

HIV Risk and Marriage in Africa

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The question of marriage and HIV risk has become something of a “hot topic” within public health. My research in this area, and this presentation, is an attempt to examine what the evidence-base is for the relationship between HIV risk and marriage, who is at risk of infection within marriage, and why.

Is marriage a risk factor?

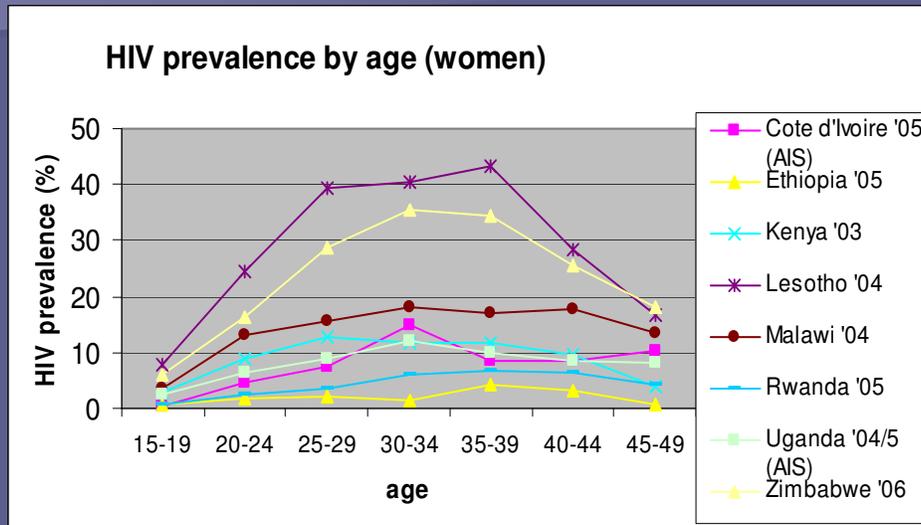
- "Today, the majority of sexually active girls aged 15-19 in developing countries are married. Ironically perhaps, these girls have significantly higher rates of infection than their sexually active, unmarried peers." (Global Coalition on Women and AIDS, 2005)
- "Marriage and other long-term, monogamous relationships do not protect women from HIV." (UNAIDS Annual Report, 2004)
- "One of the most dangerous environments for a woman in Africa is to be married." (Stephen Lewis, U.N. Special Envoy for HIV/AIDS, speech at Harvard School of Public Health graduation, 2005)
- "Evidence shows that marriage is not a protective factor against HIV for women and girls." (Center for Health and Gender Equity, 2008)

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Here are some recent statements on marriage and HIV risk.

Statements like this have become common within the public health community, but after examining the evidence base I would argue that these statements are not evidence-based, at least for Africa.

High HIV prevalence among women in some African countries



Source: Demographic and Health Surveys

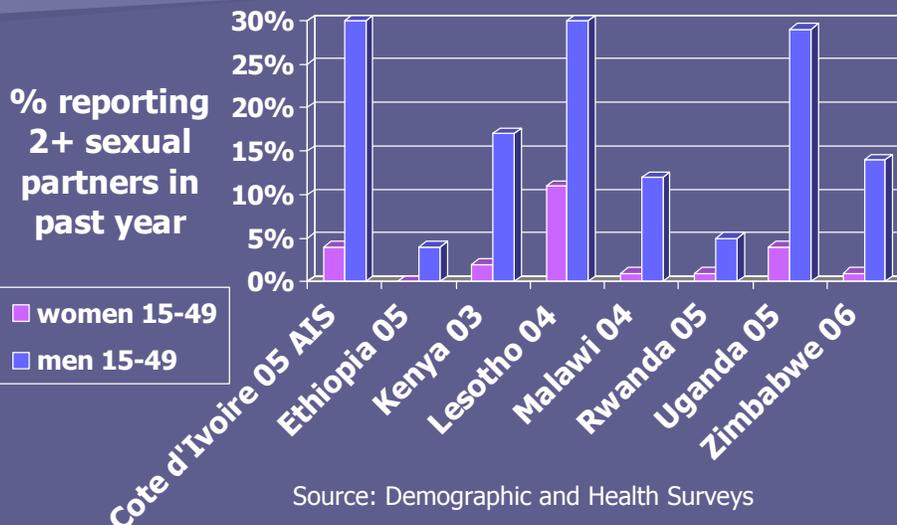
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To step back a little— there is obviously a lot of concern over women and girls because women and girls are so disproportionately affected by HIV/AIDS. I am sure I don't have to tell you that Africa accounts for a majority of the world's HIV infections, and that women and girls account for 60% of infections in Africa.

Here are prevalence curves showing HIV prevalence in 8 African countries. I show this graph for a couple reasons. Of course we can see that HIV prevalence rises very rapidly among young women— and HIV prevalence among young women tends to be several times that of young men. Obviously young women are a particular concern.

I also show this graph to remind us all of the heterogeneity of HIV within Africa. I am going to be presenting data from these 8 African countries in today's presentation, but obviously we see very different epidemics going on in these 8 countries. We see Lesotho and Zimbabwe with very high prevalence, Ethiopia with very low prevalence, and a number of countries in between.

Women report much less risky behavior than men



Source: Demographic and Health Surveys

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The fact that women are disproportionately infected, combined with the fact that women report much less risky behavior than do men, has led to the conclusion that women are overwhelmingly at risk not because of their own behavior but because of their male partner's behaviors. In marriage, for instance, it is assumed that women are faithful while men are not— and so women are infected by their husbands or partners.

This graph shows the number of men and women reporting two or more sexual partners in the past year. Obviously men report two or more partners at much greater rates than do women.

If women in Africa report fewer partners than men, yet have higher HIV prevalence, does that mean that men's behavior is the problem?

