

Evaluating the Effects of Economic Empowerment on Women's HIV Prevalence in Zimbabwe

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ABSTRACT

Women demonstrate higher HIV prevalence rates than men in sub-Saharan Africa. Physiological aspects alone do not fully account for this discrepancy, suggesting that there are additional socioeconomic and 'gender-related' contributors. These factors are analyzed within Zimbabwe specifically due to its high HIV prevalence rate overall and unique sociopolitical climate. It is hypothesized that more economically-empowered women as measured in terms of large-asset ownership have greater sexual autonomy and so are less likely to be HIV positive than their peers. Logistic regression analysis of 2015 DHS data confirms this theory, offering venues for policy development to ameliorate this aspect of the epidemic.

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INTRODUCTION

Sub-Saharan Africa demonstrates some of the highest HIV prevalence rates in the world. Within the region, Zimbabwe is the fifth-most HIV prevalent country (Banks, Zuurmond, Ferrand, & Kuper, 2017). Incidence rates in the country have been declining in recent years resulting in decreased prevalence overall since the 2005-06 Zimbabwe Demographic and Health Survey (ZDHS). Even so, HIV is still much more likely to be observed among women than men. This difference in prevalence is true across all provinces based upon the most recent findings from 2015 (Table 1).

Biological differences provide only a preliminary explanation as to why more women are HIV-positive than men (Higgins, Hoffman, & Dworkin, 2010). It is well documented that in heterosexual relationships, an HIV positive man is more likely to infect an HIV negative woman than for an HIV positive woman to infect an HIV negative man, all else equal (Boily et al., 2009). Patriarchal norms and relatively lower empowerment consequently intensify this gendered predisposition for women. For example, Myer, Kuhn, Stein, Wright, and Denny (2005) identify certain sexual practices which exacerbate women's biological predisposition to HIV infection in SSA countries. Habits, behaviors, and social norms in turn reinforce utilization of such practices. Therefore, sociocultural factors like social norms and expectations also contribute to the disparity (Poku & Whiteside, 2004; Stillwaggon, 2008).

Meanwhile, studies like that of Asiedu, Asiedu, and Owusu (2012) emphasize the role of socioeconomic factors on HIV status for both sexes. When controlling for gender, prevalence rates again are found to be significantly higher for women than for men beyond what biology alone is able to explain. These findings suggest that there are additional 'gender-related' socioeconomic factors left unconsidered in the scope of their

analysis. To this effect, Sia, Onadja, Nandi, Foro, and Brewer (2014) enumerate a subset of these factors for men and women respectively across multiple SSA countries, some of which demonstrate greater differences in prevalence between the two genders than others. The heterogeneity in the gendered differences between the countries derives from a variety of sources, such as differences in the distribution of risk factors as juxtaposed against differences in their effects between the two genders. This paper, therefore, considers an individual country-case study to analyze the nuanced societal impacts within a given national context. Zimbabwe was chosen for this analysis due to the overall prevalence of the virus within the country and its unique sociopolitical climate.¹

It is hypothesized that more economically-empowered women have greater sexual autonomy and consequently are less likely to be HIV positive than their peers. Economic empowerment is measured here in the form of large asset-ownership since these assets signify greater access to resources in times of crisis². Such ownership previously has been demonstrated to help curtail intimate partner violence (Oduro, Deere, & Catanzarite, 2015; Pereira, Peterman, & Yount, 2017; Vyas & Watts, 2009). This is because, in a game theoretic sense, asset-ownership alters the threat point to grant a woman the autonomy either to prevent abuse ex ante or else enable her to leave an abusive relationship ex post. Asset-ownership likewise contributes to a woman's intrahousehold decision-making ability. This ability includes having control over her body in the form of sexual autonomy. Women who are able to negotiate successfully for safe

1 In Zimbabwe, male-dominated gender relations have proliferated despite policies professed to pursue gender parity. For example, Maphosa, Tshuma, and Maviza (2015) find that despite purported gender equity goals, much of the subsequent policies have resulted more in a "manipulation" than true realized change in women's participation in politics.

