



# HIV Infection in Attendees of Psychiatric Clinics in Harare, Zimbabwe; Prevalence, Associated Factors and HIV Care Uptake

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## Abstract

Determination of HIV prevalence among people with mental illness is necessary for developing integrated services for HIV and mental illness. This study determined HIV prevalence and uptake of HIV care among outpatients of psychiatric hospitals in Harare, Zimbabwe. HIV status was determined using open testing of 270 randomly selected consenting adult outpatients. HIV prevalence was 14.4% and the risk of acquiring HIV was similar to the general population of adults in Zimbabwe. Females were six times more likely to have HIV infection than males. Although a relatively high proportion of patients had been tested for HIV in the past (77.2%), fewer were recently tested (27.8%). Access to HIV care was high (94%) amongst patients previously diagnosed to be HIV positive. Tertiary mental health services should offer similar HIV care packages as other points of care and there is need for interventions that reduce the risk of HIV in women with mental disorders.

**Keywords** HIV/AIDS · Psychiatry · Mental health · Outpatients · Women

## Introduction

Sub-Saharan Africa is the epicentre of the Human Immunodeficiency Virus (HIV) pandemic, with an estimated 1.8 million new HIV infections in 2017 [1]. There is a synergistic interaction between HIV infection and mental health problems and a resultant increased burden of disease [2]. Mental disorders have been shown to increase the risk of acquiring HIV, often due to risky sexual behaviours that come from social vulnerability [3]. Co-morbid mental disorders

have been associated with rapid HIV disease progression, likely due to a combination of poor antiretroviral therapy (ART) adherence, stress and diminished immune response [4]. Mental disorders in individuals with HIV infection can arise due to the social stigma, stress, and isolation. They can also arise from direct virus effects on the brain; or indirectly through opportunistic conditions or ART adverse effects that affect the brain [5].

Zimbabwe has a 14.6% prevalence of HIV among adults [6] which translates to 1.25 million adults ( $\geq 15$  years) [1]. There is also a high burden of common mental disorders (CMD), such as depression and anxiety, amongst people living with HIV (PLHIV) in primary care settings with estimates of more than 60% prevalence [7]. A study that measured HIV prevalence in psychiatric inpatients in 1996 found that the prevalence was 23.8%. At the time, the prevalence of HIV was at its peak and 28.7% in the general population [8, 9]. Other studies in Sub-Saharan Africa have equivocal rates of HIV infection amongst psychiatric patients and the general population [10–13]. With the roll-out of ART in the public sector since 2004, effective public health campaigns and improved quality of care, the prevalence of HIV in Zimbabwe has declined from 28.7 to 14.6% over the past 20 years [9]. However, the current burden of HIV infection among patients with mental disorders has not been re-examined. Clinically, understanding the HIV

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status of patients with mental illness is particularly important because HIV may increase the risk of developing extrapyramidal side-effects from the first generation anti-psychotics mainly used in Zimbabwe and psychoactive medications may speed the metabolism and reduce the efficacy of ART [14]. These vulnerable patients may have little access to the healthcare system, and psychiatric care may be an opportunity to screen them and initiate treatment. This study aimed to establish the prevalence of HIV infections through HIV testing of individuals seeking care for mental disorders in Harare, Zimbabwe. The study also aimed to outline the factors associated with HIV infection in individuals with mental disorders and describe the HIV care uptake of these patients.

## Methods

### Study Design

An analytical cross-sectional study was carried out.

### Study Setting

The study was conducted in the psychiatric outpatient units of Parirenyatwa and Harare Central hospitals, which are two of Zimbabwe's tertiary hospitals. The two hospitals are in the capital city Harare and each hospital has four psychiatrists offering specialist services. Patients at the tertiary hospitals are referred from district hospitals, primary care clinics, private practitioners and other departments within the tertiary hospitals. The hospitals offer both inpatient and outpatient services and treatments offered include psychotropic medication, psychotherapy, occupational therapy and social interventions. The hospitals also function as teaching institutions. The majority of patients seen in the clinics have severe mental illness.

### Study Population

Individuals aged 18 years and above receiving outpatient psychiatric care for mental disorders in Harare. The mental disorders include mostly psychotic conditions, substance use disorders, organic mental disorders secondary to HIV, anxiety and mood disorders. The study excluded individuals who lacked capacity to give informed consent based on the clinical judgement of the trainee psychiatrist.

