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## SPOTLIGHT ON PREVENTION

# Reducing HIV Infection in Young Women in Southern Africa: The Key to Altering Epidemic Trajectories in a Generalized, Hyperendemic Setting

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**The global HIV pandemic has evolved into a complex mosaic of epidemics within and between countries, with no single solution for preventing HIV infection.** Increasing access to antiretroviral treatment has reduced AIDS-related mortality and morbidity rates, but—with nearly three million new infections each year—we are losing the HIV prevention battle (Joint United Nations Programme on HIV/AIDS [UNAIDS] 2008), primarily in sub-Saharan Africa.

For prevention efforts to succeed, prevention programming must be tailored to the specific characteristics of the epidemic that is unfolding in the area to be targeted. Assessing an epidemic at the local or regional level is an important first step to enhancing and customizing prevention responses. This requires a nuanced understanding of who is at highest risk of infection and what drives that risk. With this information, program planners can determine who the target populations are and how to reduce risk with evidence-based interventions that are appropriate and acceptable and that have proven ability to reduce HIV incidence.

Communities in Southern Africa<sup>1</sup> are burdened with the highest HIV prevalence in the world. One segment of the general population is especially vulnerable: girls and young women. Some public health experts now believe that the way to alter epidemic trajectories in this region is to use rigorous intervention science to create innovative, comprehensive prevention programming that targets girls and young women.

### **HIV Infection in Southern Africa**

Southern Africa is at the epicenter of the global pandemic. Home to less than 1 percent of the global population, it carries a disproportionate 17 percent of the global burden of HIV infection. UNAIDS describes the region's epidemic typology as a generalized, hyperendemic epidemic characterized by uniquely high HIV prevalence, ongoing high incidence rates, and substantial morbidity and mortality, despite increasing access to antiretroviral treatment (UNAIDS 2008). Although HIV was introduced relatively late in the region, compared to North America and Central and East Africa, HIV has spread at an unprecedented rate, with

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<sup>1</sup> Defined here as including eight countries: Botswana, Lesotho, Malawi, Namibia, South Africa, Swaziland, Zambia, and Zimbabwe.

prevalence in pregnant women ranging from 10 to 30 percent (UNAIDS 2009).

Population-based studies undertaken in the early 1990s (Abdool Karim et al. 1992) and in 2005 (Shisana et al. 2005) demonstrate a unique characteristic of the epidemic in Southern Africa: the stark age-sex difference in the distribution of HIV infection (Figure 1). Women acquire HIV infection approximately five to seven years earlier than men because of the widespread practice of intergenerational sex with older men, many of whom are already infected with HIV. These men, who are more likely to have multiple concurrent partners and less likely to use condoms (Gregson et al. 2002), increase their risk of both acquiring and transmitting the disease. This widespread behavior pattern of intergenerational sex is a major driver of HIV infection in the region.

A 2005 national youth survey undertaken in South Africa (Pettifor et al. 2005) further highlights the disproportionate burden of HIV infection in young women 15 to 19 years old, compared to young boys in the same age group, because it illustrates the yearly HIV acquisition rates in young women compared to boys (Figure 2). Young girls in Southern Africa under 20 years of age are three to six times more likely to

be infected with HIV than young boys in the same age group, even though boys begin having sex at an earlier age. By age 20, approximately one-third of young women are infected with HIV (Gregson et al. 2002; Shisana et al. 2005).

Significantly, new cohorts of young women and girls become sexually active each year and, given the high background prevalence of HIV in Southern Africa, their risk of infection is high. The epidemiological data make clear that it is not having sex per se that increases young women's risk of acquiring HIV infection but instead the age of the male partner with whom they are having sex. If the partner is not a peer, the risk increases steadily from male partners age 20 and up. This age-sex difference in HIV acquisition patterns is of greatest significance for women under 20 years old (Gregson et al. 2002).

Once a young woman becomes infected, the risk to others in her sexual network compounds. When women and men engage in multiple and/or concurrent partnerships, this leads to higher transmission rates. Thus, if HIV infection rates in women under 20 years can be reduced, creating a break in the chain of transmission, the spread of HIV in the general population will also decrease.

The national cross-sectional population-based surveys undertaken by the Human Science Research Council demonstrate a reduction in HIV prevalence in young women in the 15- to 24-year-old age range from 2005 to 2008. In contrast, several longitudinal studies in South Africa demonstrate high incidence rates ranging from 9.1 per 100 women years (6.9–11.7, 95 percent confidence interval [CI]) to 16.5 per 100 women years (1.0–2.5, 95 percent CI) (Abdool Karim et al. 2010; Van Damme 2002). Efforts to alter HIV epidemic trajectories need to make reducing HIV infection rates in young women a priority.

