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Zimbabwe Demographic and Health Surveys

Risk-Taking Behaviors of HIV-Positive Adults in Zimbabwe: Opportunities for Prevention with the Positives

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Risk-Taking Behaviors of HIV-Positive Adults in Zimbabwe: Opportunities for Prevention with the Positives

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ABSTRACT

The objective of this study was to assess factors associated with HIV transmission among HIV-positive adults in Zimbabwe. The study analyzed data collected from a nationally representative sample of adults in the 2005-06 Zimbabwe Demographic and Health Survey (ZDHS), including respondents from whom blood samples for HIV testing were collected. All analysis in this study was limited to HIV-positive women and men age 15-49 who have ever had sex.

Our findings show that only about one-fourth of HIV-positive adults age 15-49 were previously tested for HIV and received test results. HIV-positive women were more likely than men to have been previously tested and received results (27% of women versus 20% of men, $p<0.05$). About two-thirds of HIV-positive adults were currently in a union, with men more likely than women to be in union (74% of men versus 58% of women, $p<0.05$).

Overall, 80% of HIV-positive adults were sexually active in the last 12 months (90% of men and 74% of women, $p<0.05$). In addition, 42% of all HIV-positive adults reported three or more lifetime sexual partners, while 17% of all HIV-positive adults reported having sex with a non-spousal sexual partner in the past year.

Despite high levels of sexual activity among HIV-positive adults, levels of condom use were low. Among HIV-positive adults who had sex in the last 12 months, 83% of last sexual acts were unprotected, and among HIV-positive adults who had sex with a non-spousal partner in the past year, less than half (48%) used condoms. Only 14% of HIV-positive men reported consistent condom use with all most recent sexual partners, while only about one in every two HIV-positive adults (47%) reported currently using any contraceptive method.

These and other study findings suggest a substantial need for more focus on positive prevention, such as scaling up HIV testing and counseling services, including provider-initiated testing and counseling. The results also highlight the importance of promoting condom use

among HIV-positive adults, including in marriages in which the partners are discordant in HIV-status.

INTRODUCTION

Although recent trends suggest a declining prevalence of HIV in Zimbabwe, as many as 40,000 Zimbabweans contract the virus each year (MOH 2007). One analysis suggests that a disproportionate number of new HIV infections may be attributed to HIV-positive persons who are not aware of their status (Marks et al. 2005). Approximately 80% of people living with HIV are unlikely to know their HIV status, because they have not been tested (CSO and Macro International 2007).

Many people who test HIV-positive reduce or eliminate behaviors that can transmit HIV to others (Higgins et al. 1991). However, this reduction is not absolute and persons who reduce their risky behaviors may relapse. It is not known for sure how many new infections result from unsafe encounters with HIV-positive individuals who do not know their HIV status.

Several positive prevention interventions have been proven effective, including HIV testing for individuals and couples, consistent condom use by those infected, and counseling and support for people living with HIV (Bunnell et al. 2006). The benefits of positive prevention go even beyond avoiding new cases of HIV infection and improving individual health. There are also community benefits, by helping to ensure that families remain together as well as helping HIV-positive people remain productive in the society (Bunnell et al. 2006).

Despite strong rationale for focusing on the HIV-positive individuals to reduce transmission of the virus, HIV-prevention efforts and interventions historically have focused on general populations or populations most at risk. In Zimbabwe and other African countries there is limited information on risk-taking behaviors of HIV-positive individuals. The 2005-06 Zimbabwe Demographic and Health Survey (ZDHS) is the first and only national survey in Zimbabwe that collected data on HIV serostatus as well as the characteristics and behaviors of

adult women and men from a nationally-representative sample. These data provide an opportunity to understand the transmission risk behaviors of HIV-positive individuals, including numbers of sexual partners, patterns of condom use, knowledge of one's HIV status, and similar information that can help develop effective positive prevention policies and programs.

METHODS

Study design

The 2005-06 ZDHS collected data from a nationally representative sample of men age 15-54 and women age 15-49. A variety of demographic, social, and behavioral indicators were collected. In addition, HIV testing was performed among women and men consenting to be tested. Respondents completed separate consent forms for the interview and for HIV and haemoglobin testing. The protocols for HIV and haemoglobin testing were approved by the Medical Research Council of Zimbabwe, Macro International, and the US Centers for Disease Control and Prevention (CDC). Details on sampling design, survey implementation, data management, and laboratory procedures for testing are presented in the 2005-06 ZDHS report (CSO and Macro International 2007).

The 2005-06 ZDHS collected information from 9,285 households in 400 selected enumeration areas. A total of 9,870 women and 8,761 men were eligible for interviews and blood sample collection. Of these, interviews were completed for 90% of women and 82% of men. Blood samples for HIV testing were collected for 70% of all eligible respondents (76% of women and 63% of men). All analysis in this study is limited to HIV-positive women and men age 15-49 who have ever had sex in the 2005-06 ZDHS.

Laboratory methods

HIV testing was performed using dried blood spot (DBS) samples. All samples were tested on the first assay test, an enzyme-linked immunosorbent assay (ELISA), Vironostika HIV Uni-Form II Plus O, bioMerieux. No further tests were performed for negative results following the first test. All positive results were retested with a second ELISA, Anilab Systems, which is

compatible with the first ELISA. Positive samples following the second test were considered positive. If the first and second test results were discrepant, both tests were repeated. Following this, consistent results were reported as such. If results continued to be discrepant, a third confirmatory test, Genetic Systems New LAV Blot I, was administered. At this stage, any results continuing to be discrepant between the ELISA and the third test were rendered indeterminate.

Measures

Respondents with laboratory-confirmed HIV infection were categorized as either HIV-positive, HIV-negative, or indeterminate. Respondents were categorized as knowing their HIV status if they reported that they were previously tested and received results of the last test. Risky sexual behavior was defined as not using condoms, having multiple lifetime sexual partners, and having sex with non-spousal (non-marital, non-cohabiting) partners. Consistent condom use was defined as using condoms all the time when having sex with all recent sexual partners.

Statistical analysis

Our analysis uses both descriptive and multivariate methods. The descriptive analysis examines gender differentials in the demographic and behavioral characteristics of HIV-positive adults. In the multivariate analysis we examine factors influencing each of the following HIV transmission risk behaviors: multiple lifetime sexual partnerships, non-spousal sex, condom use at last sex, consistent condom use, condom use at last higher-risk sex, pregnancy risk behavior, and knowledge of own HIV status. As mentioned, all analysis was of HIV-positive individuals. The multivariate analyses controlled for background factors: age, sex, religion, education,

occupation, and place of residence, and accounted for sampling weights and clustering in the survey design. Analysis was conducted using STATA version 10.0 (Stata Corporation 2007).