### Data Collection

#### Sampling

The minimum desired sample size was obtained in Stata version 13.1 [15]. Given the HIV prevalence of 23.8% among patients with mental disorders by Acuda and Sebit [8] a

margin of error of 7.5%, a 5% significance level, a power of 80%, the minimum desired sample size was 267 study participants.

Systematic sampling was done as patients arriving at the clinic were assigned consecutive numbers. Every third patient attending the outpatient clinics in both hospitals was approached for participation from 22 August 2016 to 30 September 2016. There are two main clinic days per week at each hospital, and approximately 50–70 patients are seen routinely in each clinic. During the 6-week study period, approximately 15 patients were recruited during every clinic.

Eligibility and capacity to give informed consent was assessed by two doctors who were completing specialty training in psychiatry. The participants were informed about the study and asked for consent to participate. Clinical diagnoses of the patients were obtained from their outpatient medical record. Additional consent was also sought from caregivers for those that were accompanied to the clinic by their caregivers.

Participants that met the inclusion criteria and gave written informed consent were taken individually into a private testing room where they had:

- A. Verbal questionnaire administered by a trained research assistant that included sociodemographic and HIV risk behaviour questions adapted from the Zimbabwe Population-Based HIV Impact Assessment (ZIMPHIA), a household-based national survey.
- B. HIV pre-test counselling.
- C. Rapid HIV testing (whole blood collected by fingerstick that underwent antibody testing according to the national algorithm) [16].
- D. After testing, the clients received post-test counselling and their results.
- E. Individuals that tested HIV positive were asked further questions concerning their current HIV care, and individuals not receiving treatment were linked to HIV care. The psychiatric diagnosis was obtained from an assessment done by the attending doctors using DSM V or ICD10 and obtained in the patient's records. They were given a referral form to take to the facility of their choice that offered HIV care and treatment.

### Data Analysis

Data was entered into the REDCap electronic tools [17]. This data was then exported to Stata SE/13.0 (*Stata Corporation, College Station, Texas, USA*) [15] for data management and statistical analysis. Means (standard deviations) were calculated for normally distributed continuous variables, and medians (inter-quartile ranges) were calculated if these continuous variables were skewed. Numbers and proportions were presented as categorical variables. The

association of various sexual risk behaviours and sociodemographic characters with HIV status were calculated using the Chi Square test or alternatively the Fischer's Exact test if the assumptions were not met and presented as p-values for significance along with their respective test statistics. Odds ratios and the 95% confidence intervals were calculated to assess for risk factors associated with HIV infection. Multiple logistic regression was employed to adjust for potential confounding variables by calculating multivariate-adjusted odds ratios and their 95% confidence intervals. Variables that were included in the multiple logistic regression model were those that had a p value  $\leq 0.25$  in the univariate logistic regression models. P-values were set at 5% significance level. HIV care uptake data was analysed qualitatively.

## Ethics

Ethical approval was granted Joint Research Ethics Committee (JREC) of Parirenyatwa Hospital and University of Zimbabwe College of Health Sciences (JREC ref: 167/16), Harare Hospital Ethics Committee (HCHC 210616/38) and the Medical Research Council of Zimbabwe (MRCZ/B/1106). Written informed consent was sought from and given by the study participants.

## Results

In the study 334 patients were approached for participation, 296 (87%) of these agreed to participate. Fifteen (5%) of the patients that had agreed to participate in the study did not meet the eligibility criteria and were excluded from the study. Of the 281 participants that meet the eligibility

criteria 96.1% agreed to be interviewed and underwent HIV testing and counselling.

There were eleven patients who, after consenting to participation in the study and responding to the questionnaire, declined to undergo testing, stating that they did not want a second blood test or were not ready to be tested. The study sample was therefore 270.

The diagram on Fig. 1 shows how the participants were recruited for the study.

