

HIV Self-Testing Kits Uptake in Mashonaland West Province, Zimbabwe, 2019-2020: A Secondary Data Analysis

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Abstract

Background: Human Immuno-Deficiency Virus Self-Testing (HIVST) is a process where an individual who wants to know their HIV status collects a specimen, performs a test and interprets the result by themselves. HIVST data from the Zimbabwe AIDS and TB Program (ATP) directorate showed that between 2019-2020, only 31% of the target HIVST kits were distributed in the country. Mashonaland West Province was one of the least performing provinces in meeting targets for HIVST kits distribution. Gaps in the implementation of the HIVST in the province ultimately affect the nationwide scaleup of targeted testing, a key enabler in achieving HIV epidemic control. We analyzed HIVST trends in Mashonaland West Province to inform HIV testing services programming. **Methods:** We conducted a cross-sectional study using HIVST secondary data obtained from the District Health Information Software 2 (DHIS2) electronic database. We conducted regression analysis for trends using Epi Info 7.2 and tables, bar graphs, pie charts and linear graphs were used for data presentation. **Results:** A total of 31,070 clients accessed HIVST kits in Mashonaland West Province from 2019-2020. A slightly higher proportion (50.4% and 51.7%) of females as compared to males accessed HIVST kits in 2019 and 2020 respectively. Overall, an increase in the trend of HIVST kits uptake was recorded (males $R^2 = 0.3945$, p-value = 0.003 and females $R^2 = 0.4739$, p-value = 0.001). There was generally a decline in the trend of community-based distribution of HIVST kits from the third quarter of 2019 throughout 2020 ($R^2 = 0.2441$, p-value = 0.006). Primary distribution of HIVST kits remained the dominant method of distribution, constituting

more than half of the kits distributed in both 2019 (67%) and 2020 (86%). **Conclusion:** Mashonaland West Province was mainly utilising facility-based distribution model for HIVST over the community-based distribution model. We recommended training more community-based distribution agents to increase community distribution of HIVST kits.

Keywords

HIV Self-Testing, Analysis, Secondary Data

1. Introduction

HIV Self-Testing (HIVST) is a process in which an individual, who wants to know their HIV status collects a specimen, performs a test and interprets the result by themselves. HIVST is a screening/triaging test and is not intended to provide a definitive HIV-positive diagnosis. All reactive results need to be linked to further testing and confirmation by a health provider in accordance with an existing national HIV Testing algorithm [1]. Globally, HIVST policy is at varying stages. Since 2014, the World Health Organisation (WHO) began encouraging countries to implement pilot HIVST programs to be offered as an additional approach to delivering HIV testing services (HTS) [2]. HIVST has been proven to be beneficial to the health worker by reducing workload, saving time, increasing efficiency, decongesting high volume health facilities and increasing HIV testing coverage [3]. Benefits of HIVST to the client include confidentiality, autonomy where users are empowered to be solely responsible for their own HIV status and convenience where users can self-test in private at their convenient time [1].

Overview of HIV-Self Testing in Zimbabwe

In Zimbabwe, HIVST was piloted in 2017 and was fully integrated into mainstream HIV Testing Services (HTS) in 2019 [4]. The country has been implementing the program, targeting selected high-volume facilities across the country with support mainly from UNITAID through Population Services International (PSI) and other partners supported by the U.S. President's Emergency Plan for AIDS Relief (PEPFAR). All HIVST kits being used in the country are WHO prequalified, and in-country validated. The kits that are currently being utilised are the oral fluid test kits (OFT) *i.e.*, Oraquick™ (Orasure Technologies, USA) and blood based (BBST) for example INSTI™ (bioLytical Laboratories, Canada). Test-kits are available for public sector distribution where orders are made through the Zimbabwe Assisted Pull System (ZAPS) according to health facilities' consumption needs. The ZAPS is an inventory control system for quantifying, ordering and receiving essential medicines and commodities in health care facilities. All facilities are encouraged to distribute HIVST and capacitation of health workers is being done through integrating HIVST training with Rapid Test Training [4].