RESULTS

Sample characteristics

Of the 9,804 adults age 15-49 who have ever had sex and were tested for HIV, 2,219 (23%) were HIV-positive. Women were more likely than men to be HIV-positive. Considering the characteristics of the HIV-positive adults, 60% resided in rural areas, 97% had a primary or secondary education, 60% were in the two highest household wealth quintiles, and 55% were currently working. Compared with HIV-positive men, HIV-positive women were more likely to be younger and less likely to be working (Table 1).

About two-thirds (64%) of HIV-positive adults were currently in a union, with men being more likely than women to be in union. Women were much more likely to be widowed (21%) and divorced or separated (14%) than men (6% widowed and 9% divorced or separated). As much as 22% of all HIV-positive adults reported being married more than once and 86% have at least one living child. Only 7% adults testing positive for HIV reported being chronically ill for three or more months in the past year (Table 1).

Table 1. Background characteristics of HIV-positive women and men age 15-49 who have ever had sex, ZDHS 2005-06

	Total			Women			Men			Women-Men difference
Characteristic	**%**	**95% CI**	**N**	**%**	**95% CI**	**N**	**%**	**95% CI**	**N**	
Age group										
15-19	3.9	3.0-5.0	85	4.9	3.7-6.6	69	nc	nc	16	
20-24	13.6	12.2-15.2	302	16.5	14.8-18.5	234	8.5	6.1-11.7	69	*
25-29	20.1	18.3-22.1	446	23.2	20.9-25.7	328	14.7	12.0-17.8	118	*
30-34	24.7	22.4-27.1	547	23.9	21.2-26.8	337	26.1	22.6-29.9	210	
35-39	18.0	15.9-20.3	399	16.0	13.7-18.6	226	21.4	17.9-25.4	173	
40-44	12.1	10.8-13.6	269	9.6	7.9-11.7	136	16.5	13.6-19.9	133	*
45-49	7.7	6.4-9.1	170	5.8	4.6-7.3	82	10.8	8.7-13.5	87	*
Residence										
Urban	40.1	35.5-44.9	890	38.4	33.9-43.1	542	43.1	37.1-49.3	348	
Rural	59.9	55.1-64.5	1,330	61.6	56.9-66.1	870	56.9	50.7-62.9	459	
Province										
Manicaland	12.9	9.9-16.7	286	12.4	9.7-15.8	176	13.7	9.6-19.3	111	
Mashonaland Central	10.3	5.5-18.5	229	10.6	5.7-19.1	150	9.8	5.1-17.9	79	
Mashonaland East	8.2	6.6-10.0	181	8.3	6.7-10.2	117	7.9	5.6-10.9	64	
Mashonaland West	10.8	8.5-13.7	240	10.6	8.2-13.5	149	11.2	8.3-14.9	90	
Matebeleland North	6.4	4.9-8.5	143	6.7	5.2-8.7	95	5.9	3.9-8.8	47	
Matebeleland South	5.4	4.2-6.8	120	5.8	4.6-7.2	82	(4.7)	(3.1-7.2)	38	
Midlands	12.3	10.0-15.0	273	13.0	10.5-16.0	183	11.1	8.6-14.3	90	
Masvingo	10.1	8.1-12.6	225	10.5	8.4-13.2	149	9.4	6.7-13.0	76	
Harare	18.2	15.0-21.9	403	16.2	13.3-19.7	229	21.6	17.0-27.0	174	
Bulawayo	5.5	4.4-6.8	121	5.8	4.7-7.3	82	4.8	3.3-6.9	39	
Education										
No Education	3.4	2.6-4.4	74	4.3	3.1-5.8	60	nc	nc	14	
Primary	32.4	29.8-35.2	719	35.0	31.7-38.6	495	27.8	23.5-32.6	224	
Secondary	61.3	58.5-64.0	1,361	58.8	55.4-62.0	830	65.7	61.3-70.0	530	
Higher	2.9	2.2-3.9	65	(1.9)	(1.3-2.9)	27	(4.7)	(3.2-6.8)	38	
Religion										
None	18.1	16.2-20.1	401	10.9	8.9-13.3	154	30.6	26.4-35.0	247	*
Roman Catholic	11.3	9.4-13.5	250	10.3	8.3-12.6	145	13.0	10.4-16.2	105	
Protestant	19.1	17.0-21.3	423	23.1	20.5-25.9	326	12.0	9.4-15.1	97	*
Pentecostal	14.0	12.1-16.2	311	16.7	14.4-19.4	237	9.3	6.9-12.4	75	*
Apostolic Sect	26.5	23.8-29.5	589	30.5	27.8-33.3	431	19.6	15.1-24.9	158	*
Other	11.1	9.4-12.9	246	8.5	6.9-10.3	119	15.6	12.6-19.3	126	*

(Cont'd)

Table 1 – cont'd

Characteristic	Total %	Total 95% CI	Total N	Women %	Women 95% CI	Women N	Men %	Men 95% CI	Men N	Women-Men difference
Household wealth quintile										
Lowest	14.7	12.3-17.5	326	15.1	12.7-17.9	213	14.0	11.0-17.8	113	
Second	17.5	14.5-21.1	389	17.3	15.1-19.8	245	17.9	12.4-25.1	144	
Third	17.8	15.2-20.8	396	19.5	16.1-23.5	276	14.9	11.7-18.9	120	
Fourth	30.2	26.4-34.4	671	28.7	25.1-32.7	405	32.9	27.7-38.6	266	
Highest	19.7	16.5-23.3	437	19.4	16.2-23.0	274	20.2	16.1-25.1	163	
Work status										
Not working	45.5	42.7-48.3	1,009	57.3	54.0-60.6	810	24.7	21.0-28.8	199	*
Working	54.5	51.8-57.3	1,210	42.7	39.4-46.0	603	75.3	71.2-79.0	608	*
Marital status										
Never married	8.4	7.0-10.1	186	7.1	5.8-8.7	100	10.7	8.0-14.1	86	
Currently in monogamous union	57.2	54.3-60.1	1,270	50.2	47.0-53.3	708	69.7	64.9-74.0	562	*
Currently in polygynous union	6.4	5.3-7.8	143	7.6	6.1-9.4	107	(4.5)	(3.1-6.5)	36	
Divorced/ separated	12.3	10.7-14.0	273	14.2	12.3-16.3	200	9.0	6.7-12.0	73	*
Widowed	15.6	13.9-17.5	347	21.0	18.8-23.4	297	(6.2)	(4.3-8.8)	50	
Married more than once										
No	64.6	62.2-67.0	1,434	70.4	67.8-72.9	995	54.5	50.0-58.8	439	*
Yes	22.4	20.4-24.5	497	22.4	20.2-24.7	316	22.4	18.7-26.6	181	
Missing	13.0	11.5-14.7	289	7.2	5.9-8.8	102	23.1	19.9-26.7	186	*
Number of living children										
0	13.9	12.3-15.6	308	11.0	9.2-13.1	155	19.0	15.7-22.7	153	*
1-2	45.9	43.4-48.3	1,018	49.2	46.3-52.1	694	40.1	36.1-44.3	324	*
3-4	27.1	24.9-29.4	601	28.2	25.5-31.2	399	25.1	21.3-29.4	203	
5+	13.2	11.6-15.0	292	11.7	10.1-13.4	165	15.8	12.9-19.3	128	
Chronically ill for 3 months within past 12 months										
No	93.2	91.7-94.4	2,053	92.9	91.1-94.3	1,303	93.7	91.3-95.6	750	
Yes	6.8	5.6-8.3	150	7.1	5.7-8.9	99	(6.3)	(4.4-8.7)	50	
Total			**2,219**			**1,413**			**807**	

* p<0.05.

nc: suppressed, based on 0-24 unweighted cases; (): based on 25-49 unweighted cases.

