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HIV Prevalence Trends and Risk Behaviors among Married Women, Mozambique: Analysis of the 2015 and 2021 National AIDS Indicator Surveys (IMASIDA and INSIDA)

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Abstract

Sub-Saharan Africa has experienced substantial declines in new HIV infections over the past decade; however, these gains have not been uniform across populations. In Mozambique, married women remain a largely overlooked group in HIV prevention strategies, despite persistently high HIV prevalence. Understanding temporal trends in HIV prevalence among married women is essential for developing effective policies and prevention strategies.

Methodology: We conducted repeated cross-sectional analytical study using secondary data from IMASIDA and INSIDA nationally representative surveys to analyze trends in HIV prevalence and associated factors among married women. Descriptive analyses were conducted using R statistical software (version 4.2.1). Associations between HIV serostatus and explanatory variables were examined using bivariate and multivariable logistic regression models. Interaction terms between survey year and selected covariates were tested to assess effect modification over time.

Results: Of the 4,302 married or living in a union women, HIV prevalence increased from 8.5% in 2015 to 15.4% in 2021, corresponding to an absolute increase of 6.9 percentage points. Increases in HIV prevalence were observed across all examined subgroups, ranging from 3.9 percentage points among women married before age 18 to 21.4 percentage points among women reporting more than one sexual partner in the previous 12 months. After adjustment, factors such as age, wealth quintile, area of residence, and number of lifetime sexual partners were associated with HIV prevalence in 2021 compared with 2015.

Conclusion: HIV prevalence in married women in Mozambique tends to increase, influenced by factors such as age, high

number of lifetime marriages, high total number of lifetime sexual partners and social ststus.

Keywords: HIV Trends; Sexual Health; HIV/AIDS; Marriage; HIV Women's Health

List of Abbreviations

aOR – adjusted odds ratio; AIDS - Acquired Immunodeficiency Syndrome; DHS - Demographic and Health Surveys; HIV - Human Immunodeficiency Virus; IMASIDA - Inquérito de Indicadores de Imunização, Malária e HIV/SIDA; INSIDA - Inquérito Nacional sobre o Impacto do HIV e SIDA; PHIA - Population-based HIV Impact Assessment

Introduction

Over the past two decades, the global HIV response has achieved substantial reductions in incidence, particularly in sub-Saharan Africa. Expanded access to antiretroviral therapy, prevention of vertical transmission, and scale-up of testing services have transformed HIV from a rapidly fatal disease into a chronic condition for millions. These gains, however, have not been evenly distributed across populations, and aggregate regional declines increasingly mask persistent epidemiological asymmetries [21].

One of the most enduring disparities is gendered. Women, especially in eastern and southern Africa continue to experience higher HIV prevalence and burden of infection than men across much of the life course, accounting for 62% of all new HIV infections [16]. This excess risk cannot be fully explained by individual behaviour alone. Rather, it reflects a convergence of biological susceptibility, unequal power relations, and social norms that shape sexual partnerships and constrain women's capacity to mitigate risk.

Within this landscape, marriage and marital unions occupies a paradoxical position. Long assumed to be a protective institution, marriage has often been excluded from the core focus of HIV prevention strategies. Yet, in high-prevalence settings, marital unions may expose women to sustained risk through mechanisms such as partner concurrency, limited condom use, age and power asymmetries, and reduced autonomy in sexual decision-making. For many women, marriage does not mark an exit from HIV risk, but a transition into a form of risk that is less visible, less interrogated, and less programmatically addressed [3, 12]. Systematic analyses have also reported low rates of consistent condom use among women in long-term partnerships, underscoring the structural barriers that undermine risk reduction in marital contexts.

Mozambique exemplifies this paradox within a high-prevalence, generalised epidemic context. Despite major investments in HIV prevention and treatment, the country continues to face one of the highest HIV prevalence rates in sub-Saharan Africa, particularly among women of reproductive age. The 2021 Mozambique Population-based HIV Impact Assessment (INSIDA 2021) estimated an adult prevalence of 12.5%, reaching 15.0% among women compared with 9.5% among men. Emerging evidence suggests that married women constitute a substantial share of women living with HIV, yet they remain largely absent from prevention narratives that prioritise adolescents, unmarried young women, and key populations. Whether HIV risk among married women has declined, stabilised, or intensified over time and which behavioural patterns persist within marriage remains insufficiently understood at the national level using comparable population-based data [7].