The HIV Self-Testing (HIVST) Dataset

Information on HIVST from health facilities is incorporated into the DHIS2 by the district health information officer into an electronic record. The DHIS2 is an open source, electronic tool which is currently being utilised by the country's Ministry of Health and Child Care to capture aggregate health related data. The key variables captured in the current DHIS2 HIVST dataset include the demographic characteristics of clients, distribution sources of HIVST kits, models of distributions and the number of reactive tests among other variables. Clients who are offered an HIV self-test kit at the health facility are deemed to have obtained the kit through facility-based distribution, whilst those who obtain the kit through community-based distribution agents (CBDA) would have utilised the community-based distribution model and the information is captured as such [2]. Models in the type of distribution of HIVST kits refer to the channels used in distributing the HIVST kits from the healthcare service provider to clients. In the DHIS2, data for 3 models are captured namely primary distribution, secondary distribution (excluding partners) and secondary distribution (for partners). Primary distribution is when a client receiving the HIVST is the one who will use it. Secondary distribution entails that an individual can obtain a self-test kit on behalf of another person who will utilize the kit. It is differentiated into two groups, *i.e.* secondary distribution for partners where kits are usually given to pregnant women attending ANC and STI clients to give to their partners who may not be willing to physically attend a healthcare facility to get an HIV test done. On the other hand, secondary distribution excluding partners is when an individual collects an HIVST for another individual who is not their partner for example a relative, friend, workmate, etc. [5].

Recently published Zimbabwe Population-based HIV Impact Assessment (ZIMPHIA, 2020) results show that Zimbabwe is at 86.8% of the first 95 % target of People Living with HIV who get tested and know their status by 2030 [6]. Globally testing remains the biggest challenge to meeting the 95-95-95 targets. In order to achieve these targets, innovative HIV testing services (HTS) strategies such as self-testing are necessary [3]. By September 2019, there were only three out of seven districts in Mashonaland West Province that had between 11 - 20 healthcare facilities distributing HIVST kits with the rest of the districts having less than 10 facilities distributing kits [7]. Gaps in the implementation of the HIVST in the province ultimately affect the nationwide scaleup of targeted testing which is a key enabler in achieving HIV epidemic control. It is against this background that we analyzed HIVST uptake trends in Mashonaland West Province to inform programming that will enable improved strategies in improving HIV testing coverage in the province.

2. Materials and Methods

Study design

We conducted a descriptive cross-sectional study using HIVST secondary data obtained from the District Health Information Software 2 (DHIS2) database.

Study site

Mashonaland West Province with an area of 57,441 square km is the second largest province in Zimbabwe and has a population of 1.5 million. The province has seven administrative districts and these are; Kariba, Sanyati, Zvimba, Chegutu, Makonde, Mhondoro Ngezi and Hurungwe. The province is located to the north of the country and shares the international border with Zambia in the north. The province borders with Midlands Province in the West, Matabeleland North in the West, Mashonaland Central in the East, Harare and Mashonaland East in South East [8] (Figure 1).

Data Source

We obtained information about HIV self-testing data from the seven districts in Mashonaland West Province from the District Health Information System (DHIS2).

Data collection

HIVST data was downloaded from DHIS2 onto Microsoft excel spread sheets. We collected data on the following variables:

- Demographic data that includes the gender and age of the clients receiving HIVST kits;
- Models in the type of distribution of the HIVST kits;
- Distribution sources of the self-testing kits;
- Number of tests with a reactive result;
- Number of HIVST results shared with a health care provider.