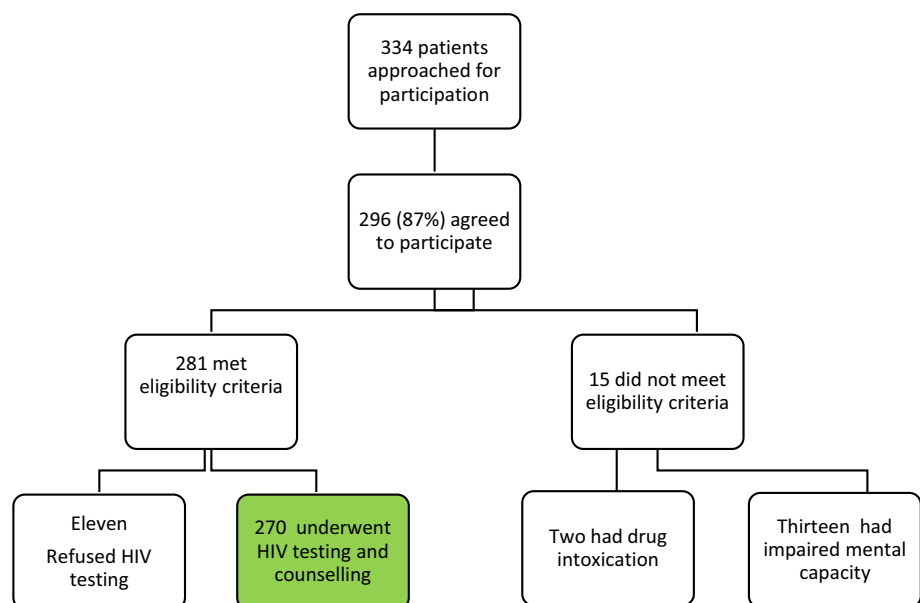
## Socio-demographic Characteristics

The age range of participants was from 18 to 72 years with a median age of 36 years and most of them resided in Harare (82.2%). Males were 52.6% of the study population. Most, (66.5%) patients had at least 10 years of education and more than half of the patients (63.0%) were unemployed.

## Psychiatric Diagnoses

Table 1 also indicates the psychiatric conditions that the participants were being treated for and the proportion of common substance use among the participants. The most common documented diagnosis was of a schizophrenia related disorder (35.9%). 7.4% of the patients had a primary diagnosis of an HIV-related mental disorder (mental disorders that were secondary to HIV infection). The majority (70.1%) of the participants reported a history of substance use. The lifetime use of alcohol was highest (60.0%) followed by use of tobacco products (23.0%).

**Fig. 1** Recruitment of participants



**Table 1** Sociodemographic characteristics and diagnosis of participants

Characteristic	n=270	N (%)
<b>Age</b>		
≤ 30	70	25.9
31–40	102	37.8
41–50	63	23.3
51 +	35	13.0
<b>Gender</b>		
Male	128	47.4
Female	142	52.6
<b>Marital status</b>		
Single	100	37.4
Married	102	37.8
Widowed	22	8.0
Divorced/separated	45	16.7
<b>Area of residence</b>		
Harare	222	82.2
Out of Harare-urban	13	4.8
Out of Harare-rural	35	13.0
<b>Level of education</b>		
≤ 10 years in school	92	34.1
More 10 years in school	178	65.9
<b>Employment status</b>		
Student	6	2.2
Formally employed	38	14.1
Informally employed	44	16.3
Unemployed	170	63.0
Retired	12	4.4
<b>Psychiatric diagnosis<sup>a</sup></b>		
Schizophrenia spectrum	97	35.9
Major depressive disorder	19	7.0
Bipolar affective disorder	60	22.2
Anxiety disorder	2	0.7
Substance-related disorder	37	13.7
Seizure disorder	44	16.3
HIV-related disorder	20	7.4
Dementia	1	0.4
Other <sup>b</sup>	8	3.0
<b>History of substance use<sup>a</sup></b>		
Lifetime use of Alcohol	161	60.0
Lifetime use of Cannabis	60	22.2
Lifetime abuse of cough mixtures	13	4.1
Lifetime abuse of benzodiazepines	5	1.9
Lifetime use of cigarettes–tobacco	62	23
Lifetime use of cocaine	1	0.4

<sup>a</sup>Psychiatric diagnoses include dual diagnosis

<sup>b</sup>Other psychiatric diagnosis consisted of one case each of impulse control disorder, psychosomatic disorder, puerperal psychosis, SLE, tardive dyskinesia, mental illness, psychiatric illness and tremors

## Sexual Related Behaviours

Of all study participants, 84.1% had been sexually active with median age of sexual debut being 20 years (IQR 18–23). The participants engaged in high-risk sexual behaviours, including having multiple concurrent sexual partners, inconsistent condom use and sex work (Table 2).

