



USAID
FROM THE AMERICAN PEOPLE

HEALTH POLICY
INITIATIVE



SERODISCORDANT COUPLES IN SUB-SAHARAN AFRICA: WHAT DO SURVEY DATA TELL US?

FEBRUARY 2010

This publication was produced for review by the U.S. Agency for International Development (USAID). It was prepared by Meghan Bishop and Karen Foreit of the Health Policy Initiative, Task Order I.

Suggested citation: Bishop, M., and K. Foreit. 2010. *Serodiscordant Couples in Sub-Saharan Africa: What Do Survey Data Tell Us?* Washington, DC: Futures Group, Health Policy Initiative, Task Order 1.

The USAID | Health Policy Initiative, Task Order 1, is funded by the U.S. Agency for International Development (USAID) under Contract No. GPO-I-01-05-00040-00, beginning September 30, 2005. HIV-related activities of the initiative are supported by the President's Emergency Plan for AIDS Relief (PEPFAR). Task Order 1 is implemented by Futures Group, in collaboration with the Centre for Development and Population Activities (CEDPA), White Ribbon Alliance for Safe Motherhood (WRA), and Futures Institute.

SERODISCORDANT COUPLES IN SUB-SAHARAN AFRICA: WHAT DO SURVEY DATA TELL US?

FEBRUARY 2010

The views expressed in this publication do not necessarily reflect the views of the U.S. Agency for International Development or the U.S. Government.

TABLE OF CONTENTS

Acknowledgments	v
Executive Summary	vi
Abbreviations	vii
Introduction.....	1
Data	2
Findings.....	3
Dynamics of HIV Serodiscordancy	3
Characteristics of Serodiscordant Couples	5
Discussion	6
Policy Recommendations and Programming Implications	7
Policy Recommendations	7
Programming Implications	8
Conclusion	10
Annex A. Sample Sizes for Serodiscordant Couples in National Surveys	11
Annex B. Methodology	12
References.....	14

LIST OF TABLES

Table 1. Impact on total population HIV prevalence by reducing positive seroconcordancy within married/cohabiting couples by 50 percent	5
---	---

LIST OF FIGURES

Figure 1. Expected characteristics of couples as a function of general HIV prevalence	4
Figure 2. Proportion of HIV-positive couples who are serodiscordant.....	4

ACKNOWLEDGMENTS

The authors sincerely thank all those who contributed to the development of this paper, including Kip Beardsley, Farley Cleghorn, Tito Coleman, Britt Herstad, Rahel Mathews, Nancy McGirr, Ken Morrison, Robert Porter, Caroline Teter, and William Winfrey. In addition, gratitude is extended to staff of the AIDSTAR project for their collaboration on programmatic implications in this paper. Finally, many thanks to Anita Bhuyan and Lori Merritt for their proficient reviews of this paper, as well as our USAID/Washington colleagues, Karen Stewart, Timothy Mah, Alison Surdo, and David Stanton for their review and useful comments.

EXECUTIVE SUMMARY

In response to growing evidence that married or cohabitating serodiscordant couples are an important source of new HIV infections in sub-Saharan Africa, programs are being urged to target prevention efforts to married or cohabitating serodiscordant couples. Implicit in these recommendations is the assumption that serodiscordant couples are an identifiable population for whom prevention efforts can be specifically tailored. This paper uses final reports and secondary data analyses from Demographic and Health Surveys (DHS) and AIDS Indicator Surveys (AIS) from 10 sub-Saharan African countries to explore the dynamics of serodiscordancy and characteristics of serodiscordant couples that might distinguish them from the general population.

The analyses consistently found that except for their HIV status, discordant couples are no different from the general population. Like the general population, serodiscordant couples are found in both rural and urban areas, often do not know their HIV status, have very low comprehensive knowledge about HIV prevention, and report very low condom use.

Because serodiscordant couples cannot be distinguished from the general population, they can only be identified through counseling and testing services. Therefore, as the recent AIDS Support and Technical Assistance Resources (AIDSTAR) report, *HIV Prevention for Serodiscordant Couples* (Spino et al., 2009), emphasizes, prevention programs to reduce intra-couple transmission must first encourage couples to get tested—through couples testing and/or referrals to bring in the non-tested partner for testing and counseling—and then provide serodiscordant couples with services to promote and maintain appropriate risk-reduction behaviors.

In addition to the recommendations included in the AIDSTAR report, the policy recommendations and programming implications stemming from the findings from this paper are to

- Review and revise national HIV plans to include serodiscordant couples;
- Conduct Modes of Transmission (MOT) analyses;
- Allocate resources for serodiscordant couples;
- Include knowledge questions about serodiscordancy in population surveys; and
- Document and evaluate existing interventions.

Specific program design implications are for programs to

- Increase efforts to encourage couples-based HIV counseling and testing;
- Integrate information about discordant couples in all prevention materials;
- Engage community leaders in couples' outreach;
- Ensure safe disclosure, with attention to issues such as gender-based violence and stigma;
- Promote consistent condom use within serodiscordant couples;
- Integrate men into prevention of mother-to-child transmission programs; and
- Train providers to discuss and manage serodiscordancy.

