

SEXUAL BEHAVIOR IN RURAL MALAWI:
PRELIMINARY RESULTS FROM DIARIES

Rebecca L. Thornton, University of Michigan

Hans-Peter Kohler, University of Pennsylvania

Sayeh Nikpay, University of Michigan

Abstract

This paper presents results from nine-day recalls of self-reported sexual behavior collected in 2007 among approximately 1,300 men and women in rural Malawi. These respondents were tested in 2006 for HIV; 8.4 percent of the sample we report in this paper were positive. We present descriptive statistics from these diaries which include each romantic interaction, including kissing, mutual masturbation, and vaginal sex.

1. Introduction

A comprehensive understanding of sexual relations among sub-Saharan Africans is essential to designing effective strategies to mitigate the spread of HIV/AIDS. Sexual diaries can provide rich information on sexual behavior. While qualitative studies enable researchers to have a deeper understanding of sexual relations, quantitative studies, on the other hand are often limited in the breadth of behavioral questions asked. For example, the majority of surveys on sexual behavior ask only about condom use or abstinence. In this paper we present results from three rounds of comprehensive nine-day quantitative sexual diaries administered to respondents in rural Malawi. In particular we compare behavior across HIV status, marital status and gender, as well as the day of week.

2. Sample and Survey Data

The data are part of a larger project (the Malawi Incentives Project), which builds upon the Malawi Diffusion and Ideational Change Project (MDICP), a longitudinal study of men and women in three districts of rural Malawi. The original respondents were randomly selected from 125 villages in 1998 and included ever-married women and their husbands; these individuals were re-interviewed in 2001 and 2004. During the survey in 2004 and in 2006, a separate team of nurses offered respondents free tests for HIV through either oral swabs in 2004, or rapid tests in 2006 (Bignami-Van Assche et al. 2004).

The Malawi Incentives Project involves a subsample of those who accepted an HIV test in 2006 from the main MDICP project. This sub-sample includes randomly selected respondents from the 2006 MDICP survey which also oversampled HIV discordant couples (based on 2004 and 2006 HIV results). At the time of the HIV test in 2006, individuals were randomly selected to be offered HIV counseling as a couple, or as an individual. Only married spouses who were both in the MDICP sample were given the chance to have the couples counseling. If both of the spouses agreed to the couple testing, they would both be tested and both learn the HIV results together. If one of the individuals did not consent, then both members of the couple would receive individual counseling, and only learn their own HIV results. During

the 2006 testing, 92 percent of the respondents who were offered an HIV test accepted the test. The HIV prevalence rate was 9.2 percent; significantly lower than the estimated national prevalence rate in rural Malawi (DHS 2004). The difference may be due to attrition from the original 1998 sample due to migrants (Anglewicz 2007), to death from the 1998 sample, or because of selection bias in HIV test refusals (Obare 2008). However, given the low refusal rate, it is unlikely that differential refusal rates of the HIV test can account for lower HIV rates. Of those who accepted an HIV test, we sampled 1408 individuals to enroll in the incentives project. Those individuals were approached one to two months after the 2006 survey and HIV testing to be invited to enroll in the incentives project. Of those sampled, 1334 (or 95 percent) were enrolled into the incentives program - only three respondents refused, the remaining had moved or were temporarily away.

While we do not evaluate the incentives project specifically in this paper, it is worth noting the particular project, to the extent that it effects the interpretation of our findings. In the incentives project, each individual or couple were randomly assigned financial rewards if they maintained their HIV status for approximately fifteen months. The incentive amounts ranged from zero to 2000 Kwacha (approximately sixteen dollars) for individuals, and from zero to 4000 Kwacha (approximately 32 dollars) for couples. Each individual was given a voucher of the financial amount they randomly drew, and was told that they must maintain their HIV status in order to receive the money 15 months later. Couples were told that both members of the couple must maintain their HIV status in order for the couple to receive the money.

Approximately three to six months after the initial enrollment in the incentives sample respondents were interviewed in their homes and were asked about the type and frequency of sexual activity they engaged in on each of the previous nine days. This included the specific activity they engaged in, number of partners, and practices which would be protective against HIV. A total of three rounds of interviews that included sexual diaries were conducted at three to six month intervals.

Table 1 presents the sample statistics of the incentives sample. Of the 1408 persons approached for this study, nearly all accepted (94.7 %). In addition, completion of diaries in rounds one, two and three was high (92.9%, 90.0% and 91.7% respectively). Only 27 respondents failed to complete a diary in all three rounds. Table 2 presents demographic characteristics for the 1334 persons enrolled for the entire sample and across key demographic groups. In the sample, 44 percent are male, the majority are married (84%) and the average age is 36. The sample is quite rural and consists of individuals who engage in subsistence agriculture. Respondents report a mean income of 9489 Kwacha, approximately \$68.