If most HIV-infected women in Africa are married, does that mean that marriage is a risk factor?

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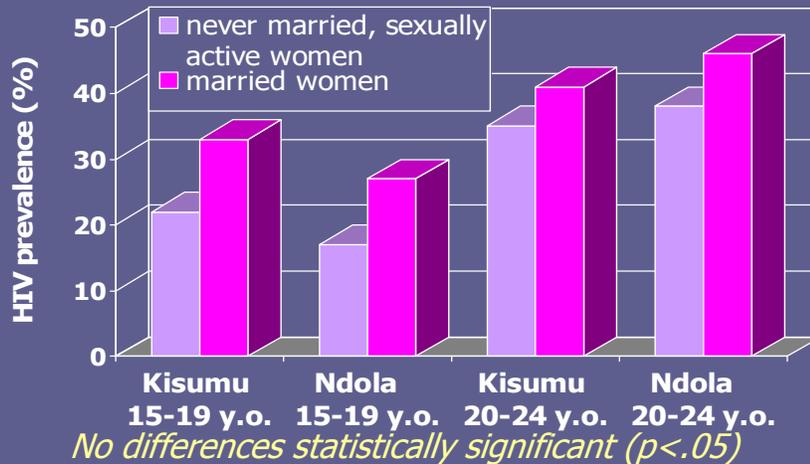
The central questions might be stated as:

A note on the word marriage. We could spend a lot of time talking about what "marriage" means in Africa. I am using the word in this presentation because it is "marriage" that has been identified as a risk factor, and because it is used by surveys such as the DHS. I am using it in the same sense as the DHS, to mean couples who are married or cohabiting. (DHS question is "Are you currently married or living with a man?")

In examining the question of whether marriage is a risk factor I did a literature search for data that showed married women having a higher risk than other sexually active women. I found a few sets of data in which young married women had higher HIV prevalence than other sexually active women. The Multicentre study found this in Kisumu, Kenya and Ndola, Zambia. Kelly and colleagues found this in Rakai, Uganda. Clark, Bruce, and Dude also reported that in over 20 countries they examined (using DHS) data, HIV prevalence was higher among married compared to non-married sexually active 15-19 y.o. in Kenya, Tanzania, and Cameroon, and the difference was stat. sign. only in Kenya. If someone knows of a study that I didn't find in my literature review, I'd love to know about it.

The preponderance of data, from Demographic and Health Surveys and some other studies that I won't be able to discuss because of time, showed that marriage is protective.

Higher HIV prevalence among married than unmarried, sexually active young women in Kisumu, Kenya and Ndola, Zambia



Source: Glynn et al, 2001 (Multicentre Study)

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I want to spend some time on some very well-known data that have been used by many as evidence that married women have higher risk than sexually active, unmarried young women. Virtually all references of married women having higher risk that I have found seem to be referencing these data. These data were published in an article by Glynn and co-authors, and then discussed in a later article by Clark that addressed reasons for young married women's risk. We see that married women do have higher HIV prevalence than never married, sexually active women...

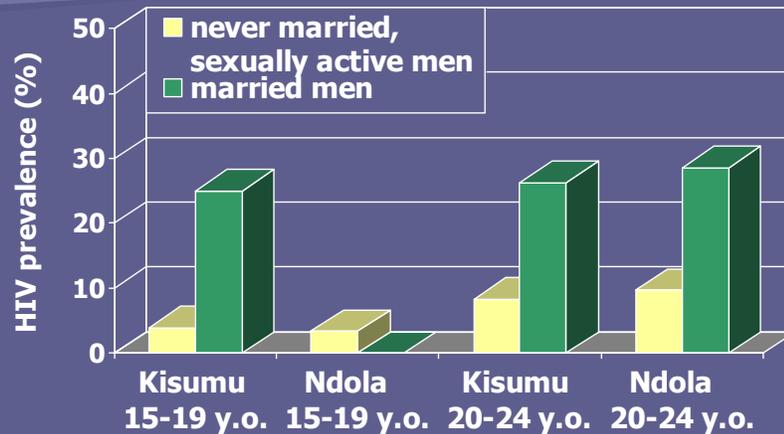
None of these differences stat. sign. at $p = .05$ (sample sizes small, < 200). If you combine all of these data (both cities and age groups), the difference is statistically significant, but perhaps the more important limitation is that they are not age-adjusted. For instance, a 19 year in Kisumu is more likely to be married and to be HIV positive. (Married girls 1.0 yr older in Kisumu, 0.5 yrs older in Ndola). Clark stated in her analysis that married girls tended to be older and less educated.

The article by Glynn also identified some other possible co-founders, such as the possibility that girls who get married younger have other risk behaviors, such as younger sexual debut and more pre-marital partners— and in fact this was true in Ndola.

Kelly et al. (2003) had similar findings in Rakai, Uganda. Those data also found higher HIV prev. among women in union compared to never-married, also not stat. sign, and also not age adjusted.

The bottom line is that I think we should be careful about drawing too many conclusions from these data, but in fact, these data seem to have been used to make some fairly sweeping conclusions.

Young married men in Kisumu and Ndola also had elevated HIV risk compared to unmarried, sexually active young men



Differences for 20-24 y.o. men statistically significant ($p < .05$)

Source: Glynn et al, 2001

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Glynn and colleagues found that in fact married young men were also at greater risk, compared to sexually active unmarried young men— and for 20-24 y.o., the differences were stat. significant.

Of course these data have the same limitations as the previous data— and Glynn and co-authors found that young men in both Kisumu and Ndola who married younger had higher-risk behavior previous to marriage (Glynn, 2003).

White et al (2000) also found that high-risk behavior prior to marriage (early sexual debut, higher number of sexual partners) was predictive of greater numbers of extramarital partners for men in Cote d'Ivoire, Tanzania, and Lusaka.