## HIV Prevalence and Associated Factors

The study showed that the overall prevalence of HIV was 14.4%. Females had a significantly higher prevalence of 22.7% compared to males whose HIV prevalence was 7.0% (Table 3). Seven patients, 18.0% of those whose test results showed HIV infection had no prior HIV positive result and were diagnosed in the study. Females were six times more likely to be HIV-positive in comparison to males.

Patients without schizophrenia spectrum disorders according to the outpatient notes were five times [multivariate-adjusted odds ratio (AOR) = 5.33 (95% confidence interval (CI) 1.56–18.13] more likely to be HIV positive compared with those with schizophrenia (Table 4).

## HIV Care Uptake

Prior to this study 22.8% of participants had never been tested for HIV. Though 77.2% of the participants reported ever being tested for HIV, only 27.8% of the participants reported being recently tested (tested in the previous 12 months). About 9% of the participants had been screened for HIV in the previous 3 months.

Amongst HIV positive patients (50%) were receiving HIV care from primary health care centres. 22% of the patients were receiving HIV care at the central hospitals where they were also receiving care for mental illness. Two patients were not receiving care from any facility. ART uptake in patients who already knew their serostatus prior to the study was (94%). The majority (69%) of those who were HIV positive were on first line ART regimens and 8% were on second line treatment. However, 20% of the patients who were on ART reported having a period of completely defaulting antiretroviral treatment (Table 5).

## Discussion

This is the first study in two decades to measure the prevalence of HIV in patients attending psychiatric outpatient clinics in Zimbabwe. We found that the prevalence of HIV infection amongst those seeking treatment for mental disorders by HIV testing at tertiary psychiatry clinics in Harare was 14.4% which is similar to the prevalence of HIV in adults in the general population in Zimbabwe

**Table 2** Sexual risk behaviours among psychiatric clinic attendees in Harare, Zimbabwe

Characteristic	Total (N=270) N (%)	HIV +ve (n=39) n (%)	HIV -ve (n=231) n (%)	$\chi^2$ statistic	P value
History of sexual activity	227 (84.1)	37 (16.3)	190 (83.7)	3.97	0.046
Never had sexual intercourse	43 (15.9)	2 (4.65)	41 (95.35)		
Previous sexual partners				4.02	0.134
Never had sexual intercourse	43 (15.9)	2 (4.65)	41 (95.35)		
Lifetime history of one sexual partner	77 (28.5)	12 (15.58)	65 (84.42)		
Lifetime history of multiple sexual partners ( $\geq 2$ )	150 (55.6)	25 (16.67)	125 (83.33)		
Concurrent sexual partners				4.33	0.12
No	190 (70.1)	30 (15.87)	160 (84.21)		
Yes	37 (13.7)	7 (18.92)	30 (81.08)		
Never had sex	43 (15.9)	2 (4.65)	41 (95.35)		
History of same sex sexual relationships				4.62	0.12
No	224 (83)	37 (16.52)	187 (83.48)		
Yes	3 (1.1)	0 (0)	3 (100.00)		
Never had sex	43 (15.9)	2 (4.65)	41 (95.35)		
Frequency of condom use when having sexual intercourse				11.51	0.01
Always	43 (16)	12 (27.91)	31 (72.09)		
Never	104 (38.5)	11 (10.58)	93 (89.42)		
Sometimes	80 (30)	14 (17.5)	66 (82.5)		
Never had sex	43 (15.9)	2 (4.65)	41 (95.35)		
History of STI treatment				6.31	0.063
None	152 (56.3)	21 (13.82)	131 (86.18)		
Yes	71 (26.3)	15 (21.13)	56 (78.87)		
Not recorded	4 (1.5)	1 (25.00)	3 (75.00)		
Never had sex	43 (15.9)	2 (4.65)	41 (95.35)		
Ever given any gifts or goods in order to have sex?				4.37	0.113
No	169 (62.6)	29 (17.2)	140 (82.8)		
Yes	58 (21.5)	8 (13.8)	50 (86.2)		
Never had sex	43 (15.9)	2 (4.65)	41 (95.4)		
Ever received gifts or goods in exchange for sex?				4.27	0.102
No	213 (78.9)	34 (15.96)	179 (84.04)		
Yes	14 (5.2)	3 (21.43)	11 (78.57)		
Never had sex	43 (15.9)	2 (4.65)	41 (95.35)		
Ever been threatened or physically forced to have sex?				4.29	0.093
No	194 (52.4)	30 (15.5)	164 (84.5)		
Yes	30 (11.1)	6 (20.0)	24 (80.0)		
Never had sex	43 (15.9)	2 (4.65)	41 (95.35)		
Ever engaged in sex whilst intoxicated with alcohol/other drugs?				4.09	0.129
No	173 (64.1)	29 (16.8)	144 (83.2)		
Yes	53 (19.6)	8 (15.1)	45 (84.9)		
Never had sex	43 (15.9)	2 (4.65)	41 (95.35)		
Intimate partner violence (Has your sexual partner ever subjected you to physical violence?)				8.33	0.014
No	198 (73.3)	29 (14.65)	169 (85.35)		
Yes	27 (10)	8 (29.63)	19 (70.37)		
Never had sex	43 (15.9)	2 (4.65)	41 (95.35)		

