org.

EXECUTIVE SUMMARY

Access to HIV treatment and care in developing countries is at last becoming a global priority. Governments, international agencies, drug manufacturers, and private organizations are mobilizing to substantially increase access to life-prolonging antiretroviral therapy (ART).

Greater availability of HIV treatment* for the 40 million people currently infected with HIV is a humanitarian imperative that could prolong the lives of millions, restore economic productivity, and stabilize societies in some of the world's hardest-hit regions.

The world has a unique opportunity to simultaneously expand both treatment and prevention.

But long-term success against HIV/AIDS requires simultaneous expansion of both ART and prevention. Unless the incidence of HIV is sharply reduced, HIV treatment will not be able to keep pace with all those who will need therapy. For example, while the WHO/UNAIDS 3 by 5 Initiative establishes the goal of having 3 million people on ART by 2005, 5 million new infections occur every year.

New Opportunities

The world has a unique opportunity, as ART programs are launched and expanded, to simultaneously bolster prevention efforts.

Increased availability of HIV treatment is likely to result in increased HIV testing rates, reduced stigma, and possibly reduced infectivity for those on ART. But more widespread access to HIV treatment could also bring millions of people into health care settings, providing new opportunities for health care workers to deliver and reinforce HIV prevention messages and interventions. Pilot programs in developing countries are demonstrating that such an integrated approach is feasible and can substantially increase condom use and HIV testing rates.

New Challenges

Greater ART access will also present new challenges for HIV prevention programs. Experience in industrialized countries suggests that HIV treatment access can alter people's perception of the risk associated with HIV, and can lead to increased risk behavior. In addition, because ART can significantly increase the longevity and health of people living with HIV, the number of opportunities for HIV transmission to occur could increase.

As testing rates increase and more people learn their HIV status, there is a unique opportunity to adapt prevention strategies to meet the differing needs of HIV-positive and HIV-negative people. While not all prevention services will be targeted this way, such a targeted prevention approach is now possible:

- **Prevention for HIV-Positive People.** Although most people diagnosed with HIV take steps to avoid exposing others to the virus, some have difficulty maintaining safer behavior, making "prevention for positives" a critical strategy in reducing the number of new HIV infections.[1]
- **Prevention for HIV-Negative and Untested People.** Prevention strategies for HIV-negative and untested people must be adapted to ensure that risk behavior does not increase in the context of ART access.

Ultimate Goal: Widespread Access to HIV Prevention and Treatment

Globally, fewer than one in five people at high risk of infection have access to proven HIV prevention interventions[2]—voluntary HIV counseling and testing, condom promotion campaigns, treatment for sexually transmitted diseases (STDs), drugs and strategies to prevent mother-to-child transmission of HIV, and harm reduction programs for injecting drug users, among others. In the case of antiretroviral therapy, access in developing countries is even lower — only 7% of people who need ART in low- and middle-income countries currently receive it.

If the world fails to act now to expand access to HIV prevention during this critical time of growing ART access,

* Throughout this report the term "HIV treatment" is used to refer to antiretroviral therapy. The Working Group recognizes that there is a spectrum of treatment needs for people living with HIV, including treatment for TB, opportunistic infections and other conditions associated with HIV infection.

we could repeat the mistakes of the industrialized world, where HIV prevention was not sufficiently prioritized as HIV treatment was expanded, leading to an increase in risk behavior and infection rates.

However, if the world mobilizes to simultaneously and aggressively expand both HIV prevention and treatment, we could achieve a truly comprehensive approach to fighting AIDS that could contain and ultimately reverse the epidemic.

SUMMARY OF RECOMMENDATIONS

The Working Group recommends a four-point plan of action:

1. Integrate HIV Prevention and Treatment

- Expansion of Access to HIV Testing. **Because HIV counseling and testing is a critical entry point for both prevention and ART services, testing programs should be significantly expanded and aggressively promoted.** As ART is introduced, testing should remain voluntary and confidential. Where ART access exists, HIV testing and counseling should be universally offered in all health care settings — including STD and TB clinics, family planning and reproductive health clinics, prenatal and prevention of mother-to-child transmission (PMTCT) settings, and mobile health programs in rural areas — provided individuals have the ability to opt out of testing.

- HIV Prevention in Health Care Settings. **All health care settings, including HIV treatment sites, should deliver HIV prevention services.** Doctors, nurses, and non-clinical staff in health care settings — including ART sites, TB and STD clinics, family planning and reproductive health clinics, harm reduction programs for injection drug users, maternal-child health clinics, and PMTCT programs — should be trained to provide HIV prevention counseling, access to condoms and other prevention tools, and screening for sexually transmitted diseases. Risk reduction strategies should also be integrated into initiatives that promote ART adherence. Prevention and treatment services should be tailored to meet the specific needs of women, recognizing the multiple social, legal, and economic disadvantages they confront. Special efforts will similarly be needed to make integrated prevention and treatment a reality for young people, who often do not enter the care system until they are adults.

- ART Promotion in Prevention Services. **Prevention outreach programs should promote HIV testing, educate communities about HIV treatments, and facilitate linkages to care.** In some circumstances, such as harm reduction programs, prevention programs may actually serve as ideal venues for the delivery of ART and other HIV/AIDS treatment.

- Donor Priorities. **Donors and national programs should prioritize integration of prevention in ART settings.** The Global Fund and the World Bank Multicountry AIDS Program should prioritize funding for proposals that include delivery of prevention services in ART settings. WHO should ensure that 3 by 5 Initiative staff receive training on HIV prevention as part of training and technical assistance activities. Bilateral and multilateral donors, such as the U.S. government and the World Bank, should ensure that all programs integrate comprehensive, science-based HIV prevention in the delivery of ART, and should require programs to report on progress toward prevention-treatment integration. Individual countries should revise their AIDS strategic plans to prioritize integration of HIV prevention in treatment settings. UNAIDS and WHO should emphasize the importance of integrating prevention services in ART settings in their technical assistance on Global Fund proposals.

- Research. **Research efforts should be strengthened and expanded to identify the most effective strategies for integrating HIV prevention and treatment.** WHO and UNAIDS should develop mechanisms to rapidly disseminate research findings to the field.

2. Deliver Prevention for HIV-Positive People

- "Prevention for Positives." **New prevention programs tailored to the needs of people living with HIV should be developed and implemented.** Programs should include counseling regarding personal disclosure of HIV status, information on the ability of individuals to transmit HIV even while on ART, and promotion of safer behavior. Research should be quickly undertaken to identify optimal messages and strategies for reaching HIV-positive people.

- Involving People Living with HIV. **Donors and governments should provide financial support to organizations of people living with HIV.** Such organizations should be involved in the planning, development, delivery, and evaluation of HIV prevention services for people living with HIV.

- **Fighting Stigma. Efforts to combat HIV-related stigma and discrimination must be strengthened and sustained.** Enforceable laws must be in place to protect people with HIV from discrimination. Community-based initiatives that empower people living with HIV will help increase rates of voluntary testing, clinic attendance, and participation in HIV prevention efforts.

3. Adapt Prevention for HIV-Negative People

- **New Messages. Prevention strategies for HIV-negative and untested people should be revised** to emphasize the continuing importance of risk reduction as HIV treatment access expands and to address the limitations of ART. Evaluation of existing programs should be undertaken to provide information about successful strategies.

- **Monitoring Behavioral Impact of ART. Behavioral surveillance and sentinel surveillance must be significantly expanded** to monitor the effect of ART access on risk behavior and trends in HIV prevalence.

4. Fund a Comprehensive Response

- **Simultaneous Scale-Up of Prevention and Treatment.** To expand access to the full range of proven HIV prevention and treatment interventions, HIV/AIDS spending from all sources should increase from $4.7 billion in 2003 to $10.5 billion in 2005 and to $15 billion in 2007, as recommended by UNAIDS.

- **Addressing Barriers to Scale-Up.** Funding initiatives for HIV prevention and treatment must include both short- and long-term strategies to build sustainable capacity in countries to deliver essential services — including health care infrastructure and training for health care personnel.

- **Research into New Prevention Technologies.** Annual funding for HIV vaccine research should double from approximately $520 million to $570 million today to at least $1 billion in 2007. Annual funding for microbicide research should increase from less than $150 million today to $300 million in 2007. In addition, funding should substantially increase for research into other prevention technologies, such as female condoms, diaphragms, circumcision, treatment of viral STDs, and oral chemoprophylaxis. Opportunities for people to participate in clinical trials of new prevention technologies should be linked with HIV testing, prevention, and ART services.

These recommendations are intended to provide guidance on one critical aspect of the global response to AIDS — the need to integrate HIV prevention into health care settings, and adapt HIV prevention strategies in the era of increased access to HIV treatment. In addition to the recommendations identified here, it will also be essential to scale up access to the full array of proven prevention interventions in all settings.

BRINGING COMPREHENSIVE HIV PREVENTION TO SCALE

In earlier reports, the Working Group has identified the key elements of an effective effort to prevent HIV transmission. Even if prevention is more fully integrated into expanded ART programs, many prevention services will need to be offered outside medical settings. This is especially the case for young people, who have much lower rates of HIV infection than adults and are therefore not as likely to visit HIV treatment sites.

Effective prevention involves a series of strategies that achieve maximum impact when pursued in combination. These elements include:

- Behavior change programs to promote condom use, reduction in the number of partners, mutual monogamy, abstinence, and delayed initiation of sexual activity
- Prevention and treatment of sexually transmitted diseases
- HIV counseling and testing
- Harm reduction programs for injecting drug users
- Prevention of mother-to-child transmission
- Blood safety practices
- Infection control in health care settings
- Policy reforms to reduce the vulnerability of women and girls, and ensure the legality and availability of proven HIV prevention strategies such as condoms and clean syringes
- Prevention programs specifically designed for people living with HIV

In addition to expanding access to existing interventions, the rapid development and deployment of new tools — such as vaccines and microbicides, once developed — will be a crucial part of the comprehensive response to the epidemic.

HIV PREVENTION IN THE ERA OF EXPANDED TREATMENT ACCESS

INTRODUCTION

The world has entered a new stage in the fight against HIV/AIDS. Fueled by a determination to improve the health and well-being of nations where 95% of the world's HIV-infected people live, the global community is beginning a major effort to expand access to anti-retroviral therapies (ART) and other HIV-related health services.

Since 2001, when 189 member states of the United Nations endorsed worldwide HIV treatment access in the Declaration of Commitment on HIV/AIDS, efforts to deliver ART in developing countries have accelerated.[3]

Rapid scale-up of HIV treatment and prevention could improve the lives of millions, avert countless new infections, and ultimately contain the global AIDS epidemic.

WHO and UNAIDS have established a global target of having 3 million people on ART by 2005. As of early 2004, the Global Fund had approved grants to support the provision of ART to 700,000 people. The President's Emergency Plan for AIDS Relief (PEPFAR) initiative of the U.S. government plans to deliver ART to 2 million people by 2007 in 14 high-prevalence countries in sub-Saharan Africa and the Caribbean. The World Bank also has announced plans to increase its financial assistance for ART programs in eligible countries, with particular focus on support for the infrastructure that will be required to initiate and sustain treatment programs. Countries in diverse regions are also examining national policies and funding allocations to facilitate the delivery of ART through the public sector.