Was marriage really the risk factor for young women in Kisumu and Ndola?

- Very similar rates of sexual activity among young women and young men, including <15
- Very high HIV prev. among *never*-married women >25 (54% in Kisumu, 47% in Ndola)
- Women who were virgins at time of marriage had significantly lower HIV prev. than women who were not (RRs=0.53 Kisumu, 0.65 Ndola)
- Glynn et al conclude: "The continued lower prevalence of HIV in those who were virgins at marriage also suggests that much of the HIV in women is acquired before marriage"

Source: Glynn et al, 2001

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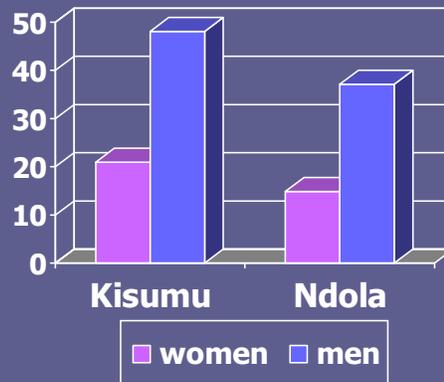
Glynn and co-authors presented some evidence that in fact marriage was not the real risk factor for young women in Kisumu and Ndola, but that much HIV was acquired before marriage.

#3 true even when excluding women who declared extra-marital partners—suggesting many infections were acquired before marriage

Was marriage really the risk factor? (cont.)

- Significant numbers of women reported non-marital partners
- Higher number of lifetime partners associated with higher HIV prev., *especially* for women

% of young women and men (15-24 y.o.) reporting non-marital partners (15-24 y.o.) in past year



Source: Glynn et al, 2001

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“Even after excluding partners from outside the age range of the survey and partners from outside the city, as well as partnerships with high-activity-women, men in Kisumu and Ndola reported about three times more non-spousal partners in the past year than did women, and the difference in reported number of partnerships was more marked in the younger age groups than in the older age groups. This suggests that women, especially young women, under-report that number of their partners.”

In addition, 8/67 (11.9%) women in Kisumu and 8/107 (7.5%) women in Ndola who denied sexual activity were HIV positive and some had other STIs.

New evidence from Demographic and Health Surveys (DHS) also challenges the assumption that marriage is a risk factor and that women's primary risk comes from unfaithful partners

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Demographic and Health Surveys (DHS), population-based surveys done approximately every 5 years in many developing countries, recently started to collect couples-level data

We know who and who is not infected in a couple (who is married or living together)

We have data on HIV status and behaviors, linked at individual level

What does this tell us?

DHS data show marriage is protective

- A study of DHS data from 33 countries concluded that 'marriage is protective' (Bongaarts/Population Council, 2006 & 2007)
 - risk for HIV infection per year of exposure among sexually active women higher *before* than *after* first marriage (Ghana and Kenya)
 - longer gap between first sex and marriage leads to higher risk (countries with highest HIV prevalence have highest "gap")
 - where rates of premarital sex are low, early marriage elevates risk; where rates of premarital sex are high, marriage is protective

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Child marriage is certainly still a concern, for many reasons besides HIV. Clark, Bruce, and Dude have written about the risks faced by young brides (older partner, more likely to be 2nd or 3rd wife): "For virgin girls, marriage transitions them from virginity (no-risk) to frequent unprotected sex."

DHS data show high numbers of female discordant couples

- Another analysis of DHS data showed that in 4 of 11 African countries it was the woman, not the man, who was infected in majority of discordant couples (Mishra, 2007)
 - “substantial proportions of female infections in discordant couples suggest infections within marriage from a non-spousal source”
 - “infections within marriage are a major driver of the epidemic... the direction of spread is not only from men to women, but women to men”

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Female extramarital sex may be the cause of most female discordancy

- DHS data from 5 African countries showed that in 30 to 40 percent of infected couples, the woman *alone* was infected (de Walque, 2007)
 - Controlling for factors such as polygyny, and HIV infection in a previous marriage or before marriage, did not significantly change rates of female discordancy
 - “It is extremely difficult to explain the sizable fraction of HIV-infected couples in which only the woman is HIV positive without female extramarital sex as a driving factor... it seems that self-reports of sexual behavior are not very reliable.”

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De Walque used a more conservative measure— not female discordant as a percentage of all discordant, but female discordant as a percentage of all infected couples.

Is self-reported data on sexual behavior reliable?

Percent reporting 2 or 3 partners in the last 3 months – 2006 (Ngudzeni ADP)

	2	3
Male	32.9	11.8
Female	58.8	2.9

= 44.7

= 61.7

Percent reporting more than one partner in the last 12 months (2006-07 Swaziland DHS):

• Males: 22.9

• Females: 2.3

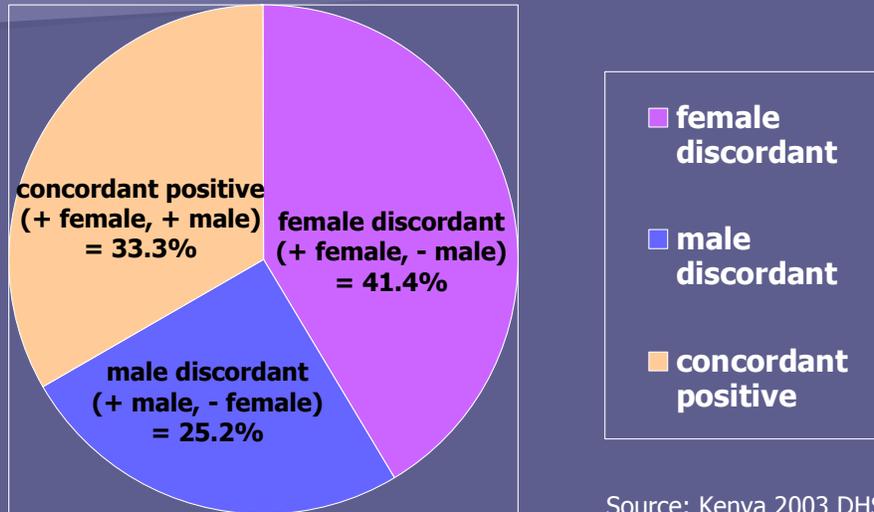
Sources: James, 2006; Swaziland DHS 2006-7 (slide created by Tim Mah)