Repeated national AIDS indicator surveys provide a rare opportunity to examine these questions empirically. The 2015 IMASIDA and the 2021 INSIDA surveys offer comparable, population-based data collected during a period of significant programmatic expansion in Mozambique's HIV response. Analysing trends across these surveys allows for assessment not only of changes in HIV prevalence among married women, but also of the evolution of risk behaviours within marital contexts.

In this study, we analyse temporal trends in HIV prevalence and associated risk behaviours among married women or in a union in Mozambique using data from the 2015 and 2021 national AIDS indicator surveys. By situating marriage as a central, rather than peripheral, site of HIV vulnerability, this analysis seeks to inform more inclusive prevention strategies and challenge prevailing assumptions about where HIV risk resides.

Methods

Study Design and Data Source

This study used a repeated cross-sectional analytical design, drawing on secondary data from two nationally representative AIDS indicator surveys conducted in Mozambique: the 2015 Inquérito de Indicadores de Imunização, Malária e HIV/SIDA em Moçambique (IMASIDA) and the 2021 Inquérito Nacional sobre o Impacto do HIV e SIDA em Moçambique (INSIDA). Both surveys were implemented using comparable sampling frameworks, questionnaires, and biological testing protocols, enabling assessment of temporal trends in HIV prevalence and associated risk behaviours over time, following internationally standardised Demographic and Health Survey (DHS)/Population-based HIV Impact Assessment (PHIA) methodological guidelines [9, 14].

Sampling and Study Population

Both surveys IMASIDA 2015 and INSIDA 2021 employed a stratified, two-stage cluster sampling design. In the first stage, enumeration areas were selected within each province using probability proportional to size. In the second stage, households were systematically selected within each enumeration area. All usual residents or visitors who slept in the selected households the night before the survey were eligible for participation.

For this analysis, we restricted the study population to women aged 15–59 years who reported being married or living with a partner at the time of the survey. For clarity, women who were married or living in a union are hereafter referred to as "married women" throughout the manuscript. This definition was applied consistently across both survey rounds to ensure comparability.

Data Collection and HIV Testing

Data were collected through face-to-face, individual interviews conducted by trained fieldworkers using standardised questionnaires. The questionnaires captured information on sociodemographic characteristics, sexual and reproductive health behaviours, HIV knowledge, and access to testing and prevention services.

Blood samples were collected from consenting participants for HIV testing and analysed according to national algorithms aligned with World Health Organization recommendations. Participants who self-reported a previous HIV-positive diagnosis were not retested and were classified as HIV-positive in the analysis, consistent with DHS survey protocols.

Study Outcomes and Explanatory Variables

The primary outcome was HIV serostatus, defined as a positive or negative HIV test result at the time of the survey. The main explanatory variable of interest was survey year (2015 vs 2021), used to assess temporal trends in HIV prevalence among married women.

Secondary explanatory variables included sociodemographic characteristics (age, place of residence, education level, and household wealth quintile), sexual behaviour indicators (total lifetime number of sexual partners, condom use at last sexual inter-

course, and partner concurrency, where available), and access to HIV-related services (history of HIV testing and knowledge of HIV status). Variables were selected based on prior evidence and conceptual relevance to HIV risk within marital relationships.

Statistical Analysis

All statistical analyses were conducted using R statistical software (version 4.2.1). Survey design features, including stratification, clustering, and sampling weights, were incorporated in descriptive and prevalence analyses to generate nationally representative estimates. Weighted HIV prevalence estimates and corresponding 95% confidence intervals were calculated separately for each survey year. Differences in HIV prevalence between the 2015 and 2021 surveys were assessed using design-based tests for equality of proportions, accounting for the complex survey design. Analyses used the survey package to account for sampling design.

Descriptive analyses summarized sociodemographic, behavioural, and biological characteristics of the study population by survey year. Associations between HIV serostatus and explanatory variables were first examined using bivariate logistic regression models.