These initiatives must overcome substantial obstacles in resource-limited settings, including the need to recruit and train tens of thousands of health care workers. By late 2003, only 400,000 people in low- and middle-income countries were receiving ART, reflecting treatment coverage of only 7%.[4] Despite the many challenges confronting the global community, however, it is clear that the response to HIV/AIDS is entering a stage of expanded access to ART.

In addition to the therapeutic benefits that will flow to millions of HIV-infected individuals, enhanced ART access will offer important new opportunities to strengthen and expand HIV prevention efforts. Increased availability of HIV treatment is likely to result in increased HIV testing rates, reduced stigma, and possibly reduced infectivity for those on ART. But more widespread access to ART also offers critical new opportunities for HIV prevention efforts:

► **Integration of Prevention and Treatment.** As access expands, ART will be delivered in health care venues where HIV prevention services can be offered.

► **Prevention for HIV-Positive People.** As more people learn their HIV status in the context of expanded ART access, prevention programs should develop and direct services to people living with HIV.

► **New Strategies for HIV-Negative or Untested Individuals.** Prevention programs will need to anticipate and seek to minimize potential increases in risk behavior associated with increased access to ART by updating prevention messages and strategies to ensure their relevance and effectiveness.

The potential health dividends from seizing these new opportunities are enormous. If rapid expansion of ART is combined with a dramatically scaled-up prevention effort, the world could substantially reduce the severity of the global epidemic. In fact, a 2002 study led by UNAIDS and WHO reported that existing HIV prevention strategies, if substantially expanded, could avert 29 million of the 45 million new infections projected to occur between 2002 and 2010.[5]

INTEGRATING HIV PREVENTION IN HEALTH CARE SETTINGS

ART can enhance HIV prevention by attracting millions of individuals into a wide range of health care settings where prevention services can be offered. Expanded HIV treatment availability will also provide greater incentives for HIV testing, and testing settings will serve as critical entry points for both prevention and HIV treatment services.

Increasing Knowledge of HIV Status

Experts estimate that close to 90% of people living with HIV in developing countries are unaware of their infection.[6] Because inadequate knowledge of HIV status impedes both prevention and HIV treatment efforts, the percentage of people in developing countries who know their HIV status must significantly increase. Numerous factors currently impede widespread knowledge of HIV status, including the perception that knowledge of serostatus is not useful where HIV treatment is unavailable. However, studies demonstrate that knowledge of HIV status has an independent HIV prevention benefit, leading people to reduce their risk behavior, even when HIV treatment is not available.[7] ART availability will provide much greater incentive to increase knowledge of HIV status.

Only 12 percent of people who need voluntary HIV counseling and testing have access to it. HIV testing services should be offered in a wide range of health care settings — from hospitals to TB clinics to mobile health centers in rural areas.

- **Limited Access to VCT Sites.** Historically, the primary means to learn one's HIV status in developing countries is through stand-alone voluntary counseling and testing (VCT) sites. At present, only 12% of individuals who need VCT have meaningful access to testing services, underscoring the importance of increased funding for VCT.[8]

- **Universal Offer of Voluntary Testing in Health Care Settings Where ART is Available.** While stand-alone VCT sites have long provided an important means of promoting knowledge of HIV status, exclusive reliance on these venues is unlikely to generate the levels of testing and counseling needed to achieve prevention and HIV treatment goals.[9] VCT depends on the individual's own volition in coming forward to be tested.

  In areas where ART has been introduced, providers should always offer testing in a broad range of health care settings, including hospitals, STD and TB clinics, family planning and reproductive health service settings, prenatal care settings, and mobile health programs in rural areas. Patients should be given the opportunity to opt not be tested, and confidentiality must in all cases be maintained. Programs should make maximum use of rapid testing technologies to increase knowledge of HIV status,[10] and donors should prioritize training in use of such technologies.

HIV TESTING: EXPANDING OPPORTUNITIES TO DELIVER PREVENTION AND HIV TREATMENT

It is estimated that 90% of people with HIV in the developing world are unaware of their infection. Expanding opportunities for voluntary HIV testing will be critical to expanding access to both prevention and ART services, yet only 12% of people who need access to testing and counseling services have it. As ART programs expand, it is essential that testing opportunities increase:

- Where ART is available:
  - HIV testing should be universally offered in a broad range of health care settings, including hospitals, STD and TB clinics, family planning and reproductive health service settings, prenatal care settings, and mobile health programs in rural areas.
  - Patients should be given the opportunity to opt not be tested, and confidentiality must in all cases be maintained.
  - If a patient presents in a health care setting with possible symptoms of HIV infection, the patient should be informed that an HIV test will be performed for diagnostic purposes unless he or she expressly declines.

- All blood donors should be advised that their blood will be tested confidentially for HIV, and HIV-infected blood donations should be removed from the blood supply. Donors who test positive for HIV should be notified of their HIV status and linked to appropriate care and ART programs.

- Programs should make maximum use of rapid testing technologies to increase knowledge of HIV status, and donors should prioritize training in use of such technologies.

Treatment and prevention are essential partners in the fight against AIDS. In the absence of HIV treatment, prevention programs lack incentives for people to know their HIV status. Without effective prevention to reduce the number of new infections, ART initiatives will not be able to keep pace with the spread of the disease.

Potential Prevention Benefits of ART

Greater access to ART is likely to benefit HIV prevention efforts in a variety of ways.

- **Increased Knowledge of HIV Status.** Pilot ART projects in Haiti and South Africa have generated increases in utilization of voluntary counseling and testing (VCT) services of 300%[11] and 1,200%,[12] respectively. After former President Fernando Henrique Cardoso of Brazil decreed in 1996 that ART would be provided through the country's public health service, demand for VCT soared; by 2003, 2.3 million people were tested, up from 1.8 million the year before.[13] The encouragement provided by ART programs for HIV testing has been shown to benefit HIV prevention efforts.[14] In a controlled trial in three developing countries (Kenya, Tanzania, and Trinidad), individuals receiving VCT were nearly three times more likely to reduce risky sexual behavior than people who received health information alone, with HIV-infected individuals being more likely than uninfected people to take protective measures.[15]

- **Reduced Stigma.** Stigma impedes the dissemination of life-saving HIV prevention information within communities and discourages key social institutions from becoming engaged in efforts to curb transmission. Early experience with ART scale-up in developing countries suggests that ART access could potentially have a major positive impact on public attitudes about AIDS. After Médecins Sans Frontières (MSF) began providing ART in the Khayelitsha township outside Cape Town, a survey of nine commuter sites throughout South Africa found that Khayelitsha residents were notably more likely than other South Africans to express willingness to be tested for HIV, seek HIV/AIDS information and counseling, and use condoms.[16] Researchers associated with an ART project in central Haiti have also detected a decline in HIV-related stigma.[17]

- **Reduced Infectivity.** Although definitive evidence is not yet available, existing data suggests that broad access to ART, when combined with interventions to promote adherence to drug regimens, might reduce an individual's risk of transmitting HIV.[18] The risk of HIV transmission is strongly correlated with the infected person's plasma viral load.[19] In individual patients, ART typically results in a significant reduction in plasma viral load.[20] Strict adherence to ART regimens increases the likelihood that viral suppression will be sustained.[21] Whether this potential individual-level prevention benefit can be extended to an entire population will depend on the balance between reduced infectivity and other epidemiological or behavioral factors, such as the longer lifespan of people who receive ART and possible shifts in community-level risk behavior.

The Potential for Increased Risk Behavior to Overwhelm the Prevention Benefits of ART

Experience in industrialized countries indicates that it is possible for the prevention benefits of ART noted above to be overwhelmed by complacency about the threat of HIV/AIDS and resulting increases in risk behavior and new HIV infections.[22]

Increases in risk behavior may occur for a variety of reasons, including a belief by some that HIV is no longer as serious and the perception that HIV-positive people on ART are no longer infectious. People may also have difficulty adhering to a lifetime of safer sexual behavior. In addition, ART significantly enhances quality of life and personal sense

Effect of Treatment News on Condom Use Among Commercial Sex Workers in Nairobi

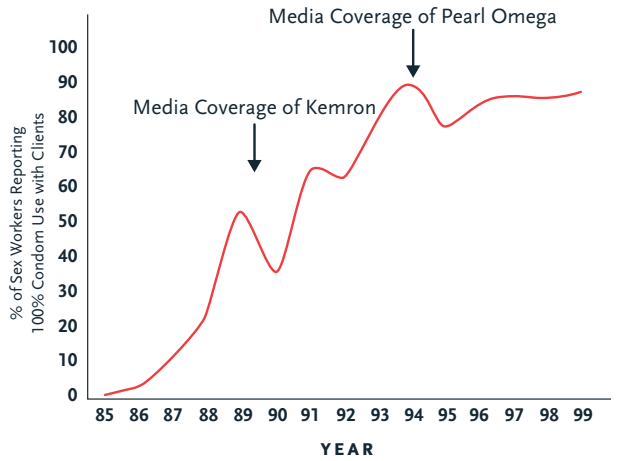


Figure 1

Source: Jha et al., Commission on Macroeconomics and Health, 2001

of well being, enabling many individuals to resume sexual activity — which may involve risky behavior. While this can be an important benefit of therapy, it could also increase opportunities for HIV transmission.

It is too early to know whether increases in risk behavior seen in industrialized countries will surface in developing countries as ART is introduced. Past evidence from Kenya suggests, however, that perceived treatment advances may have had an impact on levels of risk behavior in that country.

Since 1985, surveys have detected notable increases in condom use among commercial sex workers in Kenya. Evidence indicates, however, that the upward trajectory of condom use was twice interrupted when highly touted anti-HIV therapies attracted significant public interest. In 1988–90, when press reports in Africa suggested that the drug Kemron was a cure for AIDS, reported condom use plummeted. Again, in 1993–94, when an agent called Pearl Omega generated comparable press coverage as a possible treatment for HIV/AIDS, reported rates of condom use sharply declined (see Figure 1).

To ensure that increased risk behavior does not overwhelm the natural prevention benefits of ART, it is vital that ART be coupled with a simultaneous expansion of prevention strategies that have been shown to reduce the risk of HIV transmission.

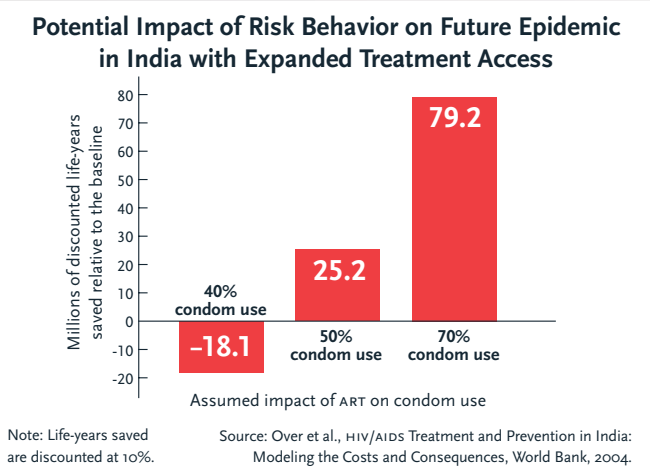


Figure 2. Projections by the World Bank estimate a savings of more than 25 million discounted life-years in India if condom use remains stable in the era of expanded treatment access. If condom use falls by only 10 percentage points following the introduction of ART, however, the net result over time will instead be a loss of more than 18 million life-years through 2033, underscoring the critical need for prevention and treatment to be brought to scale simultaneously.

