



HHS Public Access

Author manuscript

Afr J Reprod Health. Author manuscript; available in PMC 2015 October 05.

Published in final edited form as:

Afr J Reprod Health. 2014 September ; 18(3 0 0): 17–24.

HIV Prevention and Research Considerations for Women in Sub-Saharan Africa: Moving toward Biobehavioral Prevention Strategies

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Abstract

This paper addresses current and emerging HIV prevention strategies for women in Sub-Saharan Africa, in light of recent trial results and ongoing research. What are the major opportunities and challenges for widespread implementation of new and emerging HIV prevention strategies? The paper discusses the major individual, social and structural factors that underpin women's disproportionate risk for HIV infection, with attention to gender, adolescents as a vulnerable population, and the need to engage men. Also, the influence of these factors on the ultimate success of both behavioral and biomedical HIV prevention technologies for women in sub-Saharan Africa is discussed. Finally, the paper examined how the new and emerging biobehavioral prevention strategies served as tools to empower women to adopt healthy HIV preventive and reproductive health behaviors.

Keywords

Sub-Saharan Africa; biobehavioral prevention; HIV; gender; adolescents

Introduction

Of the 34 million people globally living with HIV/AIDS, approximately 50 percent are women¹. Further, women account for just over half (about 51 percent) of new infections each year. In sub-Saharan Africa, that figure is higher, with women accounting for approximately 60 percent of all new infections annually. It is common to say that women are disproportionately affected by HIV/AIDS: this results from the pronounced age differences in patterns of HIV prevalence, in which younger women are much more likely to be HIV-infected than older women, and also from gender differences, as younger women are more likely to be HIV-infected than their same-age male peers^{2,3}. In the generalized HIV/AIDS epidemics found in some parts of sub-Saharan Africa, these differences are as much as two-three fold; in other words, women are 2-3 times more likely than men of the same age to be HIV-infected^{4,5}. Strong regional differences in HIV prevalence also exist across the African

continent, ranging from nearly 20 percent of the general population in the heavily HIV-affected countries of southern Africa, to less than 10 percent in most of West Africa^{1,6}.

More than a decade has passed since the first call to action was issued regarding the need to reduce high levels of HIV infection in sub-Saharan Africa through addressing the prevention needs of young African women⁷. While substantial research has addressed this topic, particularly the area of gender relations and inequalities, further research on the links to broader social and health inequalities is needed. This paper examines current knowledge on the factors underlying women's high rates of HIV infection, and state-of-the-art approaches to HIV prevention across the social, behavioral and biomedical spectrum.

Behavioral, Biological and Structural Risk Factors for HIV Infection in Women

Although risk profiles may differ according to individual and contextual characteristics, well-known behavioral risk factors for HIV infection in women include unprotected sex, relationships with older male partners (who may be more likely to be HIV infected and whose greater power in a relationship may limit a woman's ability to negotiate the terms of sexual activity or prevention), and a history of sexual abuse or violence². The risk also increases in areas where commercial sex is common, or other forms of transactional sex^{8,9}.

Important biological risk factors are greater susceptibility to HIV transmission due to cervical ectopy, which is particularly pronounced in younger women, the presence of co-factors such as other sexually transmitted diseases or other infections, and the greater ease of transmission from men to women¹⁰.

There are important links between HIV/AIDS and reproductive health. For many women, HIV/AIDS is the most important reproductive health issue they face, because of the gender-specific ways in which the disease affects them, and because the majority of HIV infections experienced by women are related to pregnancy, childbearing, or breastfeeding. Also, pregnancy and HIV infection are inextricably linked, and younger women face a particularly high risk through unintended pregnancy¹¹. In part, this is due to the common exposure – unprotected sex – that places women at risk for both outcomes. More broadly, pregnant women generally experience higher rates of HIV infection than their non-pregnant counterparts. For instance, 15-24 year old non-pregnant women in South Africa have an HIV prevalence of 20 percent, compared to 39 percent among pregnant women in the same age group. HIV prevalence among pregnant women in South Africa is 5.6 percent at ages 15-19, 17.4 percent at ages 20-24, and rises to 31.7 percent among those aged 25-29 years¹². Family planning, one of the most basic interventions for women, is also an important HIV prevention strategy¹³. For HIV positive women, contraception can prevent mother-to-child transmission of HIV infection, while for HIV negative women, preventing unintended pregnancy is an important opportunity for HIV prevention, particularly through the use of condoms and other barrier methods for dual protection.