Variables with epidemiological relevance and those showing evidence of association in bivariate analyses were considered for inclusion in multivariable logistic regression models. Multivariable analyses were conducted to estimate adjusted odds ratio (aOR) and 95% confidence intervals for factors associated with HIV infection among married women.

To assess whether changes in HIV risk over time differed across population subgroups, interaction terms between survey year and selected covariates were evaluated. None of the interaction terms reached statistical significance or materially improved model fit and were therefore not retained in the final multivariable model. Missing data for key variables were assessed and handled using a complete-case approach, due to low levels of missingness. No imputation procedures were applied

Model specification was guided by prior evidence and theoretical considerations. Statistical significance was assessed at a two-sided α level of 0.05.

Ethical Considerations

Both IMASIDA 2015 and INSIDA 2021 received ethical approval from the National Bioethics Committee for Health (CNBS) in Mozambique as well as by the institutional review boards of the implementing partners. The surveys were conducted in accordance with national ethical guidelines and international principles for research involving human participants.

Written informed consent was obtained from all participants prior to enrolment. Participation was voluntary, and respondents were informed of their right to decline participation or withdraw at any stage without consequences. HIV testing was conducted following pre- and post-test counselling protocols, and procedures were in place to ensure confidentiality and appropriate referral to HIV care and treatment services for participants who tested positive or self-reported a prior HIV diagnosis.

The present study relied exclusively on de-identified, publicly available secondary data accessed through the DHS Program. No personal identifiers were available to the authors, and no additional data collection or contact with study participants occurred. In accordance with established ethical standards for secondary data analysis, this study did not require additional ethical approval.

Results

Trends in HIV prevalence by demographic characteristics and behavioral risk factors

Between 2015 and 2021, HIV prevalence among married women in Mozambique increased significantly, rising from 8.5% (95% CI: 6.2–10.9) to 15.4% (95%CI: 14.0–16.7), corresponding to an absolute increase of 6.9 percentage points (95% CI: 4.2–9.6; p<0·001) (Table 1).

Table 1 also presents trends in HIV prevalence across key demographic and behavioural characteristics. Across educational strata, higher HIV prevalence was observed in 2021 than in 2015, with the largest increase among women with secondary or higher education, from 8.1% to 17.7% (p=0.001). A similar pattern emerged by household wealth, with women in the richest category experiencing a pronounced rise in prevalence, from 8.1% to 20.4% (p<0.001). Regional analyses revealed substantial increases in the central (8.1% to 15.0%) and southern regions (10.6% to 24.2%), whereas changes in the northern region were not statistically significant. Increases were consistently more pronounced in urban áreas (9.4% to 20.6%) than in rural areas (8.2% to 12.9%).

Reproductive history analyses indicated a clear gradient by parity. Among women with 2–6 children ever born, prevalence increased from 8.1% to 14.9%, while among those with more than six children, prevalence nearly doubled, from 8.8% to 17.5%. Higher prevalence was observed in both survey years among women married before age 18 (9.0% to 12.9%), although the increase was more pronounced among those married at age 18 years or older (7.6% to 17.5%). Age at first sexual intercourse showed no significant change among women reporting debut before age 16, whereas prevalence rose substantially among those reporting first sex at age 16 years or older, from 6.5% to 15.4%.

Patterns by economic activity showed higher HIV prevalence in 2021 regardless of employment status. Among women reporting paid employment in the previous 12 months, prevalence increased from 7.8% to 17.3%, while among those not working it rose from 9.0% to 14.6%. Marked increases were observed among women reporting more than one sexual partner in the past 12 months (8.5% to 29.9%) and among those reporting two or more lifetime sexual partners (8.9% to 20.5%). Higher prevalence was also observed among women who had ever been tested for HIV, rising from 9.4% to 17.4%.

Partner and household-level characteristics showed similar upward trends. Prevalence among women reporting a circumcised partner increased from 7.7% to 14.7%, while women whose partners consumed alcohol experienced a rise from 7.9% to 15.2%. Women living in male-headed households showed a significant increase in HIV prevalence, from 8.4% to 15.1%, whereas changes among women in female-headed households did not reach statistical significance.

