



Research to Prevention

# IMPACT OF HIV TREATMENT ON RISK BEHAVIOR

Rigorous Evidence – Usable Results

*Fourth in a series, this summary fact sheet presents existing evidence from rigorously evaluated interventions to prevent HIV transmission in developing countries. Results are presented here from a systematic review of studies examining the impact of HIV treatment on risk behavior published in leading scientific journals. In contrast to the many anecdotal reports of best practices, this series provides readers with the strongest evidence available in a user-friendly format. The evidence provides program planners, policy makers, and other stakeholders with information about “what works.”*

## Antiretroviral Therapy (ART)

has revolutionized HIV treatment. ART, which now includes a wide range of self- and clinically administered medications, can significantly improve the physical health and quality of life for people living with HIV by reducing the level of the virus in their bodies. However, as access to and availability of ART increases globally, there are questions about how access to HIV treatment might affect sexual behavior. Improvements in health and life expectancy of HIV-infected people may lead to a belief that HIV is no longer a serious and deadly disease, or that people living with HIV are no longer infectious. In addition, improvements in physical health may enable individuals to resume sexual activity, including unsafe sex. People may also experience “safer sex burnout” and exhibit difficulty sustaining safer sex behavior over their lifetime. These issues have commonly been referred to as treatment optimism or behavioral disinhibition. Conversely, HIV-infected individuals who have more contact with health systems to receive ART and possibly increased access to support systems may be encouraged to both enact and maintain positive changes in their sexual risk behavior.



*A pharmacist at a clinic in Nairobi’s sprawling Kibera slum displays some of the ARV medications in-stock for HIV patients who visit the clinic. The clinic is supported by the Centers for Disease Control, which conducts disease surveillance of the surrounding community. Credit: © 2009 David Snyder, Courtesy of Photoshare*

## Effect of Treatment on Risk Behaviors

The systematic review by Kennedy et al.<sup>1</sup> assessed the impact of access to treatment on risk behaviors in developing countries.<sup>2-4</sup> Four outcomes were evaluated in three studies: sexual abstinence, frequency of sexual intercourse, condom use, and type of partner.

### Sexual Abstinence (3 studies)

- Both cross-sectional studies reported abstinence rates of approximately 50% for all HIV-positive patients in the previous 6 months regardless of ART status. However, due to the cross-sectional nature of the studies, the high



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rate of abstinence cannot be conclusively attributed to the treatment status of participants. One study suggests that this outcome implies sexual abstinence is a prevention strategy utilized by HIV positive individuals irrespective of treatment.

- In the before/after study, the percentage of ART patients who were sexually abstinent in the previous three months remained unchanged throughout the study.

### Frequency of Sexual Intercourse (2 studies)

- Frequency of sexual intercourse was not significantly different between ART and non-ART patients in one cross-sectional study and remained unchanged between baseline and follow-up in the before/after study.

### Condom Use (3 studies)

- Condom use was significantly higher among ART patients compared to non-ART patients in both cross-sectional studies. However, these outcomes were based on a survey conducted at only one time point, which limits the ability to infer that this increase was directly related to ART usage.
- In the before/after study, condom use at last sexual intercourse increased among HIV-positive patients with HIV-negative or unknown partners after 6 months of being on ART.

### Type of Partner (2 studies)

- One study reported that ART patients were more likely to report that the last sexual intercourse was with a main partner compared to non-ART patients.
- Another study reported that there was no significant difference between ART and non-ART patients in regards to the percent reporting multiple sexual partners in the last 6 months.



*A nurse in Malaysia speaks with personnel from the Malaysian AIDS Council at a HIV/AIDS shelter home that provides free medicine and treatment. Credit: © 2008 Shabana Palpanaban, Courtesy of Photoshare*

### How is the Impact of HIV Treatment on Sexual Risk Behaviors Determined?

For the purposes of this review, “HIV treatment” was defined as the provision of clinical, self-administered, or home-based care for HIV infection, including ART and/or treatment for opportunistic infections. Three studies were included in the review out of 166 potential papers identified. All three studies included took place in Africa—one in Côte d’Ivoire and two in Uganda—with HIV positive adults. Two were cross-sectional studies comparing patients who had received ART to those who had not. The third was a before/after study following a cohort of patients initiating ART and examining behavioral outcomes six months later.