Social factors that are well known to be protective for women, in other words to lower their HIV risk, include school attendance and completion¹⁵. Further research is needed on the

structural drivers of HIV/AIDS, to obtain a better understanding of sustained high HIV incidence, particularly in the population of women under age 30. The links between economic factors, such as poverty and household well-being, and multiple health outcomes, including HIV/AIDS, are well established¹⁵.

The Role of Gender Inequality

Gender inequality is an important structural factor underlying many common risk factors associated with women's greater HIV risk, such as unequal partner relations and their impact on HIV prevention⁹. The World Health Organization defines gender as 'the socially constructed roles, behaviors, activities and attributes that a given society considers appropriate for men and women'¹⁶. In its 2012 report on the state of the global AIDS epidemic, UNAIDS stated that 'gender inequality drives the HIV epidemic' and devoted the issue to discussion of the gender-related risk factors that influence HIV infection among women¹. Epidemiological evidence from multiple settings across sub-Saharan Africa suggests several important ways in which gender inequalities affect women's disproportionate risk for HIV infection, and many studies now demonstrate the numerous ways in which gender inequalities place women at risk for HIV. First, women's unequal social, economic and political status places women at an inherent disadvantage in many aspects of life^{9,17}. Second, within the context of relationships, women's unequal power – which in many locations remains codified in law – constraints women's ability to negotiate at a relationship, family and household level. Third, there is a high prevalence of gender-based violence, and women who experience trauma, abuse, or other forms of sexual violence are at increased risk for HIV¹⁸.

The Special Vulnerability of Adolescents and Young Women

The period of adolescence, defined broadly as the period between ages 10-19 that marks the transition from childhood into adulthood, is a unique phase of the life characterized by rapid physical, emotional and developmental change¹⁹. Adolescents may often be impulsive and inclined toward higher risk-taking, sometimes related to perceived invulnerability²⁰. For higher risk adolescents, mental health is particularly important, and low self-esteem and other outcomes may be particularly salient at this time²¹. Adolescents are considered a vulnerable population, which raises ethical considerations regarding participation in HIV prevention or other clinical trials²². As a uniquely vulnerable population, adolescents and younger women have special intervention needs.

Further, because of biological differences, some biological prevention methods may be unsafe for younger populations, concerns that have been raised increasingly with the advent of new biomedical prevention technologies and related efficacy trials²³. However, from a rights perspective, it is important to note that young people, like any other population, are entitled to the most effective HIV prevention education and methods available unless valid reasons exist for their exclusion from trials or from product use²².

The Importance of Engaging Men

As previous studies have indicated, men are often neglected in discussions of gender and sexual and reproductive health, thus comprising the ‘forgotten fifty percent’ of the population²⁴. Recent scholarship, including intervention studies, suggests the importance of engaging men, for their own improved health as well as better outcomes for women²⁵. The idea of ‘gender-transformative’ interventions by definition engages both men and women in shifting toward more equitable gender norms and values, with links to specific health outcomes such as HIV prevention^{26,27}. In some gender-focused studies, intervention effects on men have been stronger than those for women, suggesting that changing men's behaviors related to gender attitudes, beliefs and behaviors is not only important, but feasible²⁸.

What are the Available Interventions?