Table 1: Trends in HIV prevalence by demographic characteristics and behavioral risk factors, 2015-2021

	IMASIDA-2015		INSIDA-2021		Absolute difference in prevalence (95% CI)	
Variable						p value
	n/N	% (95% CI)	n/N	% (95% CI)		
Age group						
15-24	20/252	7.3 (3.9-10.7)	88/1071	9.4 (6.9-11.8)	2.1 (-2.1-6.2)	0.321
25-34	23/247	8.9 (4.9-12.8)	235/1450	16 (14.0-17.9)	7.1 (2.7-11.5)	0.001
35-49	22/211	9.5 (5.1-13.9)	291/1309	20.8 (18.3-23.4)	11.3 (6.2-16.4)	<0.001
Education level						

None	19/200	9.1 (4.9-13.3)	147/997	15.3 (12.4-18.3)	6.3 (1.1-11.3)	0.018
Primary	37/403	8.3 (5.2-11.3)	295/1842	14.2 (12.5-15.9)	5.9 (2.4-9.4)	0.001
Secondary/higher	9/107	8.1 (2.8-13.3)	170/981	17.7 (15.1-20.2)	9.6 (3.7-15.4)	0.001
Wealth category						
Poorer	21/225	7.0 (3.3-10.7)	125/1363	9.6 (7.9-11.3)	2.6 (-1.4-6.6)	0.208
Middle	17/162	11.5 (5.3-17.7)	121/752	16.4 (13.5-19.4)	4.9 (-1.9-11.7)	0.162
Richer	27/323	8.1 (5.1-11.0)	367/1707	20.4 (18.4-22.4)	12.3 (8.7-15.9)	<0.001
Region of residence						
North	20607	6.5 (1.0-12.0)	123/1139	10.3 (8.3-12.2)	3.8 (-2.0-9.6)	0.201
Center	40/468	8.1 (5.3-11.0)	204/1584	15.0 (12.4-17.6)	6.9 (3.0-10.7)	<0.001
South	18/185	10.6 (5.7-15.6)	287/1107	24.2 (21.6-26.8)	13.6 (8.0-19.2)	<0.001
Area of residence						
Urban	23/271	9.4 (5.7-13.2)	304/1368	20.6 (18.4-22.9)	11.2 (6.8-15.6)	<0.001
Rural	42/439	8.2 (5.3-11.1)	310/2462	12.9 (11.2-14.6)	4.7 (1.3-8.1)	0.006
Children ever born						
≤1	13/142	9.6 (4.4-14.9)	160/1062	15.6 (12.9-18.4)	6.0 (0.1-11.9)	0.047
46059	33/397	8.1 (4.9-11.2)	384/2383	14.9 (13.2-16.7)	6.8 (3.2-10.4)	<0.0001
>6	19/171	8.8 (4.7-12.9)	67/373	17.5 (13.6-21.3)	8.7 (3.1-14.4)	0.003
Age at first marriage						
<18	44/440	9.0 (6-12.1)	210/1622	12.9 (10.9-14.9)	3.9 (0.3-7.5)	0.036
≥18	21/270	7.6 (4.1-11.2)	404/2208	17.5 (15.7-19.3)	9.9 (5.9-13.8)	<0.0001
Age at first sexual intercourse						
<16	28/183	14.5 (9.0-20.0)	178/1126	15.5 (13.0-18.0)	1.0 (-5.0-7.0)	0.745
≥16	37/526	6.5 (4.0-9.0)	436/2703	15.4 (13.8-16.9)	8.9 (5.9-11.8)	<0.0001
Paid employment in last 12 months						
Yes	31/299	7.8 (4.3-11.3)	213/1187	17.3 (15.0-19.7)	9.5 (5.3-13.7)	<0.0001
No	34/411	9.0 (5.9-12.2)	400/2642	14.6 (12.9-16.4)	5.6 (2.03-9.17)	0.002
Condom used during last intercourse†						
Yes	14305	9.0 (-1.2-19.2)	95/316	29.7 (23.5-36.0)	20.7 (8.7-32.7)	0.001
No	59/625	8.5 (6.0-11.0)	447/3098	14.0 (12.6-15.4)	5.5 (2.6-8.4)	<0.0001
Sex partners last 12 months						
1	65/710	9.2 (6.2-10.9)	563/3586	15.0 (13.6-16.4)	6.5 (3.7-9.3)	<0.0001
>1	46/540	8.5 (6.2-10.9)	29/96	29.9 (20.1-39.8)	21.4 (11.3-31.5)	<0.0001
Ever been tested for HIV						
Yes	54/539	9.4 (6.5-12.3)	556/3065	17.4 (15.8-19.1)	8.0 (4.7-11.3)	<0.0001
No	11/171	6.3 (2.3-10.3)	57/727	8.5 (6.3-10.7)	2.2 (-2.4-6.7)	0.345