Data analysis

Data were first downloaded from the DHIS2 electronic database. HIV self-testing kits distribution sources, distribution models and trends in the uptake

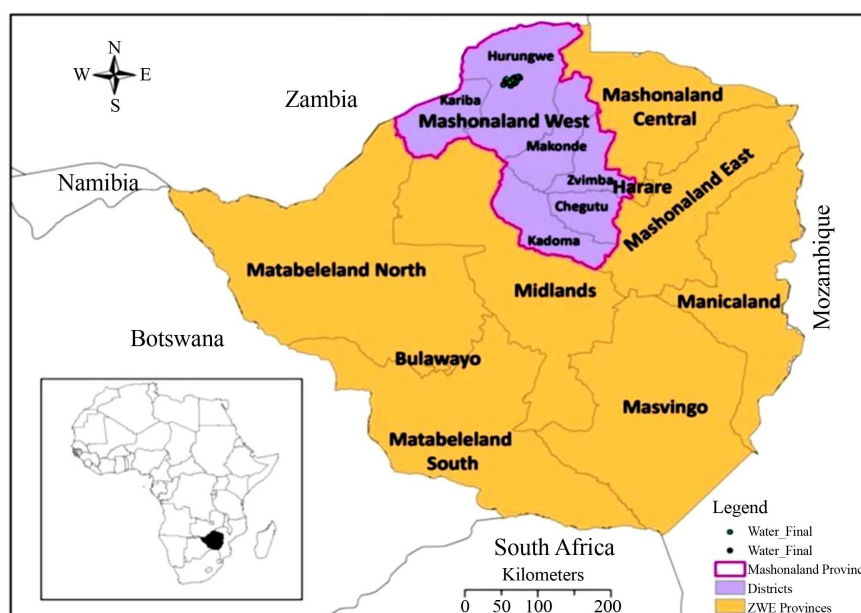


Figure 1. Geographical map of Mashonaland West Province, Zimbabwe. Source: researchgate.net accessed 01 February 2022.

of self-testing kits according to age group and gender were then evaluated using pie charts and linear graphs in Microsoft Excel 2007. The coefficient of determination (R^2) and their corresponding p-values were generated to demonstrate the trends in the uptake of self-testing kits. The coefficient of determination was used in this scenario to assess the strength of the linear relationship between the uptake of HIV self-testing kits (dependent variable) and independent variables such as gender and age group of users. The coefficient of determination was statistically significant if the p-value for the statistical measure was <0.05 .

Permission and ethical considerations

Permission to carry out the study was obtained from the AIDS and TB Program (ATP) Directorate, the Provincial Medical Director (PMD) for Mashonaland West Province and the Health Studies Office (HSO). To maintain confidentiality, no client identifying information was utilized during the analysis. The names of key informants interviewed were also not captured on the key informant interview guide.

3. Results

Demographic characteristics

A total of 31,070 clients accessed HIVST kits from 2019-2020. The highest proportion (34.5%) of clients assessing self-testing kits was from the 25 - 34 years age group. The least proportion (1.12%) of clients accessing HIVST kits was in clients aged 45 years and above. Those in the age groups 15 - 24 years and 35 - 44 years constituted 31.5% and 22.2% respectively of the total number of clients that accessed HIVST kits over the course of the two years (Table 1).

Distribution of HIVST kits per district in Mashonaland West Province

There was generally an increase in the number of HIVST kits distributed from the health facilities to clients in the various districts over the course of the 2 years except for Kariba, Mhondoro and Zvimba districts which recorded declines in the number of kits distributed between 2019 and 2020. In 2019, the

Table 1. Demographic characteristic of clients receiving HIVST kits in Mashonaland West Province, 2019-2020.

Variable	Category	Frequency	
		2019 n = 10,047 (%)	2020 n = 21,023 (%)
Age	15 - 24 years	3496 (34.8)	6305 (30)
	25 - 34 years	3135 (31.2)	7595 (36.1)
	35 - 44 years	2111 (21.0)	4801 (22.8)
	>45 years	1305 (13.0)	2322 (11.0)
Gender	Male	4988 (49.6)	10,156 (48.3)
	Female	5059 (50.4)	10,867 (51.7)

highest number of kits were distributed to clients by Zvimba District which had 4263 kits distributed followed by Sanyati District where 1956 kits had distributed. Kariba District had the least number of kits distributed in 2019 (32 kits) with no kits at all distributed in 2020. In 2020, Hurungwe District recorded the highest number of HIVST kits distributed (6744) followed by Chegutu District which had 4207 kits distributed (Figure 2).