ABBREVIATIONS

AIDS	acquired immune deficiency syndrome
AIDSTAR	AIDS Support and Technical Assistance Resources
AIS	AIDS Indicator Survey
DHS	Demographic and Health Survey
GNP+	Global Network of People Living with HIV/AIDS
HIV	human immunodeficiency virus
INA	Influence Network Agent
MOT	Modes of Transmission
PLHIV	people living with HIV
PMTCT	prevention of mother-to-child transmission
UNAIDS	Joint United Nations Program on HIV/AIDS
USAID	U.S. Agency for International Development
VCT	voluntary counseling and testing

I. INTRODUCTION

During the first two decades of the HIV epidemic, HIV prevention efforts in sub-Saharan Africa focused primarily on HIV-negative individuals, with a strong emphasis on targeting traditional “at risk” groups such as sex workers, individuals with multiple sexual partners, and vulnerable populations, such as women and young people (de Walque, 2006; Desgrées-du-Loû and Orne-Gliemann, 2008; Temoshok and Wald, 2008). In recent years, as the prevention agenda has expanded to include “positive prevention” efforts,¹ serodiscordant couples—married or cohabiting couples² in which one partner is HIV positive and the other is HIV negative—have increasingly been mentioned as an important consideration within the broader prevention framework.

Serodiscordant Couple

A married or cohabiting couple in which one partner is HIV positive and the other is HIV negative.

Recent analyses demonstrate that married or cohabiting serodiscordant couples are an important source of new HIV infections in sub-Saharan Africa. Prospective panel studies are one source of data, where serodiscordant couples are identified and then followed over a period of time. For example, Carpenter et al. (1999) followed 2,200 adults in rural Uganda over seven years, measuring their HIV status once a year. Chomba et al. (2008) state that in Lusaka, Zambia, “an estimated two thirds of new infections occur in cohabiting couples”; they refer to an earlier paper by Allen et al. (2007), who write that HIV transmission in sub-Saharan Africa occurs “predominantly between cohabiting partners,” citing an earlier paper by Trask et al. (2002). Trask et al. (2002) conducted molecular analyses of blood samples of a panel of originally discordant couples in whom seroconversion had occurred over a four-year period; they were able to rule out intra-couple transmission in only 13 percent of the cases; in the remaining 87 percent, the virus in both partners was similar enough to have been transmitted from one to the other.

Another data source on intra-couple transmission comes from Modes of Transmission (MOT) analyses. The MOT model divides a country’s population into groups with particular risks of acquiring HIV. By estimating the size of the risk groups and their level of exposure to HIV, the groups where most new HIV infections will occur can be identified. MOT analyses conducted during 2007–08 in Kenya, Lesotho, Mozambique, Rwanda, and Uganda suggest that the proportion of new infections arising from transmission within a stable union ranges from 10 percent in Kenya to 56 percent in Rwanda (Futures Group, 2008; Colvin et al., 2008).

Malamba et al. (2005) compared 49 positive seroconcordant and 126 serodiscordant couples presenting for couples counseling and testing in Kampala, Uganda. They found that both men and women in positive seroconcordant couples were many times more likely to be living together with their sexual partner than those in serodiscordant couples and concluded that living together was a “risk factor for being in an HIV-concordant relationship.” Dunkle et al. (2008) combined data from couples counseling and testing in Lusaka, Zambia, and Kigali, Rwanda, with Demographic and Health Surveys (DHS) from the same countries. Based on earlier studies, they set the probability of HIV transmission within a cohabiting serodiscordant couple at 0.2 over 12 months and estimated sexual activity and condom use from the DHS self-reports and the probability that a reported sexual relationship would involve serodiscordance from the counseling and testing data. Depending on assumptions about condom use, their models estimated that between 55 to 94 percent of new infections among sexually active adults and 60 percent to 99.9 percent of

¹ People living with HIV (PLHIV) define “positive prevention” as “Positive Health, Dignity, and Prevention” (GNP+ and UNAIDS, 2009). It refers to strategies aimed at helping PLHIV obtain better access to quality services and treatment; increasing their access to testing; engaging HIV-positive people in support, education, and stigma reduction efforts; and building their capacity to adopt protective behaviors for themselves and their partners. The present paper deals with only one component of a holistic positive prevention approach, specifically, prevention of intra-couple transmission.

² Throughout this report, the term “couple” is used as an umbrella term for married or cohabiting heterosexual couples. Data on same-sex couples were not available.

new infections among married or cohabiting adults in urban Zambia and Rwanda occurred within serodiscordant marital or cohabiting relationships.³

Despite the empirical evidence pointing to their programmatic importance, serodiscordant couples are often overlooked or, at best, only vaguely addressed in national prevention plans.⁴ This omission may stem not only from sensitivity surrounding HIV within marriage but also from misperceptions about the extent of serodiscordancy and failure to understand that it is possible to prevent transmission within a stable union once one partner has become infected (Futures Group, 2008; Colvin et al., 2008).

To fill this gap, several studies have made recommendations for married and cohabiting serodiscordant couples (Spino et al., 2009, and Desgrées-du-Loû and Orne-Gliemann, 2008). Implicit in these recommendations is the assumption that serodiscordant couples are an identifiable population for whom prevention efforts can be specifically tailored. But is this the case? Do serodiscordant couples differ from the general population in easily identifiable ways that enable programs to target them? The present report uses final reports and secondary data analyses from DHS and AIDS Indicator Surveys (AIS) from 10 sub-Saharan countries to answer the following questions:

1. What are the dynamics of serodiscordancy?
2. What are the specific characteristics of serodiscordant couples? Do these characteristics differ from the population at large?

Based on the findings, the report suggests additional data needs, policy recommendations, and programming implications for reducing the risk of HIV transmission within serodiscordant couples.

II. DATA

Ten countries were studied: Cameroon (DHS 2004), Côte d'Ivoire (AIS 2005), Ghana (DHS 2003), Kenya (DHS 2003), Lesotho (DHS 2004), Malawi (DHS 2005), Rwanda (DHS 2006), Swaziland (DHS 2006), Tanzania (AIS 2003), and Zimbabwe (DHS 2005-06). They were selected to represent a range of HIV epidemics.