### Selection Criteria and Rigor Criteria of Studies Included in the Kennedy et al.’ Meta-analysis

A study had to meet three criteria to be included in the analysis:

1. present behavioral, psychological, or biological outcomes related to HIV prevention in developing countries
2. use either a pre-/post- or multi-arm design
3. appear in a peer-reviewed journal between January 1990 and January 2006

Studies that did not meet these criteria were excluded.

### What's New?

Since the Kennedy et al.<sup>1</sup> review was completed, there have been several additional studies reporting the impact of treatment on risk behaviors in developing countries:

- One prospective cohort study in South Africa found no evidence of increased sexual risk behaviors in HIV positive individuals when comparing data up to one year after initiating ART.<sup>5</sup> Another South African study found a significant decrease in unprotected sex in participants after one year of initiating ART.<sup>6</sup> However, a third South African study examining sexual risk behaviors in HIV-infected individuals who were waiting on or just initiating ART found that approximately half of the participants reported having unprotected sex at their last sexual intercourse.<sup>7</sup>
- A prospective cohort study in Kenya noted that although unprotected sex was reduced in participants one year after receiving ART, the portion practicing unsafe sex was still considerably high.<sup>8</sup>
- Another cohort study involving sex workers in Kenya found no increase in unprotected sex in those who initiated ART compared to those who did not initiate ART.<sup>9</sup>

These studies support the findings from the Kennedy et al.<sup>1</sup> review that treatment does not increase risky sexual behaviors. However, as several of the recent studies noted, the continued prevalence of unprotected sex across study participants is a concern that should be addressed regardless of whether or not a person living with HIV is receiving treatment.

### What More Do We Need to Know about the Impact of Treatment on Sexual Risk Behavior?

The available evidence shows that ART is not associated with risky sexual behavior among HIV positive individuals in these developing country settings. In some cases, ART was actually associated with reduced sexual risk behavior. There was only

one potentially contradictory finding reported in one of the reviewed studies which found that ART patients were significantly more likely than non-ART patients to report STI treatment in the past six months. However, the authors of this study speculate that more diagnosis and treatment of STIs may be the result of individuals having better access to healthcare through ART. All studies included in the Kennedy et al.<sup>1</sup> review used clinic-based sampling, which means that individuals already seeking treatment at health facilities were enrolled. They may, therefore, have been more aware of risk factors than the population at large, and thus less likely to engage in risky sexual behavior. In addition, the context of HIV treatment varies widely across programs and countries in the developing world. From the studies included in this review, it is not possible to distinguish which aspects of the treatment program were responsible for the change, or lack of change, in risky behavior.

Components of HIV treatment can include increased access to healthcare, counseling, and support services—all of which can potentially influence behavior. Therefore, although this review is important in providing us with initial information on ART and sexual behavior in developing countries, the strength of its conclusions are limited. Studies from this review took place in a limited number of countries, which restricts the ability to generalize the results to other populations.

Another limitation of this review is the possibility of publication bias, where studies showing positive results are more likely to be published than studies showing negative results. There is also the possibility that some articles that should have been included in the review were not identified by the search methods used. Despite these limitations, this was the first review to systematically examine the impact of medical treatment on sexual risk behavior in low- and middle-income countries, and the findings are consistent with findings from similar reviews focused on developed countries. However, the findings from this review are based on a very limited number of studies, and must be interpreted with caution. In addition, all of these studies were before/after or

cross-sectional in nature and of low methodological rigor. Since 2006 there have been an increasing number of studies being conducted on this topic, and many are still ongoing. Additional research will ensure a stronger evidence base for important policy decisions, including issues such as the nature and content of prevention counseling that may need to accompany ART.

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## Terminology and Acronyms

### ART

Antiretroviral therapy

### Confidence level

The likelihood that the “true value” will fall within the confidence interval.

### Effect size

A measurement of the magnitude of change (e.g., the average point increase in a qualifying examination score from taking a test preparation course).

### Meta-analysis

Analytic method that gathers information from multiple studies and combines them statistically to determine whether an intervention is effective.

### Odds ratio

The ratio of the probability of an event occurring in one group to the probability of the same even occurring in a referent group; for example, an odds ratio of 2.0 for a condom promotion means that those in the treatment group were twice as likely as those in the control group to use condoms in last casual sexual encounter.

### STI

Sexually transmitted infection

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