Note: Ns for individual categories may not add up to the total due to missing information on some variables.

Knowledge of HIV status

Only about one in four HIV-positive adults reported previously being tested for HIV and receiving test results. More women (27%) reported ever being tested and receiving results than men (20%). Although only a small proportion had tested previously, a large majority (88%) of those who were currently in union and who had previously tested and received results reported sharing the results with their spouses. Also, among all HIV-positive adults more than 9 in 10 knew that HIV can be transmitted from mother to child (Table 2).

With other factors controlled, HIV-positive women were significantly more likely than men to know their own HIV status [AOR, 1.85; CI, 1.25-2.73] (Table 3). Among HIV-positive adults, those with more education [AOR, 1.52; CI, 1.12-2.07], in the highest wealth quintile [AOR, 1.95; CI, 1.05-3.62], and with three or more children were significantly more likely to know their own HIV status [AOR, 2.20; CI, 1.24-3.89].

Also, HIV-positive adults who were chronically ill in the past year were significantly more likely to know their status [AOR, 1.61, CI, 1.04-2.50], as were those whose spouses were tested and had shared their results [AOR, 9.27; CI, 6.46-13.31]. HIV-positive adults age 30-34 were significantly less likely than those age 15-19 to know their status [AOR, 0.41; CI, 0.17-0.98]. Those in Mashonaland Central [AOR, 0.46; CI, 0.26-0.81] and in Midlands [AOR, 0.47; CI, 0.26-0.86] were significantly less likely to know their own status than those in Manicaland.

Table 2. Knowledge and behaviors of HIV-positive women and men age 15-49 who have ever had sex, ZDHS 2005-06

	Total			Women			Men			Women-Men
Characteristic	**%**	**95% CI**	**N**	**%**	**95% CI**	**N**	**%**	**95% CI**	**N**	**difference**
Age at first sexual intercourse										
<15	7.3	5.7-9.3	162	9.8	7.4-13.0	139	nc	nc	23	
15-17	33.5	31.5-35.6	744	37.3	34.2-40.5	527	26.9	22.9-31.4	217	*
18-19	27.5	25.1-29.9	609	27.0	24.5-29.7	381	28.3	24.6-32.3	228	
20+	28.2	25.9-30.6	626	21.3	18.9-24.0	301	40.3	36.3-44.5	325	*
Missing/ inconsistent	3.5	2.7-4.6	78	4.6	3.4-6.3	65	nc	nc	13	
Number of lifetime sexual partners										
1	32.3	30.2-34.4	705	46.7	44.0-49.4	656	(6.3)	(4.5-8.8)	50	*
2	25.7	23.4-28.0	561	31.8	29.2-34.4	446	14.7	11.3-18.9	115	*
3+	42.1	39.3-44.9	921	21.5	18.7-24.7	302	78.9	74.8-82.5	618	*
Number of partners in past 12 months										
0	20.0	18.0-22.2	443	25.6	23.0-28.3	361	10.2	7.9-13.2	82	*
1	74.8	72.3-77.2	1,660	72.2	69.3-74.9	1,018	79.5	75.6-82.9	641	*
2+	5.2	4.1-6.5	115	(2.3)	(1.5-3.5)	32	10.3	7.9-13.4	83	*
Number of non-spousal[1] partners in past 12 months										
0	83.2	80.6-85.4	1,845	85.3	82.7-87.5	1,025	79.4	75.2-83.1	641	
1	15.0	12.9-17.4	333	13.3	11.1-15.8	188	17.9	14.6-21.9	145	
2+	(1.9)	(1.2-2.8)	41	nc	nc	20	nc	nc	21	
Alcohol use at last sex in past 12 months										
Neither	70.0	67.6-72.3	1,553	63.8	61.2-66.4	902	80.8	77.1-84.1	652	*
Respondent only	3.2	2.3-4.3	71	nc	nc	9	7.7	5.6-10.6	62	*
Partner only	4.8	3.9-5.9	106	7.5	6.1-9.3	106	nc	nc	0	
Both respondent and partner	(1.9)	(1.2-2.9)	42	nc	nc	34	nc	nc	8	
Missing	20.1	18.1-22.4	447	25.6	23.1-28.4	362	10.5	8.2-13.5	85	*
Condom use at last sex in past 12 months										
Used condom	13.3	11.5-15.3	294	10.4	8.7-12.4	147	18.2	14.9-22.1	147	*
Did not use condom	66.8	63.7-69.8	1,481	64.0	60.8-67.1	904	71.6	66.8-75.9	577	
No sexual intercourse in past 12 months	20.0	18.0-22.2	443	25.6	23.0-28.3	361	10.2	7.9-13.2	82	*

(Cont'd)

Table 2 – cont'd

Characteristic	Total %	Total 95% CI	Total N	Women %	Women 95% CI	Women N	Men %	Men 95% CI	Men N	Women-Men difference
Condom use at last sex with non-spousal partner in past 12 months										
Used condom	8.1	6.6-9.8	179	6.5	5.1-8.2	91	10.9	8.5-13.9	88	*
Did not use condom	8.8	7.4-10.4	195	8.3	6.7-10.1	117	9.7	7.3-12.8	78	
No sexual intercourse with non-spousal partner in past 12 months	83.2	80.6-85.4	1,845	85.3	82.7-87.5	1,205	79.4	75.2-83.1	641	
Consistent condom use with all most recent sexual partners										
Used condom consistently							12.5	9.7-15.9	101	*
Did not use condom consistently							77.3	73.0-81.1	624	*
No sexual intercourse in past 12 months							10.2	7.9-13.2	82	*
Current use of any family planning method										
Does not currently use FP	33.0	30.6-35.5	732	34.4	31.7-37.2	486	30.6	27.0-34.4	247	
Currently uses FP	47.0	44.2-49.9	1,044	40.1	36.9-43.3	566	59.2	55.2-63.2	478	*
No sexual intercourse in past 12 months	20.0	17.9-22.2	443	25.5	23.0-28.3	361	10.2	7.9-13.2	82	*
Perceived risk of acquiring HIV										
No risk	20.5	18.6-22.6	455	17.3	15.2-19.6	244	26.1	22.3-30.3	210	*
Small	28.9	26.5-31.4	640	27.6	24.9-30.4	390	31.1	27.0-35.5	251	
Medium	23.9	21.6-26.5	531	23.3	20.8-26.1	330	25.0	20.7-29.8	202	
High	12.3	11.0-13.7	272	13.2	11.2-15.5	186	10.6	8.3-13.5	86	
Don't know/missing	14.5	12.8-16.3	321	18.6	16.3-21.1	263	7.2	5.3-9.9	58	*
Knows own HIV status										
Never tested for HIV	72.1	69.6-74.5	1,599	69.1	65.8-72.2	975	77.4	73.3-81.1	625	*
Previously tested, received results of last test	24.4	22.2-26.8	541	27.0	24.0-30.2	380	19.9	16.5-23.9	161	*
Previously tested, did not receive results of last test	3.5	2.7-4.5	77	4.0	3.0-5.2	56	nc	nc	22	