HIV is a salient disease in these communities; respondents report having on average 1.5 relatives sick with HIV and the prevalence of HIV in our final incentives sample is 8.72 percent. Overall condom use is considered acceptable to only approximately 41 percent of respondents.

There are some key differences among various demographic groups. First, HIV positive individuals have higher than average income (13588 Kwacha) in contrast to the HIV negatives (9084 Kwacha) which affirms the theory that those who are more affluent are at a higher risk of contracting HIV. HIV positives are also more likely to express the opinion that using a condom with a spouse is acceptable. They are less likely to be married and thus also less likely to have tested as a couple for HIV, possibly due to higher rates of mortality among a partner.

There were also differences among those who were married as well as those who tested as a couple as opposed to as an individual. Those who were married and tested as an individual were more likely to view condom use as acceptable and also reported fewer relatives with HIV. They were also younger – this could reflect differences in preferences for couples counseling, or could be due to higher rates of mobility that would prevent two individuals from being at home on the day of the couples counseling. Those who are single are even younger on average, and view condoms as even more acceptable than those who are married.

There are also important baseline differences between men and women. Women report lower

income, are more likely to be HIV positive, and also are more likely to report accepting condoms.

These existing baseline characteristics are important to keep in mind as we compare sexual behavior across groups. We next turn to describing results from the sexual diaries.

3. Empirical Strategy and Results

To examine sexual behavior in Malawi using the diaries we take several empirical approaches. First, we present descriptive statistics for answers given by respondents in each of the three rounds. To gain more insight on differences in average sexual behavior among key demographic groups (HIV positive and HIV negative, males and females, and married and unmarried) we average responses across each round, and present average statistics as well as the difference of each group. Lastly, using the fact that we know each day of the week that respondents report sexual activity, we present average statistics for daily activity by day. We present results below and discuss implications.

3.1 Sexual Diaries each Round

Table 3 Panels A and B presents summary statistics for each of the three rounds of sexual diaries. Over each round of sexual diary, self-reported reported methods of contraception remained fairly constant, with between eight and nine percent reporting using condoms as their current form of birth control, three to four percent reporting using birth control pills, seventeen to eighteen percent reporting using injectables and five to six percent reporting using traditional methods (Table 3, Panel A). It is important to note that these reported methods of contraception was not specifically asked in regards to one particular day or romantic encounter, rather, the question asked about current use. In particular, respondents were asked “Are you and your [wife/husband/partner] currently using any form of birth control, including abstinence in order to prevent you/your partner from getting pregnant?”. It is also important to note that this question

was asked specifically about pregnancy prevention, rather than strategies for HIV prevention. Condom use – which could be used for both pregnancy and HIV prevention is quite low at under 9 percent.

Table 3, Panel B presents average statistics from the daily diaries. For each of the nine days that were asked of respondents, we coded whether or not each activity (any romantic encounter, kissing, masturbation, or vaginal sex) occurred during any of the 9 days. For condom use, withdraw, or receiving or giving a gift to/from the sexual partner, we condition on whether or not the respondent had engaged in a romantic activity. In each round over half of all respondents reported any romantic activity at all in the preceding nine days including kissing, vaginal sex, masturbation, or mutual masturbation (between 51 and 56 percent of respondents across each round). Notable in this table are the baseline levels of sexual behavior. The majority of individuals reporting engaging in any romantic activity are engaging in vaginal sex as average vaginal sex encounters track closely with overall romantic activity. The prevalence of a potential substitute of vaginal sex such as masturbation is relatively low: masturbation ranged between seven and one percent. Another supposed substitute, mutual masturbation has very low reported prevalence in the population (less than 1%). This low prevalence may suggest mutual masturbation is not practiced or that there is stigma towards reporting it. There are relatively low rates of kissing across rounds with a prevalence rate ranging between 21 percent and fourteen percent.

Between eleven and thirteen percent of those engaging in vaginal sex used a condom. In an area in which HIV rates are high, this could be considered a low rate of condom use. However, given that the majority of the respondents were married and may have perceived their partnerships as stable, we present reported condom use by marital status in further detail below. Relatively similar percentages of respondents reported using the withdraw method during vaginal sex. The remaining individuals either used another form of birth control or used no form. The relatively low level of birth control use is reflected in attitudes towards desired pregnancy. For each vaginal sexual encounter, we asked respondents whether or not they explicitly wanted to get pregnant at that encounter, did not want to get pregnant at

that time, or did not feel strongly one way or another. Of those who engaged in sex, while approximately 54 percent of respondents reported that they did not want, or did not want their partner, to get pregnant, a large percent, 41percent, reported that they were indifferent and did not care either way!