The surveys include HIV test results for nationally representative samples of men and women, including subsets of married or cohabiting couples. This makes it possible to measure serodiscordancy and compare serodiscordant couples with the general population (see Box 1).

Box 1. How DHS Measures Serostatus

DHS data are collected from representative samples of women of reproductive age and men who are interviewed using a carefully designed questionnaire. Part of the sample includes both members of married or cohabiting couples, who are interviewed separately. The interview includes questions on whether the respondent has ever been tested for HIV and received the test results. Respondents are deliberately not asked for their HIV status.

After the interview is finished, respondents are asked if they would consent to having a blood sample (finger prick) taken for HIV testing. They are told that the results will be kept anonymous (as are their interviews) and they are given educational materials and referrals for counseling and testing.

Collected blood samples are tagged with the respondent's identification number and analyzed at a central laboratory. The HIV results are added to the respondent's individual data file.

³ However, the 2007 Zambia DHS found that 58 percent of married or cohabiting couples in which one or both members were HIV positive were discordant. This means that among HIV-positive individuals who were currently in union, at least 70 percent had to have acquired their infection from someone other than their current marital partner.

⁴ The most recent national HIV/AIDS plans for Kenya, Lesotho, Rwanda, Swaziland, Tanzania, and Zimbabwe available from the Internet were reviewed for preparation of this paper. The review found that Kenya's plan was the most detailed in its reference to serodiscordant couples, devoting a paragraph to this population. Plans for Rwanda, Tanzania, and Zimbabwe refer to serodiscordant couples once or twice, while Lesotho and Swaziland do not reference serodiscordant couples at all.

III. FINDINGS

Dynamics of HIV Serodiscordancy

HIV prevalence within couples is generally comparable to HIV prevalence in the overall population, largely because the majority of adults who are of reproductive age are married or cohabitating. Therefore, as HIV prevalence in the general population increases, so does the proportion of infected couples (couples in which one or both partners are HIV positive).

There are two types of HIV-positive couples: serodiscordant couples and positive seroconcordant couples. *Serodiscordancy* (only one partner infected) arises when one partner either comes into the union already infected or becomes infected later through extramarital sexual contact. *Positive seroconcordancy* (both partners infected) arises when the infected partner transmits HIV to the previously uninfected partner or when both partners are infected outside the union, either prior to the union and/or through extramarital sexual contact. The possibility that both partners were infected by others could be enhanced by assortative mating, in which people marry partners with similar risk (or non-risk) behaviors.⁵ Box 2 describes how the DHS defines couples who are “in union.”

Box 2. How DHS Defines “Union”

The standard interview asks the question, “Are you currently married or living together with a man [or woman] as if married?” Respondents are classified “In union” if they answer either that they are “Currently married” or “Living with a man [or woman].” While the types of formal marriages (e.g., civil, religious, etc.) and consensual unions may vary from country to country, they are all captured under the generic “in union” category. Note that the same definition is used for analysis of family planning.

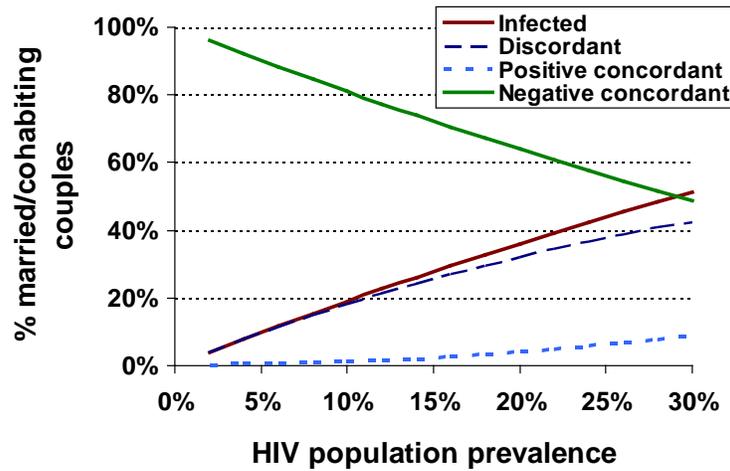
Cross-sectional data, such as national surveys, do not reveal when HIV infection occurred and, therefore, cannot pinpoint the source of either serodiscordancy (whether it was due to pre- or extramarital sexual contact) or positive seroconcordancy (whether both partners were infected outside the union or whether one partner infected the other). However, one can model the expected proportions of married or cohabiting couples that can be expected to be HIV infected (one or both partners HIV positive), serodiscordant, and positive seroconcordant, as a function of the HIV prevalence in the general population under different assumptions.

Figure 1 simulates the relationship between couples and general population HIV prevalence under the assumptions that the partner probabilities of HIV infection are equal to the general population, that all transmission takes place *outside* the union, and that there is no assortative mating.⁶ These assumptions produce the highest rates of expected serodiscordancy and the lowest rates of expected positive seroconcordancy.

⁵ There is extensive evidence for assortative mating within human populations, based on characteristics such as education, culture, and economic status (see, for example, Kalmijn, 1994).

⁶ HIV prevalence among women in sub-Saharan Africa tends to be higher than prevalence among men. The ratio of female-to-male prevalence will affect the proportions of serodiscordant couples that are female or male serodiscordant but has only a fractional impact on total serodiscordancy. See Annex B for computational details.