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That last statement points to the fact that in fact women's self-reported data on sexual behavior may not be very reliable, and at least should be interpreted with caution. I borrowed this very interesting slide from a colleague– it is comparing reporting of multiple sexual partners among women in Swaziland, using two very different methodologies.

The data on the left was collected by World Vision, using individual questionnaires.

HIV-infected couples in Kenya



Source: Kenya 2003 DHS

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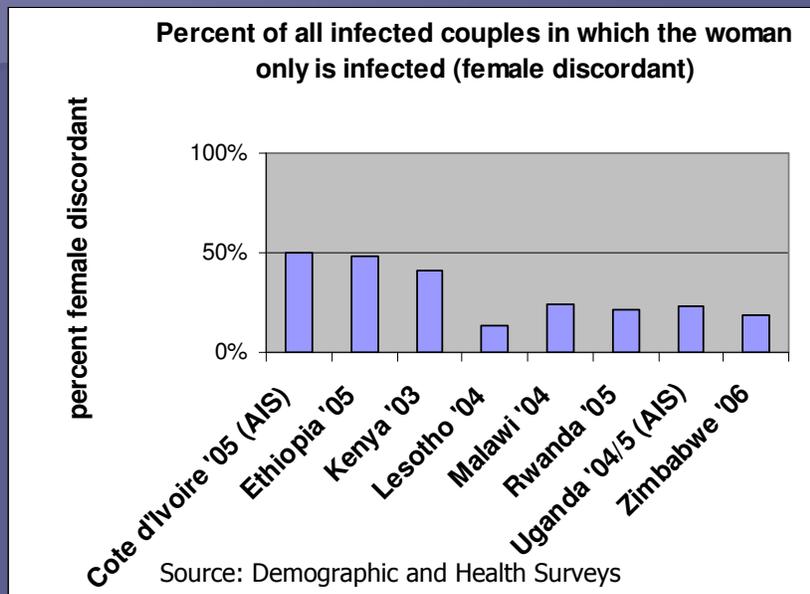
Explain discordancy. This tells us what percentage of couples only the woman is infected, what percentage only man is infected, and what percentage both are infected— for the last category, we don't know which partner first brought HIV into union (and perhaps both were infected outside of or before union). Note that most infected couples are discordant (true of most countries).

We could look at female discordant couples as a percentage of all discordant couples, as Mishra did, or female discordant couples as a percentage of all infected couples, as de Walque did. I will be presenting data of female discordant couples as a percentage of all infected couples, not as a percentage of all discordant couple— a more conservative measure of female discordancy. In at least this percentage of infected couples we know that HIV was introduced by the woman.

Even if women bring HIV into union less often than men, if women become infected more easily than men within marriage this could cause number of male discordant couples to shrink faster than number of female discordant couples (male discordant couples move into concordant positive category more easily). Therefore we can't necessarily look at this graph and infer that these are the ratios at which men and women brought HIV into union. We can't necessarily infer anything about extramarital relationships. Female discordancy may be due to premarital infection (among women). In addition, women may have extramarital relationships less often than men but become infected more easily, thus bringing HIV into union more easily.

What rates of female discordancy do tell us is that there are a significant number of couples in which the woman is positive and it is the man who is HIV negative and at

Female discordancy in 8 African countries



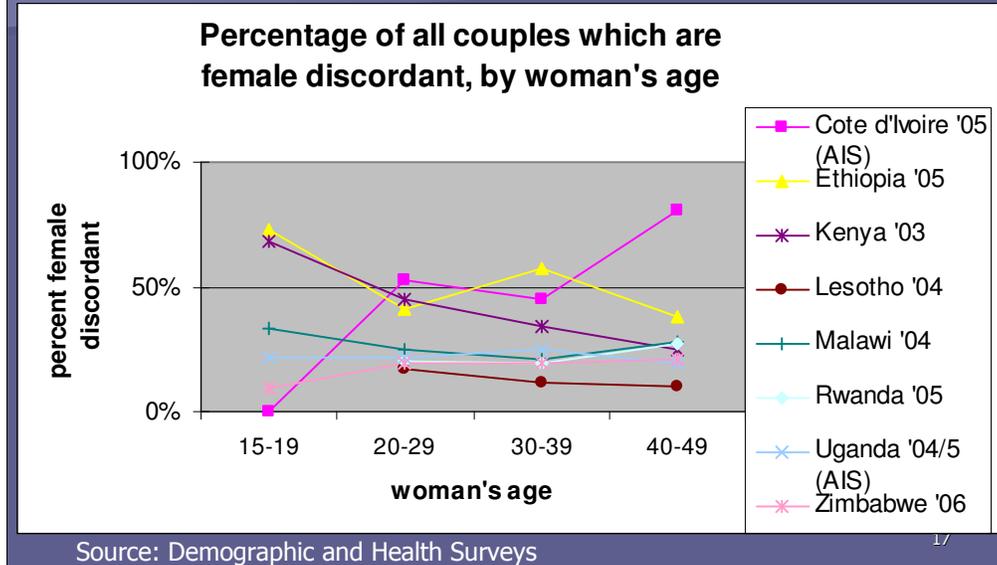
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Now I'm going to present some data I've gathered from the DHS.