2 Within the context of this study, autonomy and empowerment are treated synonymously unless otherwise specified, as when considering sexual autonomy as it relates to female empowerment more generally.

sex then are able to reduce their relative likelihood of HIV infection (Atteraya, Kimm, & Song, 2014). This study links economic empowerment with sexual autonomy and a reduction in the likelihood of being HIV positive in Zimbabwe and concludes by providing potential policy implications to curtail the epidemic in the future.

HIV/AIDS IN ZIMBABWE

The HIV crisis in Zimbabwe unfolded amidst ongoing political and economic crises. Protracted guerilla war against colonial white rule during the preceding decades culminated in the country's independence in 1980 (Stapleton, 2011). That same year, the country also adopted the Primary Health Care approach, indicating the intention of equitable health care for its citizens if not its practical realization (Gondo, 2018; Nyazema, 2010). Mugabe, winner of the British-supervised elections, sought to establish the nation's economy in the global marketplace in the following years, generating stimulative policy which temporarily bolstered economic growth. Yet as Helliker, Chiweshe, and Bhatasara, (2018) point out, the period simultaneously was "marked by pronounced state intolerance, authoritarianism, and coercion" (pp. 8-9). Subsequent neoliberal policies such as the Economic Structural Adjustment Programme (ESAP) omitted provision of any support to those adversely affected by the economic transition despite the government's stated pursuit of security, democracy, and equal rights for all in the Harare Declaration in 1991. As a result, GDP growth plummeted to less than two percent in the early 1990s (Helliker et al., 2018; Operations Evaluation Department (OPEV), 1997).

Unrest on the part of displaced workers spurred growing numbers of strikes throughout the 1990s, with tensions peaking in the latter part of the decade (Helliker et al., 2018; Whiteside, Mattes, Willan, & Manning, 2004). Meanwhile, colonial vestiges and ensuing land reform practices added to the volatility in the form of ongoing land disputes. These disputes displaced entire households and threatened to unravel the nation's health status amidst the unrelenting onslaught of HIV (Gondo, 2018). Following the reallocation of land in the 1990s, farm invasions began in 2000 as Zimbabwe became internationally notorious for its currency instability and hyperinflation. The volatility caused both rural-asset poverty and extreme poverty to worsen significantly during this time (Larochelle, Alwang, & Taruvinga, 2014). As the monetary crisis intensified and drought persisted, the informal economy flourished as a coping mechanism. Meanwhile, Mugabe's government increasingly leveraged militaristic interventions to maintain control (Helliker et al., 2018).

Whiteside (2004) emphasizes how these types of negative exogenous shocks could act as fuel for the HIV epidemic. The epidemic in turn would intensify the negative outcomes from the shocks as more individuals became ill and life expectancies fell in response. Increased migration and mobilization of armies would have contributed to greater levels of dispersion as men took more sexual partners in new areas (Whiteside, 2004). Women meanwhile engaged in commercial sex to mitigate the effects of rising poverty and inequality rates, similarly increasing dispersion. Despite the fact that sex work is outlawed in

Zimbabwe, its prevalence is nonetheless well-documented and has been connected explicitly with political and economic crises like that of the 1990s (Butcher, 1994; Takawira & Helliker, 2018). Once contracted, HIV then would impose additional income shocks to affected households. Although such shocks can be smoothed by strategies like the sale of livestock, this is dependent upon the availability of such resources *ex ante* and does not afford a long-term solution once these assets are exhausted (Mutenje, 2008).

Meanwhile, patriarchal norms persisted in Zimbabwe alongside political and economic upheaval throughout the 1990s and 2000s, making women particularly vulnerable to their effects. Chiweshe (2016) highlights this fact by tracing the evolution of the cultural practice of lobola, a sort of 'reverse-dowry' paid to the bride's parents, from pre-colonial times through to its modern-day commercialization as women are commodified in marriage arrangements. More recently however, the 2013 Zimbabwe Constitution calls for empowerment and equity for women in over twenty unique instances.³ Yet such claims appear to be mere platitudes as deeply rooted gender norms and practices persist. Zimbabwe's Gender Inequality Index (GII) remains at 0.540 in 2015, ranking it in the bottom fifth of countries for which the index was calculated that year (UNDP, 2016).⁴ As Maphosa, Tshuma, and Maviza (2015) posit, these efforts likely comprise a "systemic and calculated maneuver by politically dominant males" to preserve their hegemony while allowing for the perception of progress truncated by the existence of a glass ceiling (p. 3). Women consequently maintain a much lower status relative to men despite their being "equal" under the law.⁵