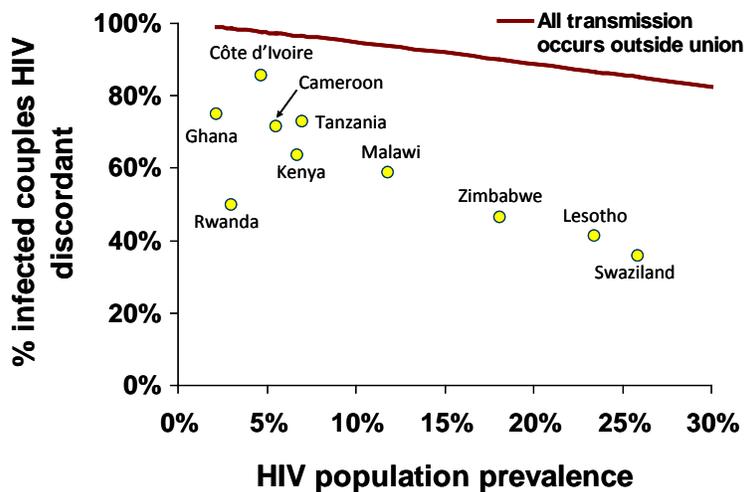
Figure 1. Expected Characteristics of Couples as a Function of General HIV Prevalence



The simulation shows that when population prevalence exceeds 29 percent, half of all couples could be expected to be HIV infected. As HIV prevalence in the general population increases, the growth rate of positive seroconcordancy should accelerate and the growth rate of serodiscordancy should decelerate, leading to declining proportions of HIV-positive couples who are serodiscordant and higher proportions of couples who are positive seroconcordant.

If there were no intra-couple transmission, most infected couples would remain serodiscordant. We can analyze the data from Figure 1 in a different way, focusing only on HIV-positive couples and calculating the percentage of infected couples that would remain serodiscordant if no intra-couple transmission occurred. Figure 2 plots the observed percentages of HIV-positive couples found to be discordant in the 10 study countries against the simulation that all transmission occurs outside the union. It is clear that all 10 countries show much less serodiscordancy than would be expected by chance. This suggests that considerable intra-couple transmission had already occurred prior to the date of the national survey.

Figure 2. Proportion of HIV-positive Couples Who Are Serodiscordant



The three countries with the highest population HIV prevalence (Swaziland, Lesotho, and Zimbabwe) show the lowest rates of serodiscordancy. (Rwanda also shows much lower than expected serodiscordancy.) While it is impossible to determine what proportion of observed positive seroconcordancy was due to intra-couple transmission, one can simulate the impact of lowering transmission rates on general population prevalence. Table 1 presents the results under the assumption that half of the cases of positive seroconcordancy were due to intra-couple transmission—half from wives to husbands and half from husbands to wives. In Swaziland, prevention of intra-couple transmission could have reduced HIV prevalence by 2.5 percent among women and 2 percent among men; in Lesotho, by 2.9 percent among women and 2.2 percent among men; and in Zimbabwe, by 2.2 percent among women and 1.6 percent among men. Table 1 presents the results of the simulation.⁷ The potential impact of reducing positive seroconcordancy would be somewhat greater if divorced and widowed individuals were added to the “in union” category. These individuals have the highest rates of HIV prevalence, perhaps reflecting the HIV-positive status of the former partner(s).

Table 1. Impact on Total Population HIV Prevalence by Reducing Positive Seroconcordancy within Married/Cohabiting Couples by 50 Percent

	Marital Status	Women 15–49			Men 15–49		
		%	Observed HIV+	Reduced trans.	%	Observed HIV+	Reduced trans.
Swaziland	In union	41	32.5%	26.3%	28	36.3%	29.1%
	Not in union	59	30.2%	30.2%	72	13.2%	13.2%
	Total		31.1%	28.6%		19.7%	17.7%
Lesotho	In union	53	26.9%	21.4%	37	32.9%	27.2%
	Not in union	47	26.0%	26.0%	63	11.2%	11.2%
	Total		26.4%	23.5%		19.3%	17.1%
Zimbabwe	In union	58	20.2%	16.5%	44	23.1%	19.4%
	Not in union	42	22.3%	22.3%	56	7.7%	7.7%
	Total		21.1%	18.9%		14.5%	12.9%

Note: Not in union includes never married, divorced or separated, and widowed.

Characteristics of Serodiscordant Couples

It is clear that preventing transmission within serodiscordant couples could have a substantial impact on reducing incidence and a long-term impact on lowering overall HIV prevalence. To develop programmatic recommendations to this end, it is important to determine whether serodiscordant couples share any distinguishing characteristics that would make it easier for programs to identify and reach them.

Using the DHS individual recode files, the Health Policy Initiative analyzed all available demographic and HIV-specific indicators for serodiscordant couples and compared them to the general population.

⁷ Note that the simulations presented in Table 1 refer to prevalence, while Dunkle et al. (2008) modeled incidence.

While DHS sample sizes are ample for most national-level analyses, the number of serodiscordant couples detected in any single survey is usually fairly small; half the surveys reviewed for this report included fewer than 100 serodiscordant couples.⁸ This limits the precision of detailed analysis. *Nevertheless, findings from the cross-country comparisons are overwhelmingly consistent—that except for their HIV status, serodiscordant couples are no different from the general population.*

Serodiscordant couples are found in both rural and urban areas. Serodiscordant couples are somewhat more urban than the population at large because HIV prevalence rates in urban areas tend to be higher than in rural areas.