Moreover, if India's program to expand access to ART is coupled with incentives to states and NGOs to improve access to HIV prevention services like condoms, the World Bank projects that such a program could, by increasing condom use by 20 percentage points, save 79.2 million discounted life years — three times more than without the prevention incentives.

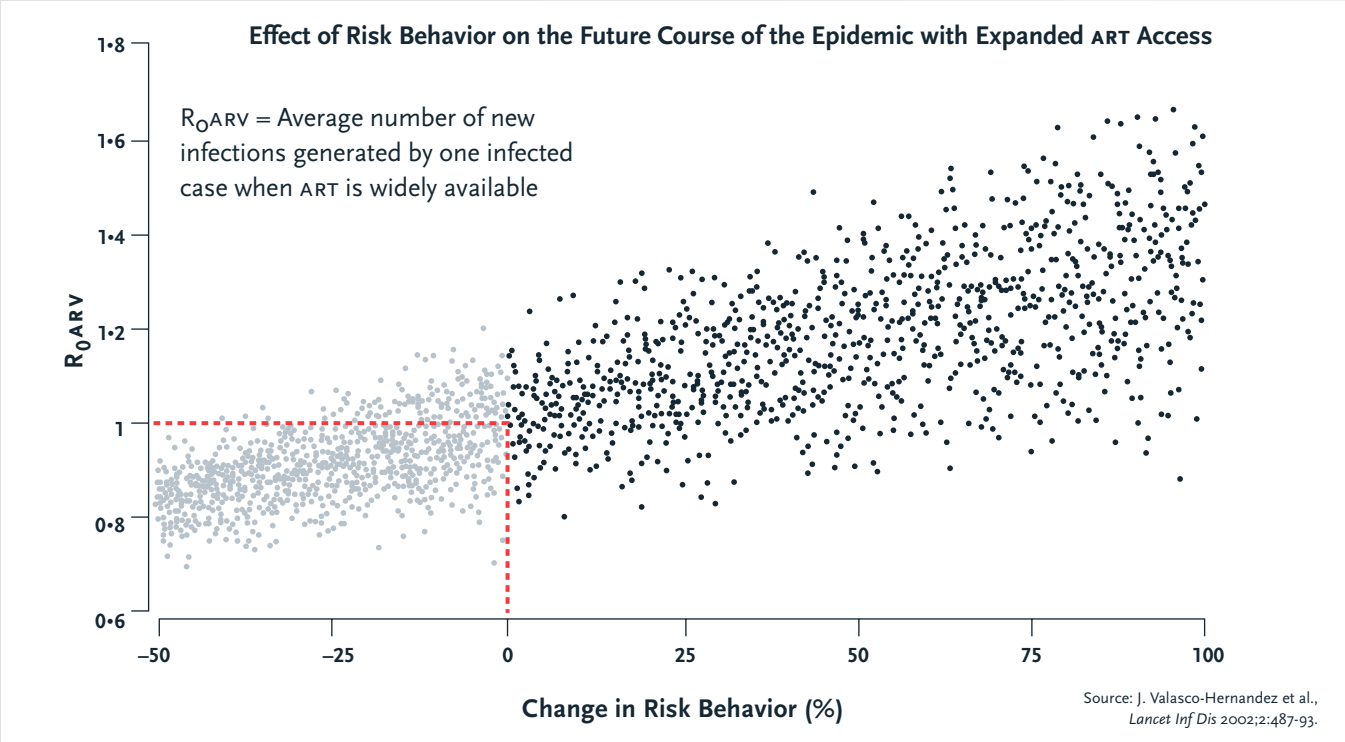


Figure 3. Using available evidence on the likelihood that ART reduces individual infectivity, Sally Blower and colleagues modeled the epidemic's future course in settings where ART is widely available (50–90% coverage). Where risk behavior declines following widespread introduction of ART, as indicated in the lower-left-hand box in the graph, HIV transmission falls, producing a decline in incidence over time. If risk behavior increases in the context of expanded ART, however, the prevention benefits of ART will be overwhelmed, leading to an increase in the rate of new infections and a continuing expansion of the epidemic.

When a patient presents in a health care setting with possible symptoms of HIV infection, providers should in the course of counseling inform the individual that an HIV test will be performed for diagnostic purposes unless he or she expressly declines. Blood donors should be advised that their blood will be tested confidentially for HIV, and HIV-infected blood donations should be removed from the blood supply.

- **Marketing Knowledge of HIV Status.** Streamlining testing procedures will help increase the number of people tested, but changes in policies and practices are unlikely on their own to lead to substantially higher testing rates. The stigma associated with HIV and with the behaviors that lead to transmission often discourage individuals from being tested, even when testing and HIV treatment services are readily available. To increase knowledge of HIV status, enhanced availability of testing services must be supported by marketing strategies that address attitudinal impediments to testing. In particular, programs should actively promote the individual benefits of testing.

  In Canada, a country with one of the world's most generous single-payer health care systems, authorities estimate that up to one-third of Canadians with HIV are unaware of their HIV status.[23] Similarly, in the U.S., CDC estimates that at least 25% of people living with HIV are unaware they are infected.[24] In Botswana, where national authorities have committed to scale up ART, knowledge of HIV status remains at low levels. Even though HIV prevalence is 38% in the adult population in Botswana, only 65,000 people had used government testing facilities by the beginning of 2003.[25]

  A recent study in South Africa compared attitudes of voluntary testers versus those who had not been tested. Individuals who avoided testing or failed to return for test results held significantly more negative attitudes toward the test than those who knew their HIV status. Untested individuals were significantly more likely to exhibit social disapproval of people with HIV and to believe that HIV infection is shameful.[26]

Delivering prevention services in ART clinical settings

ART scale-up could bring millions of individuals into health care settings, providing new opportunities to deliver and reinforce risk reduction interventions.

- **HIV Prevention Training for Clinicians.** Brief clinician-delivered prevention interventions have proven effective for a variety of health conditions, including smoking, obesity, alcohol abuse, depression, and physical inactivity.[27] A recent clinic-based study found that the delivery by medical providers of brief HIV prevention messages that emphasize the dangers of unsafe sex reduced risk behaviors among HIV-positive patients.[28] In contrast to the more structured counseling protocols for VCT, a brief intervention by a clinician could, for example, remind the patient of the importance of safer sex, provide information on clinic-based access to condoms and counseling, and ask if the patient wishes to discuss issues related to HIV prevention.

  Rapid scale-up will require significant efforts to train health care workers to deliver ART. For example, WHO envisions the need to train 100,000 clinical and community-based personnel to facilitate the scale-up of ART programs. Competency in discussing sexual and drug use behavior with patients and in delivering brief HIV prevention interventions should be included in all ART-related training protocols.* Training protocols for clinicians should also include instruction in proper infection control, such as handling and disposal of sharp instruments.

- **HIV Prevention Training for Non-Health Care Professionals.** It may not be feasible to rely solely on clinical staff to deliver prevention services in medical settings. Clinical personnel in developing countries are already overburdened, and the weight of demands will only grow as the world embarks on an unprecedented expansion of HIV treatment programs. Indeed, surveys in industrialized countries also indicate that the pace of clinical care often makes it difficult for health care workers to deliver prevention services.[29]

  A more sustainable strategy may be to structure clinical episodes to permit trained non-health care professionals to provide prevention services. For example, a patient waiting to see a clinician can be provided with HIV prevention information and referred to other needed services. Clinics and other health settings should also offer the option of a one-on-one meeting with a counselor during clinic visits.

- **Integrating HIV Prevention into Adherence Support Programs.** Early ART initiatives in developing countries have incorporated strategies to help patients adhere to treatment. Adherence support strategies that have been

* In Uganda, where aggressive plans are underway to extend access to ART beyond the private sector, an alliance of Ugandan and North American physicians and academic experts is helping the country expand human capacity by training clinical staff in the management of HIV/AIDS, including ART. The training curriculum in Uganda now includes sessions specifically devoted to HIV prevention and the delivery of brief HIV prevention messages and counseling in clinical settings.

OPPORTUNITIES FOR HIV PREVENTION IN THE HEALTH CARE SYSTEM

Health Care Settings	HIV Treatment Settings	Other Settings
STD treatment clinics	ART delivery sites	Voluntary counseling and testing sites
Reproductive and family planning clinics	Treatment education initiatives	PLWHA support programs
TB clinics	Treatment adherence programs	
Substance abuse clinics		
Prevention of mother-to-child transmission centers		
Prenatal settings		

Figure 4. HIV prevention should be integrated into each step in the health care process — especially in settings frequented by people who are at higher risk for HIV infection. Each site should offer prevention counseling, voluntary HIV testing, and appropriate prevention tools, such as condoms. HIV-positive people should be referred to treatment, where prevention counseling specifically designed for HIV-positive people should be delivered, and HIV-negative people should continue to receive prevention support and education both within and outside of the health care system.

used in developing countries include support groups and counseling interventions in Khayelitsha, South Africa, community-based adherence workers (known as accompagnateurs) in Haiti, and various informational, counseling, and support services in other locations. Because adherence support and HIV prevention services both seek to influence individual behavior, adherence programs provide an especially efficient entry point for discussion of HIV prevention.

- **Access to Condoms.** Male and female condoms should be readily available in all health care settings, but the "condom gap" is substantial. For example, current donor country funding for condoms is sufficient to provide roughly three condoms per year for every adult male in sub-Saharan Africa.[30] As ART attracts many more people to health care settings, clinics provide an optimal venue to help close the gap in condom access, which in sub-Saharan Africa alone is estimated at 1.9 billion condoms annually.[31] In addition to increasing the condom supply, distribution problems often contribute to condom shortages. As in the case of ART, assuring a continuous supply of high-quality condoms is an urgent global necessity. Addressing stock supply issues for ARVs could yield important lessons for condom supplies, as well.

Delivering HIV Prevention Services in Non-ART Sites

An integrated response to HIV/AIDS will ensure that prevention and ART services are made available in key health care and social service sites that might be used by people with HIV.

