Positive prevention has been recommended by UNAIDS (the Joint United Nations Programme on HIV/AIDS), is being implemented in industrialized countries, is being implemented in Africa and other high-prevalence regions. We propose 10 approaches for implementing positive prevention in Africa that prioritize interventions with the largest potential impact on HIV transmission (TABLE). Some approaches have proven efficacy, some are being piloted, and some would benefit from exploration and development of evidence-based policy.

Implementation of Positive Prevention

Ensuring Individuals With HIV Learn Their HIV Status. The vast majority of individuals with HIV in Africa have never had an HIV test, although knowledge of HIV status has been associated with preventive behavior by individuals with HIV. Expansion of traditional voluntary counseling and testing, routine HIV counseling and testing in clinical settings, and mobile, community-based, and door-to-door testing would increase the proportion of individuals living with HIV who know their status and has begun in several countries. In Lesotho, a government-sponsored campaign aims to offer voluntary counseling and testing to all adults to achieve universal knowledge of serostatus. This should help to allow preventive behavior, informed partner selection, and increased access to care and treatment for all individuals with HIV.

Disclosure of HIV Status to Partners. Traditional HIV programs focus on individuals rather than couples or families, and a shift in approach is required to reach partners of individuals with HIV. One challenge is disclosure of HIV status, as rates of disclosure to sexual partners in Africa are generally low. Disclosure, especially to partners, may facilitate effective prevention of sexual transmission of HIV, prevention of mother-to-child transmission (MTCT), and treatment adherence. In Uganda, counselor-assisted disclosure for couples in their home or at a facility is being piloted, and in Kenya, partner disclosure by women with HIV has been associated with a 4-fold increase in reported condom use to nearly 70%.

TABLE

Disclosure of HIV Status to Partners

<table>
<thead>
<tr>
<th>Country</th>
<th>Disclosure Method</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesotho</td>
<td>Government-sponsored campaign</td>
<td>Voluntary counseling and testing to all adults to achieve universal knowledge of serostatus</td>
</tr>
<tr>
<td>Uganda</td>
<td>Counselor-assisted disclosure</td>
<td>Increased access to care and treatment for all individuals with HIV</td>
</tr>
<tr>
<td>Kenya</td>
<td>Partner disclosure by women with HIV</td>
<td>Increased condom use to nearly 70%</td>
</tr>
</tbody>
</table>

©2006 American Medical Association. All rights reserved.
African countries with mixed results, but could be adapted, in contextually appropriate ways, for HIV. Operational research is required to determine how to make HIV partner disclosure routine, expected, and safe, while protecting the rights of persons with HIV.

**HIV Testing of Partners.** Human immunodeficiency virus discordance within couples is common in Africa. Of married individuals with HIV in East Africa, approximately 40% to 50% have spouses who are HIV negative. However, in East Africa, only approximately 20% of adults with HIV are aware of their infection status, and condom use within marriage is low. Seronegative partners in discordant couples are likely to be Africa’s largest single risk group for HIV infection. In this context, knowledge of partners’ HIV status and safer sexual activity are needed in conjunction with faithfulness by individuals with HIV to reduce HIV transmission. Many clinicians and individuals who are HIV positive assume that sexual partners of infected persons must also