Some countries have more female discordant couples; some countries have more male discordant couples. In sub-Saharan Africa, HIV prevalence rates are higher among women than among men. Therefore, it is not surprising to find more female serodiscordant couples (woman infected) than male serodiscordant couples (man infected).⁹ Of course, it is not possible to determine whether the infected partner was already infected before the union or became infected later through extramarital sexual contact.

Most serodiscordant couples have not been tested for HIV and, consequently, do not know their status. The proportion of respondents reporting never having been tested for HIV ranges from 86 percent of women and 92 percent of men in Côte d’Ivoire to 49 percent of women and 67 percent of men in Swaziland. Therefore, it is not surprising to find similarly low rates among serodiscordant couples: the proportion of respondents in serodiscordant couples reporting never having been tested for HIV ranges from 92 percent of women and 94 percent of men in Côte d’Ivoire to 52 percent of women and 64 percent of men in Swaziland.¹⁰

Few serodiscordant couples have comprehensive knowledge about how to prevent HIV transmission. The proportion of all couples who report having comprehensive knowledge about how to prevent HIV transmission¹¹ ranges from 14 percent of women and 23 percent of men in Côte d’Ivoire to 57 percent of women and 60 percent of men in Rwanda. The results are similarly low for serodiscordant couples.

Condom use is low among serodiscordant couples. Most couples in general do not use condoms. Given that most serodiscordant couples are unaware of their status, it is not surprising that condom use among these couples is also low.

IV. DISCUSSION

While the goal of general prevention interventions is that neither partner in a couple becomes infected, the prevention aim within serodiscordant couples is to ensure that should one partner be or become infected, the couple remains serodiscordant—in other words, to prevent intra-couple transmission. The question, then, is how can countries achieve this goal?

⁸ For a list of the sample sizes for each country, see Annex A.

⁹ Four countries (Cameroon, Côte d’Ivoire, Kenya, and Swaziland) showed more female serodiscordancy than male. Overall, there was no consistent relationship between relative serodiscordancy—male vs. female—and any other characteristic.

¹⁰ Prevention of mother-to-child transmission (PMTCT) programs testing pregnant women may be at least in part responsible for higher testing rates among married women than married men.

¹¹ The DHS definition of having “comprehensive knowledge of HIV prevention” is knowing that consistent use of condoms during sexual intercourse and having just one uninfected partner can reduce the chances of being infected with the AIDS virus; knowing that a healthy-looking person can have the AIDS virus; and rejecting the two most common local misperceptions about AIDS transmission or prevention (http://www.measuredhs.com/pubs/pdf/AISQ1/AIS_Individual_Questionnaire.pdf).

Traditional HIV “at-risk” groups often have identifiable characteristics—such as their profession (e.g., sex workers) or their age (e.g., young people)—that make it possible to employ targeted prevention strategies. Outreach efforts for young people, for example, can offer services at schools and youth centers. Even “hidden” populations such as injecting drug users and men who have sex with men, although difficult to reach, can be targeted. But as the findings in this report demonstrate, serodiscordant couples are no different from the general population—in effect, they are a hidden population hiding in plain view. Therefore, prevention to reduce intra-couple transmission must first encourage couples to get tested and then provide serodiscordant couples with services to promote and maintain positive health and appropriate risk-reduction behaviors.

V. POLICY RECOMMENDATIONS AND PROGRAMMING IMPLICATIONS

Recommendations for national HIV/AIDS agencies aimed at including serodiscordant couples in national HIV plans, increasing awareness about serodiscordancy and couples’ uptake of voluntary counseling and testing (VCT) services, and providing positive prevention programs (see Box 3) for serodiscordant couples are detailed below. Note that these recommendations do not require new programs but rather the integration of couples’ prevention into existing programs for the general population.

Policy Recommendations

Review and revise national HIV plans to include serodiscordant couples.

While most national plans in sub-Saharan Africa reference serodiscordant couples, such references tend to be limited and vague. Recognizing the importance of this issue in national plans is a crucial step in integrating messages about serodiscordancy into existing programs.

Conduct MOT analyses. The MOT model is designed to help align prevention responses to actual HIV prevention needs. Using country-specific biological and behavioral data, the model calculates the expected short-term incidence of HIV infections among the adult population and predicts where most of the new HIV infections will be found and the relative order of magnitude of new infections possible within risk groups. Countries can use these outputs to appropriately target prevention responses and resources.

MOT analyses have been applied in several countries, including three of the countries discussed in this brief (Kenya, Lesotho, and Rwanda). It is recommended that all countries conduct MOT studies to understand the potential impact of serodiscordant couples on the HIV epidemic and appropriately allocate resources to integrate serodiscordant prevention efforts into existing prevention responses. It is also recommended that countries update MOT analyses as new survey data become available.

Box 3. Positive Health, Dignity, and Prevention

“Positive Health, Dignity, and Prevention,” as defined by PLHIV themselves, embraces a holistic approach to positive prevention. This holistic approach recognizes the importance of not only protecting HIV-negative people from HIV transmission but also enhancing the health of HIV-positive people. Key components include ensuring access to antiretroviral treatment and proper nutrition, preventing and treating opportunistic infections, preventing transmission of HIV and other sexually transmitted infections, supporting sexual and reproductive health rights of PLHIV, protecting human rights and reducing stigma and discrimination, and changing harmful gender norms. Promoting the overall health and well-being of PLHIV contributes to the health and well-being of their partners and families and thus should be an integral part of prevention programs for serodiscordant couples.

Sources: Lawson, 2008; GNP+ and UNAIDS, 2009.