Total lifetime number of sexual partners						
1	40/443	8.4 (5.6-11.1)	146/1654	9.0 (7.4-10.7)	0.6 (-2.6-3.8)	0.712
≥2	23/256	8.9 (5.3-12.4)	415/1885	20.5 (18.4-22.6)	11.6 (7.5-15.7)	<0.0001
Partner circumcision status						
Yes	39/482	7.7 (5.2-10.3)	323/2052	14.7 (13.1-16.4)	7.0 (3.9-10.03)	<0.0001
No	22/183	11.5 (5.7-17.3)	244/1470	16.5 (14.1-18.9)	5.0 (-1.3-11.3)	0.119
Partner alcohol consumption						
Yes	22/268	7.9 (4.6-11.2)	133/859	15.2 (12.6-17.8)	7.3 (3.1-11.5)	0.001
No	25/275	7.7 (4.3-11.0)	480/2961	15.5 (13.9-17.1)	7.8 (4.1-11.5)	<0.0001
Sex of household head						
Male	57/636	8.4 (5.8-10.9)	464/2911	15.1 (13.6-16.5)	6.7 (3.7-9.6)	<0.0001
Female	27242	10.0 (3-16.9)	150/919	16.4 (13.5-19.3)	6.4 (-1.1-13.9)	0.096
Year						
2015	65/710	8.5 (6.2-10.9)	614/3830	15.4 (14.0-16.7)	6.9 (4.2-9.6)	<0.0001

Multivariable Analysis of Factors Associated with HIV Infection Among Married Women

Table 2 presents the results of the multivariable logistic regression analysis. After adjustment for sociodemographic, behavioural, and contextual factors, several variables remained independently associated with HIV seropositivity among married women in Mozambique.

Age showed a clear and strong association with HIV infection. Compared with women aged 15–24 years, those aged 25–34 years had higher odds of HIV infection (aOR=1.4; 95% CI: 1.0–1.9), and women aged 35–49 years had approximately twice the odds (aOR=2.0; 95% CI: 1.4–2.7).

Household wealth was associated with HIV infection, with women in the middle wealth quintile having higher odds compared with those in the poorest quintile (aOR=1.7; 95% CI: 1.2–2.4).

Geographic differences persisted after adjustment. Married women residing in the central (aOR=2.0; 95% CI: 1.4–2.7) and southern regions (aOR=2.1; 95% CI: 1.4–2.9) had higher odds of HIV infection compared with those living in the northern region.

Behavioural and service-related variables were also associated with HIV infection. Women reporting non-use of condoms at last sexual intercourse had lower odds of HIV infection compared with those reporting condom use (aOR=0.5; 95% CI: 0.4–0.7). Similarly, women who had never been tested for HIV had lower odds of infection compared with those who had been tested (aOR=0.6; 95% CI: 0.4–0.8).

Sexual history remained strongly associated with HIV infection. Women reporting more than one sexual partner in the past 12 months (aOR=2.2; 95% CI: 1.3–3.9) and those reporting two or more lifetime sexual partners (aOR=1.9; 95% CI: 1.4–2.4) had higher odds of HIV infection compared with their respective reference groups.

Temporal analysis indicated a significant increase in HIV prevalence over time. In 2021, married women had 1.8 times higher odds of HIV infection compared with 2015, after controlling for covariates.