This shows rates of female discordancy in 8 countries for which I had couples-level data. This is the percent of all infected couples in which the woman only is infected, and it is the man who is at risk.

Considerable variation between countries.

Relationship with age is... complicated

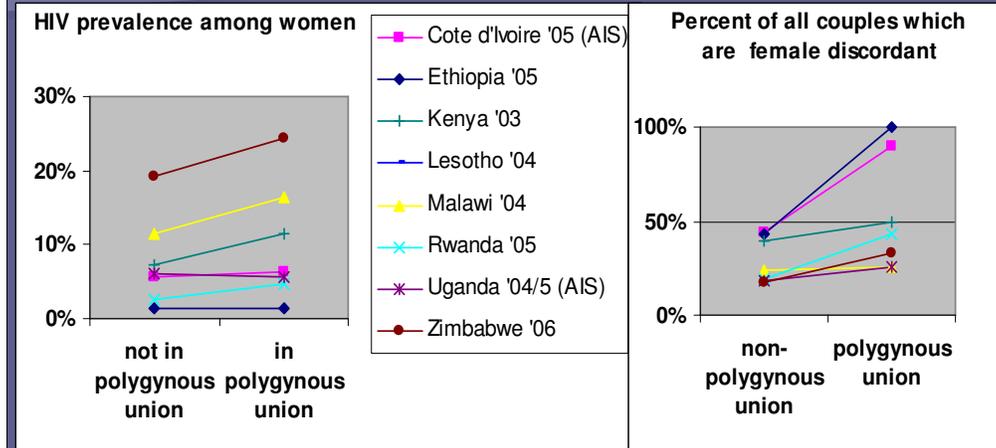


I looked at rates of female discordancy compared to education and wealth— to see, for instance, if poorer or less educated women were more likely to be in a relationship where they were at risk of infection. I did not find any clear relationship, so I will not show those graphs.

This graph shows female discordancy by women's age, and we also do not see a clear relationship. What we do **not** see here is the pattern we would expect if the major driver of young women's infections was infection by older partner, within union. If that were the case, we would expect to see very low rates of female discordancy among the youngest cohort. The only country in which we see this clear relationship is Cote d'Ivoire. In fact in some countries (e.g. Kenya, Ethiopia) the rates of female discordancy are highest among the youngest cohort, meaning that unions with young brides are the most likely to be female discordant, and the most likely for the woman and not the man to bring HIV into the union.

This is in fact consistent with another analysis of Ndola and Kisumu (Glynn et al 2003) which found that women were 2x more likely to be HIV infected at first marriage than were men.

Relationship with polygyny is... unexpected



Source: Demographic and Health Surveys

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HIV rates higher among women higher in polygynous unions...

But interestingly rates of female discordancy also higher in polygynous marriages.

In other words, if marriage is a risk factor, it seems to be because women are more likely to introduce HIV infection into the marriage than in non-polygynous unions.

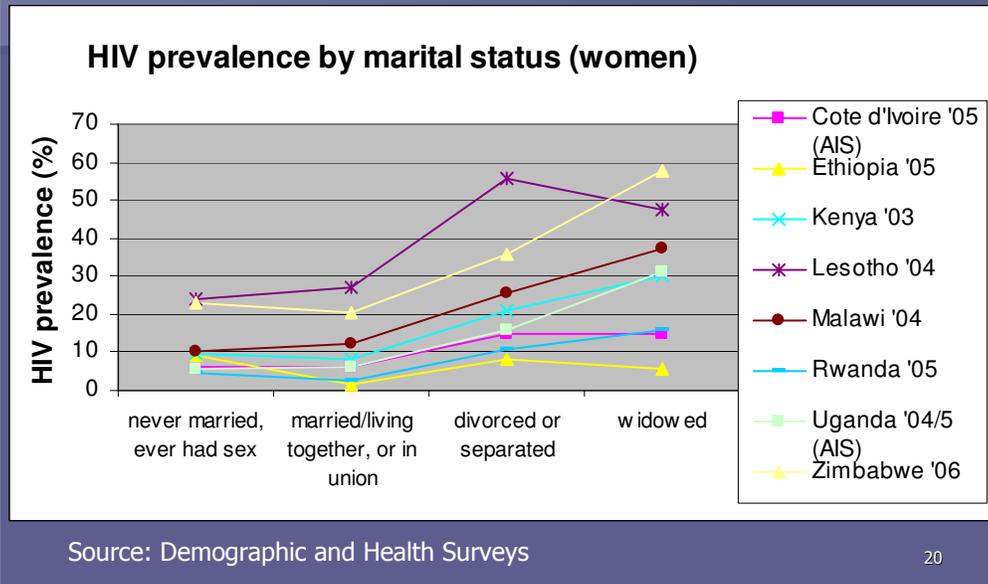
Possible explanations for high rates of female discordancy?

- Women are infected when they enter marriage
- Women are becoming infected through extramarital relationships
- Women may be more biologically vulnerable, and more likely to become infected (within and outside of marriage) than men
- Women are infected through non-sexual modes of transmission

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Coerced sex

Marriage is risky compared to what?