Trends in the uptake of HIVST kits according to gender in Mashonaland West Province

There were fluctuations in the uptake of kits among both males and females over the course of the two years even though in general, an increase in uptake trend was recorded (males $R^2 = 0.3945$, p-value = 0.003 and females $R^2 = 0.4739$, p-value = 0.001) (Figure 3).

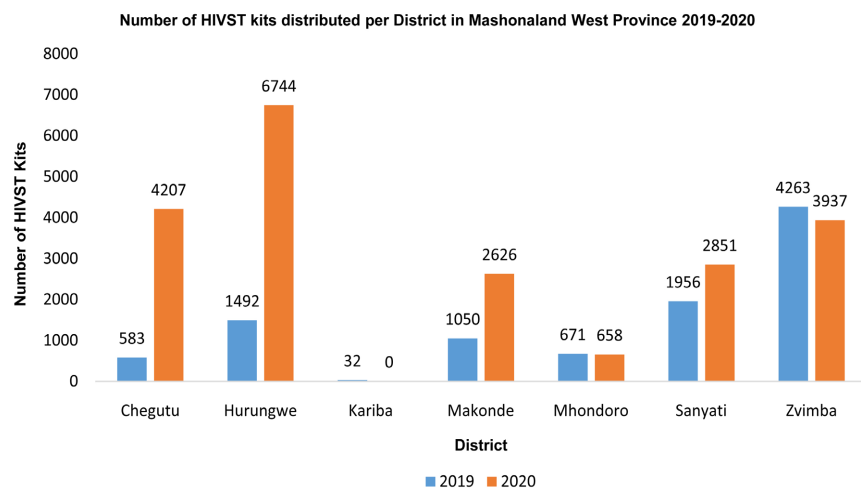


Figure 2. The distribution of HIVST kits per district in Mashonaland West Province, 2019-2020.

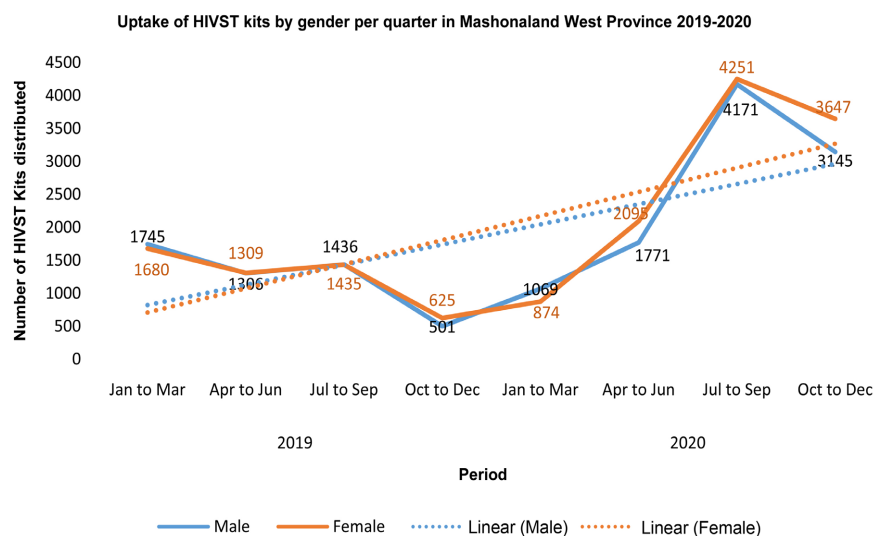


Figure 3. Trends in the distribution of HIVST kits according to gender in Mashonaland West Province, 2019-2020.