One aspect that becomes evident when contextualizing the HIV epidemic in Zimbabwe relative to contemporaneous events is the endogeneity of HIV and the surrounding sociopolitical environment. This feature is similarly reflected at the household level: being in a more secure economic position reduces vulnerability to HIV while contraction of HIV can lead to increased odds of poverty. Nevertheless, the former observation suggests that individuals may be able to reduce their own relative vulnerability by holding assets like houses and land, as this study emphasizes for women in particular. Most importantly, there is a clear need for up-to-date analysis in order to capture the effects of a changing sociopolitical sphere on HIV vulnerability and trends in prevalence.

THE INTERSECTION OF GENDER AND HIV

Social norms and lack of available resources contribute to reduced sexual autonomy, putting women at a relative disadvantage when entering a decision-making process. By exten-

3 It goes so far as to specify that "every woman has full and equal dignity of the person with men and this includes equal opportunities in political, economic and social activities" among its Declaration of Rights (Comparative Constitutions Project, 2017, p. 44)

4 The GII measures gender-based inequalities across reproductive health, empowerment, and economic activity. It ranges from zero to one with higher values corresponding with greater inequality.

5 Izumi (2006) further supports this fact in a more in-depth treatment of land and property rights in Zimbabwe, including discussion of how the laws present these rights and how they are practically enacted within the patriarchal, patrilineal society.

sion, these disadvantaged individuals also may be unable to negotiate usage of preventative measures to reduce their risk of contracting HIV (Ackermann & de Klerk, 2002). For example, Poku and Whiteside (2004) broadly link the cultural practice of polygyny, presence of partner infidelity, and existence of rural poverty as contributing to the more general trends in HIV prevalence observed across both sexes in Africa. Meanwhile, Chacham, Maia, Greco, Silva, and Greco (2007) test this hypothesis by interviewing poor young women living in an urban slum area of Brazil and find significant positive correlations between indicators of female autonomy and HIV prevention behaviors. However, their survey was conducted amongst only a small subset of Brazilian women and only considered reported usage of preventative measures with no attention to actual viral status.

Bloom and Griffiths (2007) examine female autonomy as it affects HIV knowledge and condom use in three Indian states as a corollary to findings like that of Chacham et al. (2007). They find that higher levels of autonomy indicate greater likelihood of both having and utilizing preventive knowledge to reduce relative vulnerability. Atteraya et al. (2014) likewise find that higher degrees of sexual autonomy have positive effects on reported negotiation of safe sex practices amongst Nepalese women. But in both of these studies, the emphasis is on knowledge and relevant risk-factors. No consideration is given to the direct linkages to the participants' HIV status or to the separate role of asset-ownership as it contributes toward autonomy and reduction of HIV vulnerability.⁶

Moreover, the cultural contexts for these three studies in Brazil, India, and Nepal limit their results. Findings may vary in other regions, especially in orders of magnitude. Given that gender comprises a socially constructed set of behavioral expectations present in every society, it is imperative to evaluate its conceptualization and effects within its respective environment (Chacham et al., 2007). There are studies which consider HIV knowledge and attitudes as they relate to autonomy in Zimbabwe (Agüero & Bharadwaj, 2014; Takarinda et al., 2016). Thus far, however, no literature examines female economic empowerment as it specifically affects women's HIV status within the country despite the extreme degree of prevalence and nuanced societal setting. The literature that does exist instead evaluates the opposite scenario in terms of effects of HIV on land and property rights, as studied by Izumi (2006). Furthermore, they exclude married women entirely in their case-study analysis whereas this study critically evaluates effects across all marital statuses and then more specifically within a traditional household setting.

