

HIV status and contraceptive use in Zimbabwe among sexually active adolescent girls and women: Secondary analysis of Zimbabwe Demographic Health survey data

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Background. Understanding the pattern of contraceptive use among women living with HIV is critical for formulating relevant public health interventions to improve the uptake and use of reliable methods in this population. This helps to reduce the incidence of unintended pregnancies. **Objective.** In this secondary data analysis, we aimed to describe contraceptive use by HIV-positive and HIV-negative sexually active adolescent girls and women, using data from the Zimbabwe Demographic and Health Survey (2015-16).

Method. We used statistical analysis to determine the association between the use of various methods of contraception and HIV status using the Zimbabwe Demographic and Health Survey, 2015-16 data.

Results. Overall, the contraceptive use prevalence in this study was 60%. Sexually active adolescent girls and women on the Pill and injections were less likely to be HIV-positive compared with those not using any method of contraception (odds ratio (OR)=0.54, 95% confidence interval (CI) (0.45 - 0.64), $p=0.001$; and OR=0.75, 95% CI (0.59 - 0.96), $p=0.020$, respectively). Those using either a male or female condom were more likely to be HIV-positive, OR=3.36, 95% CI (2.63 - 4.28), $p=0.001$.

Conclusions. This study revealed that there is still a considerable unmet need for contraception among the study population, highlighting the need to devise strategies to increase contraception uptake among women. Statistically significant differences were noted in the use of condoms, with those who are HIV-positive having a higher use of condoms compared with those who are HIV-negative. This may reflect that HIV-positive individuals have received appropriate counselling messages on the need to use barrier methods.

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HIV continues to be a major public health challenge in Zimbabwe with a national prevalence of 14%, which is one of the highest globally. The prevalence is 11.8% for the 15 - 49-year age group.^[1] Owing to several socioeconomic and cultural disadvantages, adolescent girls and women are differentially affected by the HIV epidemic and constitute an estimated 67% of people living with HIV/AIDS (PLWHA) in the country. The country has a comprehensive family planning (FP) strategy which has seen a gradual increase in the uptake of modern methods of contraception over the past two decades.^[2] However, evidence of integration of HIV education and FP and maternal health services is generally lacking in the sub-Saharan Africa region, including Zimbabwe.^[3-5] This is despite the fact that the integration of FP and HIV education is effective in preventing both HIV and unplanned pregnancies. FP and HIV care and treatment contacts provide healthcare providers with an opportunity to educate adolescent girls on the prevention of both.^[3] Unfortunately, a higher incidence of unintended pregnancies in women living with the virus than in the general population has been reported.^[6]

The Zimbabwe National Family Planning Council (ZNFPC)^[7] lists the following FP methods in use: (i) short-acting methods (emergency contraception, the Pill, male and female condoms and injectables, fertility awareness-based methods, and lactational amenorrhoea method (LAM)); (ii) long-acting reversible contraceptives (LARCs) (implants and intrauterine contraceptive devices (IUCDs)); and (iii) permanent methods (both male and female surgical contraception). Between 1988 and 2015, the use of modern contraception among women increased from 36% to 66%.^[8] Hormonal contraceptives, in particular oral contraceptives, implants and injectables, dominate the method mix.^[2] Understanding the pattern of FP use among women living with HIV is critical for formulating relevant public health interventions to improve the uptake and use of reliable methods in this population to reduce the incidence of unintended pregnancies. Our study uses the Zimbabwe Demographic and Health Survey (ZDHS) 2015-16 data to describe the various contraceptive methods used by HIV-positive and HIV-negative adolescent girls and women in Zimbabwe.

Methods

Study area and data sources

Subjects were enrolled in the ZDHS via a two-stage sampling procedure to select households. A total of 400 ZDHS sample locations were selected. The women's response rate was high at 96%. The study population was limited to 7 397 sexually active adolescent girls and women aged 15 to 49 years who had ever had sex, were asked about contraceptive use, and had a definitive HIV result. Anonymous HIV testing was performed with the informed consent of all sampled individuals. HIV serostatus was determined by testing with the enzyme-linked immunosorbent assay (ELISA) Vironostika Uniform 2 Ag/AB (Organon Teknika, the Netherlands). All samples that tested positive and a random sample of 10% of samples that tested negative were retested with a second ELISA, the Enzygnost HIV Integral II assay (Siemens, Germany). Positive samples on both tests were classified as HIV-positive. If the first and second tests were discordant, the two ELISAs were repeated; if the results remained discordant, a confirmatory test, the HIV 2.2 western blot (DiaSorin, Italy), was administered.