Respondents were asked for each day in which they reporting a romantic encounter whether they gave (for men) or received (for women) a gift from their partner. On average, two to four percent of the days respondents reported gift transactions with seven to eight percent of the days there were reported monetary transactions

In general, reported sexual behavior is fairly consistent across rounds of the survey. There could be a number of interpretations to this result. First, there are important seasons in Malawi across the year. Because the majority of the respondents are engaged in subsistence agriculture, crop seasons that follow the weather determine activities that respondents are engaged in across the year and their time allocations. In addition, there are certain periods in time that are known as a “hunger season” before the harvest season, when individuals have limited access to food and income. The finding of consistent reported behaviors throughout the year could suggest that the agricultural season has little effect on sexual activity.

A second possibility is that rather than picking up no effects of the agricultural seasons on sexual activity, these results are a function of limitations of self-reports as a measure of actual sexual behavior. If there are biases in self-reports and individuals answer these questions using a rule of thumb, estimating or reporting what they perceive to be the desired answer, then we would observe very little variance in these answers across seasons. However, given that we find important differences in reported sexual behaviors across other demographic groups below, we might conclude that these results reflect consistency of sexual behavior across the year rather than respondents simply reporting their sexual behavior according to rules of thumb. We present these results by demographic groups in the next section.

3.2 Difference in Characteristics between Demographic Groups

We next examine differences in average reported sexual behavior by various demographic subgroups. To do this, we average sexual behavior across each round and day of the data for a total of 27 days. Results from Table 4 compare average behavior across all three rounds between those of different HIV status as well as by type of testing and marital status and gender. One unique aspect of our data is that we know the actual HIV status of each respondent at the time of the 2006 survey, allowing us to examine the differences in reported behaviors between HIV positives and HIV negatives.

Respondents who were HIV positive were five percentage points less likely to have a romantic encounter ($p=0.002$) and they also had fewer days of romantic activity ($p=0.001$) than HIV negative respondents. This decreased romantic activity is mainly due to reductions in vaginal sex. Although not statistically significant at traditional confidence intervals, HIV positive respondents kissed fewer times and on fewer days, which is in line with the fact that kissing is likely to be a complement to vaginal sex rather than a substitute. Although they were less likely to engage in vaginal sex, HIV positives who did have vaginal sex were 7 percentage points more likely to report using a condom than HIV negatives ($p=0.038$). There was no difference between HIV positive and HIV negative respondents in the likelihood of exchanging gifts or money.

The difference in sexual frequency and likelihood of engaging in sexual behavior may be due to either reductions in sexual drive among the HIV positives, or to desire to protect one's partner. The findings of increased reported condom use among HIV positives suggest that there is at least some element of the desire to use a condom with a partner – likely as a preventative measure. Recall that all individuals were tested in 2006 by MDICP survey staff. These tests were rapid tests and almost all respondents learned of their results at this time. The entire incentives sample – the sample used in this paper – learned of their results. Thus, these HIV positives were aware of their status. Note, however, despite this awareness, 84 percent of the days that HIV positives engaged in vaginal sex, a condom was

not used. While number of sexual encounters were lower among the HIV positives as a whole, the majority of sexual encounters were unprotected ones.

Comparing reported sexual behavior across marital status as well as among those who tested as a couple or an individual in 2006 yield interesting results. Married respondents who tested as a couple were two percentage points more likely to have any romantic encounter, and had 0.6 additional days of romantic encounters than those who tested individually ($p=0.038$ and $p=0.032$, respectively). Again, this is mainly due to vaginal sex.

Holding testing method constant and comparing sexual behavior among those who were married and those who were single, married respondents were eleven percentage points more likely to engage in any romantic activity and had almost 3 additional days of sexual activity than single respondents ($p=0.000$ and $p=0.000$, respectively). Married persons also were 2 percentage points more likely to kiss than single respondents ($p=0.006$), and were less likely to engage in vaginal sex and on fewer days than single respondents. Although they had fewer instances of vaginal sex, when they did engage in vaginal sex, single respondents were ten percentage points more likely to use a condom than married respondents ($p=0.001$). Single persons also were 21 percentage points more likely to exchange money associated with a sexual partner ($p=0.000$).