Trends in the uptake of HIVST kits by age group in Mashonaland West Province

There were fluctuations in the trends of the uptake of HIVST kits in 2019 among the age groups 15 - 24 years and 25 - 34 years before recording an increase in the trend between the first and third quarters of 2020 for the same age groups ($R^2 = 0.4285$, p-value = 0.002 and $R^2 = 0.4705$, p-value = 0.005 respectively). Among the 35 - 44-year age group there was a downward trend in the uptake of HIVST kits over the course of 2019 before recording an increase in 2020 ($R^2 = 0.4029$, p-value = 0.002). A steady increase in the trend of uptake was recorded among the 45+ years age group over the course of the two years ($R^2 = 0.3837$, p-value = 0.002). However, a sharp decline in the trend was recorded in all the age groups in the last quarter of 2020 (Figure 4).

Trends in the distribution sources of HIVST kits in Mashonaland West Province

There was predominantly facility-based distribution of HIVST kits in 2020 over community-based distribution. There was generally a decline in the trend of community-based distribution of HIVST kits from the third quarter of 2019 throughout to 2020 ($R^2 = 0.2441$, p-value = 0.006). A sharp increase in the trend of facility distribution of HIVST kits was recorded from the first quarter until the third quarter of 2020 though it was not significant ($R^2 = 0.5426$, p-value = 0.134) (Figure 5).

Models of distribution for HIVST kits for Mashonaland West Province

Primary distribution of HIVST kits remained the dominant method constituting more than half of the kits distributed in both 2019 (67%) and 2020 (86%). This was followed by secondary distribution for partners which constituted 22% in 2019 and 8% in 2020 of the total number of HIVST kits distributed. The least model used was secondary partners (excluding partners) which constituted 11% in 2019 and 6% in 2020 (Figure 6).

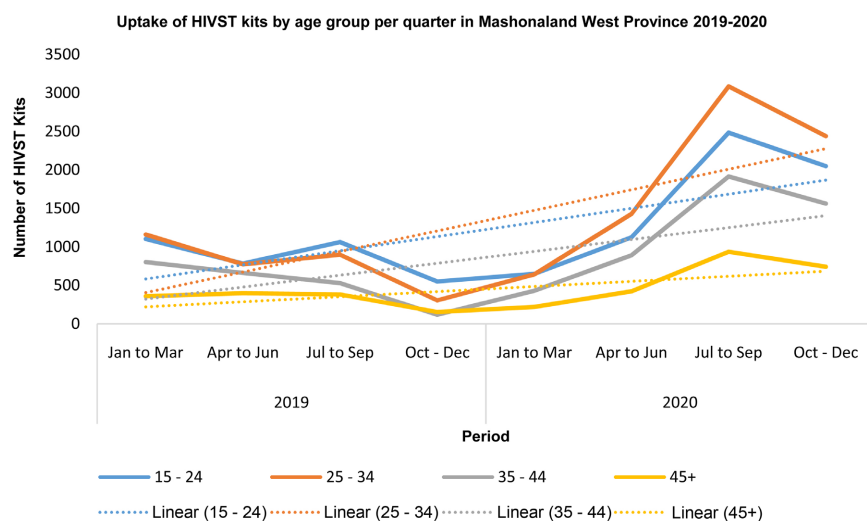


Figure 4. Trends in the distribution of HIVST kits by age group in Mashonaland West Province, 2019-2020.