In response to the observed disproportionate prevalence of HIV by gender in sub-Saharan Africa more generally, Sia et al. (2016, 2014) and De Araujo and Miller (2014) analyze earlier waves of DHS data. Sia et al. (2014) attribute higher female HIV prevalence in Tanzania entirely to the disproportionate distribution

6 The DHS did not begin conducting anonymous blood testing in any country until 2001 and varied its methodological approach in doing so year over year. Furthermore, participation rates were notoriously low in the earlier iterations of the test. This especially curtails the ability to connect and evaluate individualized survey responses with regards to HIV status. Zimbabwe, for instance, did not include HIV status data until the 2005 survey.

of risk factors like wealth quintile by gender; yet they do not isolate effects of asset-ownership outright in their decomposition. In countries such as Kenya and Lesotho, the corresponding distribution only partially explains the discrepancies. De Araujo and Miller (2014) meanwhile find that women's health knowledge has a positive impact on sexual empowerment, which then has a negative effect on the likelihood of being HIV positive. Since these studies utilize data spanning 2003-2009/10, there is room not only to update the analyses to reflect more recent trends, but also to garner greater insight into a specific country in the region. In addition, separating out the effects of house and land ownership in particular comprise an added level of analysis not captured by either of these studies.

Within Zimbabwe, Hallett et al. (2007) emphasize age at first sex as the primary mechanism behind the differences in HIV prevalence by gender. Gregson et al. (2011) support the story put forth by Whiteside et al. (2004) that women are infected at earlier ages, zooming in even further to study effects within a specific province. But Hallett et al. (2007) lack information on socioeconomic status, degrees of asset-ownership, and negotiating capabilities of individuals beyond educational attainment which obfuscates why it is that women are marrying at younger ages. Especially in light of Atteraya et al.'s (2014) findings from another patriarchal society in Nepal, this study compares magnitudes of effects between age at first sex and relative female empowerment concurrently.

Traditional measures of female empowerment or autonomy include proxies in the form of labor force participation and education. Hindin (2000, 2002) meanwhile demonstrates how DHS data can be leveraged to discern directly effects from household decision-making independently, particularly as it relates to fertility behaviors and by extension sexual practices. She cites four key scenarios in which women are able to exert intrahousehold bargaining power as captured by the survey: (1) decisions regarding purchases of major household items, (2) whether or not the woman works outside of the household, (3) decisions regarding fertility, and (4) decisions regarding usage of any earned income by the woman, when applicable (Hindin, 2002, pp. 157-158). Women with lower autonomy captured by these and other indicators are found to demonstrate less participation in negotiating fertility planning. This limited control over when to have children implies that these women likewise have less sexual autonomy in general.

Hindin's construction of indices based on these dimensions provides one way for this study to create a similar composite measure of relative empowerment to test directly on the likelihood of being HIV positive. Furthermore, this study argues that large asset-ownership is the primary driver behind such decision-making capabilities. Therefore, large asset-ownership first is tested for its effects on HIV status across all survey participants, both men and women, to determine the relative contributions on the likelihood of being HIV positive for each. These findings are then compared against other concordant effects such as age at first sex and sexual autonomy as described by Atteraya et al. (2014) and De Araujo and Miller (2014) for married and cohabitating women specifically to ascertain the degrees to which each factor contributes as they pertain to

possible policy interventions.

DATA

This study utilizes data published in the 2015 Zimbabwe Demographic and Health Survey (ZDHS) to ascertain the magnitude and significance of economic empowerment on the likelihood of being HIV positive. The 2015 ZDHS is the sixth such iteration to be conducted. Women ages 15-49 and men ages 15-54 were eligible for individual interviews. All adults who participated in the survey were eligible for HIV testing, but participation was voluntary and anonymous; the results were never conveyed to the participants. Instead, case numbers connect HIV test results to the individual survey records.⁷ Although there is the potential for bias due to self-selection into the voluntary test, DHS statisticians find no significant evidence of such. Table 2 summarizes the testing response rates by environment and geographic location, while Table 3 elucidates testing participation by demographic characteristics.⁸ Prevalence rate calculations can be taken as representative once the appropriate weights are applied in spite of the noted trends between socioeconomic status and HIV-related stigma in Zimbabwe as they do not rely on self-disclosure (Mateveke, Singh, Chingono, Sibanda, & Machingura, 2016).⁹

METHOD

Logistic regression is utilized due to the binary nature of the key dependent variable of interest, contemporaneous HIV status. Marginal effects are reported to determine the degree of contribution of the independent variable(s) of interest. Separate specifications are run for men and women in order to compare the effects of asset-ownership by gender and determine the potential pathways for women in particular to reduce their vulnerability to HIV. An additional “full” specification is run for married and cohabitating women to further refine these potential pathways and test concordant effects between asset ownership, household decision making capabilities, and reported justification to refuse sex.