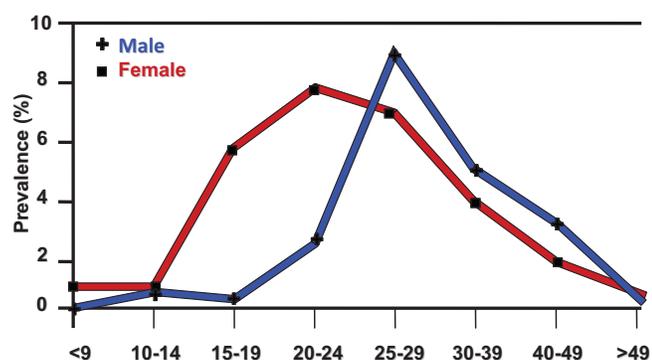


Figure 1. HIV prevalence in South Africa, 1992, by age and sex (adapted from Abdool Karim et al. 1992).

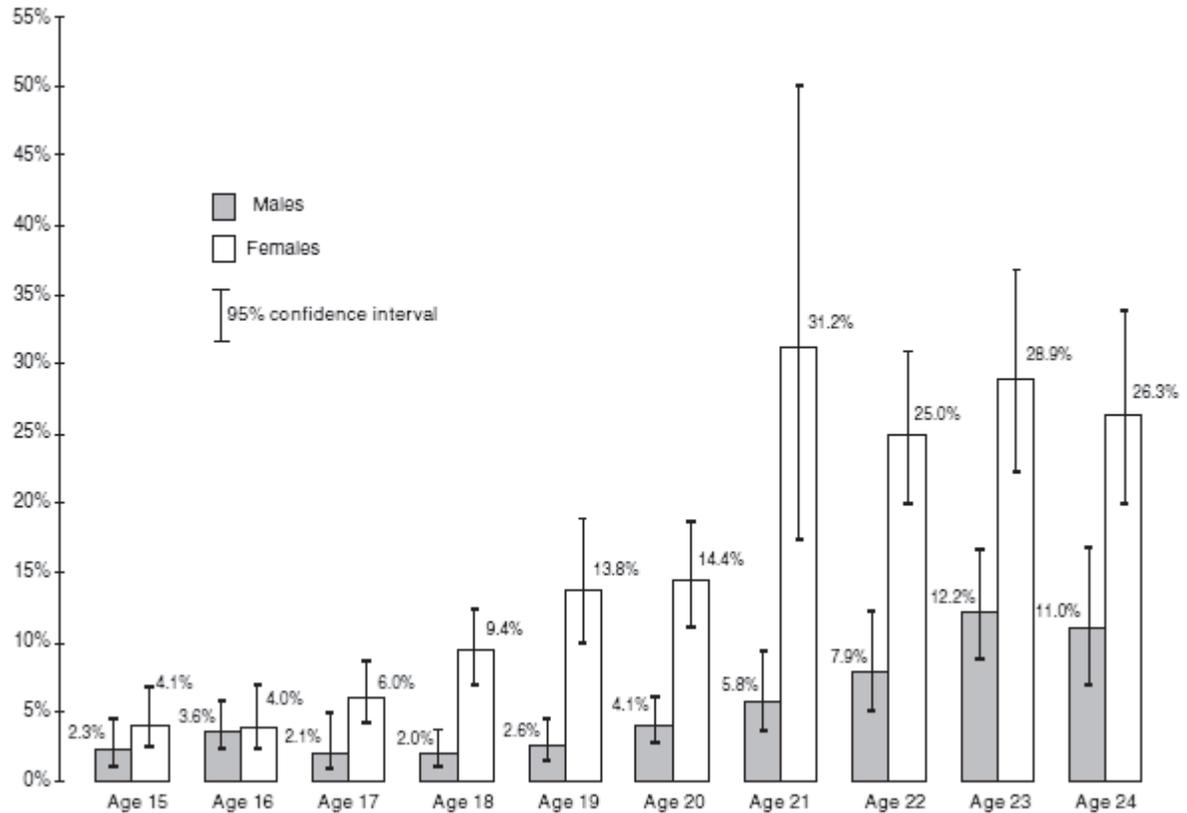


Figure 2. HIV prevalence among 15–24 year olds in South Africa, 2003, by age and sex (adapted from Pettifor et al. 2005: 1528).