1, 3 and 1 participants with missing data on concurrent sexual partners, history of verbal/physical abuse and history of intoxication with alcohol/drugs have been excluded from the table above

**Table 3** HIV status stratified by sociodemographic characteristics and diagnosis of participants

Characteristics	(n=39) HIV +ve n (%)	(n=231) HIV -ve n (%)	$\chi^2$ statistic	P-value
Age (in years)				
≤30	8 (11.43)	62 (88.57)	1.40	0.71
31–40	15 (14.71)	87 (85.29)		
41–50	9 (14.29)	54 (85.71)		
51+	7 (20)	28 (80)		
Gender				
Female	29 (22.7)	99 (77.3)	13.28	<0.01
Male	10 (7.0)	132 (93.0)		
Marital status				
Single	3 (3.0)	98 (97.0)	41.24	<0.01
Married	19 (18.6)	83 (81.4)		
Widowed	12 (54.6)	10 (45.5)		
Divorced/separated	5 (11.1)	40 (88.9)		
Area of residence				
Harare	32 (14.4)	190 (85.6)	0.01	0.99
Out of Harare-urban	2 (15.4)	11 (84.6)		
Out of Harare-rural	5 (14.3)	30 (85.7)		
Level of education				
≤10 years in school	14 (35.9)	78 (33.8)	0.07	0.795
More than 10 years in school	25 (64.1)	153 (66.2)		
Employment status				
Student	0 (0)	6 (100)	2.44	0.838
Formally employed	4 (10.5)	34 (89.5)		
Informally employed	6 (13.6)	38 (86.4)		
Unemployed	28 (16.5)	142 (83.5)		
Pensioner	1 (8.3)	11 (91.7)		
*Psychiatry diagnosis				
Schizophrenia spectrum	4 (4.1)	93 (95.9)	13.05	<0.01
Major depressive disorder	3 (15.8)	16 (84.2)	0.03	0.744
Bipolar affective disorder	8 (13.3)	52 (86.7)	0.08	0.781
Anxiety disorder	0 (0)	2 (100.0)	0.34	0.99
Substance-related disorder	4 (10.8)	33 (89.2)	0.46	0.499
Seizural disorder	4 (9.1)	40 (90.9)	1.22	0.27
HIV-related disorder	19 (95)	1 (5.0)	113.42	<0.01
Dementia	0 (0)	1 (100.0)	0.17	0.99
**Other	0 (0)	8 (100.0)	1.39	0.607
History of substance use				
Yes	28 (14.7)	162 (85.3)	0.04	0.833
None	11 (13.8)	69 (86.3)		
Lifetime use of alcohol	27 (16.8)	134 (83.2)	1.75	0.186
Lifetime use of Cannabis	8 (13.3)	52 (86.7)	0.08	0.781
Lifetime abuse of cough mixtures	0 (0)	13 (100.0)	2.31	0.226
Lifetime abuse of benzodiazepines	0 (0)	5 (100.0)	0.86	0.99
Lifetime use of cigarettes–tobacco	10 (16.1)	52 (83.9)	0.18	0.667

\*Psychiatric diagnoses include dual diagnosis

\*\*Other psychiatric diagnosis consisted of one case each of impulse control disorder, psychosomatic disorder, puerperal psychosis, SLE, tardive dyskinesia, mental illness, psychiatric illness and tremors