Statistical analysis

STATA Version 16.1, (StataCorp, USA), was used to conduct statistical analysis. Because these are survey data, the data were first declared as survey data. All statistical commands were prefixed with `svy` command in STATA to adjust for weights. We used simple proportions to describe the characteristics of the women included in the analysis. We presented a table showing various types of contraceptives used by HIV-positive and HIV-negative women. Thereafter, for each contraceptive method, women not using any contraceptive method at all were used as the comparison group to show an association between contraceptive use and HIV status. Odds ratios (ORs) and their 95% confidence intervals (CIs) were used to calculate the risk estimate for HIV positivity among these women for various forms of contraceptives used. Statistical significance cut-off for purposes of describing the significant contraceptive factors associated with HIV positivity was set at $p < 0.05$.

Ethics approval and consent to participate

Procedures and questionnaires for standard Demographic Health Surveys (DHSs) have been reviewed and approved by the ICF International Institutional Review Board (IRB). Additionally, country-specific DHS survey protocols are reviewed by the ICF IRB and typically by an IRB in the host country. The ICF International IRB ensures that the survey complies with the US Department of Health and Human Services regulations for the protection of human subjects, while the host country IRB ensures that the survey complies with the laws and norms of the nation. In the original primary data collection for each DHS, informed consent was sought from all participants before serological testing for HIV (<https://dhsprogram.com/methodology/Protecting-the-Privacy-of-DHS-Survey-Respondents.cfm#sthash.Ot3N7n5m.dpuf>). We sought and were granted permission to use the core dataset for this analysis by MEASURE DHS. In Zimbabwe the ZDHS was approved by the Medical Research Council of Zimbabwe (MRCZ) which is the national IRB. Informed consent was sought in writing. For minors, consent was obtained from their parents or guardians.

Results

Participant demographics

As shown in Table 1, approximately two-thirds (4 248) of the participants lived in rural areas, consistent with the national population distribution by area of residence, and 4 696 (63%) had

secondary education. The majority of the women 5 170 (72%) were married. The largest religious group was the apostolic sect with 2 958 (43%) respondents. HIV prevalence for the sample was 1 531/7 397 (19.8%).

Geospatial distribution of contraceptive use by women in Zimbabwe

Fig. 1 shows the geospatial distribution of contraceptive use by women in Zimbabwe. The maps show that the use of oral contraceptives and injectable contraception is low in high HIV-prevalence areas.

HIV positivity: type of contraceptive use by HIV status of the women

From Table 2, a smaller proportion of the HIV-positive women (23%) use the Pill compared with their HIV-negative counterparts (37%), $p < 0.001$. Use of IUCDs was very low for both groups and not significantly different ($p = 0.554$). There were no significant differences in the proportions of injection use for the HIV-positive and the HIV-negative women ($p = 0.147$). A significantly larger proportion of the HIV-positive use condoms compared with the HIV-negative women ($p < 0.001$). There is low adoption of female and male sterilisation methods, and the use is not different between the HIV-positive and the HIV-negative groups ($p = 0.992$). Very small proportions use the withdrawal method and there are no significant differences between the two groups of HIV status ($p = 0.975$). Only 11% of the HIV-positive women use implants compared with 10% of the HIV-negative and these proportions are statistically the same ($p = 0.145$). A negligible proportion of the women from both groups use the LAM.

Association between contraceptive use and HIV positivity

Table 3 shows the association between contraceptive use and HIV positivity. Each method is only compared with those not using any method, to eliminate background confounding. From Table 3, women on the Pill and injections were less likely to be HIV-positive compared with those not using any method of contraception (OR=0.54, 95% CI 0.45 - 0.64, $p = 0.001$, and OR=0.75, 95% CI 0.59 - 0.96, $p = 0.024$, respectively). On the contrary, the odds of being HIV-positive were higher for those using either a male or female condom compared with those not using any method of contraceptive (OR=3.37, 95% CI 2.64 - 4.32, $p = 0.001$).