The primary independent variable of interest is economic empowerment as measured by large asset-ownership. Large asset-ownership in the form of land or a house is asked of all respondents and so is tested separately by gender in the first set of regressions. Summary statistics of degree of asset-ownership by gender are presented in Table 4. To capture the effects of asset-ownership and to ensure adequate sample size, the type of ownership is condensed from the four potential responses indicated in the survey to two: does not own or owns either alone or jointly. For the analysis, two separate

⁷ Only one female blood test was coded as yielding an indeterminate result; all others were coded as either positive or negative. This woman subsequently was dropped from the sample in order to conduct the analysis. As a result, the weighted total number of women appears as one less in these calculations when compared to the published ZDHS report, but effects to calculated proportions are inconsequential for the sake of this analysis.

⁸ Note that these tables report unweighted tabulations to reflect raw participation rates. Complete breakdowns of participation rates, including by sociodemographic characteristics, can be found in Chapter 14 of the 2015 ZDHS Final Report.

⁹ Unless otherwise noted, HIV-specific weights have been applied to ensure representativeness in keeping with DHS best practices.

indices then are constructed to test varying composite effects of asset-ownership between land and houses as they share a high level of correlation. Descriptions of how the indices are constructed are summarized in Figure 1:

	Yes (1)	No (0)
Asset Ownership: Either	Owens land, a house, or both either alone or jointly with a partner	Does not own land or a house in any capacity
Asset Ownership: Both	Owens both land and a house either alone or jointly with a partner	Does not own land or a house in any capacity or owns one but not the other (alone or jointly)

Figure 1: Construction of asset ownership variables.

Summary statistics of the four binary variables measuring asset-ownership are presented in Table 5. The effects of owning a house alone or jointly is tested in the first specification; effects of owning land alone or jointly is tested in the second specification. The composite indices then are tested in the third and fourth specifications respectively.

Provinces are included as controls in addition to applying the HIV weights provided by the DHS to ensure representativeness; however, province level effects are omitted from the tables for the sake of space. Sociodemographic controls are also applied across specifications as reported for all respondents in accordance with the supporting literature. These include: age at first sex, current age, number of children, highest level of education, current marital status, and urban/rural residence. These controls have been tested for their inclusion in the models. Other controls such as ethnicity proxied by language meanwhile were tested but ultimately excluded from the final model specifications due to their limited predictive power and not significant effects on the estimated coefficients of the independent variable(s) of interest. The wealth quintile index was included only for the subset of married and cohabitating women to account for the different characteristics presented within the restricted subsample.

The “full” specification considers the effects of female empowerment and sexual autonomy on HIV status more generally in terms of contributions to household decision making and the reported justification to refuse sex alongside ownership of both a house and land either alone or jointly with a partner. However, this analysis is limited to currently married or cohabitating women as they were the only ones surveyed in this manner. The decision-making index is based on women’s responses across three questions regarding who usually makes decisions about the respondent’s health care, major household purchas-

es, and visits to the respondent's family and relatives. If the woman reported having at least some say with her husband/partner, she receives a "1" in the respective category. These three categories are then aggregated to form a single indicator. Women must have at least some say in all three categories to be coded as "1" for the major household decision variable, else they are coded as "0". Meanwhile, the reported ability to refuse sex when the woman is aware of her husband having extra-marital sex is a dummy variable corresponding to the indicated response to the singular question: "1" denotes an affirmative response that the wife is able/justified to refuse sex while "0" denotes a negative response that the wife is not able/justified or "doesn't know".