Allocate resources for serodiscordant couples. The magnitude of the HIV epidemic among serodiscordant couples demands that countries allocate resources for prevention efforts aimed at this population. While serodiscordant couples cannot be identified *a priori*, strategies aimed at (1) raising awareness about serodiscordancy, (2) encouraging couples to get tested either through couples testing and/or partner referrals to bring in the non-tested partner for testing and counseling, and (3) providing positive prevention interventions—based on the principles of positive health, dignity, and prevention—for serodiscordant couples as they learn their status can contribute to reducing intra-couple transmission.

Include knowledge questions about serodiscordancy in population surveys. Population-based surveys such as DHS should include knowledge questions about serodiscordancy to gauge respondents’ understanding of the issue. Findings can be used to design messages and evaluate educational efforts. Possible questions include the following:

- Can one partner be HIV negative if the other partner is HIV positive?
- If only one partner is HIV positive, is it possible to prevent transmission to the HIV-negative person?
- If one partner is HIV positive and the other is HIV negative, does this mean that the HIV-positive partner has been unfaithful?
- If both are HIV positive, does this mean that one partner infected the other?

Document and evaluate existing interventions. Program design and implementation would benefit from documented experiences and lessons learned from other programs aimed at reducing intra-couple transmission. Operations and evaluation research should be conducted to measure the extent to which couple-based interventions are able to achieve and maintain behavior change and to assess the cost-effectiveness of program inputs against outputs.

Programming Implications

“Be Faithful” messages that promote fidelity within marriage as a way to reduce risk of HIV transmission implicitly assume that couples know their status and that are both HIV negative. However, as this report shows, few serodiscordant couples realize they are in a serodiscordant relationship because they have not been tested for HIV. Therefore, as the recent AIDS Support and Technical Assistance Resources (AIDSTAR) report, *HIV Prevention for Serodiscordant Couples* (Spino et al. 2009), states, “The cornerstone of prevention programs with serodiscordant couples is ensuring couples learn if they are HIV discordant.” Couples should be encouraged to be faithful and be tested. Moreover, couples should be counseled and supported to safely disclose their status to their partner so that, together, the couple can take action to reduce the risk of HIV transmission and live positively. Box 4 highlights this and other recommendations made by the AIDSTAR report.

Box 4. Prevention within Serodiscordant Couples: AIDSTAR Report Recommendations

- **Couples HIV counseling and testing:** The key to HIV prevention with serodiscordant couples is couples HIV counseling and testing. Counseling couples together enables the challenging issue of disclosure to be addressed—although this requires counselors who are skilled at supporting serodiscordant couples.
- **Group-based interventions:** Small group-based interventions working with both partners in a serodiscordant relationship have proven to be effective in reducing risk. Group-based interventions include providing information, developing risk-reduction strategies, and developing personal skills. These interventions have also highlighted male partner influence in the adoption of risk-reduction strategies for serodiscordant couples.
- **Supportive environment:** Prevention programs are more effective when they occur within the context of a supporting environment. Fear of stigma often also needs to be overcome to further facilitate access.

Source: Spino et al., 2009.

Based on findings in this report, the following are recommendations for supporting the scale-up of counseling and testing for couples and for holistic positive prevention strategies aimed at couples who have learned their status:

Integrate information about discordant couples in all prevention materials. Awareness and understanding of serodiscordancy tend to be very low. For example, a study in Uganda found that nearly all study participants lacked accurate knowledge about serodiscordancy (Bunnell et al., 2005). Some people assumed that if their partner was HIV positive, they too must be positive; others did not believe that married couples could become infected, perhaps in part because “Be faithful” messages emphasize fidelity for couples as a way to reduce the risk of HIV exposure. Such messages could inadvertently reinforce the notion that marriage in and of itself is a safe haven. To increase awareness about serodiscordancy, the authors recommend that prevention education materials include messages such as

- Serodiscordancy is common;
- Serodiscordancy does not necessarily imply infidelity;
- HIV-negative partners in serodiscordant couples are at risk of HIV infection; and
- Intra-couple transmission within serodiscordant couples can be prevented.

Engage community leaders in couples’ outreach. Engaging community leaders to relay prevention messages to couples has had some success in increasing the uptake of VCT services among couples. Interventions in Kigali, Rwanda, and Lusaka, Zambia, recruited and trained influential members of the community, known as Influence Network Agents (INAs), who then promoted couples-based VCT (Allen et al., 2007). While the uptake of services after the intervention varied—27 percent of couples invited for testing in Rwanda got tested versus 10 percent of couples in Zambia—the predictors of success were similar. For example, INAs were more effective when addressing couples together, when they invited people they knew, and when they invited couples to attend VCT in settings allowing for discreet conversation, such as the home or workplace. In addition, invitations delivered after a public endorsement of couples-based VCT were associated with a higher response rate.

Ensure safe disclosure. Efforts to expand couples testing and partner referrals for testing must be mindful of potential risks to those who disclose their positive status, including violence (especially gender-based violence), stigma, discrimination, and abandonment. Counseling and testing programs must develop (1) procedures to screen for potential risks (e.g., for violence); (2) counseling protocols; (3) supportive services; and (4) linkages with community and/or faith-based groups, opinion leaders, and others to help reduce and mitigate these risks.

Promote consistent condom use within serodiscordant couples. Condom use within marriage is a sensitive topic because condoms are often associated with multiple partners and, thus, are viewed as proof of infidelity. However, recent studies demonstrate that intensive condom programming as part of couples-based VCT can dramatically increase condom use within serodiscordant couples. For example, in Zambia, condom use among serodiscordant couples increased from 3 percent before couples VCT to 80 percent after couples VCT (Allen et al., 2007). In the Democratic Republic of Congo, condom use increased from 5 percent to 71 percent (Kamenga et al., 1991).