Discussion

The trajectory of the HIV epidemic has changed significantly over the past two decades globally, with increased life expectancy among PLWHA.^[9] Widespread access to safe and effective antiretrovirals (ARVs)^[10] has enabled women to live full reproductive lives, and children who were born with HIV are reaching adolescence and adulthood. As people become healthier, the desire for sexual activities naturally increases.^[11] It is critical to ensure that women living with HIV and AIDS are enabled to enjoy their adulthood fully, and against this background, ensure safer sexual practices with regard to acquiring other sexually transmitted infections, cross-infection with other HIV strains and prevention of unintended pregnancies. A key element of Sustainable Development Goal 3 is ensuring equitable access to reproductive health services across all populations.^[12] Dual protection encompasses the use of protective barrier methods concurrently with another effective method of contraception, and this should be the target for the cohort of women living with HIV/AIDS.

In this cross-sectional study, we analysed the mix of methods used by sexually active women living with HIV/AIDS and compared the use with that of their HIV-negative counterparts. Overall, the

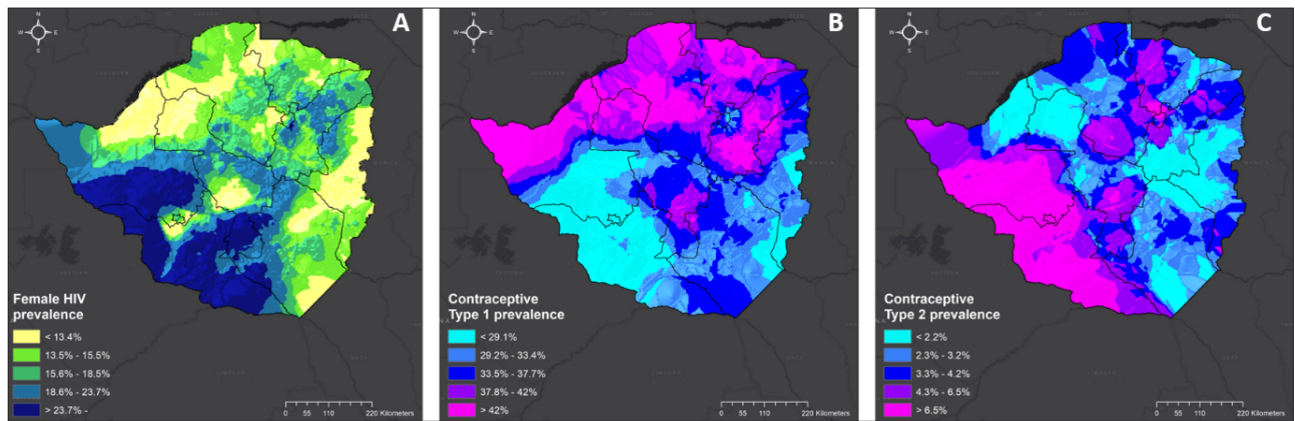


Fig. 1. Geospatial distribution of contraceptive use by women in Zimbabwe. A. Female HIV prevalence. B. Contraceptive type 1 (contraceptive pills) prevalence. C. Contraceptive type 2 (condoms) prevalence.

Table 1. Participant demographic characteristics (N=7 397)

Variable	n (%)*
Age group (years)	
15 - 19	655 (9)
20 - 24	1 385 (18)
25 - 29	1 466 (20)
30 - 34	1 426 (20)
35 - 39	1 074 (15)
40 - 44	873 (12)
45 - 49	518 (7)
Type of residence	
Urban	3 149 (37)
Rural	4 248 (63)
Highest education level	
None	94 (2)
Primary	2 002 (27)
Secondary	4 696 (64)
Higher	605 (8)
Marital status	
Never in union	780 (8)
Married	5 170 (72)
Living with partner	285 (4)
Widowed	388 (5)
Divorced	444 (6)
Separated	330 (4)
Religion	
None	401 (6)
Traditional	44 (1)
Roman Catholic	464 (6)
Protestant	1 108 (15)
Pentecostal	1 937 (25)
Apostolic sect	2 958 (43)
Other Christian	456 (5)
Muslim	21 (0)
Other	8 (0)

* Percentages are weighted.

contraceptive prevalence in this study was 60%. Though there are differences in the definition of contraceptive prevalence used by the ZNFPC, which reports contraceptive prevalence for married or in-union women only,^[2] and what we used in our study, where we included all sexually active women regardless of their

marital/union status, the contraceptive prevalence rates are still comparable. The ZNFPC and United Nations Population Fund (UNFPA) reported the prevalence of contraceptive use to be about 67%.^[13] Our study population, randomly selected from the ZHDS for this study, was therefore representative of the population of Zimbabwean women. However, there is still a considerable unmet need in our study population and the general population of reproductive-age Zimbabwean women, and public health stakeholders in FP must devise strategies to continually improve contraceptive uptake and use.