### Table. Positive Prevention Action Plan for Africa

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Potential Benefits</th>
<th>Possible Implementation Approaches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ensuring individuals with HIV learn their HIV status</td>
<td>Allows for efficient targeting of prevention efforts&lt;br&gt;Facilitates early entry into care and treatment</td>
<td>Implementation of a range of testing approaches, including routine HIV counseling and testing in clinical settings&lt;br&gt;100% access to voluntary counseling and testing through door-to-door programs&lt;br&gt;Stand-alone, mobile, and family-based voluntary counseling and testing</td>
</tr>
<tr>
<td>Supporting HIV status disclosure by individuals who are HIV positive</td>
<td>Involves partner in prevention, care, and support</td>
<td>Disclosure by individual with HIV&lt;br&gt;Counselor-assisted disclosure&lt;br&gt;Voluntary partner notification</td>
</tr>
<tr>
<td>Testing and counseling of sexual partners of individuals with HIV</td>
<td>Identifies previously undiagnosed HIV infections and HIV-discordant couples&lt;br&gt;Facilitates transmission prevention</td>
<td>Integration of partner testing as routine component of prevention, care, and treatment programs&lt;br&gt;Facility, mobile, and home-based voluntary counseling and testing provision&lt;br&gt;Counseling of couples</td>
</tr>
<tr>
<td>Provision of ART</td>
<td>Reduces viral load and risk of HIV transmission&lt;br&gt;Provides opportunities for integrating prevention into ART programs</td>
<td>Ensure access to and provision of ART for those individuals clinically eligible&lt;br&gt;Ensure education emphasizing that ART does not eliminate transmission risk&lt;br&gt;Incorporate free condom and family planning services into ART programs</td>
</tr>
<tr>
<td>Behavioral interventions for individuals with HIV</td>
<td>Focuses on source of new infections&lt;br&gt;Reduces frequency of unprotected sexual acts&lt;br&gt;Reduces HIV transmission risk</td>
<td>Individual, group, and structural interventions for individuals with HIV to promote abstinence, reduced frequency of sex, partner reduction, condom use, and nonpenetrative means of sexual expression&lt;br&gt;Addiction treatment and behavioral interventions for drug users with HIV&lt;br&gt;Use of clinical practitioners as well as counselors and peer supporters&lt;br&gt;Ongoing interventions for HIV-discordant couples</td>
</tr>
<tr>
<td>Selection of low-risk blood donors</td>
<td>Reduces risk of HIV transmission through blood transfusions</td>
<td>Volunteer blood donors with screening based on locally determined risk factors&lt;br&gt;Emphasis on repeat donors</td>
</tr>
<tr>
<td>Prevention of unintended pregnancies among women with HIV</td>
<td>Prevents vertical transmission&lt;br&gt;Reduces HIV infection risk for women who are HIV negative in HIV-discordant couples</td>
<td>Integration of family planning counseling and services into care, treatment, and MTCT prevention programs&lt;br&gt;Training for AIDS service practitioners in family planning counseling and service delivery</td>
</tr>
<tr>
<td>Universal access to more effective prevention of MTCT for pregnant and delivering women with HIV</td>
<td>Reduces HIV transmission risk from HIV-positive mothers to their infants</td>
<td>Routine HIV testing and counseling for all pregnant and delivering women&lt;br&gt;Full package of MTCT prevention interventions, including ART prophylaxis and treatment&lt;br&gt;Provision of breast milk alternatives and early-weaning counseling, according to country guidelines</td>
</tr>
<tr>
<td>STI screening and treatment for individuals with HIV and their partners</td>
<td>Reduces HIV transmission and acquisition risks</td>
<td>Routine STI screening for all individuals with HIV in care and treatment programs and partner notification should be considered&lt;br&gt;Guidelines for effective approaches to STI diagnosis and treatment for individuals with HIV should be developed</td>
</tr>
<tr>
<td>Promotion of leadership by individuals with HIV in positive prevention</td>
<td>Supports a human and civil rights approach and ownership by target group</td>
<td>Support for HIV/AIDS organizations that promote individuals with HIV to become implementers and leaders in advocating positive prevention</td>
</tr>
</tbody>
</table>

Abbreviations: ART, antiretroviral therapy; HIV, human immunodeficiency virus; MTCT, mother-to-child transmission; STI, sexually transmitted infection.
be infected with HIV and see no need for partner testing. Ensuring that partners of individuals with HIV receive voluntary counseling and testing is an essential part of a basic prevention and care package.

Providing ART. Providing of ART to persons who are infected in discordant relationships also reduces the risk of HIV transmission by reducing viral load in the individual with HIV. Because ART is indicated for those persons with advanced HIV disease and the highest viral loads, widespread provision of ART could affect HIV incidence, provided that the preventive effects of ART are not offset by increases in risk behavior. In Africa, integrated prevention and ART programs that include partner testing, behavioral interventions, counseling, condom provision, and ART have been associated with an estimated 98% reduction in HIV transmission risk.

Reducing Behaviors That Put Others at Risk. In addition to disclosure and partner testing, individual and small group behavioral interventions designed for use by persons with HIV to reduce sexual HIV transmission through abstinence, condom use, partner reduction, serosorting, reduced frequency of sex, and nonpenetrative sexual activity should be developed, evaluated, and expanded. Clinician attitudes, discomfort, and lack of skills in discussing sex with patients need to be addressed to ensure that individuals with HIV who choose to be sexually active can be supported to do so with minimal transmission risk and without stigma. Although prospective cohort data suggest that integration of prevention interventions into treatment programs can reduce HIV transmission risk, randomized evaluations of different behavioral intervention models, including clinician-initiated communication, are needed. In areas in which HIV is spreading in drug-using populations, addiction treatment and behavioral interventions, such as the use of bleach for disinfecting needles and syringes, should be implemented. Selection of low-risk blood donors is a component of positive prevention that has been effective, but selection criteria should be based on current HIV incidence patterns in generalized epidemics.