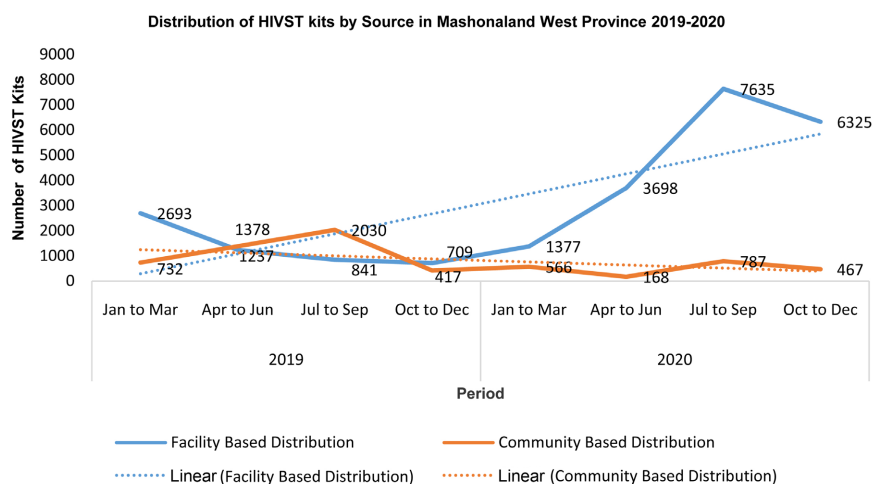


Figure 5. Trends in the distribution sources of HIVST kits in Mashonaland West Province, 2019-2020.

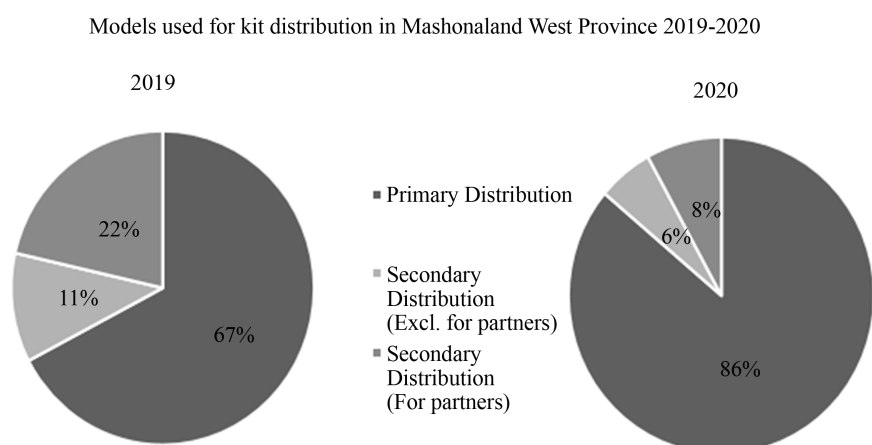


Figure 6. Models of distribution for HIVST kits for Mashonaland West Province, 2019-2020.

4. Discussion

In our secondary data analysis for HIV self-testing data for Mashonaland West Province, Zimbabwe findings showed that there was generally an increase across all age groups and genders in the uptake of HIVST during 2019-2020. Overall uptake of HIV self-testing was highest among the 25 - 34-year-old age group and there were no remarkable differences in uptake between males and females. On the source of distribution, there was predominantly facility-based distribution of kits as compared to community-based distribution. On models of distribution, the highest proportion over the course of the two years was in primary distribution, followed by secondary distribution for partners and lastly secondary distribution excluding partners.

A general increase in the uptake of HIVST can be attributed to the effort by the Ministry of Health and Child Care and its partners in promoting the use of HIVST through media campaigns and the extensive training of health care work-

ers in the administration of HIV self-testing. Overall uptake of HIV self-testing was highest among the 25 - 34-year-old age group. Indravudh *et al.* (2017) reported that HIVST is highly acceptable to young adults as it empowers them to choose the location and timing of the test and control disclosure around their results. Other factors that attract young adults to HIVST were found to be the innovative new technology, appreciating the decision-making autonomy and control that self-testing gives them at a time of life when they were becoming more independent from their parents and more sexually active [9].