The combined oral contraceptive pill has traditionally dominated the method mix in Zimbabwe.^[2] Unfortunately, for the HIV-positive woman this may not be the best choice because of interaction with some ARV medicines. Nevirapine and efavirenz, which were previously integral components of most ARV regimens, and have hepatic metabolism, have been known to possibly reduce the efficacy of hormonal contraceptives.^[14] Fortunately, there is currently a general switch to dolutegravir-containing regimens, which has no documented interactions with hormonal contraception. Progestin-only pills, which are commonly used by breastfeeding women, also interact significantly with ARVs and other medicines such as antituberculous medicines. HIV/tuberculosis (TB) coinfection is significantly high in Zimbabwe,^[15] with a consequent risk of unintended pregnancies among women on ARVs, anti-TB medicines and some hormonal contraceptive methods.

The discrepancy in the use of oral contraceptives was not accompanied by a rise in the use of other methods such as injectables, implants and intrauterine contraceptive devices. The use of LARCs was low in this study, and this is comparable to results from other studies. In one study, the use of LARCs was reported by only 5.3% of women, and women who used LARCs or an injectable were likely to be aged 18 - 29 years, with much lower use in older age groups.^[16] In that study, the high prevalence of unintended pregnancies, and the low use of LARCs necessitated the need for strengthening integration of FP and contraceptive awareness among women living with HIV. Innovative interventions are needed to realise the maximum benefit from the integration of HIV care and treatment services with FP services,^[17] and must be an ongoing process.

Statistically significant differences were noted in the use of condoms, with a higher prevalence of use among HIV-infected women (13% v. 3%, $p=0.001$). While it is encouraging that those who have a positive HIV status have higher use of condoms, which may reflect knowledge of HIV status, receipt of appropriate counselling messages or protection of their partners, the use of barrier methods is still very low in both groups. More needs to be

Table 2. Type of contraceptive use by HIV status of the women

Contraceptive type	HIV-positive <i>n</i> (%)	HIV-negative <i>n</i> (%)	<i>p</i> -value
Pill			
Not using Pill	1 216 (77)	3 768 (63)	
Using	315 (23)	2 098 (37)	0.001
IUD			
Not using IUD	1 521 (99)	5 834 (100)	
Using	10 (1)	32 (0)	0.554
Injections			
Not using injection	1 399 (92)	5 293 (91)	
Using	132 (8)	573 (9)	0.147
Male or female condom			
Not using condom	1 333 (87)	5 629 (97)	
Using	198 (13)	237 (3)	0.001
Male or female sterilisation			
Not using sterilisation	1 518 (99)	5 814 (99)	
Using	13 (1)	52 (1)	0.992
Withdrawal			
Not using withdrawal	1 524 (99)	5 833 (99)	
Using	7 (1)	33 (1)	0.975
Implants			
Not using implants	1 348 (89)	5 266 (90)	
Using	183 (11)	600 (10)	0.145
LAM			
Not using LAM	1 528 (100)	5 854 (100)	
Using	3 (0)	12 (0)	0.840