(Cont'd)

Table 2 – cont'd

Characteristic	Total %	Total 95% CI	Total N	Women %	Women 95% CI	Women N	Men %	Men 95% CI	Men N	Women-Men difference
Shared own test results with spouse										
Previously tested, shared results with spouse	13.3	11.5-15.3	295	11.8	9.4-14.5	166	16.1	13.1-19.6	130	
Previously tested, did not share results with spouse	(1.9)	(1.4-2.6)	41	(1.8)	(1.3-2.7)	26	nc	nc	15	
Never tested for HIV /not in union	84.8	82.7-86.7	1,883	86.4	83.7-88.8	1,221	82.1	78.2-85.4	662	
Knows spouse's HIV status										
Spouse not tested /not in union	76.2	74.0-78.2	1,691	84.0	81.7-86.1	1,186	62.5	57.8-67.0	504	*
Spouse tested and shared results	10.6	9.0-12.3	234	8.0	6.5-9.9	113	15.0	12.1-18.3	121	*
Don't know/missing	13.3	11.5-15.3	295	8.0	6.5-9.8	113	22.5	18.8-26.7	182	*
Knows HIV transmitted from mother to child										
No	5.9	4.7-7.3	130	7.2	5.7-9.1	102	(3.5)	(2.3-5.4)	29	*
Yes	94.1	92.8-95.3	2,089	92.8	90.9-94.3	1,311	96.5	94.6-97.7	778	*
Total			**2,219**			**1,413**			**807**	

[1]Non-marital, non-cohabiting partner.

* p<0.05.

nc: suppressed, based on 0-24 unweighted cases; (): based on 25-49 unweighted cases.

Note: Ns for individual categories may not add up to the total due to missing information on some variables.

Table 3. Adjusted effects of selected variables on knowing one's own HIV status, among HIV-positive women and men age 15-49 who have ever had sex, ZDHS 2005-06

	Knowing own HIV status[1] N=2,201		
Characteristic	**Odds ratio**	**95% CI**	**p-value**
Sex			
Male	1.00		
Female	1.85	1.25-2.73	0.002
Age group			
15-19	1.00		
20-24	0.87	0.42-1.80	0.707
25-29	0.58	0.24-1.41	0.227
30-34	0.41	0.17-0.98	0.044
35-39	0.44	0.17-1.09	0.075
40-44	0.53	0.20-1.44	0.212
45-49	0.42	0.16-1.15	0.091
Residence			
Urban	1.00		
Rural	1.09	0.65-1.84	0.736
Province			
Manicaland	1.00		
Mashonaland Central	0.46	0.26-0.81	0.007
Mashonaland East	0.73	0.45-1.20	0.214
Mashonaland West	1.11	0.65-1.91	0.690
Matebeleland North	0.96	0.46-2.00	0.908
Matebeleland South	0.57	0.28-1.12	0.104
Midlands	0.47	0.26-0.86	0.015
Masvingo	0.95	0.57-1.59	0.836
Harare	0.94	0.61-1.46	0.791
Bulawayo	0.71	0.42-1.19	0.192
Education			
No Education/ Primary	1.00		
Secondary/Higher	1.52	1.12-2.07	0.008
Religion			
None	1.00		
Roman Catholic	0.91	0.54-1.55	0.740
Protestant	1.32	0.83-2.09	0.242
Pentecostal	1.29	0.77-2.18	0.335
Apostolic Sect	1.49	0.97-2.27	0.066
Other	1.19	0.72-1.96	0.501

(Cont'd)

Table 3 – cont'd

	Knowing own HIV status[1] N=2,201		
Characteristic	**Odds ratio**	**95% CI**	**p-value**
Household wealth quintile			
Lowest	1.00		
Second	0.97	0.65-1.46	0.883
Third	1.29	0.81-2.06	0.277
Fourth	1.47	0.86-2.49	0.158
Highest	1.95	1.05-3.62	0.034
Work status			
Not working	1.00		
Working	1.28	0.97-1.69	0.085
Marital status			
Never married	1.00		
Married/living together	0.59	0.26-1.35	0.214
Widowed/divorced/separated	0.78	0.34-1.82	0.570
Married more than once			
No	1.00		
Yes	0.88	0.61-1.28	0.516
Missing	0.76	0.38-1.51	0.431
Number of living children			
0	1.00		
1-2	1.65	0.99-2.74	0.055
3+	2.20	1.24-3.89	0.007
Chronically ill for 3 months within past 12 months			
No	1.00		
Yes	1.61	1.04-2.50	0.034
Perceived risk of acquiring HIV			
No risk	1.00		
Small	1.03	0.71-1.51	0.868
Medium	0.76	0.54-1.08	0.132
High	1.27	0.83-1.95	0.273
Don't know/missing	0.45	0.29-0.71	0.001
Knows spouse's HIV status			
Spouse not tested /not in union	1.00		
Spouse tested and shared results	9.27	6.46-13.31	<0.001
Don't know/missing	0.93	0.62-1.39	0.729

[1] The dependent variable for this model is a dichotomous variable with two categories: ever tested and got results of last HIV test; and never tested or tested but did not get results (reference).

Sexual behavior

Multiple lifetime partners: Overall, 80% of HIV-positive adults were sexually active in the last 12 months (90% of men and 74% of women). Among HIV-positive men, 10% reported multiple sexual partners in the past year, as did 2% of women. Also, 79% of HIV-positive men and 22% of women reported three or more lifetime sexual partners (Table 2).

In multivariate analysis, HIV-positive women were much less likely than men to have multiple lifetime sexual partners [AOR, 0.06; CI, 0.04-0.10] (Table 4). Among HIV-positive adults, those with secondary education [AOR, 0.75; CI, 0.56-1.00] and in wealthier households [AOR, 0.37; CI, 0.20-0.66 for the highest wealth quintile] were less likely to have multiple lifetime sexual partners. HIV-positive adults with a perceived risk of acquiring HIV were significantly more likely than those with no perceived risk to have multiple lifetime partners.