- **Prenatal Clinics and PMTCT Programs.** Prenatal care clinics are essential venues for delivering prevention services to women, as they are often the only point of contact women in developing countries have with the health system.[32] Programs that implement measures to prevent mother-to-child HIV transmission (PMTCT) also offer an ideal venue for delivery of a broad array of HIV prevention services. In many respects, PMTCT programs are in the vanguard of efforts to integrate prevention and HIV treatment. Recognition of the importance of ART for mothers who test HIV-positive in prenatal settings led to the formation in December 2001 of the MTCT-Plus initiative. Based at Columbia University's Mailman School of Public Health in New York, MTCT-Plus seeks to provide lifelong care and ART to HIV-affected families in developing countries. The initiative is supporting HIV treatment programs in 12 demonstration sites and providing additional financing for planning in 13 other sites, with an initial goal of enrolling 10,000 people.

- **TB and STD Clinics.** TB and STD clinics constitute critical entry points for HIV treatment and care, as well as for

EARLY EXPERIENCE WITH COORDINATED PREVENTION AND TREATMENT PROGRAMS

Although ART programs are in their early stages in developing countries, there are several examples of efforts by countries to simultaneously scale up prevention and treatment, and some pilot projects are specifically exploring strategies to integrate HIV prevention in ART settings.

Brazil: Expanded Access to Prevention and HIV Treatment

The response to HIV/AIDS in Brazil predated the emergence of combination ART in the mid-1990s. Early responses to the epidemic — facilitated by strong community activism and financial support from the World Bank — included public AIDS awareness efforts, initiatives to ensure the safety of national blood supplies, and provision of AZT to HIV-positive patients through the public sector. Brazil has also prioritized research on new prevention technologies, beginning with the initiation of a National AIDS Vaccine Task Force in 1992.

Distribution of ART through the public sector began in 1996 in São Paulo and Rio de Janiero and was then extended nationwide. Since 1996, more than 141,000 people have received ART through the public sector in Brazil. Nationwide access to ART has enabled the country to avert an estimated 58,000 new AIDS cases and an estimated 90,000 deaths, reduce HIV-related hospitalizations seven-fold, and realize net savings of $2.2 billion.[33] Brazil's ART program benefited from the national capacity to manufacture high-quality, lower-cost generic equivalents of antiretroviral drugs.

The advent of ART in Brazil also produced extraordinary changes in the public response to the epidemic. In the first year of the country's ART program, the number of people entering the HIV/AIDS care system rose by 30%. AIDS activism and public awareness of the epidemic have significantly strengthened since ART was introduced.[34]

Brazil has coupled its ART program with energetic prevention efforts, including a major nationwide testing initiative called "Be Aware" to identify approximately 376,000 people who are estimated to be infected with HIV, but are unaware of their infection. The result has been a simultaneous increase in use of ART and voluntary counseling and testing (see Figure 5). Between 1994 and 2000, the country also initiated dozens of needle exchange projects, which resulted in steep declines in HIV incidence among injection drug users. Between 1996 and 2000, as the country aggressively promoted condoms, sales of condoms increased by 57%.[35]

South Africa: An Integrated Response by the Private Sector

A promising South Africa-based program is in the early launching stage. South Africa's national HIV prevention program for youth — loveLife — supports development of HIV service delivery in government clinics around the country. In partnership with the South African mining company Anglo American, loveLife is working to integrate prevention and HIV treatment programs in communities where Anglo American has its main operations.

Anglo American was an early leader among large South African employers to commit to providing ART to its workers. The partnership with loveLife will extend the benefits of Anglo's treatment program to the families of its employees and communities in which it operates. This program will establish comprehensive HIV/AIDS services, including ART management, in government clinics in the target sites within the context of an intensive ongoing HIV education and prevention effort.

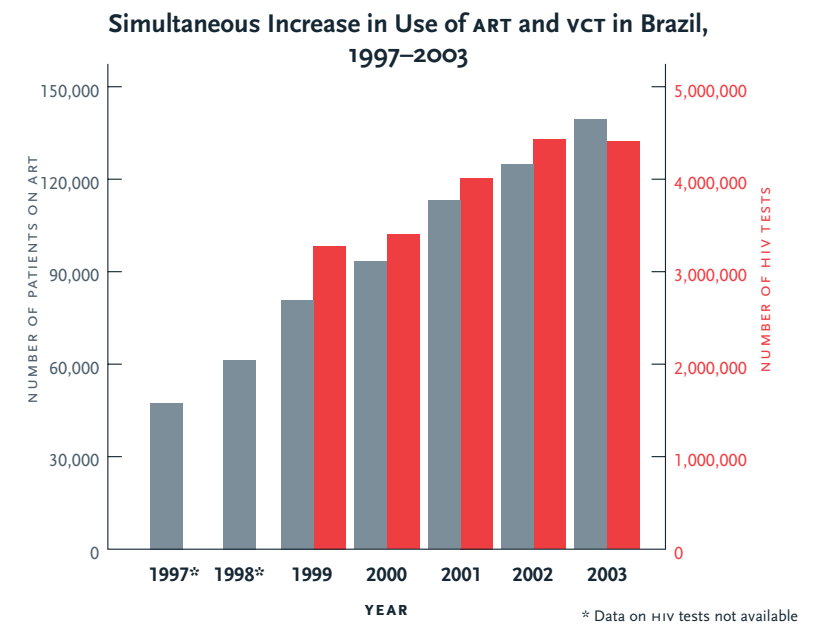


Figure 5

South Africa: Incorporating Prevention in Treatment Settings

In the Khayelitsha township near Cape Town, South Africa, Médecins sans Frontières (MSF) provides HIV/AIDS medical services in a primary care setting. The MSF project relies on generic medications and seeks to integrate HIV, TB, and STD treatment services. The program includes standardized regimens, laboratory monitoring, and patient-centered adherence support strategies. Prevention programs in the Khayelitsha project offer group services on risk reduction counseling and disclosure of HIV status to partners.

The Khayelitsha project provides ARVs to more than 400 patients. Median weight gain at six months is 8.8 kg, and at 12 months there is an 83% survival rate and a 70% reduction in opportunistic infections. Adherence rates are as high as those reported in developed countries, and 91% of patients have undetectable viral loads at six months.

There is early evidence that the Khayelitsha project may be influencing public attitudes in ways that support HIV prevention. Surveys of South African commuters at nine different sites found that residents of Khayelitsha had greater awareness of HIV, more positive feelings toward voluntary HIV testing, and higher rates of condom use.

The Khayelitsha project in South Africa has successfully provided HIV treatment while increasing condom use in the community.

MSF, working in partnership with provincial health authorities and the Nelson Mandela Foundation, has recently expanded its HIV treatment activities in South Africa to rural public health clinics sites in the Eastern Cape Province. South Africa's national HIV prevention program for youth, loveLife, is working in the same clinics in an effort to ensure ongoing integration of prevention services.

Haiti: Integrating Prevention and HIV Treatment

Partners in Health has long administered a rural health program in Haiti that has delivered directly observed TB therapy. In 1998, the program began extending this model to HIV/AIDS, providing combination ART free of charge.

The Haiti project relies primarily on community-based care that is closely monitored by outreach workers known as accompagnateurs. In addition to observing patients take their therapy, accompagnateurs provide practical and social support to individuals enrolled in the program. They receive extensive training on TB and HIV, including medications and their side effects, confidentiality, referral systems, and strategies for promoting adherence. Given the many social and economic challenges confronted by individuals in rural Haiti, both clinical and non-clinical staff participate in addressing non-medical impediments to adherence and health promotion.

A key feature of the Haiti program is its incorporation of HIV prevention interventions, many of them led by people with HIV themselves. Patients are routinely counseled to avoid risky behaviors.[36]

Results of the program have been encouraging. The Partners in Health program is currently following more than 3,000 patients living with HIV/AIDS and providing ARVs (through directly observed therapy) to more than 400 patients. Eighty-six percent of patients on ARVs have suppressed viral loads, all have experienced weight gain and other improvements in health, and fewer than 10% have required medication changes due to side effects. This model is now being expanded in other parts of central Haiti and in certain urban areas.

Botswana: Simultaneous Scale-Up of Prevention and ART

Botswana was the first African country to initiate a comprehensive response to the epidemic that includes both access to ART and strengthened HIV prevention efforts. Partnering with the Bill & Melinda Gates Foundation and The Merck Company Foundation/Merck Co., Inc., the government of Botswana introduced ART in four clinics in 2002. As of April 2004, the ART component of Botswana's comprehensive program, known as MASA, was providing ART to approximately 14,000 patients.

ART access is one component of a comprehensive plan set forth in Botswana's national HIV/AIDS strategy. In late 2003, Botswana decided to routinely offer VCT in medical settings. The country is installing 10,500 condom vending machines in diverse settings and supporting these with social marketing campaigns. Having installed video equipment in all the country's schools, Botswana is training teachers to play a role in delivering HIV prevention messages to young people. The government is conducting a series of trainings over three years to enhance the ability of diverse communities and stakeholders to develop and deliver prevention interventions that are tailored to local needs and circumstances. Botswana is also enhancing support programs for children orphaned by AIDS, providing funding to organizations of people living with HIV/AIDS, educating its citizens about HIV/AIDS and available treatments, and making an offer of HIV testing and counseling routine in medical settings.

All materials and standard presentations on HIV/AIDS, including those specifically targeted to HIV-positive people, emphasize the importance of HIV prevention and provide information on correct and consistent condom use. In 2004, Botswana will increasingly focus on strategies to enhance the integration of prevention and treatment components.

enhanced prevention programming for people at increased risk of acquiring HIV. TB is the leading cause of death for people with HIV, underscoring the necessity of close linkages between TB and HIV/AIDS clinical services.[37] Likewise, as untreated STDs significantly increase the risk of HIV transmission, STD service settings are ideally positioned to provide HIV testing and to deliver HIV prevention interventions.

- **Family Planning and Reproductive Health Services.** Family planning and reproductive health services function as a key entry point for HIV-infected and at-risk women, providing voluntary HIV counseling and testing, STD screening and treatment, and information to permit HIV-positive and HIV-negative women to make informed reproductive health decisions.[38] These settings serve as potentially critical venues for the delivery of enhanced HIV prevention services and linkage to ART.

Promoting ART in HIV Prevention Settings

Not only is HIV prevention critical to reducing the number of people who will ever need ART and thus helping to preserve the financial and logistical feasibility of HIV treatment programs, but prevention programs also have a vital role to play in the promotion and delivery of ART.

- **HIV Prevention Outreach and Education.** Prevention workers should actively promote knowledge of serostatus; educate communities about ART availability, benefits, and limitations; and facilitate linkages to care.

- **Harm Reduction Programs.** Harm reduction programs offer an ideal venue for delivery of ART and other HIV-related medical services. This is especially important in the many countries where IDUs experience overwhelming barriers to care.

Coordinated Planning to Promote an Integrated Approach

In developed countries, bureaucratic structures have often separated HIV prevention and treatment programs. In practice, this resulted in prevention programs that focused on HIV-negative individuals and care settings that provided few, if any, prevention services for HIV-positive people. As the expansion of ART access in developing countries gets underway, the global community has an opportunity to do things differently and ensure maximum synergy between prevention and treatment. A potentially ideal vehicle for promoting careful integration of prevention and HIV treatment at the country level is the Global Fund, which already mandates that all funding proposals be developed by Country Coordinating Mechanisms. Similarly, the World Bank Multicountry AIDS Program, which has pioneered new ways of channeling HIV-related funds to affected communities, offers another important avenue for the integration of prevention and treatment services.