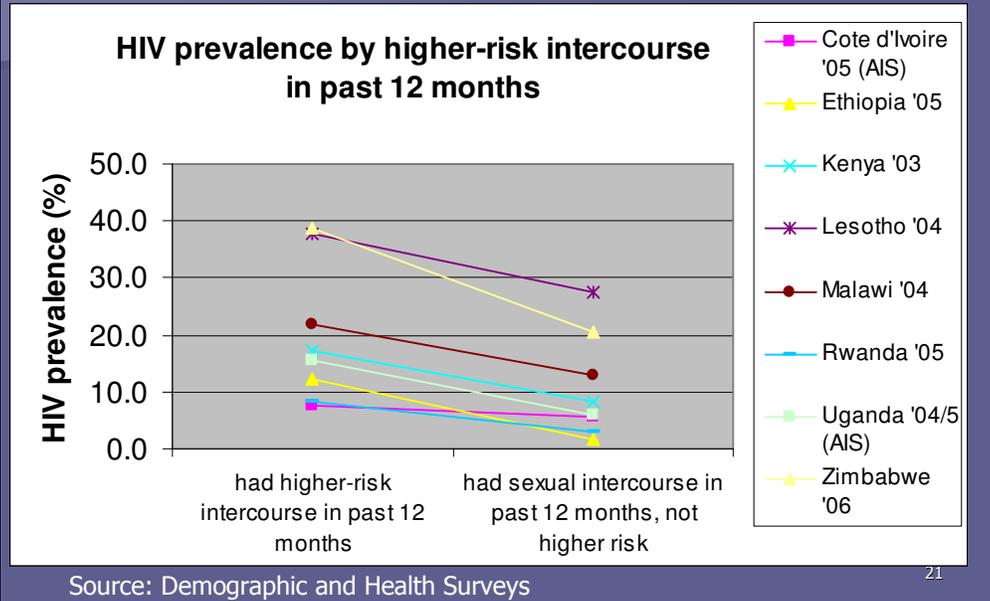


Question: marriage is risky compared to **WHAT?**

Not age-adjusted— we would expect never-married women to be younger and have the lowest HIV prevalence, but in fact even though married women tend to be older they have HIV prevalence basically equal to never-married women.

Much higher rates among divorced, separated, or widowed. Women are safer being married than in any other state (except for not sexually active)

Women's behavior very much affects their HIV risk



Strong correlation between women's sexual behavior and HIV risk— women's sexual behavior does matter, they are not at risk only due to partner's behavior (and regardless of their behavior)

What do we know?

- Marriage can place women at risk (a woman can be infected by her partner, just as a man can), *but overall marriage is protective*
- Early marriage and older partners can increase women's risk
- In a significant minority of unions, it is the woman who brings HIV into the relationship
- Multiple partners (premarital or extramarital) can place men and women *and* their partners at risk

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- Evidence for risk from older partners from Kelly et al, 2003 (Rakai):

Among young women 15-24, those with older partners had elevated HIV prev

Women 15-19 y.o. with partners 10+ years older had 2x HIV prev

Women 25-29 had no elevated risk with older partner

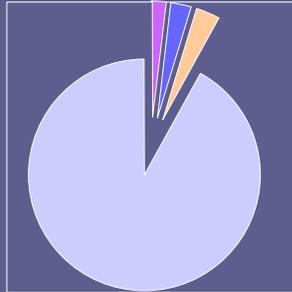
Only HIV prev, not HIV incidence, increased with older partners.

Incidence lower in longer-duration relationships

Women with <4 years age difference with partners had lower HIV prevalence

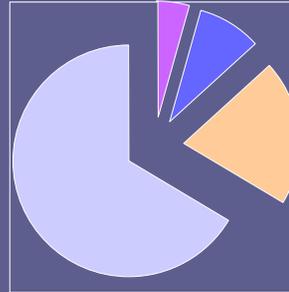
The majority of married individuals are *not* at risk in their marriages

HIV infections among couples in Uganda



■ female discordant=1.8%
■ male discordant=2.8%
■ both HIV positive=3.4%
■ both HIV negative=91.4%

HIV infections among couples in Lesotho



■ female discordant=4.5%
■ male discordant=8.9%
■ both HIV positive=20.2%
■ both HIV negative=66.4%

Sources: Uganda 2004/5 AIS, Lesotho 2006 DHS

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One final point— the majority of married individuals in Africa are *not* at risk in their marriages.

How can we keep the uninfected couples— the great majority— uninfected?

What can be done about risk within marriage?

- Gender-sensitive approaches? **YES!**
- Women's empowerment? **YES!**
- Better prevention strategies for women? **YES!**
- Protecting women from violence and coercion? **YES!**
- Testing for couples and prevention for positives? **YES!**

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These are the approaches that are often suggested to reduce women's risk, and absolutely, we should be investing in all of them.

But also recognize...

- Women's own behaviors (and not just behavior of partners) may be placing them at risk– so we need to know more about women's actual behaviors.
- Men as well as women can be at risk within marriage
- Partner reduction/"be faithful" messages needed for men and women

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Under what circumstances do women engage in premarital or extramarital sex?

I think perhaps we have only told one story about women's sexuality in Africa– that women are placed at risk of HIV because of economic need, violence, coercion, or through their partner's behavior. Certainly recognizing ways in which women lack power over their sexual lives, and addressing these factors, is critically important.

But reality is more complex than this– women as well as men have sexual relationships for many reasons– and perhaps we haven't given enough attention to the fact that women may enter into sexual relationships that could place them at risk, for many reasons. As long as we're only telling one story about why women are at risk– that they are infected by partners and powerless– we are not addressing other reasons women may be at risk.

We need to let reality be a little more complex, and allow our research and our programs to recognize and address all the reasons that women's sexual behavior may place them and their partners at risk.

There is increasing recognition that patterns of multiple concurrent partnerships are driving the HIV epidemics in Africa, particularly in southern Africa. In order to address the pattern of MCP we need to address male and female behavior.

One example of “out of the box” research of women’s behavior...