**Table 4** Factors associated with HIV infection in psychiatric clinic attendees in Harare, Zimbabwe

Characteristic (N = 270)	HIV +ve n (%)	AOR (95% CI)
<b>Gender</b>		
Female	29 (22.7)	Reference
Male	10 (7.0)	0.17 (0.05–0.56)
<b>Marital status</b>		
Single	3 (3.0)	Reference
Married	19 (18.6)	11.47 (2.22–59.35)
Widowed	12 (54.6)	29.14 (4.48–189.63)
Divorced/separated	5 (11.1)	3.29 (0.54–20.03)
<b>Level of education</b>		
≤ 10 years in school	14 (22.73)	Reference
More than 10 years in school	25(8.33)	0.33 (0.07–1.61)
<b>Schizophrenia spectrum</b>		
Yes	4 (4.1)	Reference
No	35 (20.2)	0.19 (0.06–0.64)
<b>Alcohol use</b>		
No	27 (16.8)	Reference
Yes	12 (11.0)	2.1 (0.69–6.35)
<b>Cough mixture</b>		
Yes	0 (0)	Reference
No	39 (15.18)	–
<b>Previous sexual partners</b>		
Never had sexual intercourse	2 (4.65)	Reference
Lifetime history of one sexual partner	12 (15.58)	0.33 (0.04–2.81)
Lifetime history of multiple sexual partners	25 (16.67)	0.83 (0.12–5.93)
<b>Concurrent sexual partners</b>		
Yes	30 (15.87)	Reference
No	7 (18.92)	2.62 (0.69–9.92)
Never had sex	2 (4.65)	2.14 (0.27–16.77)
<b>History of same sex sexual relationships</b>		
No	37 (16.52)	Reference
Yes	0 (0)	–
Never had sex	2 (4.65)	1.63 (0.22–12.19)
<b>Frequency of condom use when having sexual intercourse</b>		
Always	12 (27.91)	Reference
Never	11 (10.58)	0.1 (0.03–0.39)
Sometimes	14 (17.5)	0.29 (0.08–1)
Never had sex	2 (4.65)	0.57 (0.07–4.54)
<b>History of STI treatment</b>		
No	21 (13.82)	Reference
Yes	15 (21.13)	1.46 (0.59–3.62)
Not recorded	1 (25)	1.54 (0.02–101.08)
Never had sex	2 (4.65)	2 (0.26–15.58)
<b>Ever given any gifts or goods in order to have sex?</b>		
No	29 (17.2)	Reference
Yes	8 (13.8)	16.13 (2.13–122.21)
Never had sex	2 (4.7)	5.51 (0.56–54.13)
<b>Ever received gifts or goods in exchange for sex?</b>		
No	34 (15.96)	Reference
Yes	3 (21.43)	0.89 (0.11–7.08)
Never had sex	2 (4.65)	1.71 (0.23–12.77)

**Table 4** (continued)

Characteristic (N = 270)	HIV +ve n (%)	AOR (95% CI)
Ever been threatened or physically forced to have sex?		
No	30 (11.5)	Reference
Yes	6 (2.0)	2.04 (0.66–6.33)
Never had sex	2 (4.7)	1.67 (0.23–12.37)
Ever engaged in sex whilst intoxicated with alcohol/other drugs?		
No	29 (16.8)	Reference
Yes	8 (15.1)	6.69 (1.27–35.22)
Never had sex	2 (4.7)	2.81 (0.34–23.28)
Has your sexual partner ever subjected you to physical violence?		
No	29 (14.65)	Reference
Yes	8 (29.63)	2.04 (0.66–6.33)
Never had sex	2 (4.65)	1.67 (0.23–12.37)

**Table 5** HIV care uptake among psychiatric clinic attendees in Harare, Zimbabwe

Characteristic	N	n	%
Ever tested for HIV			
Yes	281	217	77.2
No	281	64	22.8
Ever tested for HIV in the past 12 months			
No	281	203	72.2
Yes	281	78	27.8
Ever tested for HIV in the past 3 months			
No	281	256	91.1
Yes	281	25	8.9
HIV status			
Positive	270	39	14.4
Negative	270	231	85.6
Not tested	281	11	3.9
Prior HIV-positive test result among HIV-positive patients			
Yes	39	32	82.1
No	39	7	7.9
Cotrimoxazole uptake in previously diagnosed HIV-positive patients			
No	32	9	28.1
Yes	32	23	71.9
ART uptake in previously diagnosed HIV-positive patients			
No	32	2	6.3
Yes	32	30	93.8
Centre where HIV care was received			
Local primary care clinic	32	16	50.0
Tertiary (Central) Hospital	32	7	21.9
Provincial/District Hospital	32	3	9.3
General practitioner	32	2	6.3
Work Clinic	32	1	3.1
Specialist physician	32	1	3.1
Not receiving care	32	2	6.3



[9]. More women than men receiving psychiatric outpatient care were HIV positive whilst individuals without a diagnosis of schizophrenia were more likely to be HIV positive [18].