Biomedical HIV Prevention

The advent of the ‘treatment as prevention’ era has major implications for women's HIV prevention in sub-Saharan Africa, as for other high-risk populations²⁹. Since 2000, great hope has been placed in the development of microbicides and other pre-exposure prophylaxis. Microbicides are vaginal or rectal products applied topically to prevent sexual transmission of HIV infection³⁰. Most of the microbicide trials have been conducted in women. Prior to 2011, of the nine microbicide trials conducted, only three were completed, and the results were marked by low efficacy of the products, limited acceptability, and poor product adherence³¹. The newer products, however, are ART-based, and have shown promising results. In 2010, the results of CAPRISA 004, a trial of tenofovir gel use in South African women, found 39 percent fewer incident HIV infections in women who used the gel, as compared to a placebo³². This positive finding was supplemented by positive results from several other trials of pre-exposure prophylaxis, including a reduction in heterosexual transmission among couples in Botswana, men who have sex with men in the United States, and injection drug users in Thailand³⁰. Two other trials, however, Partners PrEP in Uganda and Kenya and FemPrEP in Kenya, Tanzania and South Africa, found only partial effectiveness or no effectiveness³⁰. Most importantly to advancement of HIV prevention research, the VOICE trial (vaginal and oral interventions to control the epidemic), a confirmatory trial of more than 5,000 women in Uganda, South Africa and Zimbabwe, did not demonstrate efficacy of the product, which was both orally and topically administered tenofovir gel³³. A further trial, FACTS, is currently ongoing in South Africa³³.

These differential results are difficult to interpret, and have led to widespread debate about women's use of the products and ability or desire to adhere to product use, most specifically with regard to daily, long-term use. In many of the trials, adherence to the product has been low, in the range of 50 percent or less³¹. There are many known barriers to use of microbicides and other prevention products by women³⁴. Commonly cited barriers include questions about the feasibility for women to use a product daily or even at each sexual intercourse, an important concern underlying low adherence³⁵. For many women, there are also partner considerations, especially negotiating use of a product. Above all, it may simply be difficult to expect that any group of people use a pill daily for prevention, as opposed to treatment. While more data are needed to understand these outcomes and women's own

perspectives, the trial results do highlight women's different needs, motivations and barriers to use, as well as shifting needs and preferences over their lifecourse, or even a much shorter window, possibly a six month period. HIV prevention does not occur in isolation, but rather in the context of women's daily lives, which may include a desire for pregnancy, or a desire to prevent pregnancy. To be successful in the long term, any daily use product for women would likely need to take such factors into consideration.

In response to such concerns, and drawing on expertise from the family planning field, the idea of multipurpose prevention technologies (MPTs) has emerged^{36,37}. MPTs generally provide simultaneous protection against HIV and pregnancy, with a range of products currently under development³⁸. These include vaginal gels with HIV prevention and contraceptive properties, long-acting intravaginal rings such as the dapivirine ring or SILCS diaphragm, new and improved barrier devices, and vaginal tablets and films^{39,40}. The development of these products acknowledges the critical importance of the ongoing search for female controlled technologies, as well as the need to situate women's HIV prevention in a broader reproductive health context.

Behavioral Interventions

Ideally, biobehavioral intervention strategies should combine elements of effective biomedical and behavioral interventions. A wide range of behavioral HIV prevention interventions for women has been tested in sub-Saharan Africa⁴¹. In this report, interventions with promise for addressing women's needs in relation to gender, HIV prevention and pregnancy are discussed. One of the largest studies, the MIRA trial in Zimbabwe and South Africa, evaluated the efficacy of diaphragm and condom use for preventing HIV infection and pregnancy in high risk women⁴². Although the study did not reduce incident HIV infections, numerous important lessons were obtained regarding women's HIV preventive behaviors and changes over time. In South Africa, the Stepping Stones intervention was evaluated via a community-level randomised controlled trial. This study, which included both women and men, had important effects on gender-related risk factors, as well as on incidence of HSV-2, and on lowering men's sexual risk behaviors and perpetration of violence toward women⁴³. Stepping Stones is one of several emerging 'gender-transformative' interventions, which are focused on shifting gender norms and values in pursuit of specific health outcomes such as HIV prevention.

Focusing on women's most pressing needs, including pregnancy prevention, may have secondary effects on HIV prevention⁴⁴. Targeted interventions could help to address the issue of high HIV infection and pregnancy rates, particularly among the highest risk group of young adult women. Use of family planning by HIV positive women has important implications for preventing mother-child transmission of HIV infection⁴⁵, while use of dual protection among uninfected women can prevent both HIV and pregnancy.

Finally, starting early and addressing adolescent HIV prevention needs is of critical importance. Across a number of African settings, HIV prevention interventions in both school and non-school settings have been evaluated^{46,47}. Implementing more effective sexuality education in schools is an important first step, followed by evidence-based HIV prevention strategies^{48,49}.