RESULTS

The marginal effects of economic empowerment in the form of asset ownership on the likelihood of being HIV positive are presented in Table 6. Owning land, a house, or both either alone or jointly reduce the likelihood of being HIV positive. For men, owning a house significantly reduces likelihood of being HIV positive, though land ownership does not demonstrate such effects. For women, owning land reduces the likelihood of being HIV positive more than owning a house. Women demonstrate the strongest results both in terms of significance and orders of magnitude across all levels of asset-ownership. Moreover, owning both land and a house simultaneously demonstrate larger relative effects than the "either" combination, suggesting that greater asset-ownership especially in the form of land is indeed connected with reduced vulnerability even when controlling for province and rural/urban effects.

Major household decision contributions and justification in refusal of sex are then evaluated concomitant with ownership of both a house and land specifically for married and cohabitating women. Table 7 presents the results from this "full" specification. Asset-ownership still significantly reduces likelihood of being HIV positive by approximately six percentage points, slightly more than what was found previously for all women in the sample when testing asset-ownership alone. Similarly, a woman's reported justification to refuse sex when she knows that her husband is having sex with other people also significantly reduces the likelihood of being HIV-positive, albeit to a lesser degree (2.3 percentage points). However, the effects of the major household decisions index on HIV status are ambiguous.

DISCUSSION

The empirical findings support the hypothesis that greater economic empowerment corresponds with a lower likelihood of being HIV positive. Owning land, a house, or both simultaneously reduces the odds for both genders, though it has been shown to be especially true for women in terms of land ownership. Likewise, married and cohabitating women's reported ability to refuse sex also reduces their likelihood of being HIV positive, particularly in conjunction with large asset-ownership. Yet the effects of major household decisions on HIV status are

ambiguous. It could be that the asset-ownership effects are superseding the decision-making power. Alternatively, there could be self-reporting bias present in the survey that the decision index constructed may not accurately reflect the true level of autonomy a woman is able to exert within her household (Lee & Cronin, 2016). Even if it is a true representation, the index is limited to the three described dimensions and so is not a "complete" measure of their autonomy (Ghose et al., 2017). Additional research in this regard is warranted, such as greater in-depth, in-person interviews to ascertain qualitative information which could supplement the empirical findings given that the original hypothesis would suggest strong negative effects.

The study has several additional limitations. The blood test reports status at a single point in time, yet status in effect can change at any moment. Absence of the time dimension precludes the ability to draw conclusions around changes in behavior resultant from changing viral status. One possible extension, therefore, would be to conduct a longitudinal study to follow a cohort of individuals to test economic empowerment on likelihood of contracting HIV, or time to contracting HIV, rather than simply being HIV positive. Doing so would likewise address a secondary limitation regarding reverse causality. The logic flows that having large-scale assets means being less vulnerable. Asset-ownership promotes greater sexual autonomy and reduces the need to engage in risky activities such as sex work for additional income. But having HIV can also result in the loss or liquidation of assets as a coping mechanism as demonstrated by Mutenje, (2008). Longitudinal data would be able to confirm the original hypothesis by considering effects *ex ante* rather than exclusively *ex post*.

Regardless, the connection between large asset-ownership and reduced likelihood of being HIV positive supports the call for microfinance related policy. More specifically, policies such as group lending or flexible repayment arrangements could facilitate asset acquisition for both genders. Similarly, conditional cash transfers could be designed to better ameliorate women's relative status, as shown by studies such as that of Kohler and Thornton (2012). Although the effects of such policies on HIV directly have demonstrated somewhat mixed results, studies such as the one conducted by Dworkin and Blankenship (2009) nevertheless call for additional programs and research to better understand the effects of specific components of the policies on the very mechanisms emphasized in this paper: female empowerment and sexual autonomy. Even if it is the case that the reduced likelihood of being HIV positive derives more from the selling of assets after becoming HIV positive, promoting policy to be able to acquire such assets supports a positive coping strategy to minimize the necessity of engaging in informal or illicit work to cover the related medical expenses.

CONCLUSION

This study contributes to the conversation regarding HIV and women's autonomy, arguing that greater economic empowerment in particular increases sexual autonomy and reduces the relative likelihood of being HIV-positive. Logistic regression results support this hypothesis, finding particularly significant negative effects of owning land or owning both a house

and land combined on the likelihood of being HIV positive for women. Furthermore, such results are robust for married and cohabitating women. Refusing sex when they are aware of their partners having extramarital sex then further reduces their likelihood. However, one critical limitation of this study is its singular time dimension; future research should emphasize longitudinal effects, ideally following a cohort over several years to acquire qualitative information in addition to quantitative data. Nevertheless, these findings offer insights for potential policy in the form of microfinance to support individuals' abilities to acquire such large assets and so improve their relative status and reduce their vulnerability.