- Tawfik & Watkins (2006): “Sex in Geneva, Sex in Lilongwe, Sex in Balaka” (Malawi)
 - three interpretations of women and the transmission of HIV in rural Malawi
 - In Lilongwe and Geneva the view was that women from rural Malawi engage in extramarital sexual relationships because they need money for survival
 - In Balaka, women said they were motivated not primarily by money for survival but by desire for attractive consumer goods as well as by passion and revenge for husband’s infidelity

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Other examples of interesting research on women’s motivations for sex come from Suzanne Leclerc-Madlala: women engage in transactional sex not for items they need but items they want (consumer culture).

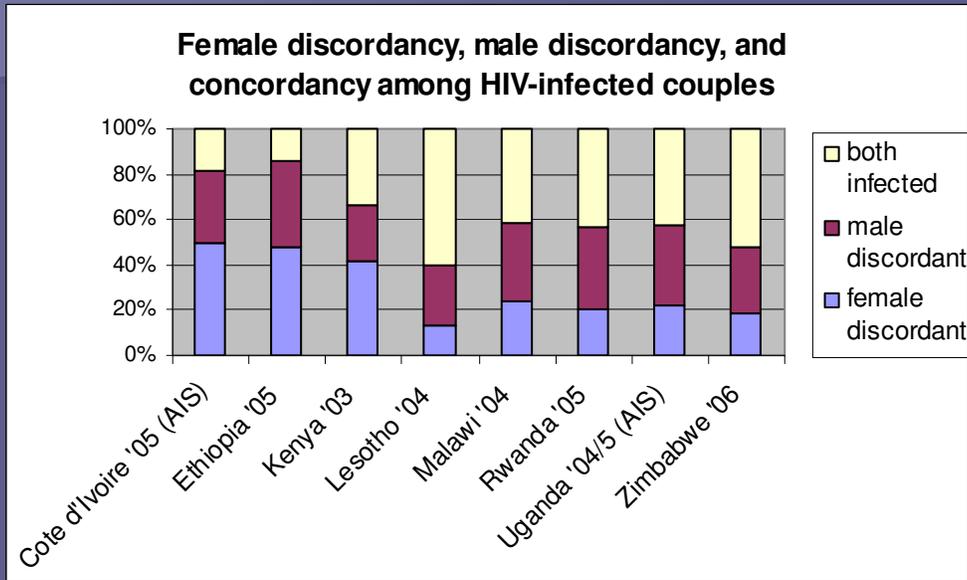
Luke (2005) found that in Kisumu, Kenya only 4% of non-marital partnerships reported by older men were “sugar daddy” relationships (age difference of >10 years, and exchange of more than mean amount of male-to-female material assistance).

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Extra Slides

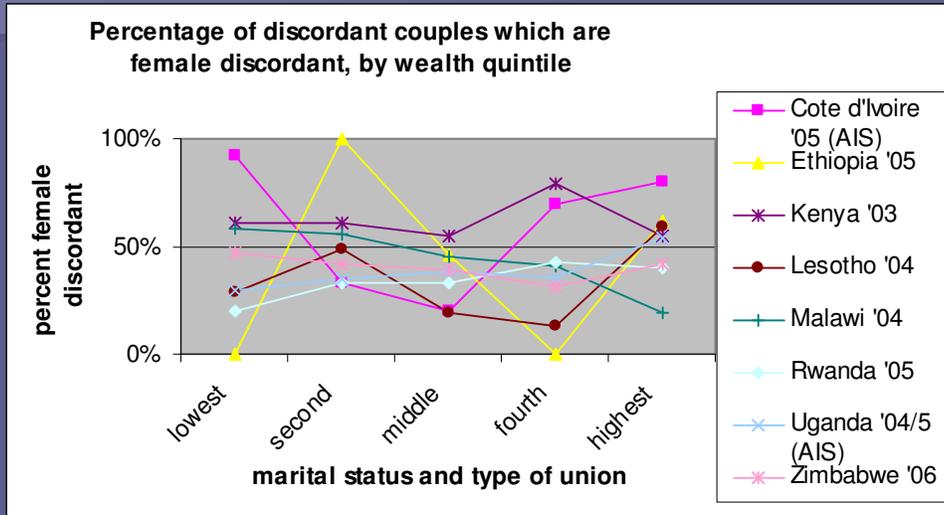
Discordancy and concordancy among couples in 8 African countries



Source: Demographic and Health Surveys

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Female discordancy and wealth

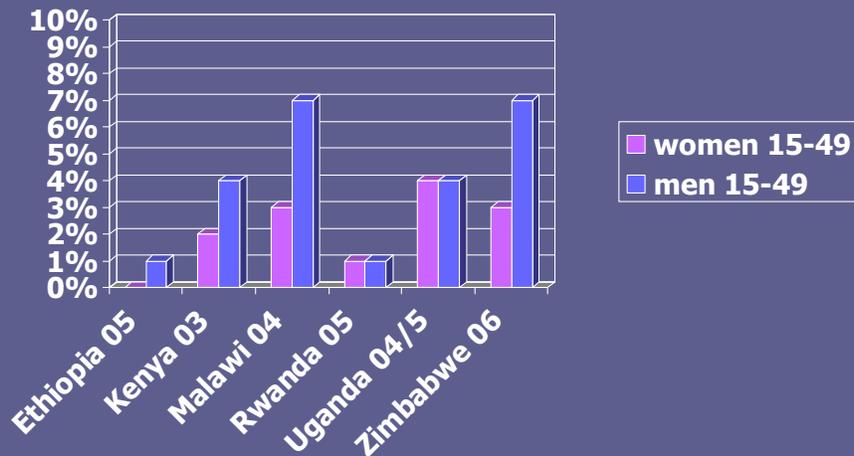


Source: Demographic and Health Surveys

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No clear relationship— poorer women do not seem to be more likely to be in relationships in which they are at risk of infection.