The prevalence of HIV in patients with mental disorders has come down compared to the previous study at the peak of the HIV pandemic in 1996 which was 23.8% [8]. This is in keeping with the trend of HIV prevalence decline in the general population [9]. The prevalence of HIV amongst outpatients with mental disorders was similar to the general population and these findings are supported by a meta-analysis that showed that the risk of HIV in patients with mental disorders is high in regions that have a low HIV prevalence and similar to that of the general population in areas such as Zimbabwe that have an HIV epidemic [19]. Probable reasons for the HIV prevalence in the sample being similar to the general population could be that, people with mental illness may be at higher risk for risky sexual encounters (given vulnerability) but may also face more stigma with social and sexual isolation [20]. We surveyed an outpatient population, which may be more similar to the general population than a more severely ill psychiatric inpatient population. It could be argued that the HIV prevalence would be higher in an inpatient setting as shown in other studies [21] and this hypothesis should be tested in future studies. With this in mind tertiary mental health services should offer similar HIV care packages as other points of health care to improve the prevention, testing and treatment of HIV.

Prior to the study, four in every five of the patients who were HIV positive had knowledge of their HIV status. The proportion is lower than the United Nations Programme on HIV and AIDS (UNAIDS) target that aims to have of 90% of all PLHIV knowing their HIV status by 2020. Psychiatric patients could be part of the remainder of underserved populations that need to be targeted in order to reach the 90–90–90 UNAIDS targets by 2020 [22].

This study showed that there was an association between female gender and HIV infection. While women are more vulnerable to HIV infection than men [10, 11, 19, 23], six times greater prevalence among women with mental disorders is a much greater gender disparity than is seen in the general population. Women with mental health disorders are a vulnerable group, at high risk of HIV infection possibly due to increased risk of coercive sex, unsafe sexual practices and reduced access to preventative interventions.

A diagnosis of schizophrenia as reported by outpatient clinic records was associated with a reduction in risk of HIV infection. This could be due to the symptomatology that includes social withdrawal which makes patients less likely to have intimate relationships and engage in sexual intercourse. This could also explain the low prevalence of HIV in males, as a third of the patients with a diagnosis of schizophrenia spectrum disorders were male.

“HIV-related mental disorders” were grouped as all mental disorders that were secondary to HIV infection examples being psychotic disorder due to HIV infection and HIV-associated neurocognitive disorders (HAND). The group formed only 7.4% of the diagnostic group and the number is low considering the prevalence of HIV. It is possible that not all HIV-associated diagnoses were identified, as patients were not formally screened for HIV associated psychiatric diagnoses. Some patients may have had relatively new HIV diagnoses so would not yet have psychiatric manifestations. Additionally, doctors may not have been aware of their patient’s HIV status when making psychiatric diagnoses. Accordingly, it is possible that patients were being managed for other psychiatric conditions without consideration for their HIV comorbidity and the possibility that their diagnosis could be HIV-related. This underscores the importance of screening for HIV within mental health services to help with diagnosis and avoid serious side effects and drug interactions.

This study showed that individuals with mental disorders were engaging in risky sexual practices, highlighting the need for interventions, such as sexual and reproductive health education, condom distribution, and economic empowerment initiatives, as many of these risk behaviours may be broadly due to social vulnerability and poverty. Sexual behaviour was assessed through verbal self-reports, so respondent bias is likely, as a health care professional was conducting the interview. This may explain the finding that HIV infection was associated with always using condoms. This is an anomaly as condom use has been shown to reduce HIV infection [24]. Probable explanations to this include inconsistent use of condoms, false report on use of condoms and condom use is increased after one is already aware of their HIV status.

A relatively high proportion of patients had been tested for HIV in the past but, fewer were recently tested. The rate of ever being tested (77.2%) was high in this study compared to the rate of ever being tested in patients attending a psychiatry clinic in Malawi which was 63.2% [10]. Only a third of the participants reported being tested in the previous 12 months and this is lower than the rate of 43% in adults in the general population in Zimbabwe [9]. The low rates of recent HIV tests in patients with mental disorders may lead to late diagnosis of HIV infection. As some patients with HIV were treated for mental disorders before HIV was diagnosed it is necessary to promote HIV counselling and testing at psychiatry clinics. Using qualitative methods to explore reasons for not getting tested for HIV amongst patients with mental disorders could help with the development of interventions to increase the uptake of HIV testing.