APPENDIX: TABLES

Province	Men		Women	
	Percentage	(n)	Percentage	(n)
Manicaland	8.88%	1,043	12.89%	1,102
Mashonaland Central	10.46%	783	13.70%	768
Mashonaland East	12.64%	782	18.00%	829
Mashonaland West	10.44%	976	16.30%	1,010
Matabeleland North	14.69%	366	21.60%	405
Matabeleland South	14.62%	327	27.30%	365
Midlands	12.35%	951	17.80%	1,098
Masvingo	9.49%	815	16.24%	1,033
Harare	11.31%	1,367	16.52%	1,553
Bulawayo	13.91%	397	15.14%	502
Total	11.29%	7,808	16.66%	8,666

Notes: Prevalence rates are reported as percentages of the HIV-weighted total population in the respective region.

Source: Author calculations based on data from the 2015 ZDHS weighted by the corresponding DHS published HIV-population weights.

Type of Residence	Men		Women	
	Percentage	Total	Percentage	Total
Urban	83.80%	3,456	88.03%	4,521
Rural	91.58%	4,940	93.39%	5,434
Province				
Manicaland	86.37%	895	89.60%	1,019
Mashonaland Central	91.79%	987	94.26%	993
Mashonaland East	80.89%	790	86.26%	910
Mashonaland west	90.55%	931	91.65%	1,054
Matabeleland North	92.75%	745	94.70%	849
Matabeleland South	89.31%	664	92.76%	829
Midlands	86.88%	884	89.92%	1,062
Masvingo	89.91%	783	92.35%	1,046
Harare	84.31%	994	86.96%	1,235
Bulawayo	91.98%	723	92.59%	958
Total	88.38%	8,396	90.96%	9,955

Notes: Participation rates are reported as percentages to reflect the raw proportion of surveyed individuals who volunteered to have their blood drawn to be tested. "Total" refers to the corresponding raw total population.

Source: Author calculations using unweighted data from the 2015 ZDHS.

TABLE 3 – PARTICIPATION IN HIV TESTING BY EDUCATION, MARITAL STATUS, AND PREVIOUS TESTING STATUS

	Men		Women	
	Percentage	Total	Percentage	Total
Highest Education				
No education	85.96%	57	89.62%	106
Primary	91.75%	1,855	92.37%	2,385
Secondary	88.40%	5,524	91.26%	6,637
Higher	81.88%	960	84.64%	827
Marital Status				
Never in union	89.97%	3,619	91.41%	2,666
Married	86.95%	4,267	90.72%	5,700
Living with partner	94.29%	70	90.48%	315
Widowed	84.85%	66	90.23%	430
Divorced	90.18%	163	90.98%	488
No longer living together	87.68%	211	92.70%	356
Age				
15-19	91.53%	2,065	91.74%	2,156
20-24	89.46%	1,376	91.64%	1,782
25-29	86.54%	1,166	91.30%	1,656
30-34	88.86%	1,104	90.57%	1,591
35-39	85.73%	932	89.74%	1,209
40-44	85.70%	797	91.30%	966
45-49	84.60%	578	88.07%	595
50-54	89.42%	378	--	--
Previously Tested				
No	86.54%	2,889	83.39%	1,890
Yes	89.34%	5,507	92.73%	8,065
Total	88.38%	8,396	90.96%	9,955

Notes: Participation rates are reported as percentages to reflect the raw proportion of surveyed individuals who volunteered to have their blood drawn to be tested. “Total” refers to the corresponding raw total population. The survey design was such that men ages 15-54 and women ages 15-49 were sampled.

Source: Author calculations using unweighted data from the 2015 ZDHS.