Prevention of Unintended Pregnancies and MTCT. Infants born to mothers with HIV constitute a numerically large group at risk for acquiring HIV in Africa. In 2005, the estimated 700,000 new infections in children worldwide constituted approximately 14% of a total of 4.9 million infections, and the vast majority were in Africa. Prevention of HIV infection in women and of unintended pregnancy among women with HIV are the most cost-effective ways to prevent HIV infection of infants. However, many MTCT prevention programs do not provide any family planning education or services. In Uganda, 35% of 1092 adults with HIV reported sex without contraception in the previous 3 months; however, 73% of these individuals did not want more children.

Additional challenges regarding family planning are emerging. Life circumstances and feeling of well-being change with ART, and desire for children may increase. Additional training in family planning for staff and provision of free family planning services should be included in the context of ART scale-up.

For women who are pregnant, only routine, universally available HIV testing can ensure equitable delivery of prevention of MTCT. For women with HIV who desire more children in resource-limited settings, research on use of ART for viral suppression through late pregnancy, delivery, and time-limited, exclusive breastfeeding suggests promise for maximally reducing MTCT.

Sexually Transmitted Infections. Although population-based STI interventions have shown mixed results regarding HIV risk in Africa, at the individual level, STIs increase risk of HIV transmission and acquisition and are associated with increased HIV viral load in genital secretions. A syndromic approach to STI management, which is widely used in resource-limited settings where laboratory diagnostics are limited, has not been evaluated in Africa for individuals with HIV infection. The usefulness of syndromic management may be different among people with HIV in this setting, where the prevalence of herpes simplex virus type 2 infection, syphilis, and other genital infections is greater than in the general population. Effective approaches for STI diagnosis and treatment for individuals living with HIV and their partners should be identified and systematically integrated into all HIV care and treatment programs. An especially important group to target for STI control, consistent condom use, and other aspects of positive prevention is commercial sex workers and their partners who have the potential to transmit HIV across sexual networks.

Leadership by Individuals With HIV. To effectively reduce HIV transmission in Africa, individuals living with HIV/AIDS should be active leaders in positive prevention efforts. Involvement of individuals with HIV will likely help prevent discrimination and ensure that positive prevention is seen as a necessary approach that is mutually beneficial for infected and uninfected individuals. For individuals with HIV, positive prevention not only provides protection from acquisition of other STIs, it also protects those they love from HIV infection and their children from orphanhood. Widespread commitment to the pledge “HIV stops with me” among individuals with HIV is needed, without reducing the responsibility of individuals who are HIV negative to remain so.

Promising Interventions and Prevention Research. In a recent trial in South Africa, circumcision of men who were HIV negative was associated with a two-thirds reduction in HIV acquisition. Other circumcision trials will soon provide efficacy data, as well as information on the impact of male circumcision on HIV transmission to partners uninfected with HIV. Results from these trials should be rapidly translated into programmatic interventions if benefit is shown, especially if similar high levels of protection are demonstrated. Several...
other potential interventions, such as acyclovir prophylaxis for those individuals with herpes simplex virus type 2 coinfection and microbicides, also appear promising and some trials are now under way. Increased resources for evaluating the efficacy of new prevention interventions and for rapid translation of research into policy are needed concurrently with increased prevention programmatic resources. Ideas for other prevention interventions may be best developed by those individuals currently working on program implementation. Technical and financial resources are necessary to ensure scientifically rigorous evaluations.

Conclusions

There is an ethical and public health imperative to implement effective prevention strategies and treatment. Epidemiological surveillance can indicate in which populations HIV transmission is most intense. Combining prevention services for the most at-risk HIV-negative groups with universal access to HIV testing and positive prevention offers the best opportunity to control HIV/AIDS in Africa.

Financial Disclosures: All authors were employees of the Centers for Disease Control and Prevention, Department of Health and Human Services, or the World Health Organization at the time this article was written.

Disclaimer: The Centers for Disease Control and Prevention was involved in the clearance process, but the findings and conclusions in this article are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention or the World Health Organization.

Acknowledgment: We thank Lawrence Marum, MD, MPH, of the Centers for Disease Control and Prevention–Kenya, Lydia Munhgerera, MBChB, MPH, of the AIDS Support Organisation, and Nafuna Wamai, MBChB, MPH, Winnie Bikaako-Kajura, MA, and Rachel King, MPH, of the Centers for Disease Control and Prevention–Uganda, for their comments on the manuscript. None of these individuals received any compensation for their contributions.

REFERENCES