On the source of distribution, findings from this study showed that there was predominantly facility-based distribution of kits over community-based distribution. This was similar to findings by Van Rooyen *et al.* (2015) in a study to ascertain HIVST opportunities and constraints in three countries namely Malawi, Kenya and South Africa. In the study, respondents from all three countries supported distribution of self-tests through health facilities with nearly all respondents suggesting that public health facilities were the preferred distribution point for self-test kits [10]. The advantages for facility-based distribution include possibilities for pre-and post-test counselling, greater potential for tracking test distribution, easier linkage to care and appropriate storage of test kits offered at the health facilities. However, a counter argument against facility distribution is that it undermines the true value of self-testing which addresses the tendency of many target groups of the HIVST to avoid facilities and interaction with health-care personnel [10]. Contrary to these findings, a study on preferences for models of HIV self-testing kit distribution in Mazowe district by Sibanda *et al.* (2016), found that an optimum HIVST model is one where local community volunteers distribute kits door-to-door to households. The study highlighted that participants' favored household distribution by community volunteers as they said it reduced travel, time costs and was convenient. Participants in the study viewed distribution by nurses or community health workers less favorably as they perceived them as always busy and unable to cope with the physical demands of the task [5].

Study limitations

We used secondary data rather than the primary respondents hence factors contributing to the trends in the HIVST data could not be objectively assessed.

5. Conclusions

Uptake of HIVST kits was highest among the 25 - 34 years age group and there were no remarkable differences in the uptake of HIVST between males and females. Mashonaland West Province was mainly utilising facility-based distribution model for HIVST over community-based distribution models for HIVST.

We recommended that facility managers in the province ensure that HIVST kits are always readily available at all entry points at health care facilities and use other innovative places for distribution such as workplaces and churches to boost distribution targets. The Ministry of Health and Child Care should also

train more community cadres such as village health workers (VHWs) and Community Based Distribution Agents to increase community distribution of HIVST kits. Secondary distribution models for HIVST for example utilizing women attending ante-natal care (ANC) clinic, sexually transmitted infection (STI) clients for partner testing should also be strengthened.

Public health actions taken

We conducted a training workshop on HIV self-testing for the Kariba District Health Team. Kariba District was the least performing district in the province on HIVST implementation. We also distributed HIVST training manuals to all 7 district hospitals in the province.

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Authors' Contributions

TH: conception, design, collection, analysis and interpretation of data and drafting the manuscript. **OM:** conception, design, collection, analysis and interpretation of data and drafting the manuscript. **HN:** conception, design, collection, analysis and interpretation of data and drafting the manuscript. **AC:** conception, design, collection, analysis and interpretation of data and drafting the manuscript. **NTG:** analysis, interpretation and reviewing several manuscript drafts for important intellectual content. **EG:** analysis, interpretation of data and reviewing manuscript drafts for important intellectual content. **TJ:** analysis and interpretation of data and reviewing manuscript drafts for important intellectual content. **MT:** analysis, interpretation of data and reviewing several drafts of the manuscript draft for important intellectual content. All the authors read and approved the final manuscript.

Availability of Data and Materials

The data that support the findings of this study are available from the Ministry of Health and Child Care in Zimbabwe, but restrictions apply to the availability of the data. Data are, however, available from the authors upon reasonable request and with permission from the Ministry of Health and Child Care.

Ethics Approval and Consent to Participate

Permission to carry out the study was sought and obtained from the AIDS and TB Programs Directorate, the Health Studies Office, and the Mashonaland West Provincial Directorate. Strict confidentiality was assured during all processes of data collection, capturing, analysis and storage.

Conflicts of Interest

We declare that we have no competing interests as the authors.

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Abbreviations

ART: Antiretroviral Therapy

ANC: Ante-Natal Care

CBDA: Community Based Distributing Agent

HCW: Health Care Worker

HIV: Human Immunodeficiency Virus

HIV: OFT HIV Oral Fluid Test

HIVST: HIV Self-Testing

HTS: HIV Testing Services

MoHCC: Ministry of Health and Child Care

OFT: Oral Fluid Test Kit

PDHTC: Provider Delivered HIV Testing and Counselling

STI: Sexually Transmitted Infection

WHO: World Health Organisation