There are large regional differences in HIV-positive adults having multiple lifetime partners. Compared with Manicaland, HIV-positive adults living in Mashonaland West [AOR, 1.72; CI, 1.02-2.91], Matabeleland North [AOR, 2.30; CI, 1.22-4.32], Matabeleland South [AOR, 3.55; CI, 1.81-6.95], and Bulawayo [AOR, 2.01; CI, 1.04-3.87] were significantly more likely and those residing in Masvingo [AOR, 0.59; CI, 0.35-0.97] were significantly less likely to have multiple lifetime partners.

Table 4. Adjusted effects of selected variables on having multiple lifetime partners and having non-spousal partners, among HIV-positive women and men age 15-49, ZDHS 2005-06

	Multiple lifetime partners (among HIV+ respondents who have ever had sex) N=2,185			Sex with a non-spousal partner in past 12 months (among HIV+ respondents who had sex in past 12 months) N=1,776		
Characteristic	**Odds ratio**	**95% CI**	**p-value**	**Odds ratio**	**95% CI**	**p-value**
Sex						
Male	1.00			1.00		
Female	0.06	0.04-0.10	<0.001	0.54	0.37-0.79	0.002
Age group						
15-19	1.00			1.00		
20-24	1.75	0.73-4.20	0.207	0.56	0.31-1.02	0.060
25-29	2.12	0.88-5.15	0.095	0.44	0.24-0.83	0.011
30-34	2.14	0.77-5.99	0.146	0.49	0.26-0.95	0.035
35-39	2.12	0.81-5.49	0.123	0.61	0.30-1.23	0.166
40-44	3.17	1.26-7.97	0.014	0.51	0.20-1.28	0.151
45-49	1.69	0.62-4.54	0.300	0.64	0.23-1.82	0.408
Residence						
Urban	1.00			1.00		
Rural	0.68	0.42-1.10	0.117	0.71	0.36-1.38	0.310
Province						
Manicaland	1.00			1.00		
Mashonaland Central	1.49	0.90-2.47	0.124	0.84	0.29-2.40	0.744
Mashonaland East	1.28	0.75-2.20	0.360	0.75	0.36-1.55	0.433
Mashonaland West	1.72	1.02-2.91	0.042	1.09	0.54-2.20	0.810
Matebeleland North	2.30	1.22-4.32	0.010	1.65	0.68-4.05	0.270
Matebeleland South	3.55	1.81-6.95	<0.001	2.84	1.39-5.80	0.004
Midlands	1.15	0.70-1.89	0.582	0.81	0.43-1.54	0.519
Masvingo	0.59	0.35-0.97	0.039	0.91	0.42-1.94	0.803
Harare	1.02	0.56-1.86	0.952	0.69	0.34-1.39	0.294
Bulawayo	2.01	1.04-3.87	0.037	1.61	0.73-3.56	0.241
Education						
No Education/Primary	1.00			1.00		
Secondary	0.75	0.56-1.00	0.048	0.93	0.66-1.30	0.657
Higher	0.84	0.43-1.65	0.611	0.34	0.11-1.01	0.052
Religion						
None	1.00			1.00		
Roman Catholic	0.77	0.45-1.32	0.338	0.95	0.54-1.67	0.858
Protestant	0.63	0.38-1.04	0.069	0.73	0.44-1.22	0.227
Pentecostal	1.11	0.64-1.93	0.698	0.93	0.55-1.57	0.799
Apostolic Sect	1.20	0.64-2.28	0.567	1.02	0.68-1.52	0.941
Other	0.71	0.40-1.24	0.226	0.69	0.39-1.21	0.194

(Cont'd)

Table 4 – cont'd

	Multiple lifetime partners (among HIV+ respondents who have ever had sex) N=2,185			Sex with a non-spousal partner in past 12 months (among HIV+ respondents who had sex in past 12 months) N=1,776		
Characteristic	**Odds ratio**	**95% CI**	**p-value**	**Odds ratio**	**95% CI**	**p-value**
Household wealth quintile						
Lowest	1.00			1.00		
Second	0.61	0.40-0.91	0.017	0.69	0.42-1.13	0.142
Third	0.67	0.43-1.03	0.066	1.42	0.82-2.47	0.213
Fourth	0.65	0.40-1.06	0.082	1.25	0.69-2.28	0.464
Highest	0.37	0.20-0.66	0.001	1.41	0.62-3.18	0.407
Work status						
Not working	1.00			1.00		
Working	1.28	0.98-1.67	0.067	1.20	0.83-1.73	0.328
Marital status						
Never married	1.00					
Currently in union	0.76	0.47-1.24	0.271			
Divorced/separated/widowed	1.42	0.87-2.34	0.161			
Number of living children						
0	1.00			1.00		
1-2	0.98	0.65-1.48	0.928	0.33	0.23-0.47	<0.001
3-4	1.00	0.61-1.65	0.998	0.22	0.13-0.36	<0.001
5+	1.06	0.63-1.77	0.825	0.13	0.06-0.28	<0.001
Perceived risk of acquiring HIV						
No risk	1.00			1.00		
Small	1.51	1.02-2.24	0.042	1.12	0.73-1.71	0.605
Medium	1.84	1.15-2.93	0.010	1.26	0.83-1.92	0.276
High	1.69	1.08-2.66	0.023	2.14	1.22-3.76	0.008
Don't know/missing	1.25	0.84-1.87	0.266	1.57	0.93-2.64	0.089
Knows own HIV status						
Never tested for HIV	1.00			1.00		
Previously tested, received results of last test	1.21	0.89-1.64	0.214	1.17	0.80-1.70	0.427
Previously tested, did not receive results of last test	1.05	0.53-2.11	0.885	1.55	0.68-3.54	0.295
Knows spouse's HIV status						
Spouse not tested /not in union	1.00			1.00		
Spouse tested and shared results	1.17	0.71-1.92	0.533	0.09	0.04-0.19	<0.001
Don't know/missing	1.07	0.70-1.64	0.750	0.13	0.07-0.26	<0.001

Non-spousal partners: 17% of HIV-positive adults reported having sex with a non-spousal sexual partner in the past year (21% of men and 15% of women) (Table 2). In multivariate analysis, with other factors controlled, HIV-positive women were significantly less likely than HIV-positive men to have sex with a non-spousal sexual partner in the past year [AOR, 0.54; CI, 0.37-0.79] (Table 4). HIV-positive adults age 25-34 were significantly less likely than those age 15-19 to have non-spousal partner in the past year. HIV-positive adults with education beyond the secondary level were much less likely than adults with primary or no education [AOR, 0.34; CI, 0.11-1.01], and also less likely than those with secondary education, to have sex with a non-spousal partner. HIV-positive adults who had any living children were significantly less likely than adults with no children to have sex with a non-spousal sexual partner. In addition, HIV-positive adults whose spouses had tested and shared their HIV test results were significantly less likely to have non-spousal sex than those not in union or whose spouses had not previously tested for HIV [AOR, 0.09; CI, 0.04-0.19]. Conversely, HIV-positive adults reporting a high perceived risk of acquiring HIV were significantly more likely to have non-spousal sex than those with no perceived risk [A0R, 2.14; CI, 1.22-3.76]. Also, HIV-positive adults living in Matabeleland South were significantly more likely than those living in Manicaland to have sex with a non-spousal partner in the past year [AOR, 2.84; CI, 1.39-5.80].