HIV PREVENTION FOR PEOPLE LIVING WITH HIV

Because so few people in developing countries are aware of their HIV status, prevention programs have often relied on general messages that implicitly assume that all individuals are in the same situation. This approach has sometimes limited the effectiveness and sophistication of HIV prevention strategies.

Every new HIV infection through sexual behavior or injecting drug use requires the participation of one individual who is HIV-positive and one who is HIV-negative. In addition, HIV-positive people can be reinfected with another strain of HIV, and emerging evidence suggests that reinfection may accelerate the progression of HIV disease.[39] To maximize the likelihood of success, prevention strategies should influence the behaviors of each partner. However, individual needs, perspectives, and risk reduction challenges can differ substantially depending on HIV status. As more people become aware of their HIV status as ART access expands, prevention programs will need to craft carefully tailored strategies that are optimally effective for different audiences.

Although a positive test result typically prompts HIV-positive people to avoid transmitting HIV to others, evidence in developed countries indicates that a notable share of people with HIV infection have difficulty implementing and/or sustaining safer behavior.[40] Historically, in both developing and industrialized countries, HIV prevention strategies have almost exclusively targeted individuals who are uninfected or untested.[41]

In recent years, experts have recommended the development and implementation of community-based prevention services that are specifically targeted to people with HIV/AIDS.[42] The U.S. Centers for Disease Control and Prevention (CDC), for example, allocated $35 million in FY2003 to program models that address HIV prevention in the context of ART access. Specifically, CDC is supporting a

UNIQUE NEEDS OF KEY POPULATIONS

While greater ART access will generally afford new opportunities to strengthen HIV prevention, certain key populations will not necessarily benefit from integrating prevention programs into health care settings, including those who do not regularly use health care or experience special barriers to access. Making the integration of prevention and health care services meaningful for certain populations will require additional funding, policy reforms, and outreach.

▶ **Young People.** Although young people account for one-half or more all new HIV infections, they typically enter HIV/AIDS care systems many years after infection, when they are adults. In addition, young people generally have limited health care options. Even when youth-oriented HIV-specific health services are available, HIV stigma often discourages young people from seeking care.

South Africa's Adolescent-Friendly Clinic Initiative, a partnership between the national loveLife program and the South African health ministry, offers a potentially useful strategy for overcoming historic impediments to care for young people and for integrating HIV prevention into ART settings. The initiative, supported in large part by financing from the Global Fund, is establishing comprehensive youth-friendly HIV services, including treatment monitoring, in public clinics throughout the country. To encourage young people to frequent the clinics, loveLife maintains outreach, youth activities, and educational programs in the surrounding communities and clinics. loveLife-trained peer educators, based in the clinics, provide clinic attendees with HIV prevention information and counseling.

▶ **Women.** Women represent about 50% of all people living with HIV, including 58% in sub-Saharan Africa. Infection rates are especially high among teenage girls due to numerous factors, including greater physical susceptibility to infection and the high prevalence of sex with older men, who are more likely than younger men to be HIV-infected. The above-noted strategies to increase health service utilization for young people will help draw young girls into care, where they can receive both medical and HIV prevention services.

In addition, programs must acknowledge the multiple social, legal, and economic disadvantages that women confront. Health services must address access barriers faced by many women, including lack of transportation, lack of child care, and limited options for women-oriented care.[43] HIV treatment and prevention programs should provide guarantees of privacy and confidentiality, and counseling, referrals, and follow-up about the risk of abandonment or violence after disclosing their HIV status, including links to safe shelters for women.

The Elizabeth Glaser Pediatric AIDS Foundation (EGPAF) reports that participation in its PMTCT clinics has increased, due in part to concerted efforts to make clinic attendance more attractive to women. Where transportation, child care, and other support services are provided, women often come to view the clinic as a refuge from the day-to-day pressures associated with caregiving. Several EGPAF sites now participate in the MTCT-Plus initiative, which offers HIV-infected women access to ART and primary care. Safer sex counseling is integrated in all EGPAF sites.

▶ **Injecting Drug Users.** Worldwide, IDUs account for approximately 10% of all HIV infections.[44] In many parts of the world, injecting drug use is driving the epidemic, with IDUs representing the largest share of cases.[45]

Due to longstanding barriers to health care access experienced by injection drug users,[46] bringing prevention to traditional clinical settings may not suffice to produce an integrated public health strategy. In the case of IDUs, it may be more feasible to bring ART to more accessible and client-centered harm reduction programs that are currently providing essential HIV prevention services, such as syringe and needle programs, drug substitution therapy, and mobile van programs.

Integration of prevention and treatment in harm reduction settings will require substantially greater support for harm reduction programs. In the Russian Federation, for example, existing harm reduction services are able to reach only about 3–5% of those in need.[47] In Russia and several other countries in Central Asia and Eastern Europe, legal reform is also needed to eliminate harassment of harm reduction programs and to legalize methadone maintenance or other drug substitution therapy.[48]

series of U.S.-based demonstration projects to evaluate and compare various approaches to "prevention for positives."[49]

Prevention programs targeted to HIV-positive people must, for example, underscore that transmission is still possible, even when a person is on ART. It is critical that research be undertaken to determine the most effective messages to influence the risk behavior of HIV-positive people.

ART will help many people with HIV recover sexual desire that had been lost due to illness. Prevention programs for people with HIV must acknowledge the natural desire to engage in sexual activity, and provide individually tailored support to facilitate safer sexual choices.[50]

As fewer people become ill and fewer die, AIDS may come to seem less threatening and risk behavior could increase.

Organizations of people living with HIV are often ideally positioned to deliver HIV prevention services. In Thailand, national efforts to expand access to ART have enlisted HIV-positive patients on therapy to help convince the public that HIV therapy works. Botswana's national AIDS program provides financial support to organizations of people with HIV, enabling them to build capacity to increase understanding of the benefits and limitations of ART, and provide education and counseling on living with HIV/AIDS.

HIV PREVENTION FOR PEOPLE WHO ARE UNINFECTED OR UNTESTED

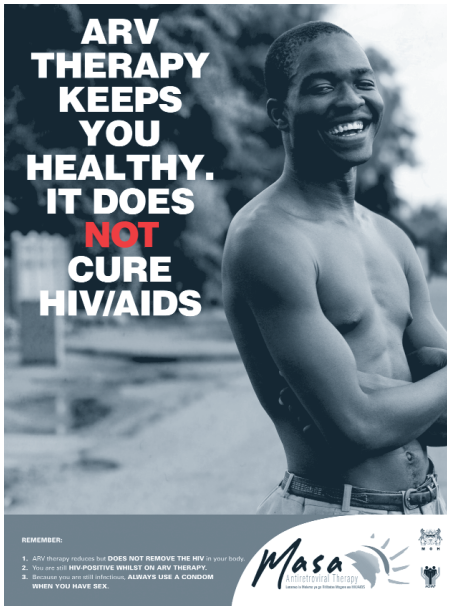
While greater ART access will have the most obvious impact on people living with HIV, it may also alter the perspectives of people who are uninfected or untested. As fewer people become ill and fewer die, the disease may come to seem less threatening. Individuals who have taken steps to reduce their risk due to fear of contracting HIV may over time relax their guard against infection.

As ART access expands, prevention programs will need to anticipate such potential behavioral shifts by helping people understand both the benefits and limitations of current therapies. In particular, common ground must be found between the need to stress the potential benefits of ART and the prevention imperative of emphasizing that HIV infection, a preventable and incurable condition, should be avoided.

Key to striking a reasonable balance between these competing interests is the development of meaningful "treatment literacy" in developing countries.[51] Improving community-based treatment awareness will help people understand HIV treatment options, assist in the de-stigmatization of the disease, enable the broader public to make informed decisions on the risks and benefits of relevant behaviors, and help individuals understand that people on ART are still infectious.

Botswana's national ART program — entitled MASA, which means "hope" in the local language — couples the use of hope in its public messages with extensive education regarding the benefits and limitations of therapies. To ensure that its emphasis on hope does not lull people into a sense of complacency, Botswana subjected its program logo and materials to pre-testing by experts at the University of Botswana. Adopting a "train-the-trainer" model, Botswana has trained 60 full-time treatment educators to present information on HIV treatments in workplaces, churches, schools, and other community gathering places.

In this HIV treatment education initiative, Botswana balances the positive news about ART with information about the limitations of current drugs. Botswana's program, for example, strongly emphasizes that ART is not a cure for HIV/AIDS. Educational sessions inform participants of the side effects of ART and note that people infected with the virus are encouraged to stay off ART until such drugs are medically indicated. All presentations and materials produced in connection with Botswana's treatment literacy initiatives emphasize condom use and provide instructions on how to use condoms correctly.



This poster from Botswana's MASA HIV treatment program is part of a campaign to educate the public about the benefits and limitations of HIV therapy.

As ART access expands, timely information on the behavioral impact of ART will be critical to effective prevention planning. Research will also be needed to identify effective prevention messages and program models in an era of more widespread access to ART.

FUNDING A COMPREHENSIVE RESPONSE

Although funding for HIV/AIDS programs has increased in recent years, it remains far short of what is needed for an effective response to the global epidemic. UNAIDS estimates that funding for HIV-related interventions at the country level totaled $4.7 billion in 2003 — less than one-half of amounts needed by 2005 ($10.5 billion) and under one-third of what will be required by 2007 ($15 billion).[52] Separate estimates by WHO/UNAIDS project that $5.5 billion will be needed over the 2004–2005 period to ensure 3 million people on ART in high-priority countries. Funding for research into new prevention technologies should also increase substantially to $1 billion annually for HIV vaccines and $300 million annually for microbicides by 2007. Resources should also increase for research into other prevention techniques such as female condoms, circumcision, treatment of viral STDs, and oral chemoprophylaxis.