Integrate men into PMTCT programs. As more countries adopt “opt-out” HIV testing of pregnant women, more and more women will eventually get tested for HIV. Integrating a couples-based approach and partner referrals into antenatal care, in general, and PMTCT programs, in particular, could increase couples testing as well as increase male involvement in maternal and child healthcare.

Train providers to discuss and manage serodiscordancy. Clinicians and other service providers should be trained about the risk of HIV transmission within couples; effective interventions for

serodiscordant couples; how to support safe disclosure within couples; and ways to talk to serodiscordant couples about positive health, dignity, and prevention. Such training could be offered within pre-service training and continuing education programs.

CONCLUSION

Serodiscordant couples are an important source of new HIV infections in sub-Saharan Africa; therefore, preventing intra-couple transmission could have a substantial impact on the epidemic. However, the DHS analyses presented here demonstrate that, except for their HIV status, serodiscordant couples are no different from the general population. In other words, they are not an easily identifiable “at-risk” population for whom specific prevention strategies can be targeted. Consequently, prevention strategies aimed at reducing intra-couple transmission must first encourage couples to get tested. Once serodiscordant couples become aware of their status, they should have access to services to promote and maintain appropriate risk-reduction behaviors. This can be broadly accomplished by integrating couples’ prevention into existing policies and programs for the general population; including specific provisions and budgets for serodiscordant couples in national HIV plans; encouraging couples to get tested and supporting them to safely disclose their status; and providing holistic positive prevention services to serodiscordant couples within existing programs.

ANNEX A. SAMPLE SIZES FOR SERODISCORDANT COUPLES IN NATIONAL SURVEYS

Country	Sample Size for Serodiscordant Couples
Cameroon	103
Côte d'Ivoire	64
Ghana	46
Kenya	83
Lesotho	77
Malawi	129
Rwanda	47
Swaziland	115
Tanzania	178
Zimbabwe	265

Source: DHS data for all countries, except for Côte d'Ivoire and Tanzania, which had AIS data.

ANNEX B. METHODOLOGY

Modeling expected rates of serodiscordancy as a function of general HIV prevalence.

Assumptions:

- a) All HIV infections are acquired prior to union.
- b) There are equal numbers of men and women in the population (monogamy).
- c) HIV prevalence among adults in union is equal to prevalence in the general population.

$$1. HIV_m = (2 * HIV_g) / (1 + Ratio_{f:m})$$

$$2. HIV_f = HIV_m * Ratio_{f:m}$$

$$3. CONCORD_{neg} = (1 - HIV_m) * (1 - HIV_f)$$

$$4. DISCORD_m = HIV_m * (1 - HIV_f)$$

$$5. DISCORD_f = (1 - HIV_m) * HIV_f$$

$$6. DISCORD_{tot} = DISCORD_m + DISCORD_f$$

$$7. CONCORD_{pos} = HIV_m * HIV_f$$

where

HIV_m HIV prevalence among men ages 15–49

HIV_f HIV prevalence among women ages 15–49

HIV_g HIV prevalence in general population 15–49

$Ratio_{f:m}$ Ratio of female prevalence to male prevalence

$CONCORD_{neg}$ Both partners HIV negative

$DISCORD_m$ Man HIV positive, woman HIV negative

$DISCORD_f$ Woman HIV positive, man HIV negative

$DISCORD_{tot}$ Total serodiscordancy

$CONCORD_{pos}$ Both man and woman HIV positive

To calculate the proportion of all HIV-positive couples who are discordant:

$$8. PROP_{discord} = DISCORD_{tot} / (DISCORD_{tot} + CONCORD_{pos})$$

where

$PROP_{discord}$ Proportion of all HIV-positive couples who are discordant

Estimating the impact of reducing positive seroconcordancy.

Positive seroconcordancy (both partners infected) arises when the infected partner transmits HIV to the previously uninfected partner or when both partners are infected outside the union, either prior to the union and/or through extramarital sexual contact. The cross-sectional nature of the DHS makes it impossible to estimate the proportion of positive seroconcordancy due to intra-couple transmission vs. positive seroconcordancy due to pre- or extramarital transmission.

The simulations presented in Table 1 were derived from the assumption that half of the cases of positive seroconcordancy were due to intra-couple transmission—divided equally between wives to husbands and husbands to wives—and the other half were due to pre- or extramarital transmission. Eliminating the intra-couple transmission would leave one member infected and reduce HIV prevalence of both men and women in union.

The further assumption was made that reducing positive seroconcordancy would have no effect on HIV prevalence rates of adult men and women who are not currently in union. (This is a conservative assumption, because it is likely that some widowed men and women had been infected by their now-deceased spouse.) The overall impact of reducing positive seroconcordancy among men and women in union is, therefore, weighted by the proportions who are not in union, the higher the proportion of adults who are in union, the greater the relative impact of reducing positive seroconcordancy, and vice-versa. Thus, a 6.2 percent reduction in HIV prevalence among women in union in Swaziland, where only 41 percent of women age 15–49 are in union, translates into a 2.5 percent reduction in HIV prevalence among all women ages 15–49; while in Zimbabwe, where 58 percent of women ages 15–49 are in union, a 3.7 percent reduction in HIV prevalence among women in union translates into a 2.2 percent reduction in HIV prevalence among all women. Obviously, the higher the proportion of positive seroconcordancy due to intra-couple transmission, the greater the potential population impact of reducing that transmission.