Condom use

Among HIV-positive adults who had sex in the last 12 months, 83% of last sexual acts were unprotected. Among HIV-positive adults who had sex with a non-spousal partner in the past year, less than half (48%) used condoms. Only 14% of HIV-positive men who had sex in the past year reported using condoms consistently with all recent sexual partners (Table 2).

Results from the multivariate analysis show that among HIV-positive adults who had sex in the past year, women were significantly less likely than men to report condom use at last sex [AOR, 0.44; CI, 0.29-0.67] (Table 5). Among HIV-positive adults who had sex in the past year, those currently married or living together were much less likely to report condom use than those who were never married [AOR, 0.03; CI, 0.01-0.09]. HIV-positive adults who reported more than one sexual partner in the past year were significantly less likely than those with only one sexual partner to have used condoms at last sex [AOR, 0.49; CI, 0.28-0.84].

Among HIV-positive adults who had sex in the past year, those who were older, more educated, and wealthier were more likely to have used condoms at last sex than their younger, less educated, and poorer counterparts. With other factors controlled, HIV-positive adults age 35-49 were 2.02 times more likely than those age 15-24 to report condom use at last sex; adults with higher than secondary education were 2.18 times more likely than those with no education or primary education; and adults in the highest wealth quintile were 2.64 times more likely than those in the lowest wealth quintile.

HIV-positive adults in Mashonaland West were significantly more likely than those in Manicaland to have used condoms at last sex [AOR, 1.90; CI, 1.06-3.39]. In addition, HIV-positive adults who had tested for HIV and received results were significantly more likely to report condom use at last sex than those had never tested [AOR, 1.67; CI, 1.11-2.51]. However, HIV-positive adults who had previously tested for HIV but did not receive results were even more likely to have used condoms at last sex than those had never tested [AOR, 2.96; CI, 1.50-5.83] (Table 5).

Due to small numbers of HIV-positive women with multiple partners in last 12 months, multivariate analysis on consistent condom use with all most recent sexual partners was run only

for HIV-positive men. HIV-positive men who were working were significantly less likely than those not working to have used condoms consistently with all most recent sexual partners in the past year [AOR, 0.42; CI, 0.21-0.85]. HIV-positive men who were currently married or living together with a partner were much less likely than never married men to have used condoms consistently [AOR, 0.02; CI, 0.00-0.13].

Conversely, HIV-positive men who had previously tested for HIV were more likely than those never tested, and men living in Mashonaland East, Matabeleland South, and Bulawayo were more likely than those living in Manicaland to have used condoms consistently. But these associations were not statistically significant, except for men living in Bulawayo [AOR, 4.12; CI, 1.09-15.61] (Table 5).

Among HIV-positive adults who had sex with a non-spousal partner in the past year, women were significantly less likely than men to have used condoms at last non-spousal sex [AOR, 0.35; CI, 0.16-0.78]. Also among this group, working adults [AOR, 0.49; CI, 0.27-0.89] and those whose spouses were tested and shared results [AOR, 0.07; CI, 0.01-0.48] were significantly less likely to have used condoms at last non-spousal sex. Conversely, HIV-positive adults living in Mashonaland Central, Mashonaland East, Mashonaland West, and Harare were significantly more likely than those living in Manicaland to report condom use at last non-spousal sex. Also, wealthier adults (fourth wealth quintile [AOR, 3.90; CI, 1.10-13.89] and the highest wealth quintile [AOR, 5.33; CI, 1.20-23.71]) and adults who had previously tested for HIV but did not receive results of the test were significantly more likely to have used condoms at last non-spousal sex [AOR, 5.51; CI, 1.67-18.19] (Table 5).

Table 5. Adjusted effects of selected variables on condom use, among HIV-positive women and men age 15-49, ZDHS 2005-06

	Condom use at last sex (among HIV+ respondents who had sex in past 12 months) N=1,776			Consistent condom use with all most recent sexual partners (among HIV+ men who had sex in past 12 months) N=725			Condom use at last sex with non-spousal partner (among HIV+ respondents who had sex with a non-spousal partner in past 12 months) N=374		
Characteristic	**Odds ratio**	**95% CI**	**p-value**	**Odds ratio**	**95% CI**	**p-value**	**Odds ratio**	**95% CI**	**p-value**
Sex									
Male	1.00						1.00		
Female	0.44	0.29-0.67	<0.001				0.35	0.16-0.78	0.010
Age group									
15-24	1.00			1.00			1.00		
25-34	1.42	0.85-2.37	0.182	0.46	0.15-1.41	0.172	2.08	0.99-4.37	0.052
35-49	2.02	1.11-3.70	0.022	0.65	0.20-2.12	0.479	2.09	0.87-5.02	0.099
Residence									
Urban	1.00			1.00			1.00		
Rural	1.27	0.69-2.32	0.436	1.34	0.34-5.25	0.674	1.60	0.56-4.58	0.381
Province									
Manicaland	1.00			1.00			1.00		
Mashonaland Central	1.32	0.54-3.22	0.544	1.48	0.31-7.19	0.625	6.85	1.76-26.67	0.006
Mashonaland East	1.36	0.63-2.94	0.437	3.42	0.88-13.26	0.075	3.35	0.99-11.3	0.051
Mashonaland West	1.90	1.06-3.39	0.031	1.94	0.40-9.37	0.409	5.15	1.69-15.67	0.004
Matebeleland North	0.68	0.27-1.73	0.419	1.12	0.15-8.35	0.911	0.52	0.13-2.15	0.367
Matebeleland South	0.99	0.40-2.48	0.989	3.62	0.25-52.16	0.343	1.13	0.50-2.55	0.769
Midlands	0.89	0.47-1.69	0.714	1.27	0.28-5.72	0.752	1.54	0.47-5.06	0.476
Masvingo	1.53	0.80-2.92	0.195	1.74	0.46-6.58	0.416	1.98	0.72-5.48	0.186
Harare	1.24	0.70-2.21	0.462	1.58	0.48-5.26	0.451	4.37	1.35-14.16	0.014
Bulawayo	1.32	0.68-2.59	0.412	4.12	1.09-15.61	0.037	1.91	0.65-5.62	0.237
Education									
No Education/ Primary	1.00			1.00			1.00		
Secondary	1.38	0.93-2.05	0.111	1.68	0.80-3.52	0.170	1.20	0.63-2.29	0.580
Higher	2.18	0.89-5.35	0.087	2.54	0.51-12.59	0.252	1.28	0.20-8.21	0.793