The uptake of ART amongst these patients exceeded the UNAIDS target of 90% of patients to be on ART by 2020 [22]. The ART uptake was high in patients with mental

disorders in this study compared to the general population in Zimbabwe where ART uptake is 86.8% based on self-reports according to the Zimbabwe Population-Based HIV impact assessment (ZIMPHIA) 2015–2016 [9]. The high ART uptake is commendable and it is important to explore factors contributing to the high ART uptake so as to enhance these. Despite the high ART uptake patients on ART reported defaulting ART completely at some point in care so it is necessary to explore and address the reasons for defaulting ART.

The greater proportion of the PLHIV were receiving HIV care at council primary care clinics whilst management of the mental disorder was offered at the tertiary psychiatric care. This leads to fragmented care and the disorders are treated as separate entities contrary to the knowledge of the synergistic linkage of the conditions.

### Study Limitations

Approximately a tenth of the patients approached refused to participate in the study. This is a significant subgroup that impacts the study results. It can be postulated that this was a partition of those who knew they had a high risk of testing positive due to exposure. The group could also incorporate those who already knew their status and found no reason to participate. Patients who could not give informed consent were excluded from the study and this is also a subgroup that impacts the results. With this in mind, the HIV prevalence could be higher and unlinked anonymous testing could reduce the bias but would disadvantage patients who would need care and follow up.

### Policy and Practice Implications

This study indicated that women with mental disorders are a vulnerable group and could possibly be a key population with a high risk of HIV infection in Zimbabwe. Despite its gains in HIV treatment, Zimbabwe continues to have gaps in coverage and reach of HIV care, particularly for certain key populations. Zimbabwe's National Key Populations HIV and AIDS Implementation Plan offers strategies such as scaling up prevention, care and treatment with strengthening of meaningful involvement of the vulnerable communities to HIV response [25] but, people with mental disorders are not included in the strategy. This is a significant gap given the vulnerability and specific needs of this population.

Future policies for both mental health and HIV care should deliberately address integration of these program areas at all levels of health care. HIV care should be integrated into mental health settings, such as psychiatric inpatient wards and outpatient facilities, using strategies that are already part of the Zimbabwe Combination HIV Prevention Strategy, such as voluntary male circumcision, provision of

ART, behaviour change programs combined with service provider capacity building, and sexuality education. These interventions could be adapted to meet the needs of individuals with mental illness [26]. In centres such as tertiary psychiatry hospital where ART initiation services were unavailable, there is a need to establish robust liaison services with other centres that provide ART to manage patients holistically. Additionally, there is need to screen patients for HIV when they seek mental health care. HIV screening in psychiatric assessment may be a point of entry to HIV care and may be an opportunity for primary and secondary prevention of HIV in individuals with mental health disorders. HIV prevention education, economic empowerment, and interventions to address stigma and discrimination against people with mental illness can be used to prevent people with mental illness from acquiring HIV [27]. Additionally, in primary and secondary health settings, there is the need to equip practitioners with skills to identify and manage common mental disorders in patients seeking HIV care and understand how and when to refer to a higher level of care; these efforts could be guided by the WHO's mhGAP framework [28].

Future studies should consider obtaining viral load and CD4 data of HIV positive patients in psychiatry clinics to better understand their HIV control and disease progression. Furthermore, while we used chart review to gather data on diagnoses of HIV associated psychiatric disorders, future research could more formally screen for these disorders in a population presenting at a psychiatric clinic in an area with high HIV prevalence. There is also need for further research to identify factors that increase the risk of HIV infection in women with mental illness and develop interventions that address these factors and reduce their vulnerability.

### Conclusion

As Zimbabwe nears HIV epidemic control, it is critical to address barriers and gaps in HIV service provision in key and vulnerable populations. This study demonstrated that such gaps do exist amongst patients attending outpatient psychiatric clinics in Harare particularly women and urgent attention should be given to scale up interventions which target individuals with or at risk of this comorbidity.

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## Compliance with Ethical Standards

**Conflict of interest** The authors declare that they have no conflict of interest.

**Ethical Approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Informed Consent** Informed consent was obtained from all individual participants included in the study.

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