TABLE 4 – HOUSE AND LAND OWNERSHIP BY GENDER				
	Men		Women	
	Percentage	(n)	Percentage	(n)
House				
Does not own	61.65%	5,176	63.29%	6,230
Alone only	11.41%	958	5.63%	560
Jointly only	21.80%	1,830	29.25%	2,911
Both alone and jointly	5.15%	432	1.83%	182
Land				
Does not own	64.56%	5,420	69.62%	6,930
Alone only	11.59%	973	3.86%	384
Jointly only	19.62%	1,647	24.92%	2,480
Both alone and jointly	4.23%	355	1.60%	159
Total	100%	8,396	100%	9,953

Notes: General population weights were applied rather than HIV weights given that the summary statistics are presented holistically rather than by HIV status. As a result, the total population is greater than when considering the HIV tested and weighted subpopulation specifically.

Source: Author calculations based on data from the 2015 ZDHS weighted by the corresponding DHS published population weights.

TABLE 5 - LARGE ASSET-OWNERSHIP BY GENDER				
Men			Women	
	Percentage	(n)	Percentage	(n)
House				
Does not own	61.65%	5,176	63.29%	6,230
Alone, jointly, or both	38.35%	3,220	36.71%	3,654
Land				
Does not own	64.56%	5,420	69.62%	6,930
Alone, jointly, or both	35.44%	2,976	30.38%	3,024
Either a House or Land				
Does not own	54.01%	4,535	57.47%	5,720
Alone, jointly, or both	45.99%	3,861	42.53%	4,234
Both a House and Land				
Does not own	72.20%	6,062	75.45%	7,509
Alone, jointly, or both	27.80%	2,334	24.55%	2,444
Total	100%	8,396	100%	9,953

Notes: See notes from Table 4.

Source: Author calculations based on data from the 2015 ZDHS weighted by the corresponding DHS published population weights.

TABLE 6: EFFECTS OF ASSET-OWNERSHIP ON HIV STATUS

	Men				Women			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Asset Ownership								
House	-0.0192*				-0.0353***			
	(0.0093)				(0.0090)			
Land		-0.00946				-0.0537***		
		(0.0091)				(0.0100)		
Either Land or House			-0.0100				-0.0428***	
			(0.0094)				(0.0097)	
Both Land and House				-0.0205*				-0.0519***
				(0.0093)				(0.0094)
(n)	7,420	7,420	7,420	7,420	9,054	9,054	9,054	9,054

Notes: Logistic regression results from four different specifications run separately for men and women. Regressions were run on all individuals who participated in the voluntary HIV testing as provided by the DHS. Age at first sex, current age, current age squared, number of children, highest level of education, current marital status, type of residence, and provinces were included in the regressions to control for their unique effects but are not reported here for the sake of space (full results are available upon request). Significance is denoted in the following manner: + $p \leq 0.10$, * $p \leq 0.05$, ** $p \leq 0.01$, and *** $p \leq 0.001$.

Source: Author calculations using the 2015 ZDHS with HIV-population weights applied.

TABLE 7: EFFECTS OF ASSET-OWNERSHIP AND AUTONOMY ON HIV STATUS FOR WOMEN								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Asset Ownership								
House	-0.0455***							
	(0.0121)							
Land		-0.0630***					-0.0617***	
		(0.0133)					(0.0132)	
Either Land or House			-0.0563***					
			(0.0135)					
Both Land and House				-0.0603***				-0.0597***
				(0.0122)				(0.0122)
Autonomy								
Major Household Decisions					0.0128		0.0121	0.0137
					(0.0130)		(0.0129)	(0.0129)
Refuse Sex						-0.0238+	-0.0218+	-0.0230+
						(0.0134)	(0.0131)	(0.0131)
(n)	5,455	5,455	5,455	5,455	5,453	5,453	5,453	5,453

Notes: Regressions were run on married and cohabitating women who participated in the voluntary HIV testing as provided by the DHS. Wealth index quintiles, current age, current age squared, number of children, highest level of education, type of residence, and provinces were included in the regressions to control for their unique effects but are not reported here for the sake of space (full results are available upon request). Significance is denoted in the following manner: + $p \leq 0.10$, * $p \leq 0.05$, ** $p \leq 0.01$, and *** $p \leq 0.001$.

Source: Author calculations using the 2015 ZDHS with HIV-population weights applied.

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