There were also large differences in reported sexual behavior by gender of the respondent. In our data, respondents are not matched by spousal link and therefore we do not compare the reports of men and women within the relationship rather, we report overall trends. As with other literature comparing reports by men and women, men are more likely to report sexual encounters. We also find this: men are 4 percentage points more likely to report engaging in any sexual behavior and report on average one additional day. Perhaps surprisingly, they are significantly less likely to report kissing. Men are also more likely to report using a condom. There is no difference in reported exchange of gifts or money.

3.3 Sexual Behavior by Day of Week

Table 5 presents patterns of overall romantic activity and vaginal sex over the week. In theory, there may be patterns associated with weekdays – such as religious attendance on Saturdays or Sundays, or market days that may affect sexual behavior. However, both vaginal sex and romantic activity appear to be constant on each day of the week. In theory, because individuals were asked to report their sexual behavior starting with the day prior to the interview day, and then back in time, there may be recall bias in activities that were reported for days that were further back in time. We also report sexual behavior for reported romantic activity and vaginal sex for the day prior to the interview only. Note that interviews were not conducted on Sundays and therefore we have no results for Saturday reports. We find that the results do not differ greatly from overall results, indicating that recall bias may not be a strong concern.

4. Conclusion

In this paper, we present descriptive results from sexual diaries collected in rural Malawi. We examine daily reported sexual activity and contrast the activity of those who are HIV positive and negative as well as among those who are married and single and male or females. We learn that the majority of romantic activities include vaginal sex and activities considered likely substitutes for vaginal sex such as mutual masturbation or masturbation are practiced infrequently. We also illustrate that HIV positive respondents appear to have fewer romantic encounters and while they report condom use more frequently than HIV negative respondents, they are engaging in many acts of unprotected sex.

Sexual activity does not appear to be either seasonal, across times of the year, or affected by days of the week. We also find evidence of a large amount of transactions among un-married individuals – 24 percent of encounters are associated with monetary transfers. It is not clear whether increased economic status will increase or decrease these transactions.

Table 1: Summary Statistics

Approached for Incentives Project	1408
Enrolled in Incentives Project	1334
Acceptance Rate	94.74%
Completed Round 1 Diary	1239
Completed Round 2 Diary	1187
Completed Round 3 Diary	1223
Never Completed a Diary	27
Tested as a Couple	314

Notes: This table describes enrollment and participation in the study as completion of diaries in each of three successive rounds.

Table 2: Baseline Summary Statistics by Demographic Groups

	Overall	HIV Negative	HIV Positive	Married, Couples testing	Married, Individual testing	Single, Individual testing	Males	Females
Believes condom use acceptable	0.41	0.39	0.56	0.29	0.41	0.59	0.36	0.44
Relatives sick with HIV	1.54	1.55	1.42	2.13	1.44	1.02	1.57	1.52
Self reported health (1-5)	2.06	2.03	2.44	2.02	2.10	1.98	1.89	2.20
Income (Kwacha)	9476	9084	13588	9889	9441	8983	12165	7303
Age	36	36	37	41	36	26	38	34
Tested for HIV as couple	0.24	0.25	0.13	1.00	0.00	0.00	0.27	0.22
Male	0.44	0.46	0.29	0.50	0.41	0.49	1.00	0.00
HIV positive	0.09	0.00	1.00	0.05	0.10	0.11	0.06	0.11
Married	0.84	0.84	0.79	1.00	1.00	0.00	0.82	0.85
Observations	1284	1172	112	309	768	207	571	713

Notes: This table presents baseline summary statistics from the background module and the MDICP 2006 survey.

Table 3: Summary Statistics from Sexual Diaries, Rounds 1-3

Panel A: "Current" Contraceptive Use			
	Round 1	Round 2	Round 3
Condoms	9%	8%	8%
Pills	4%	3%	3%
Injection	18%	18%	17%
Traditional	6%	5%	5%
Others	7%	14%	11%
Observations	1210	1190	1204

Panel B: Sexual Activities in Preceding 9 Days			
	Round 1	Round 2	Round 3
Romantic Econunter	0.56	0.53	0.51
Kiss	0.21	0.14	0.17
Masturbation	0.07	0.01	0.01
Mutual Masturbation	0.01	0.00	0.00
Vaginal sex	0.55	0.53	0.50
Used a condom	0.13	0.13	0.11
Withdraw	0.11	0.12	0.11
Gifts given or received	0.04	0.03	0.02
Money given or received	0.09	0.07	0.08
Observations	1217	1167	1204

Notes: Table 2, panel A describes contraceptive methods used by respondents or respondents' wives. Panel B reports average romantic activity over the preceding nine days for each round. Sample sizes for variables conditional on having sex had smaller sample size (N=672 for round 1, N=621 for round 2 and N=607 for round 3).