Structural Interventions

Structural interventions seek to influence the societal and contextual factors underlying HIV risk⁵⁰. Other pressing needs for women may include financial support, such as livelihoods and economic opportunities⁵¹, or support to complete schooling, or provision of safe spaces in communities where young people can gather. An important intervention for women, the IMAGE project, examined via a randomized controlled trial whether participation in micro-credit lending and sexual violence prevention education reduced women's HIV risk⁵². While no effect on HIV incidence was found, such combined economic-behavioral approaches may hold promise for African women.

Recommendations and Way Forward

Interventions aimed at reducing the high incidence of HIV infection in African women do not come in a 'one size fits all' package. Multiple, integrated interventions will likely be needed to address the diverse needs of women. Importantly, there is an emerging consensus around the idea of 'biobehavioral' HIV prevention strategies for women, recognizing that the biomedical and the behavioral need to work together, in mutually reinforcing ways. With the advent of new ART-based prevention strategies, a greatly expanded toolkit to promote biobehavioral HIV prevention for women exists.

In this regard, the idea of a 'lifecourse approach to interventions' may be relevant, in which a series of interventions beginning in childhood and continuing through to adulthood are implemented. Ideally, these would include a focus on gender equitable norms and values in childhood, to lay the foundation for health-promoting behaviors; age-appropriate sexuality education in early adolescence, primarily focused on life skills and a range of preventive behaviors; and a focus on the more specific needs of the teenage population to ensure a safe and healthy transition to adulthood, followed by high quality service and individual level interventions to promote effective use of HIV prevention strategies. The separate and integrated needs of young women and men should also be considered.

Specific recommendations can be offered as follows:

Integrate HIV prevention with women's broader reproductive health concerns

At different times in their lives, most women will desire to prevent pregnancy, and also to bear children. Multi-purpose interventions or technologies, and combined biomedical/behavioral approaches, will likely work best to address women's shifting needs and desires over the lifecourse. Within high HIV prevalence settings like southern Africa, such interventions should include attention to safe reproductive decision-making and planned pregnancy, including knowledge of HIV status among couples, in order to reduce unintended pregnancy and the likely transmission of HIV infection. Integration of HIV/RH services is also important in order to ensure better access to care and prevention. Family planning remains one of the most basic and cost-effective interventions for women, and plays a critical role in reducing mother-child HIV transmission.

Facilitating rapid integration of successful results from intervention trials into policy

With important new results emerging for women, particularly in the area of ART-based biomedical prevention including PrEP, microbicides and treatment-as-prevention, steps must be taken to prepare health services as well as the general population with women-centered strategies for the advent of new and more effective interventions and technologies. Given that adherence is one of the biggest challenges to successful implementation, education and communication efforts are particularly important. Engaging women and communities in meaningful ways in this research and policy development is important to define these needs.

Addressing the special needs and vulnerabilities of young, high-risk women

The risk for a range of adverse reproductive health outcomes is compounded by young age and by being female. Services and interventions need to address younger women's high-risk status, as well as the increased vulnerability related to developmental factors, particularly increased life instability during the transition to adulthood. Adolescents and young adult women require specialized services and interventions, and access to comprehensive services including social, psychological, and mental health. Preventing unintended pregnancies along with HIV/STIs is a top priority for this age group.

Situating HIV prevention in the context of women's daily lives

Perhaps most importantly, there is a need to situate prevention efforts – whether biomedical or behavioral or combined – in the context of women's daily lives and realities. Many African women face family, social and economic pressures, some of which may impede successful HIV prevention. Women's needs and desires shift over time, as do those of their partners and families. Different products and prevention methods will suit different women, making the expanded toolkit even more important.

Committing sufficient resources to this area is a necessary condition for success

The past decade has witnessed the unprecedented commitment of resources to the global HIV/AIDS epidemic. For the next decade, similar commitment to women's reproductive health and HIV concerns is warranted. Efforts to revise the Millenium Development Goals should take these concerns into account, as well as global efforts to renew and expand funding for family planning and the prevention of unintended pregnancies. All of these efforts can act synergistically to improve women's health and reduce HIV rates over time.

Together, these recommendations can help to ensure that the policy and programmatic successes and innovations of the past decade, along with emerging scientific results, are translated into effective action for women.

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