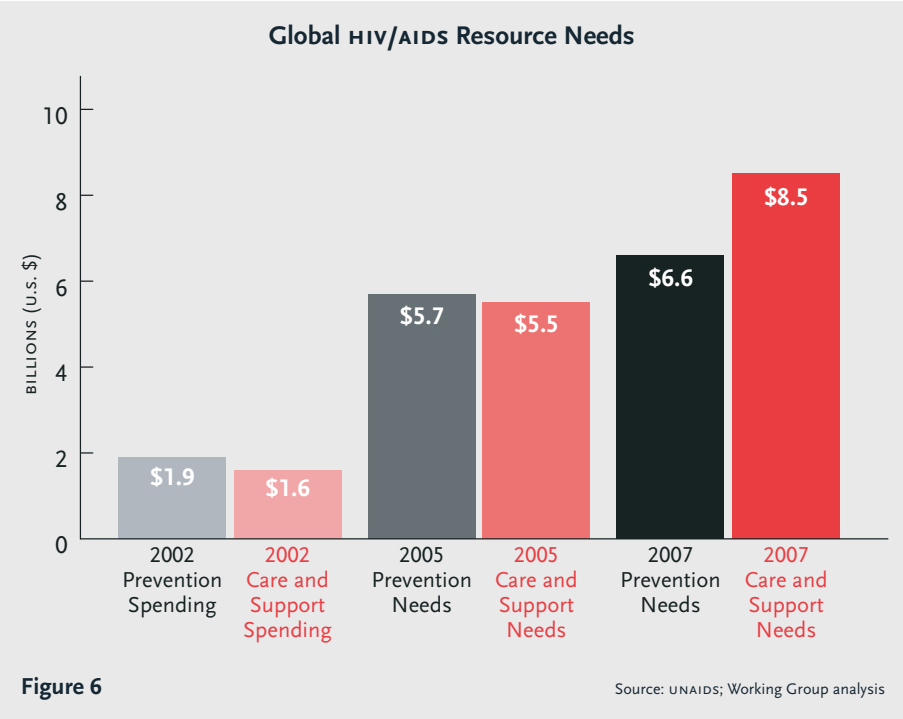


Figure 6

Source: UNAIDS; Working Group analysis

As a result of under-financing, prevention programs currently reach fewer than one in five of people at high risk of infection, and only 7% of people in low- and middle-income countries who need ART have access to the regimens. Only 5% of pregnant women received services in 2001 to prevent mother-to-child transmission; 12% of individuals who wanted to be tested for HIV had access to testing and counseling services; and 19% of injecting drug users could obtain harm reduction services. Globally, fewer than one in four people worldwide had access in 2001 to basic AIDS education, and only 42% of people who wanted to use a condom during sex could obtain one.

The costs of integrating prevention into HIV treatment settings may be relatively small. The cost of failing to integrate prevention and treatment services, however, will be significant since the number of new infections will continue to grow, with a resulting need to continually expand HIV treatment services. Due to dramatic under-funding of HIV/AIDS programs of all kinds, however, integrated programs will reach few who need them unless the entire response to the epidemic is brought to scale. To capitalize on the momentous opportunity afforded by ART access to produce durable progress against the epidemic, funding for both prevention and treatment programs must simultaneously increase.

Unfortunately, the experience in developed countries, where ART scale-up began in the mid-1990s, suggests that commitment to prevention sometimes wanes when new treatments emerge. In the U.S., for example, public sector expenditures for HIV treatment and research are substantially higher than those devoted to prevention activities. In recent years, public spending on HIV prevention has grown at a notably slower pace than other forms of HIV-related programming (e.g., care and treatment, housing, and research).[53]

In addition to inadequate funding, a major barrier to rapid expansion of prevention and HIV treatment programs is the frequent lack of national capacity to absorb substantial new funding. To make funding increases meaningful, donors, technical agencies, national governments, and other stakeholders must also significantly strengthen efforts to expand sustainable national capacity.

When ART first emerged in the mid-1990s, wealthy countries rapidly brought treatment programs to scale, ensuring universal access to these new therapies. ART access, for example, produced dramatic public health results. In the U.S., HIV-related mortality declined by 66% between 1995 and 2002.[54]

As ART programs were expanded in industrialized countries, however, prevention messages often continued to be the same ones used in the pre-ART era.

As ART drew patients to health care settings, HIV prevention interventions were not incorporated in clinical practice. Surveys have repeatedly found that HIV health care providers in the U.S. seldom inquire about sexual risk behavior or provide related counseling.[55]

In the treatment era, risk behaviors have increased in industrialized countries. Especially among men who have sex with men (MSM), substantial evidence has emerged of an overall increase in risk behavior in recent years.[56] Outbreaks of syphilis and gonorrhea among MSM illustrate the increased level of risk behavior in many industrialized countries.[57] Several studies have linked these increases in risk behavior to the growing perception among many MSM that the advent of ART has made HIV/AIDS less threatening,[58] particularly as HIV-related mortality has declined.

Recently, evidence indicates that this phenomenon is beginning to affect the trajectory of the HIV/AIDS epidemic in some industrialized countries.

In the United Kingdom, where studies have documented recent increases in sexual risk behavior, nearly twice as many people were diagnosed with HIV in 2002 as in 1998. For the European Union as a whole, the annual number of new HIV diagnoses increased notably between 2000 and 2002 among all major population groups except injecting drug users, with especially significant increases among heterosexuals (excluding cases among immigrants from countries with generalized HIV/AIDS epidemics).[59] The rate of new HIV diagnoses is also on the rise in Canada, with notable increases among MSM.[60] In Australia, the annual number of new HIV diagnoses increased by 23% between 1998 and 2002, with a growing share of new diagnoses representing recent infection.[61]

Likewise, in the U.S., the overall increase in risk behavior appears to have overwhelmed the beneficial prevention effects of widespread ART utilization.[62] In the 29 U.S. states that had HIV infection reporting systems in place by 1999, the number of HIV diagnoses among MSM significantly increased between 1999–2002.[63] Analysis of available data has led CDC to conclude that these trends in new diagnoses likely reflect an actual increase in new infections (as opposed, for example, to increased utilization of testing services and knowledge of HIV status).[64]

In response to these emerging trends, public health agencies in industrialized countries are now actively working to update prevention strategies to ensure their effectiveness in the treatment era. The U.S. Department of Health and Human Services recently issued recommendations for incorporating HIV prevention services in HIV-related medical care settings.[65] In 2003, CDC announced a new national HIV prevention strategy with an emphasis on prevention/treatment integration; key components include promoting HIV testing and counseling, implementing prevention programs specifically targeted to people living with HIV, and strengthening national efforts to prevent mother-to-child transmission.

As HIV treatment expands in developing countries, the global community should learn from the experience of industrialized countries. As ART access is expanded, prevention services must be brought to scale as well. Prevention programs should be integrated in all health care settings, and prevention strategies should be revised to meet the differing needs of HIV-positive and HIV-negative people.

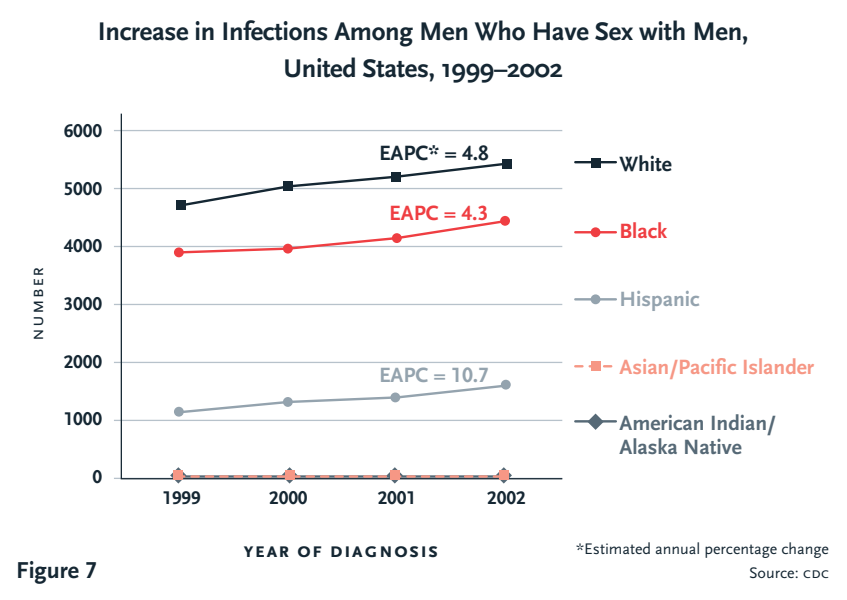


Figure 7

RECOMMENDATIONS

To capture the many opportunities to expand HIV prevention as access to ART increases and significantly reduce HIV incidence over the coming years, the Working Group makes the following recommendations and urges their rapid implementation:

1. INTEGRATE HIV PREVENTION AND TREATMENT

Access to voluntary counseling and testing programs should be significantly expanded.

► **In Areas Where ART Access Exists, Voluntary HIV Counseling and Testing Should Be Universally Offered in Diverse Health Care Settings.** Where ART access is available, providers should always offer voluntary HIV counseling and testing in a broad range of health care settings, including hospitals, PMTCT programs, family planning and reproductive health clinics, STD and TB clinics, blood donation sites, and in mobile health programs in rural areas.[66] Testing should in all cases remain confidential and voluntary, and clients should have the right to opt out of testing. All blood donations should be screened for HIV and other bloodborne diseases.

► **Funding Should Increase for VCT.** The number of VCT centers should significantly increase, and staffing for existing centers should grow. Testing services should be offered free of charge, as studies suggest that service fees often discourage individuals from voluntarily learning their HIV status.[67]

► **The Importance of Knowing HIV Status Should be Effectively Marketed.** State-of-the-art social marketing techniques should be used to promote knowledge of HIV status and address attitudinal barriers to voluntary testing. Social marketing has effectively been employed to promote condom use,[68] and early experience in developing countries suggests that social marketing may be successful, as well, in promoting use of HIV testing and counseling services.[69]

► **Expand Use of Rapid Testing Technologies.** Rapid testing technologies are ideal for widespread use in resource-limited settings, as they are relatively inexpensive,[70] are extremely accurate,[71] and do not require highly trained laboratory technicians.[72] Rapid testing enables individuals to receive test results in a matter of minutes rather than waiting for hours or even days. Rapid testing also permits VCT to be delivered in a wide range of non-clinical sites, including churches and mosques, workplaces and community centers.

► **Expand Access to Post-Test Services.** VCT sites, community groups, and HIV clinics should offer a variety of post-test services. Post-test services can provide vital HIV prevention information to people who have just tested positive, help HIV-positive individuals cope with their diagnosis, link individuals to ART, help individuals prevent transmission to their partners, and provide avenues for people living with HIV/AIDS to develop communications and advocacy networks.

All health care settings, including HIV treatment sites, should deliver HIV prevention services.

► **Deliver HIV Prevention Services in HIV/AIDS Clinical Settings.** Training in delivering brief HIV prevention interventions should be included in ART-related training protocols. Both clinical and non-clinical staff in health care settings should receive training, as all will need to contribute to the delivery of HIV prevention messages. Staff should also receive training in proper infection control procedures. Clinic appointments should be structured to facilitate the delivery of prevention interventions. Male and female condoms should be readily available in all health care settings. As new technologies emerge, such as vaccines or microbicides, health systems will need to adapt to quickly integrate these new prevention tools.

► **Integrate Prevention and Adherence Support Programs.** Clinic-based adherence counselors, leaders of patient support groups, and other adherence workers should receive HIV prevention training. Written informational materials on adherence should be supplemented with information on risk reduction targeted to the needs of people with HIV/AIDS.

► **Emphasize Prevention and ART in Prenatal Settings and in Programs to Prevent Mother-to-Child Transmission (PMTCT).** Early experience in the PMTCT field confirms that access to ART can facilitate HIV prevention. In the six Elizabeth Glaser Pediatric AIDS Foundation sites that have initiated ART programs through MTCT-Plus, demand for testing and counseling has significantly increased, and community attitudes toward HIV/AIDS have rapidly begun to change.