(Cont'd)

Table 5 – cont'd

Characteristic	Condom use at last sex (among HIV+ respondents who had sex in past 12 months) N=1,776			Consistent condom use with all most recent sexual partners (among HIV+ men who had sex in past 12 months) N=725			Condom use at last sex with non-spousal partner (among HIV+ respondents who had sex with a non-spousal partner in past 12 months) N=374		
	Odds ratio	95% CI	p-value	Odds ratio	95% CI	p-value	Odds ratio	95% CI	p-value
Religion									
None	1.00			1.00			1.00		
Roman Catholic	1.69	0.87-3.29	0.121	1.58	0.52-4.83	0.419	0.53	0.19-1.52	0.239
Protestant	1.32	0.67-2.57	0.421	1.53	0.45-5.20	0.493	1.08	0.29-3.03	0.879
Pentecostal	1.00	0.57-1.75	0.998	0.76	0.22-2.57	0.655	0.63	0.23-1.75	0.372
Apostolic Sect	1.02	0.62-1.68	0.935	0.70	0.29-1.68	0.419	1.02	0.49-2.13	0.948
Other	1.12	0.58-2.14	0.739	0.79	0.26-2.43	0.676	0.85	0.27-2.66	0.774
Household wealth quintile									
Lowest	1.00			1.00			1.00		
Second	1.26	0.65-2.42	0.497	0.96	0.19-4.85	0.965	1.31	0.40-4.34	0.657
Third	1.12	0.58-2.16	0.735	0.93	0.18-4.71	0.930	1.71	0.58-5.06	0.335
Fourth	1.96	1.02-3.76	0.043	2.73	0.62-12.07	0.185	3.90	1.10-13.89	0.036
Highest	2.64	1.14-6.10	0.023	3.16	0.57-17.60	0.189	5.33	1.20-23.71	0.028
Work status									
Not working	1.00			1.00			1.00		
Working	0.96	0.65-1.42	0.827	0.42	0.21-0.85	0.015	0.49	0.27-0.89	0.020
Marital Status									
Never married	1.00			1.00					
Married/ living together	0.03	0.01-0.09	<0.001	0.02	0.00-0.13	<0.001			
Widowed/ Divorced/ separated	0.40	0.14-1.19	0.100	0.70	0.12-3.97	0.685			
Married more than once									
No	1.00			1.00			1.00		
Yes	0.82	0.53-1.26	0.365	1.00	0.47-2.11	0.998	0.72	0.28-1.85	0.491
Missing	0.67	0.25-1.78	0.425	1.35	0.40-4.55	0.625	1.03	0.51-2.07	0.931
Number of living children									
0	1.00			1.00			1.00		
1-2	0.84	0.54-1.32	0.452	0.87	0.28-2.72	0.810	0.42	0.19-0.91	0.029
3-4	0.87	0.51-1.48	0.605	1.77	0.46-6.79	0.402	0.54	0.19-1.55	0.251
5+	1.54	0.76-3.11	0.226	2.71	0.65-11.26	0.169	0.55	0.13-2.32	0.411
Number of partners in past 12 months									
1	1.00			1.00			1.00		
2+	0.49	0.28-0.84	0.010	1.65	0.68-4.01	0.272	0.45	0.19-1.07	0.071

(Cont'd)

Table 5 – cont'd

	Condom use at last sex (among HIV+ respondents who had sex in past 12 months) N=1,776			Consistent condom use with all most recent sexual partners (among HIV+ men who had sex in past 12 months) N=725			Condom use at last sex with non-spousal partner (among HIV+ respondents who had sex with a non-spousal partner in past 12 months) N=374		
Characteristic	**Odds ratio**	**95% CI**	**p-value**	**Odds ratio**	**95% CI**	**p-value**	**Odds ratio**	**95% CI**	**p-value**
Perceived risk of acquiring HIV									
No risk	1.00			1.00			1.00		
Small	0.86	0.50-1.46	0.574	0.99	0.35-2.78	0.986	1.13	0.49-2.60	0.767
Medium	1.04	0.60-1.80	0.894	0.59	0.19-1.84	0.360	1.13	0.46-2.82	0.785
High	1.10	0.59-2.05	0.759	1.08	0.32-3.58	0.903	1.61	0.57-4.58	0.369
Don't know/missing	1.40	0.78-2.53	0.258	1.43	0.33-6.15	0.628	2.32	0.82-6.57	0.113
Knows own HIV status									
Never tested for HIV	1.00			1.00			1.00		
Previously tested, received results of last test	1.67	1.11-2.51	0.014	2.16	0.84-5.50	0.108	1.74	0.94-3.24	0.080
Previously tested, did not receive results of last test	2.96	1.50-5.83	0.002	2.92	0.87-9.77	0.081	5.51	1.67-18.19	0.005
Knows spouse's HIV status									
Spouse not tested /not in union	1.00			1.00			1.00		
Spouse tested and shared results	1.02	0.61-1.70	0.935	1.25	0.41-3.80	0.697	0.07	0.01-0.48	0.007
Don't know/missing	0.77	0.41-1.44	0.408	1.60	0.41- 6.23	0.498	0.01	0.00-0.16	0.001
Knows HIV transmitted from mother to child									
No	1.00			1.00			1.00		
Yes	1.11	0.56-2.22	0.760	1.28	0.32-5.09	0.728	0.86	0.29-2.57	0.782

Pregnancy risk behavior

Among HIV-positive adults who had ever had sex, 47% were currently using a contraceptive method (59% of men and 47% of women, $p<0.05$). Among HIV-positive adults who had sex in the past year, 59% were currently using contraception (Table 2).

Among HIV-positive adults who had sex in the past year, those with higher than secondary education [AOR, 3.27; CI, 1.31-8.16] and those in the two highest household wealth quintiles (fourth quintile [AOR, 2.27; CI 1.39-3.71] and fifth quintile [AOR, 2.28; CI, 1.15-4.52]) were significantly more likely to currently use a contraceptive method (Table 6). Also, HIV-positive adults who had previously tested for HIV and received results were significantly more likely to currently use contraception than those who had never tested [AOR, 1.40; CI, 1.03-1.89]. Similarly, HIV-positive adults with medium self-risk perception of acquiring HIV were significantly more likely to currently use a contraceptive method than those who perceived themselves to be at no risk [AOR, 1.52; CI, 1.03-2.25].

The odds of currently using a contraceptive method increased with an increase in the number of living children: HIV-positive adults with one or two living children, and those with three or more living children, were 2.57 [CI, 1.92-3.45] and 4.24 [CI, 2.76-6.53] times more likely to currently use a contraceptive method than those with no living children. Conversely, HIV-positive women were less likely than men [AOR, 0.59; CI, 0.43-0.82], and adults of the Apostolic Sect were less likely than other religious affiliations [AOR, 0.65; CI, 0.43-1.00] to currently use a contraceptive method (Table 6).