Condom use at last sex with regular partner



Source: Demographic and Health Surveys

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Note the Y axis only goes to 10%-- condom use with at last sex with regular partner is universally low, and consistent usage rates are probably lower still. Multiple partners, especially concurrent partners, clearly increase risk of HIV infection, and in the vast majority of regular partnerships condoms are not used consistently enough to reduce these risks. Therefore the focus must be on reducing number of sexual partners, for men and women.

Other evidence that married women at lower HIV risk than unmarried

- **Urassa et al, 2006** (ANC data, northern Tanzania)
 - per-year risk higher before than after first marriage (OR 1.20 (95% CI 1.12-1.28)/year of premarital exposure and 1.09 (1.04-1.16)/year after first marriage)
 - “lengthy premarital exposure is riskier than equivalent years of exposure after marriage”
 - most important risk factors (behavioral) were duration of exposure to sexual activity, esp premarital, and having a partner who was >10 years older
- **Hattori et al, 2007** (Nairobi Cross-Sectional Slum Survey)
 - Co-habiting women nearly 10X as likely to have multiple partners as married women, even adjusting for other factors of education, ethnic group, religion, age.
 - *OR of reporting more than one partner in the past year:*
 - Married, co-residing: 1.00
 - Married, not co-residing: 1.64
 - Not married, co-resides: 9.50
 - Widowed: 15.56 (30% of widows abstained in previous year)
 - Divorced or separated: 31.33
 - Has co-wives: 4.36

HIV incidence of married men and women

- **Carpenter et al, 1999** (Masaka, Uganda)
 - Among those with HIV-positive spouses, age-adjusted HIV incidence in women twice that of men (rate ratio (RR)=2.2, 95% confidence interval (CI) 0.9-5.4)
 - Among those with HIV-negative spouses, incidence in women less than half that of men (RR=0.4, 95% CI 0.2-0.8)
 - Age-adjusted incidence among women with HIV-positive spouses 105.8 times (95% CI 33.6-332.7) than of women with HIV-negative spouses; equivalent ratio for men 11.6 (95% CI 5.8-23.4)
- **Hugonnet et al, 2002** (Mwanza, Tanzania)
 - Men 3x more likely than women to introduce HIV into concordant negative partnership
- **Gray et al, 2000** (Rakai, Uganda)
 - Higher HIV incidence among uncircumcised men than women (in discordant relationships)
 - HIV incidence, uncircumcised men= 16.7/100 person years (95% CI = 12.0-21.4)
 - HIV incidence, women= 13.2/100 person years (95% CI= 9.6-16.8)
 - No HIV infections among circumcised men (N=106)

Forced first sex

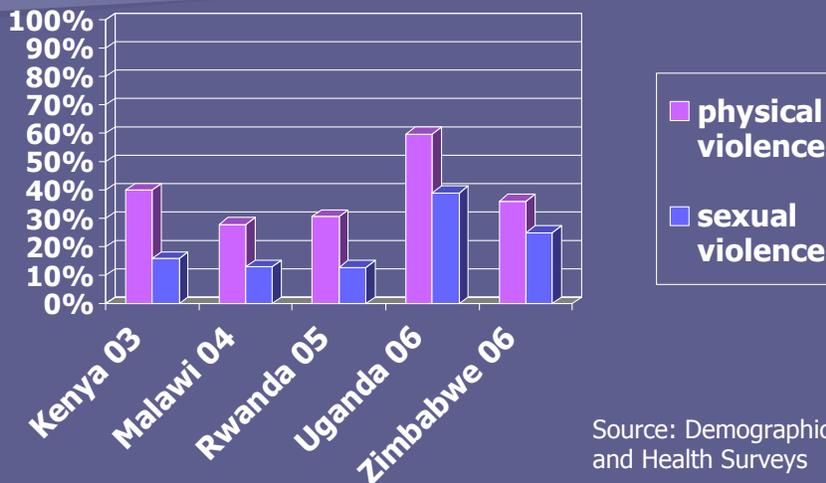
- 21% of women in Zimbabwe, 24% of women in Uganda, and 1 in 3 women in South Africa report that first sex was forced

Sources: Zimbabwe 2005/6 DHS; Uganda 2005/6 DHS, South Africa; South African National HIV Prevalence, HIV Incidence, Behavioral, and Communications Survey 2005

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Coerced/forced sex, esp among young women, is still a critical problem.

Percent of women who have ever experienced physical and sexual violence

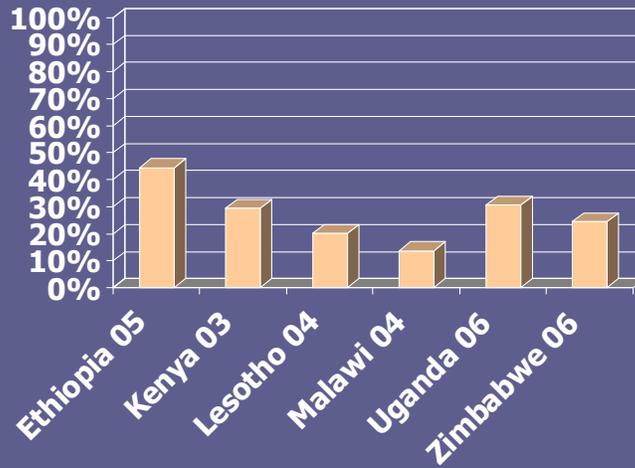


Source: Demographic and Health Surveys

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Physical and sexual violence against women is a huge problem— and worth addressing for its own sake— even though violence against women are women's lack of power in a society doesn't necessarily directly relate to increased HIV prevalence.

Percent of women who believe a husband is justified in beating wife if she refuses to have sex with him



Source: Demographic and Health Surveys

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For example, we see the highest level of violence against women in Ethiopia, which has by far the lowest HIV prevalence. (Once again, violence should be addressed for its own sake...)

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