Table 3. Association between contraceptive use and HIV status

Contraceptive type	HIV-positive <i>n</i> (%)	HIV-negative <i>n</i> (%)	OR (95% CI)	<i>p</i> -value
Pill				
Not using any method	669 (22)	2 216 (78)		
Using	315 (13)	2 098 (87)	0.54 (0.45-0.64)	0.001
IUCD				
Not using any method	669 (22)	2 216 (78)		
Using	10 (24)	32 (76)	1.13 (0.49-2.61)	0.772
Injections				
Not using any method	669 (22)	2 216 (78)		
Using	132 (17)	573 (83)	0.75 (0.59-0.96)	0.024
Male or female condom				
Not using any method	669 (22)	2 216 (78)		
Using	198 (49)	237 (51)	3.37 (2.64-4.32)	0.001
Male or female sterilisation				
Not using any method	669 (22)	2 216 (78)		
Using	13 (20)	52 (80)	0.89 (0.44-1.79)	0.734
Withdrawal				
Not using any method	669 (22)	2 216 (78)		
Using	7 (20)	33 (80)	0.90 (0.35-2.30)	0.818
Implants				
Not using any method	669 (22)	2216 (78)		
Using	183 (22)	600 (78)	10.1 (0.81-1.26)	0.913
LAM				
Not using any method	669 (22)	2 216 (78)		
Using	3 (18)	12 (82)	0.77 (0.20-2.96)	0.702

done to promote the use of barrier methods, which are not only contraceptive but also significantly reduce the risk of acquiring other sexually transmitted infections (STIs) such as *Neisseria gonorrhoeae*, *Chlamydia trachomatis* and human papillomavirus, all of which are prevalent in the population. Health education and health promotion messages aimed at improving the uptake of barrier methods are critical as public health aims at reducing the occurrence of new HIV infections to zero, but also to protect against other STIs which substantially increase the risk of other problems such as subfertility and cervical cancer.

This study corroborates that the use of implants and IUCDs is very low, among both HIV-positive and HIV-negative women, with no statistically significant differences. These are tier 1 methods, highly protective against pregnancy and their protective efficacy is not user dependent. However, several factors serve as barriers to their uptake, including lack of knowledge, limited availability in resource-limited settings, and lack of appropriately trained and skilled manpower to administer these methods.^[18,19] Several fears, myths and misconceptions surround the reduced uptake of LARCs, including fears of disappearing IUCDs, weight changes, altered bleeding patterns and subfertility.^[20] Although these studies were carried out among non-HIV-positive populations, there are no reasons to believe that the same barriers do not apply to HIV-positive cohorts. Unfortunately, these are the more reliable methods for women living with HIV. The copper IUCDs have no known interactions with ARVs and other medicines commonly prescribed to this cohort of women.

Examining associations between contraceptive use and HIV status revealed statistically significant differences in the use of oral contraceptive pills, with higher use among HIV-negative women. There were also statistically significant differences in the use of condoms as highlighted earlier, with more HIV-positive women using condoms. Reasons for these differences need to be explored further to tailor-make public health interventions to promote dual contraception in the HIV-positive cohort, but also to reduce risky sexual behaviour in the HIV-negative cohort. Because this was a cross-sectional study, we cannot explain the differences. Therefore, in-depth qualitative studies would be useful for identifying the possible explanations to address them appropriately.

The main limitation of this study is that the ZHDS was a cross-sectional survey and collected only one biomarker, HIV status. Therefore, some associations cannot be stated with certainty, and further studies are needed. More in-depth qualitative studies are also required to understand the barriers and facilitators of contraceptive uptake among both HIV-positive and HIV-negative women. Nevertheless, the study findings significantly contribute to understanding the patterns of contraceptive use in Zimbabwe among HIV-positive women, an area that needs continuous appraisal and tailored interventions.

Conclusion

Continued efforts at integration of HIV care and treatment services and FP services are critical for improving contraceptive uptake among HIV-positive women, to reduce the risk of unintended pregnancies and new STIs. A lot of work needs to be done to address the barriers and improve the uptake of long-acting methods and continued use of barrier methods. Public health players, policymakers and women living with HIV must consistently work together to attain the common goal of improving and maintaining contraceptive uptake. Safeguards must be put in place to ensure that HIV-positive women freely access this critical service and fully enjoy their sexual and reproductive health rights without discrimination.

What is already known on this topic

- Adolescent girls and women living with HIV are encouraged to use dual protection with both condoms and another reliable method of contraception.
- This reduces the risk of unintended pregnancies, STIs and cross-infection with other HIV strains.

What this study adds

- The use of reliable methods of contraception among adolescent girls and women in Zimbabwe, whether HIV-infected or HIV-negative, remains low.
- HIV-infected women are more likely to use condoms than HIV-negative women.
- There remains a greater need for innovative ways of improving contraceptive uptake among both HIV-negative and HIV-positive adolescent girls and women in Zimbabwe.

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