Table 2: Multivariable logistic regression analysis of factors associated with HIV infection among married women in Mozambique

Variables	aOR (95% CI)	p-value
Age group (Ref. = 15-24 years old)		
25-34	1.4 (1.0-1.9)	0.042
35-49	2.0 (1.4-2.7)	<0.001
Household wealth category (Ref. = Poorest)		
Middle	1.7 (1.2-2.4)	0.006
Richer	1.4 (0.9-2.1)	0.076
Region of residence (Ref. = North)		
Center	2.0 (1.4-2.7)	<0.001
South	2.1 (1.4-2.9)	<0.001
Residence area (Ref. = Urban)		
Rural	0.8 (0.6-1.1)	0.262
At first marriage age (Ref. = <18 years)		
≥18	1.0 (0.7-1.2)	0.723
Age at first sexual intercourse (Ref. = <16 years)		
≥16	0.8 (0.6-1.1)	0.121
Condom use at last sexual intercourse (Ref. = Yes)		
No	0.5 (0.4-0.7)	<0.001
Ever tested for HIV (Ref. = Yes)		
No	0.6 (0.4-0.8)	0.012
Sex partners last 12months (Ref. = 1)		
> 1	2.2 (1.3-3.9)	0.006
Total lifetime number of sexual partners (Ref. = 1)		
≥2	1.9 (1.4-2.4)	<0.001
Sex of household head (Ref. = Male)		
Female	1.1 (0.8-1.5)	0.394
Year (Ref. = 2015)		
2021	1.8 (1.3-2.5)	0.001

Discussion

The results of this study indicate an increase in HIV prevalence among married women of reproductive age in Mozambique between 2015 and 2021, suggesting that the epidemic in this subpopulation is not declining. After adjustment for key sociodemographic and behavioural factors, the findings demonstrate persistent and widening disparities by age, geography, and sexual history.

Age-stratified analysis revealed that the most substantial increases occurred among women aged 25–34 and 35–49 years, a pattern that remained robust after multivariable adjustment. This findings aligns with existing literature linking older age to higher HIV prevalence, likely reflecting comulative exposure over the time, as well was a differential access to prevention and testing services [3, 12, 15]. Together, these results highlight potential gaps in HIV prevention strategies for married women in older reproductive age groups, who may be less prioritised by interventions traditionally focused on adolescents and young women.

Regarding educational attainment and socioeconomic status, the findings indicate increased prevalence across all categories, with particularly pronounced increases among women with secondary or higher education and those in higher wealth. In the multivariable analysis, women in the middle wealth remained independently associated with higher odds of HIV infection, while the association for the richest did not reach statistical significance. A positive relationship between wealth and HIV prevalence among women has been documented in several African contexts, where greater mobility, broader sexual networks, and and improved survival following access to antiretroviral therapy may contribute to higher observed prevalence [2, 12]. This finding challenges the simplistic narratives that frame HIV risk primarily through poverty and vulnerability and highlight the need for differentiated prevention approaches that also address women with higher socioeconomic status.

Geographic heterogeneity was a consistent feature of the findings. Both descriptive and multivariable analyses showed significantly higher HIV prevalence and odds of infection among women residing in the central and southern regions of Mozambique compared with the north, suggesting the influence of contextual and structural factors beyond individual behaviours [7, 10]. Higher prevalence in urban areas and southern provinces has been previously documented in Mozambique and elsewhere in the region [19]. Urbanisation, population density, labour-related mobility, and migration patterns may contribute to these geographic differences, shaping local epidemic dynamics [15].

Behavioural and service-related variables displayed patterns that require cautious interpretation. In the adjusted analysis, women reporting non-use of condoms at last sexual intercourse and those who had never been tested for HIV showed lower odds of HIV infection. Rather than indicating a protective effect, these findings are most plausibly explained by reverse causality, whereby women who are aware of their HIV-positive status or perceive themselves to be at higher risk are more likely to adopt protective behaviours and seek testing. Similarly, "condom use at last intercourse" does not capture consistency or correctness of use, limiting its value as a proxy for sustained risk reduction [4, 12]. These results highlight the importance of interpreting behavioural indicators within the context of HIV status awareness and testing history, particularly in cross-sectional analyses [6, 17].

Sexual history emerged as a strong and consistent predictor of HIV infection. Women reporting two or more lifetime sexual partners had nearly twice the odds of HIV infection compared with those reporting a single partner, even after adjustment for other covariates. This association reflects cumulative exposure to risk over the life course and reinforces the importance of considering long-term partnership dynamics, including within marriage, when assessing HIV vulnerability [18]. Notably, variables capturing recent sexual partnerships were not retained in the final multivariable model to avoid collinearity, but descriptive findings nonetheless suggest substantial heterogeneity in recent risk behaviours among married women.