### What Have We Learned about HIV Prevention for Young Women?

For women, and young women in particular, HIV risk derives not only from greater biological vulnerability to infection, but also from gender roles and power disparities that limit their ability to follow the ABCCC approach to prevention: practice *abstinence*, be in monogamous relationships, demand condom use, be conscious of your HIV status, or insist that male partners be circumcised. In other words, our current “prevention toolbox” is woefully inadequate for preventing HIV infection in young women who cannot negotiate monogamy and/or condom use with their sexual partner.

Three key interlinked factors further drive HIV risk in young black women, the group at highest risk of acquiring HIV infection in Southern Africa: no sense of the future or control of their destiny, which is exacerbated in settings where gender-based violence is epidemic, such as in South Africa (Jewkes et al. 2007); poor personalization of HIV risk; and lack of knowledge of HIV status.

The first factor—an inability to envision a secure and promising adulthood—is largely a result of gender inequity. A long history of exclusion of black women from the formal economy, due to either political exclusion or societal constructions of masculinity and

femininity, have resulted in major disparities in power between men and women.

Economic marginalization and gender inequity bring with them a greater risk of poverty. Because marriage is rare, the norm for many women has become sexual relationships of varying duration, households of children by different fathers, and, ultimately, an increasing number of female-headed households, usually with low or unstable income. As a result, many young black women grow up with the belief that the short-term benefits of engaging in sex with multiple partners are their only means of economic survival. This “living for the moment” allows little room for considering how decisions made today affect the future. In contexts where sex for survival is dominant, there is immense peer pressure to be sexually active at an early age, and to have sex with older men to acquire material resources.

For both women and men, there is also poor internalization and sometimes outright denial of the HIV crisis in the region; HIV is too often seen as “someone else’s problem.” Many Southern Africans do not personalize HIV risk, which leads to low rates of condom use, low uptake of voluntary counseling and testing services, and low levels of knowledge of HIV status. In addition to disregarding their HIV risk, young women do not take advantage of contraceptive and sexually transmitted infection (STI) services, as reflected in a high teenage pregnancy rate and a high burden of untreated STIs.

### **How Effective Are School-based Interventions at Lowering Risk?**

From the early days of the epidemic, ministries of education, nongovernmental organizations, and academic institutions developed and implemented HIV risk-reduction interventions for youth, largely as school-based programming. These programs have focused mainly on imparting information on modes of transmission and preventing sexual transmission of

HIV through life skills and abstinence-only programs delivered by educators and peer educators.

So far, however, no school-based intervention anywhere in the world has been effective in statistically reducing HIV incidence in young women. The rigor and quality of these interventions have been inconsistent, as has their evaluation. In Southern Africa, the poor state of education—inadequate infrastructure, insufficient human resources, and poor quality of teaching, particularly in historically disadvantaged communities—have limited the ability of these school-based interventions to be delivered effectively, or have failed to saturate the target groups sufficiently to make a difference. Of note is the fact that HIV risk-reduction programs administered by non-educators are more likely to result in positive behavioral outcomes than educator-delivered programs (Jukes, Simmons, and Bundy 2008). This is probably because students feel more comfortable discussing these issues with someone they do not know and do not see on a regular basis, unlike their teachers, with whom they interact daily.

Even where resources are available and conditions are good, school-based programming too often fails at many levels to take on some of the most critical prevention challenges: linking prevention and treatment, dealing with the pervasive stigma and discrimination associated with HIV, recognizing that HIV is more than a behavioral problem and is deeply embedded within local socioeconomic and political contexts, addressing age-appropriate gender power relations, changing the predominantly prescriptive nature of interventions, avoiding moral and judgmental overtones about adolescent sexual activity, considering how survival and coping strategies affect sexual behaviors, and actually talking to students about sex. Most school-based interventions have instead focused on knowledge, abstinence, or condom use, which are not known to predict reductions in rates of new HIV infection.

Of note is that, to date, among a plethora of interventions targeted at reducing adolescent HIV risk, only three cluster randomized controlled trials targeting HIV risk reduction in adolescents with HIV incidence as the primary outcome have been undertaken (Cow-an et al. 2008; Jewkes et al. 2007; Ross et al. 2007).

The role of structural interventions has received less attention in the context of HIV prevention, specifically the role played by schooling itself. While the causal relationship between receiving an education and HIV infection rates has yet to be established, there are several studies that demonstrate a strong association between higher levels of schooling and lower rates of HIV infection (Hargreaves and Glynn 2002). There is some evidence that women who complete secondary-level schooling have lower teenage pregnancy rates, better overall health decision-making skills, and improved economic opportunities.