► **Provide Prevention and HIV Treatment in STD and TB Clinics.** Training should be provided to personnel in STD and TB clinics to enable them to deliver brief HIV prevention interventions. In addition, training should equip personnel in STD and TB clinics to make timely referrals for HIV prevention services and HIV/AIDS clinical care.

► **Integrate Prevention in Family Planning and Reproductive Health Services.** Because family planning and reproductive health services function as a key entry point for HIV-infected and at-risk women, HIV prevention training should be provided to reproductive health personnel.

► **Particular Efforts for Women.** Issues affecting HIV treatment and prevention access for women should be comprehensively addressed, ranging from cost of HIV treatment, transportation, and child care, to sufficient numbers of women health workers, and guarantees of privacy and confidentiality. ART and prevention programs should provide women with counseling, referrals, and follow-up about the risk of abandonment or violence after disclosing their HIV status, including links to safe shelters for women.

ART should be promoted and/or delivered in the context of prevention services.

► **Promote ART Through Prevention Programs.** Prevention outreach and educational efforts should promote knowledge of HIV status, educate people at risk about HIV/AIDS treatments, and facilitate linkage to care and treatment services.

► **Integrate Prevention and HIV Treatment in Harm Reduction Settings.** HIV/AIDS prevention and medical services — including access to ART, screening and treatment for TB and STDs, prevention interventions, and drug treatment — should be integrated into harm reduction programs for injecting drug users. Funding for harm reduction programs should significantly increase, and laws should be revised, where needed, to legalize methadone maintenance and needle syringe programming and address other official impediments to harm reduction.

Donors and national programs should prioritize integration of prevention and ART services.

► **All ART Initiatives Should Establish Policies to Promote Integrated Services.** In cooperation with national governments, donors should prioritize community-based strategies for the delivery of integrated ART and prevention programs. The Global Fund and the World Bank should prioritize funding for country proposals on HIV/AIDS that integrate prevention and ART. WHO should ensure that 3 by 5 Initiative staff receive training on HIV prevention as part of training and technical assistance activities. In their assistance to countries in developing proposals for the Global Fund, UNAIDS and WHO should emphasize the importance of integrating prevention services in HIV treatment settings. All bilateral funding sources should promote integration of prevention services in ART settings; for example, the U.S. government should ensure that all programs funded through the President's Emergency Plan for AIDS Relief (PEPFAR) integrate science-based HIV prevention in the delivery of HIV treatment. Countries should revise their AIDS strategic plans to prioritize integration of HIV prevention in ART settings.

► **Donors Should Require That Reports of Country Activities Specify How Prevention and HIV Treatment are Being Integrated.** Bilateral programs such as the U.S. PEPFAR initiative should require programs that receive funding to provide documentation on provision of prevention services in treatment settings and on clinical linkages and coordination with other prevention services.

Research efforts should be strengthened and expanded to help inform the scaling-up of an integrated response to HIV/AIDS.

▶ **Support Research on Integration.** Donors and research agencies should collaborate on research to identify the most effective strategies to integrate prevention and ART programs, and to promote testing and counseling services.

▶ **Research Results Must Be Disseminated Rapidly.** WHO and UNAIDS should develop communications mechanisms to facilitate rapid delivery of research findings to the field. Bilateral and international technical agencies should be prepared to assist national governments in integrating new research findings into national policies and programs.

2. DELIVER PREVENTION FOR HIV-POSITIVE PEOPLE

▶ **New Prevention Programs Tailored to the Needs of People Living with HIV Should Be Developed and Implemented.** "Prevention for positives" should include counseling regarding personal disclosure of HIV status, information on the ability of individuals to transmit HIV even while on ART, assistance in identifying and addressing impediments to safer behavior, and promotion of accessible STD screening. Programs should acknowledge the natural desire of many people with HIV to be sexually active, and provide individually tailored support to facilitate safer sexual choices.

▶ **All Countries Should Include the Delivery of Prevention Services for People with HIV in their National AIDS Plans.** Programs to address the unique HIV prevention needs of people living with HIV should be an integral part of each country's broader strategy to fight HIV/AIDS.

▶ **Prevention Services for People Living with HIV Must Be Supported by Strengthened and Sustained Efforts to Combat HIV-related Stigma and Discrimination.** In many countries, stigma against people living with HIV remains a major deterrent to expanded voluntary HIV counseling and testing and provision of ART and prevention services. Anti-stigma campaigns, anti-discrimination protections, and political leadership are all necessary to combat negative social attitudes.

▶ **Involve Organizations of People with HIV.** People living with HIV/AIDS (PLWHA) remain a major underutilized resource in the fight against the global epidemic. Donors should direct significant financial support to PLWHA organizations, and these organizations should be actively engaged in the delivery of HIV prevention services to HIV-positive people.

▶ **Research Should Be Urgently Undertaken to Identify Optimal Messages and Strategies for Reaching HIV-Positive People.** Best practices must be rapidly and widely disseminated.

3. ADAPT PREVENTION FOR HIV-NEGATIVE PEOPLE

▶ **Prevention Strategies for HIV-Negative and Untested People Should Be Revised to Emphasize the Continuing Importance of Risk Reduction.** Without further stigmatizing people living with HIV, prevention programs will need to persuade individuals at risk that HIV/AIDS remains a serious, incurable disease that should be avoided.

▶ **Community-Based Prevention and Education Programs Must Help People — Both Infected and Uninfected — to Understand the Benefits and Limitations of ART.** While promoting the benefits of ART, programs should emphasize that ART is not a cure and that patients undergoing treatment could spread the virus to their partners.

▶ **Capacity to Undertake Behavioral Surveillance and Sentinel Surveillance Must Be Significantly Expanded to Monitor the Behavioral Impact of ART.** Surveys should be undertaken to assess any behavioral impact of ART. Special studies should be undertaken to monitor new HIV infections in the treatment era. In addition, aggregate information from routine voluntary and confidential HIV testing should be collected and analyzed on an ongoing basis from key settings, such as prenatal clinics.

▶ **Research Should Identify Optimal Prevention Messages and Strategies in the Treatment Era.** The global community must prioritize research to identify effective messages in this new era and ensure the swift dissemination of best practices to the field.

4. FUND A COMPREHENSIVE RESPONSE

▶ **Funding for HIV Prevention and Treatment Programs Should Grow to at Least $10.5 Billion in 2005 and $15 Billion in 2007.** Even though existing prevention strategies could, if adequately funded, prevent 63% of all new infections projected during this decade,[73] HIV prevention has yet to attract sufficient donor support. With minimal ART coverage worldwide, funding for HIV-related treatment is even more inadequate. UNAIDS estimates that funding for all HIV-related interventions at country-level totaled $4.7 billion in 2003 — less than one-half of amounts needed by 2005 ($10.5 billion) and under one-third of what will be required by 2007 ($15 billion).

▶ **Funding Initiatives for Prevention and HIV Treatment Must Emphasize Both Short- and Long-term Strategies to Build Sustainable Capacity in Countries.** Short-term strategies may include intensive training initiatives, preceptorship programs, and virtual networks for consultation and learning. Longer-term strategies include substantial investments in medical and other education, health care infrastructure, as well as comprehensive efforts to strengthen key national sectors.

▶ **Support for HIV Prevention Research Should Be Substantially Increased.** Annual funding for HIV vaccine research should double from approximately $520 million to $570 million today to at least $1 billion in 2007. Annual funding for microbicide research should increase from less than $150 million today to $300 million in 2007. Funding for research into other prevention technologies — such as female condoms, diaphragms, circumcision, treatment of viral STDs, and oral chemoprophylaxis — should increase substantially. In addition, because the infrastructure needs for conducting HIV prevention research in developing countries are similar to the infrastructure needed for ongoing primary prevention and ART efforts, opportunities to participate in clinical trials of new prevention technologies should be linked with HIV testing, prevention, and treatment services.

REFERENCES

1 Holtgrave, Estimation of Annual HIV Transmission Rates in the United States, 1978-2000, *J Acquir Immune Defic Syndr* 2004;35:89-92.

2 *See* World Health Organization, *Coverage of Selected Health Services for HIV/AIDS Prevention and Care in Less Developed Countries, 2001*, 2002.

3 *Declaration of Commitment on HIV/AIDS*, ¶ 55, unanimously adopted by the United Nations General Assembly Special Session on HIV/AIDS, June 2001.

4 World Health Organization and UNAIDS, *Treating 3 Million by 2005: Making It Happen*, 2003 ("WHO/UNAIDS 3 by 5 Strategy").

5 Stover et al., Can we reverse the AIDS epidemic with an expanded response?, *Lancet* 2002;360:19-20.

6 *See* World Health Organization, *Increasing Access to HIV Testing and Counseling: Report of a WHO Consultation, 19–21 November 2002, Geneva, Switzerland*, 2002 ("WHO Testing Consultation").

7 *Ibid.*, Voluntary HIV-1 Counseling and Testing Efficacy Study Group, 2000. *See* U.S. Agency for International Development, *What Happened in Uganda? Declining HIV Prevalence, Behavior Change, and the National Response*, 2002.

8 *Ibid.*, WHO, 2002.

9 *See* De Cock et al., A serostatus-based approach to HIV/AIDS prevention and care in Africa, *Lancet* 2003;362:1847-49; *ibid.*, WHO Testing Consultation, 2002.

10 *See* Branson, *Point-of-Care Rapid Tests for HIV Antibodies*, *J Lab Med* 2003;27:288-95.

11 Mukherjee et al., *Access to Antiretroviral Treatment and Care: The Experience of the HIV Equity Initiative, Cange, Haiti*, 2003, available at www.who.int/hiv/pub/prev_care/en/Haiti_en_Final 2004.pdf.

12 MSF South Africa et al., *Antiretroviral Therapy in Primary Health Care: Experience of the Khayelitsha Programme in South Africa*, 2003, available at www.who.int/hiv/pub/prev_care/enSouth_Africa_E .pdf.

13 Presentation of Dr. Amilcar Tanuri, Brazilian Network for HIV Drug Resistance Surveillance, "Provision of ARV Therapy in Resource-Limited Settings: The Challenges of Drug Resistance and Adherence," Meeting sponsored by Global HIV/AIDS Program, World Bank, 17–18 June 2003.

14 Kilmarx et al., Living with HIV: Experiences and perspectives of HIV-infected sexually transmitted disease clinic patients after posttest counseling, *Sex Transm Dis* 1998;25:28-37; Hays et al., Actual versus perceived HIV status, sexual behaviors and predictors of unprotected sex among gay and bisexual who identify as HIV-negative, HIV-positive and untested, *AIDS* 1997;11:1495-1502; Wenger et al., Sexual behavior of individuals infected with the human immunodeficiency virus: The need for intervention, *Arch Int Med* 1994;154:1849-54; Higgins et al., Evidence for the effects of HIV antibody counseling and testing on risk behaviors, *JAMA* 1991;266:2419-29. *See also* UNAIDS, *The impact of Voluntary Counseling and Testing: A global review of the benefits and challenges*, UNAIDS Best Practice Collection, 2001 ("UNAIDS VCT Best Practices").