Table 4: Sexual Behavior By HIV Status, Mode of Testing, and Gender

	HIV Negative Mean (1)	HIV Positive Mean (2)	Diff (3)	Married, Couples testing Mean (4)	Married, Individual testing Mean (5)	Single, Individual testing Mean (6)	Married: Couple testing vs. single testing Diff (7)	Individual testing: Married vs Single Diff (8)	Males Mean (9)	Females Mean (10)	Diff (11)
Any Romantic Activity	0.17	0.12	** <i>-0.05**</i> <i>0.00</i>	0.20	0.18	0.07	** <i>0.02**</i> <i>0.04</i>	** <i>0.11**</i> <i>0.00</i>	0.19	0.15	** <i>0.04**</i> <i>0.00</i>
Days of Romantic Activity	4.39	2.95	** <i>-1.44**</i> <i>0.00</i>	5.21	4.58	1.68	** <i>0.63**</i> <i>0.03</i>	** <i>2.91**</i> <i>0.00</i>	4.80	3.84	** <i>0.96**</i> <i>0.00</i>
Kissed	0.05	0.05	0.00 <i>0.80</i>	0.05	0.06	0.03	0.00 <i>0.93</i>	** <i>0.02**</i> <i>0.01</i>	0.04	0.06	** <i>-0.02**</i> <i>0.03</i>
Days Kissed	1.32	1.16	<i>-0.16</i> <i>0.50</i>	1.40	1.40	0.85	0.01 <i>0.97</i>	** <i>0.55**</i> <i>0.00</i>	1.04	1.52	** <i>-0.48**</i> <i>0.00</i>
Vaginal Sex	0.17	0.12	** <i>-0.05**</i> <i>0.00</i>	0.20	0.18	0.07	** <i>0.02**</i> <i>0.05</i>	** <i>0.11**</i> <i>0.00</i>	0.19	0.15	** <i>0.04**</i> <i>0.00</i>
Days of Vaginal Sex	4.33	2.92	** <i>-1.41**</i> <i>0.00</i>	5.13	4.53	1.67	** <i>0.60**</i> <i>0.04</i>	** <i>2.86**</i> <i>0.00</i>	4.72	3.80	** <i>0.92**</i> <i>0.00</i>
Used Condom Vaginal Sex	0.09	0.16	** <i>0.07**</i> <i>0.04</i>	0.08	0.10	0.20	<i>-0.02</i> <i>0.25</i>	** <i>-0.10**</i> <i>0.00</i>	0.12	0.08	** <i>0.05**</i> <i>0.00</i>
Gifts Exchanged Vaginal Sex	0.02	0.02	0.00 <i>0.28</i>	0.01	0.01	0.08	0.00 <i>0.51</i>	** <i>-0.07**</i> <i>0.00</i>	0.02	0.02	0.00 <i>0.25</i>
Money Exchanged Vaginal Sex	0.05	0.03	<i>-0.02</i> <i>0.989</i>	0.03	0.03	0.24	<i>-0.01</i> <i>0.873</i>	** <i>-0.21**</i> <i>0</i>	0.05	0.04	0.01 <i>0.575</i>
Observations	1172	112		309	768	207			571	713	

Notes: Table 3 describes differences in frequency of sexual activity between respondents based on HIV status, marital and testing status and gender. Differences that are statistically significant at the 95% level are indicated by ** * and P values are presented below. sample size for variables conditional on vaginal sex are lower for each round (N=908 for HIV negatives, N= 69 for HIV positives, N=262 for married testing as couple, N=630 for married testing individually, N=85 for singles testing individually, N= 460 for males and N=517 for females).

Table 5: Romantic Activity and Vaginal Sex by Day of Week

	Any Activity	Vaginal Sex	Any Activity (day before interview)	Vaginal Sex (day before interview)
	(1)	(2)	(3)	(4)
Sunday	0.17	0.17	0.16	0.16
Monday	0.17	0.17	0.17	0.17
Tuesday	0.17	0.17	0.16	0.16
Wednesday	0.16	0.16	0.16	0.16
Thursday	0.18	0.17	0.18	0.18
Friday	0.17	0.17	0.18	0.18
Saturday	0.16	0.16	--	--

Notes: This table presents average activity for each day of the week for all respondents.