REFERENCES

- Allen, S., E. Karita, E. Chomba, D.L. Roth, J. Telfair, I. Zulu, L. Clark, N. Kancheya, M. Conkling, R. Stephenson, B. Bekan, K. Kimbrell, S. Dunham, F. Henderson, M. Sinkala, M. Carael, and A. Haworth. 2007. "Promotion of Couples' Voluntary Counseling and Testing for HIV Through Influential Networks in Two African Capital Cities." *BMC Public Health* 7: 349.
- Bunnell, R.E., J. Nassozi, E. Marum, J. Mubangizi, S. Malamba, B. Dillon, J. Kalule, J. Bahizi, N. Musoke, and J.H. Mermin. 2005. "Living with Discordance: Knowledge, Challenges, and Prevention Strategies of HIV-Discordant Couples in Uganda." *AIDS Care* 17(8): 999–1012.
- Carpenter, L.M., A. Kamali, A. Ruberantwari, S.S. Malamba, and J.A. Whitworth. 1999. "Rates of HIV-1 Transmission within Marriage in Rural Uganda in Relation to the HIV Sero-status of the Partners." *AIDS* 13(9): 1083–1089.
- Chomba, E., S. Allen, W. Kanweka, A. Tichacek, G. Cox, E. Shutes, I. Zulu, N. Kancheva, M. Sinkala, R. Stephenson, and A. Haworth. 2008. "Evolution of Couples' Voluntary Counseling and Testing for HIV in Lusaka, Zambia." *Journal of Acquired Immune Deficiency Syndromes* 47(1): 108–15.
- Colvin, M., M. Gorgens-Albino, and S. Kasedde. 2008. "Analysis of HIV Prevention Response and Modes of HIV Transmission: The UNAIDS-GAMET Supported Synthesis Process." UNAIDS Regional Support Team for Eastern and Southern Africa. Available at: http://www.unaidsrstea.org/files/u1/analysis_hiv_prevention_response_and_mot.pdf [Accessed on December 11, 2009].
- Desgrées-du-Loû, A., and J. Orne-Gliemann. 2008. "Couple-centered Testing and Counselling for HIV Serodiscordant Heterosexual Couples in sub-Saharan Africa." *Reproductive Health Matters* 16(32): 151–161.
- de Walque, D. 2006. "Discordant Couples: HIV Infection among Couples in Burkina Faso, Cameroon, Ghana, Kenya, and Tanzania." *Policy Research Working Paper Series 3956*. Washington, DC: World Bank.
- Dunkle, K.L., R. Stephenson, E. Karita, E. Chomba, K. Kayitenkore, C. Vwalika, L. Greenberg, and S. Allen. 2008. "New Heterosexually Transmitted HIV Infections in Married or Cohabiting Couples in Urban Zambia and Rwanda: An Analysis of Survey and Clinical Data." *Lancet* 371(9631): 2183–91.
- Futures Group. 2008. *Modes of Transmission Analysis: Rwanda*. Unpublished.
- Global Network of People Living with HIV/AIDS (GNP+) and Joint United Nations Program on HIV/AIDS (UNAIDS). 2009. *Positive Health, Dignity and Prevention: Technical Consultation Report, 27 – 28 April 2009, Hammamet, Tunisia*. Amsterdam: GNP+.
- Kalmijn, M. 1994. "Assortative Mating by Cultural and Economic Occupational Status." *The American Journal of Sociology* 100: 422–452.
- Kamenga, M., M. Jingu, N. Mbuvi, L. Mbu, F. Behets, C. Brown, and W.L. Heyward. 1991. "Evidence of Marked Sexual Behavior Change Associated with Low HIV-1 Seroconversion in 149 Married Couples with Discordant HIV-1 Serostatus: Experience at an HIV Counselling Center in Zaire." *AIDS* 5(1): 61–7.

Lawson, P. 2008. "Positive Prevention By and For People Living with HIV." Presented at the LIVING 2008: Positive Leadership Summit, held in Mexico City, Mexico, July 31–August 1, 2008. Available at http://www.gnplusplus.net/component/option,com_docman/task,doc_download/gid,327/Itemid,116/ [accessed February 5, 2010].

Malamba, S., J.H. Mermin, R.E. Bunnell, J. Mubangizi, J. Kalule, E. Marum, D.J. Hu, S. Wangalwa, D. Smith, and R. Downing. 2005. "Couples at Risk, HIV-1 Concordance and Discordance among Sexual Partners Receiving Voluntary Counseling and Testing in Uganda." *Journal of Acquired Immune Deficiency Syndromes* 39(5): 576–80.

Spino, A., M. Clark, and S. Stash. 2009. *HIV Prevention for Serodiscordant Couples*. Arlington, VA: USAID | AIDS Support and Technical Assistance Resources, AIDSTAR-One Task Order 1.

Temoshok, L., and R. Wald. 2008. "Integrating Multidimensional HIV Prevention Programs into Healthcare Settings." *Psychosomatic Medicine* 70: 612–19.

Trask, S.A., Derdeyn, C.A., Fideli, U., Chen, Y., Meleth, S., Kasolo, F., Musonda, R., Hunter, E., Gao, F., Allen, S. and Hahn, B.H. 2002. "Molecular Epidemiology of Human Immunodeficiency Virus Type 1 Transmission in a Heterosexual Cohort of Discordant Couples in Zambia." *Journal of Virology* 76: 397–405.

Health Policy Initiative, Task Order I
Futures Group
One Thomas Circle, NW, Suite 200
Washington, DC 20005 USA
Tel: (202) 775-9680
Fax: (202) 775-9694
Email: policyinfo@futuresgroup.com
<http://ghiqc.usaid.gov>
<http://www.healthpolicyinitiative.com>