15 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 randomized trial, *Lancet* 2000;356:103-12.

16 *Ibid.*, MSF South Africa et al., 2003.

17 *Ibid.*, Mukhergee et al., 2003.

18 Porco et al., Decline in HIV infectivity following the introduction of highly active antiretroviral therapy, *AIDS* 2004;18:81-88. This hypothesis is presently being tested by HPTN 052, a randomized, placebo-controlled trial involving serodiscordant couples in Brazil, India, Malawi, Thailand and Zimbabwe.

19 Quinn et al., Viral load and heterosexual transmission of Human Immunodeficiency Virus Type 1, *N Engl J Med* 2001;342:921-29.

20 Palella et al., Declining Morbidity and Mortality Among Patients with Advanced Human Immunodeficiency Virus Infections, *New Eng J Med* 1998;338:853-60; 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.

21 Paterson et al. Adherence to Protease Inhibitor Therapy and Outcomes in Patients with HIV Infection. *Ann Intern Med* 2000;133:21-30.

22 Valdiserri, Mapping the Roots of HIV/AIDS Complacency: Implications for Program and Policy Development, *AIDS Ed & Prev*, in press. Gremy & Beltzer, HIV risk and condom use in the adult heterosexual population in France between 1992 and 2001: return to the starting point? AIDS 2004;18:805-09; Stolte et al., Homosexual men change to risky sex when perceiving less threat of HIV/AIDS since availability of highly active antiretroviral therapy: a longitudinal study, *AIDS* 2004;18:303-09.

23 Health Canada, *HIV/AIDS Epi Updates*, 2003.

24 Fleming et al., *HIV Prevalence in the United States*, Abstract, 9th Conference on Retroviruses and Opportunistic Infections, Seattle, USA, February 2002.

25 South African Press Association, October 19, 2003, cited in Henry J. Kaiser Family Foundation, *Daily HIV/AIDS Report*, October 21, 2003, www.kaisernetwork.org.

26 S. Kalichman & L. Simbayi, HIV testing attitudes, AIDS stigma, and voluntary HIV counseling and testing in a black township in Cape Town, South Africa, *Sex Transm Infect* 2003;79:442-47.

27 *See* studies cited in CDC, Incorporating HIV Prevention into the Medical Care of Persons Living with HIV, *MMWR* 2003;52:RR-12 ("CDC Guidelines").

28 Richardson et al., Effect of brief safer-sex counseling by medical providers to HIV-1 seropositive patients: a multi-clinic assessment, *AIDS* 2004;18:1179-86.

29 Kottke et al., Counseling: Implementing Our Knowledge in a Hurried and Complex World, *Am J Prev Med* 1999;17:295-98.

30 United Nations Population Fund, *Reproductive Health Essentials: Securing the Supply*, 2002.

31 J. Shelton & B. Johnston, Condom gap in Africa: evidence from donor agencies and key informants, *Brit Med J* 2001; 323:139-41)

32 P. Teixeira, Universal Access to AIDS Treatment: The Experience of Brazil, *Diffusion in Health for Debate* (Brazilian Centre for Health Studies) 2003; 27: 50-57.

33 Presentation of Paulo Teixeira, "Provision of ARV Therapy in Resource-Limited Settings: The Challenges of Drug Resistance and Adherence," Meeting sponsored by Global HIV/AIDS Program, World Bank, 17–18 June 2003.

34 *Ibid.*, Teixeira, 2003.

35 G. Levi & M. Vitório, Fighting against AIDS: the Brazilian experience, *AIDS* 2002;16:2373-83.

36 S. Blower et al., Predicting the Impact of Antiretrovirals in Resource-Poor Settings: Preventing HIV Infections whilst Controlling Drug Resistance, *CID — Inf Disorders* 2003;3:345-53.

37 Karim et al., Implementing antiretroviral therapy in resource-constrained settings: opportunities and challenges in integrating HIV and tuberculosis care, *AIDS* 2004;18:975-979.

38 Askew & Berer, The Contribution of Sexual and Reproductive Health Services to the Fight against HIV/AIDS: A Review, *Repro Health Matters* 2003;11:51-73.

39 Gottlieb et al., Dual HIV-1 infection associated with rapid disease progression, *Lancet* 2004;363:619-22.

40 *See* Crepaz & Marks, Towards an understanding of sexual risk behavior in people living with HIV: a review of social, psychological, and medical findings, *AIDS* 2002;16:135-49; Stall et al., The gay 90s: a review of research in the 1990s on sexual behavior and HIV risk among men who have sex with men, *AIDS* 2000;14(supp. 3):S101-14.

41 De Cock et al., A serostatus-based approach to HIV/AIDS prevention and care in Africa, *Lancet* 2003;362:1847-49; Janssen et al., The Serostatus Approach to Fighting the HIV Epidemic: Prevention Strategies for Infected Individuals, *Am J Pub Health* 2001;91:1019-24.

42 International HIV/AIDS Alliance, *Positive Prevention: Prevention Strategies for People with HIV/AIDS*, 2003; *ibid.*, CDC HIV Prevention Strategy, 2003; *ibid.*, Institute of Medicine, 2001; C. Collins et al., *Designing Primary Prevention for People Living with HIV*, Center for AIDS Prevention Studies, University of California San Francisco, 2000.

43 J. Fleischman, *Breaking the Cycle: Ensuring Equitable Access to HIV Treatment for Women and Girls*, Center for Strategic and International Studies, February, 2004.

44 UNAIDS, *Drug Use and HIV/AIDS*, Fact Sheet, United Nations General Assembly Special Session on HIV/AIDS, 2001.

45 UNAIDS, *AIDS Epidemic Update*, 2003.

46 Central and Eastern Europe Harm Reduction Network, *Injecting Drug Users, HIV/AIDS Treatment and Primary Care in Central and Eastern Europe and the Former Soviet Union*, 2002.

47 Information provided by Kasia Malinowska-Sempruch, Open Society Institute, December 2003.

48 Open Society Institute, *Unintended Consequences: Drug Policies Fuel the HIV Epidemic in Russia and Ukraine*, 2003; Central and Eastern European Harm Reduction Network, *Injecting Drug Users, HIV/AIDS Treatment and Primary Care in Central and Eastern Europe and the Former Soviet Union*, 2002.

49 *See* CDC, Advancing HIV Prevention: New Strategies for a Changing Epidemic, U.S., 2003, *MMWR* 2003;52:329-32.

50 *See* Pan American Health Organization, *Promotion of Sexual Health: Recommendations for Action*, 2000.

51 *See* Final Report, International HIV Treatment Preparedness Summit, Cape Town, South Africa, 13-16 March, 2003.

52 *See* UNAIDS, *Progress Report on the Global Response to the HIV/AIDS Epidemic*, 2003.

53 Alagiri et al., *Spending on HIV/AIDS: Trends in* U.S. *Spending on HIV/AIDS*, 2002, Henry J. Kaiser Family Foundation.

54 CDC, *Cases of HIV infection and AIDS in the United States, 2002*, 2003.

55 See Marks et al., Are HIV Care Providers Talking with Patients About Safer Sex and Disclosure?, *AIDS* 2002;16:1953-57; Dodge et al., Enhancing Primary Care HIV Prevention, *Am J Prev Med* 2001;20:177-183.

56 Mansergh, Paradigm shift for HIV prevention in the United States, *AIDSscience* 2002;2; 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; Gomez et al., 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, Georgia,1999.

57 CDC, Primary and Secondary Syphilis Among Men Who Have Sex With Men — New York City, 2001, *MMWR* 2002;51:853-856; CDC, Outbreak of Syphilis Among Men Who Have Sex with Men — Southern California, 2000, *MMWR* 2001;50:117-20; CDC, Resurgent Bacterial Sexually Transmitted Disease Among Men Who Have Sex with Men — King County, Washington, 1997–1999, *MMWR* 1999;48:773-76; CDC, Increases in Unsafe Sex and Rectal Gonorrhea Among Men Who Have Sex with Men — San Francisco, California, 1994-1997, *MMWR* 1999;48:45-48.

58 Suarez et al., Influence of a Partner's HIV Serostatus, Use of Highly Active Antiretroviral Therapy, and Viral Load on the Perceptions of Sexual Risk Behavior in a Community Sample of Men Who Have Sex with Men, *JAIDS* 2001;28:471-77; 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.

59 EuroAIDS information accessed on the Web site of French Health Ministry, at www.invs.sante.fr/publications/2003/vih_sida_ist_2003/vih_sida_en_france.pdf.

60 Health Canada, *HIV and AIDS in Canada: Surveillance Report to June 30, 2003*, 2003.

61 National Centre in HIV Epidemiology and Clinical Research, *HIV/AIDS, Viral Hepatitis and Sexually Transmissible Infections in Australia, Annual Surveillance Report 2003*, 2003.

62 Katz et al., Impact of highly active antiretroviral treatment on HIV seroincidence among men who have sex with men, *Am J Pub Health* 2002;92:388-94.

63 CDC, *HIV/AIDS Surveillance Report*, 2003:14.

64 CDC, Increases in HIV Diagnoses — 29 States, 1999–2002, *MMWR* 2003;52:1145-48.

65 CDC, Incorporating HIV Prevention into the Medical Care of Persons Living with HIV: Recommendations of CDC, the Health Resources and Services Administration, the National Institutes of Health, and the HIV Medicine Association of the Infectious Diseases Society of America, *MMWR* 2003;52:RR-12.

66 *See ibid.*, DeCock et al., 2003; Janssen et al., 2001.

67 Damesyn et al., Locally sustainable administration of HIV counseling and testing to young couples in rural regions of Western Kenya, XII World AIDS Conference, Geneva, Switzerland, 1998.

68 D. Meekers, Going underground and going after women: trends in sexual risk behaviors among gold miners in South Africa, *Int J STD & AIDS* 2000;11:21-26; F. Dubois-Arber et al., Increased condom use without other major changes in sexual behavior among the general population in Switzerland, *Am J Pub Health* 1997;87:558-66; J. Convisser, *The Zaire Mass Media Project*, Washington, D.C.: Population Services International, 1992.

69 *Ibid.*, WHO Testing Consultation.

70 Spielberg et al., HIV Testing with Oral Fluids and Rapid Tests Is More Effective and Less Costly, 2002 National STD Prevention Conference, San Diego, California, 4–7 March 2002.

71 Branson et al., How Well Do Rapid HIV Tests Detect Seroconverters?, XIV International AIDS Conference, Barcelona, Spain, 7–12 July, 2002; Calero et al., Rapid HIV-1 Diagnostic Algorithms for Use in HIV Infection Screening, XXIV International AIDS Conference, Barcelona, Spain, 7–12 July 2002.

72 Delaney et al., Ability of Untrained Users to Perform Rapid HIV Antibody Screening Tests, American Public Health Association Annual Meeting, October 2002.

73 *Ibid.*, Stover et al., 2002.

THIS REPORT IS AVAILABLE AT WWW.GATESFOUNDATION.ORG AND WWW.KAISERNETWORK.ORG