Temporal analysis further demonstrated that, independent of changes in population characteristics, HIV prevalence was significantly higher in 2021 than in 2015. After adjustment, married women in 2021 had 1.8 times higher odds of HIV infection compared with 2015, indicating that the observed increase cannot be attributed solely to shifts in sociodemographic composition. This finding likely reflects a combination of ongoing transmission within marital contexts and improved survival due to expanded antiretroviral therapy coverage, rather than incidence alone [1, 21].

Taken together, these findings underscore marriage as a context of accumulated and often underestimated HIV risk. Married women may be exposed to HIV through partner behaviours that are not easily mitigated by individual-level prevention strate-

gies, particularly in settings characterised by gendered power imbalances, low condom negotiation capacity, and limited male partner engagement [8, 11, 20].

The implications of these findings are substantial for HIV prevention and control in Mozambique. Programs should expand their focus beyond adolescents and young women to include married women aged 25–49 years, particularly those living in urban areas and in the central and southern regions. Prevention strategies must be differentiated to address women across socioeconomic strata, recognising that higher education and wealth do not confer protection. Interventions should also strengthen couple-based and male-inclusive approaches, including promotion of consistent condom use, reduction of harmful alcohol consumption, and sustained engagement of male partners in testing and treatment services.

Several limitations should be acknowledged. The analysis is based on repeated cross-sectional surveys and therefore cannot infer causality or directly measure HIV incidence; observed prevalence reflects both new infections and survival with treatment, particularly in the context of expanding antiretroviral therapy coverage. Behavioural variables are self-reported and subject to recall and social desirability biases, which may differ by age, residence, or socioeconomic status. Despite these limitations, the use of nationally representative surveys with comparable designs provides a robust platform for examining population-level trends over time. Future research should prioritise incidence estimation, qualitative exploration of partnership dynamics among married women, and fine-grained geospatial analyses to identify emerging hotspots of HIV prevalence.

Conclusion

This study shows a marked increase in HIV prevalence among married women of reproductive age in Mozambique between 2015 and 2021, underscoring that marriage does not confer protection against HIV and given the current dimension of the HIV pandemic, this constitutes a ''fertilized field'' for the transmission of the HIV between married. Higher prevalence among women aged 25–49 years, those living in central and southern regions, and those reporting multiple lifetime sexual partners highlights the cumulative nature of HIV risk within marital contexts.

These findings challenge prevention narratives that prioritise adolescents and young women while overlooking married women, including those with higher socioeconomic status. The results point to the need for more inclusive and differentiated HIV prevention strategies that explicitly address married women across the life course. Expanding couple-based and male-inclusive approaches, strengthening prevention and testing efforts in high-burden regions, and addressing relational and structural vulnerabilities within marriage are essential to sustaining progress in Mozambique's HIV response.

Declarations

Ethics Approval and Consent To Participate

This study used secondary, anonymised data from the 2015 IMASIDA and 2021 INSIDA surveys conducted in Mozambique. Both surveys received ethical approval from the Mozambican National Bioethics Committee for Health (CNBS) and relevant institutional review boards. Written informed consent was obtained from all participants at the time of data collection. The present analysis involved no direct contact with study participants and posed minimal risk.

Consent for Publication

Not applicable. This study uses anonymised secondary data with no identifiable information.

Availability of data and materials

The datasets analysed during the current study are publicly available through the DHS Program repository (https://dhsprogram.com) following a standard data request procedure. INSIDA 2021 datasets are available through the PHIA Project (https://phia.icap.columbia.edu) upon request and approval.

Competing Interests

The authors declare that they have no competing interests.

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Authors' Contributions

SN and ARB conceptualised the study and authored the initial manuscript draft. RM conducted the data analysis. ARB, RM, and CSB provided substantial critical revisions to improve the intellectual content and clarity of the manuscript. All authors contributed equally by offering their perspectives during writing, reviewing, and editing processes, and all authors approved the final version of the manuscript.

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Disclaimer

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