Table 6. Adjusted effects of selected variables on current use of any contraceptive method, among HIV-positive women and men age 15-49 who had sex in the past 12 months, ZDHS 2005-06

	Current use of any contraceptive method N=1,776		
Characteristic	**Odds ratio**	**95% CI**	**p-value**
Sex			
Male	1.00		
Female	0.59	0.43- 0.82	0.002
Age group			
15-19	1.00		
20-24	1.57	0.77- 3.20	0.216
25-29	1.80	0.73- 4.44	0.200
30-34	1.56	0.59- 4.08	0.367
35-39	1.03	0.42- 2.53	0.944
40-44	1.19	0.44- 3.23	0.730
45-49	0.60	0.23- 1.61	0.311
Residence			
Urban	1.00		
Rural	1.20	0.68- 2.10	0.534
Province			
Manicaland	1.00		
Mashonaland Central	1.37	0.74- 2.53	0.323
Mashonaland East	0.79	0.41- 1.51	0.474
Mashonaland West	1.23	0.65- 2.30	0.526
Matebeleland North	0.63	0.33- 1.21	0.164
Matebeleland South	0.71	0.36- 1.40	0.326
Midlands	0.68	0.38- 1.24	0.212
Masvingo	1.17	0.58- 2.37	0.662
Harare	1.11	0.56- 2.20	0.760
Bulawayo	1.07	0.49- 2.33	0.857
Education			
No Education/ Primary	1.00		
Secondary	1.24	0.92- 1.66	0.157
Higher	3.27	1.31- 8.16	0.011
Religion			
None	1.00		
Roman Catholic	1.02	0.63- 1.63	0.949
Protestant	0.77	0.52- 1.16	0.219
Pentecostal	1.06	0.65- 1.73	0.805
Apostolic Sect	0.65	0.43- 1.00	0.050
Other	0.75	0.46- 1.22	0.248

(Cont'd)

Table 6 – cont'd

	Current use of any contraceptive method N=1,776		
Characteristic	**Odds ratio**	**95% CI**	**p-value**
Household wealth quintile			
Lowest	1.00		
Second	1.13	0.70- 1.84	0.615
Third	1.26	0.77- 2.05	0.359
Fourth	2.27	1.39- 3.71	0.001
Highest	2.28	1.15- 4.52	0.018
Work status			
Not working	1.00		
Working	1.20	0.92- 1.56	0.174
Marital Status			
Never married	1.00		
Married/living together	1.90	0.87- 4.13	0.106
Divorced/separated/widowed	0.84	0.39- 1.84	0.665
Married more than once			
No	1.00		
Yes	0.43	0.30- 0.61	<0.001
Missing	0.78	0.40- 1.49	0.445
Number of living children			
0	1.00		
1-2	2.57	1.92- 3.45	<0.001
3+	4.24	2.76- 6.53	<0.001
Perceived risk of acquiring HIV			
No risk	1.00		
Small	1.16	0.80- 1.67	0.436
Medium	1.52	1.03- 2.25	0.034
High	0.90	0.56- 1.45	0.661
Don't know/missing	1.33	0.86- 2.06	0.195
Knows own HIV status			
Never tested for HIV	1.00		
Previously tested, received results of last test	1.40	1.03- 1.89	0.033
Previously tested, did not receive results of last test	0.96	0.51- 1.81	0.910
Knows spouse's HIV status			
Spouse not tested /not in union	1.00		
Spouse tested and shared results	0.73	0.43- 1.23	0.236
Don't know/missing	0.77	0.54- 1.10	0.150
Knows HIV transmitted from mother to child			
No	1.00		
Yes	1.51	0.82- 2.76	0.183

DISCUSSION

Our study of HIV-positive people in Zimbabwe age 15-49 found that only 24% were previously tested for HIV and received test results. Among those, a large majority (88%) reported sharing the results with their spouses. Overall, 80% of all HIV-positive persons had sex in the year preceding the 2005-06 ZDHS, and 83% of last sexual acts were unprotected while only 14% of HIV-positive men reported consistent condom use.

About 10% of HIV-positive men had two or more sexual partners in the past year, as did 2% of women. Also among all HIV-positive adults, 17% had sex with a non-spousal partner in the past year (21% of men and 15% of women). Less than half (48%) of sexual acts with non-spousal partners were protected. Among HIV-positive adults who had sex in the past year, those who were older, more educated, and wealthier were more likely to have used condoms at last sex than their younger, less educated, and poorer counterparts.

The odds of condom use among HIV positive adults who had previously tested for HIV and received results were 1.7 times higher than those who had not tested for HIV. This statistic suggests a key link between knowing one's HIV status and using condoms. In addition, the odds of condom use among married and or cohabiting HIV-positive adults were much lower. Similarly, the odds of currently using any contraceptive method among those who previously tested for HIV and received results were 1.4 times higher than those who had never tested.

While interpreting these results, it is important to consider the following limitations of our study. A major limitation is that the analysis is based on cross-sectional data. It is therefore difficult to assess causality of various risk behaviors on HIV infection because, for many HIV-positive adults, the infection may have preceded their sexual and other behaviors recorded in the survey. Some of the observed relationships may be due to reverse causality, or due to

confounding. Reverse causality could result if either HIV infection or an associated illness results in changes in certain characteristics or behaviors. Confounding could result if an observed association between HIV serostatus and a certain factor is due to another factor that is correlated both with HIV serostatus and with the first factor.

Another limitation is that our analysis is based on self-reported data about sexual behaviors and our findings may be biased to the extent that men and women may misreport these behaviors. For example, women tend to underreport and men tend to exaggerate their premarital and extramarital sexual activity (Zaba et al. 2004). Finally, some of the estimates presented in this report are based on small numbers of cases in survey samples, and should be interpreted with caution.

Despite these data limitations, the findings of this study have important implications for policies and programs. A key finding is that a large majority of HIV-positive adults in Zimbabwe are sexually active, yet most of their last sexual acts were unprotected and consistent condom use was even lower. Accordingly, programs to promote condom use among HIV-positive adults, including in marriages in which the partners are discordant in HIV status, need to be scaled up. In particular, Zimbabwe's once strong public sector condom distribution program needs to be strengthened again and directed at people living with HIV, while the complementary social marketing program should also be enhanced. This study also shows that many HIV-positive individuals are engaging in multiple partnerships and non-spousal sex, highlighting the need to strengthen programs to promote partner reduction and faithfulness. In addition, the findings that very few HIV-positive individuals, particularly men, know their own HIV status and that knowledge of HIV status is positively related to condom use and contraceptive use among the HIV-positive adults underscore the critical importance of HIV counseling and testing services.

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