### **New Directions, Both In and Out of School**

Two areas that have received some attention are school attendance (both overall enrollment and class attendance) and educational attainment (how well students perform academically, based on assessment of subject grades attained as well as grade pass rates [Jukes, Simmons, and Bundy 2008]). School attendance has shown an HIV-protective effect for boys. Less is known about the relationship between educational attainment and HIV risk. There is some evidence to suggest that the quality of education may be more important for young women than for young boys. The effects of schooling on HIV risk also appear to be linked to the stage of the epidemic; in mature epidemics, this could be confounded by the need to care for sick parents or family members, or by the death of parents, rendering young people even more vulnerable.

Schools remain important institutions for fostering new behaviors in young people who, in many instances, are still not at risk, although in mature HIV

epidemics, many may already be infected and need care. An important assumption that needs validation is whether young people at high HIV risk are actually in school.

Given that even complex, multi-level behavioral interventions to date have not been demonstrated to have a substantial impact on reducing HIV incidence rates (Padian et al. 2010), attention is increasingly turning to combination prevention approaches. These may combine strengthening education systems to enhance educational outcomes and increase secondary school completion rates with HIV risk-reduction interventions. These interventions would incorporate context-specific risk information, personalize HIV risk, and support knowledge of testing with incentives for key desired behaviors. Such combination approaches are worth testing in a rigorous manner, with HIV outcomes, such as incidence, used to determine effectiveness.

A novel approach for school-based programs to reduce HIV risk is cash incentives (Medlin and de Walque 2008). While the use of cash to encourage behavior change and better school attendance has been well described at the community level (Fernald, Gertner, and Neufeld 2009), in hard-to-reach populations, and in the workplace (Volpp et al. 2009), its utility for reducing HIV infection is not known. Data from Kenya demonstrating that cash transfers can help lower teenage pregnancy rates and decrease intergenerational sex show promise (Duflo et al. 2006). Other promising data include the “proof of concept” RESPECT study in Tanzania, which showed a reduction in STIs among participants receiving conditional cash transfers, and studies in Malawi showing a reduction in risky sexual behavior among participants receiving conditional cash transfers (Baird et al. 2009). While these data are promising, thus far there has been a poor correlation between HIV infection rates and reduced levels of sexually transmitted illnesses and risky behaviors.

Outside of the school setting, “test and treat” (Granich et al. 2009) is another novel combination prevention approach that is receiving attention. Although studies to assess this strategy’s effectiveness are currently under way, mathematical modeling suggests that it holds substantial promise for preventing HIV infection, if programs are carefully planned (Dodd, Garnett, and Hallett 2010; Granich et al. 2009). Combining test and treat with a broader HIV prevention combination strategy that targets men between ages 20 and 40 and includes extensive HIV testing, voluntary circumcision of uninfected men, and antiretroviral treatment of all infected men regardless of disease status may be an important means of reducing HIV infections in Southern Africa. Although proof of concept needs to be established, extensive testing and treatment of Southern African men in the 25- to 40-year age range hold potential for lowering HIV incidence in adolescent women as well as women in the 20- to 30-year age group. This could have an immediate and major impact on HIV risk and survival for both men and women.

### **Developing a New Prevention Portfolio**

It is clear that we urgently need bold prevention options for young women that push the limits of current prevention paradigms. As we continue our efforts to find biomedical solutions to reduce HIV infection and establish their safety for adolescents, it is critically important to develop a more balanced and innovative HIV prevention portfolio that addresses the real, immediate, and substantial risk facing young women in Southern Africa.

To help young people choose a better future through better health decision making, interventions should enhance their economic options through educational attainment and improved secondary school completion rates. This will strengthen young women by giving

them improved economic opportunities and encouraging self-initiated and self-imposed behavior change, and will therefore have a greater prospect of sustainability over the course of their lives.

Equally important are interventions to reduce risk of HIV acquisition in men in the 20- to 40-year age group, as well as treatment of infected men (and women) to reduce transmission of HIV. Interventions need to be subjected to rigorous evaluation based on the highest standards of scientific evidence and ethics, with lowered HIV incidence as the primary outcome to derail this devastating epidemic. Policy based on anything less is a colossal waste of resources.

Prevention programs for young women therefore need to encompass a broader perspective on the factors that affect their HIV risk. Greater emphasis should be placed on enabling young women to access such reproductive health services as contraceptives, condoms, and testing for STIs and HIV. Altering the HIV epidemic pathway in Southern Africa can only be achieved if the infection rates of young women are dramatically reduced. This requires not only sound policies based on high-quality research, but an understanding of the factors that affect their lives and decisions, and an effort to provide them with the information and resources to look forward to their future. ■

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