

# Level and Factors Associated with Comprehensive Knowledge About HIV Among Currently Married Women in Somalia: A Nationwide Cross-Sectional Study

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**Background:** The Human Immunodeficiency Virus (HIV) is a major public health issue, particularly in underdeveloped nations, where limited knowledge contributes to high prevalence among women facing socio-economic and educational barriers. To the best of our knowledge, no study has comprehensively examined HIV knowledge among Somali married women using nationally representative data. This study aims to assess the level of comprehensive HIV knowledge and its determinants among currently married women in Somalia, identifying regions and groups with limited awareness to prioritize targeted education and healthcare interventions, support NSP goals, and provide baseline data for future efforts.

**Methods:** A multivariable ordinal logistic regression analysis was performed to examine the relationship between comprehensive HIV knowledge and various sociodemographic factors using data from the 2018–2019 SDHS. Adjusted odds ratios (AORs) with 95% confidence intervals (CIs) were calculated to determine significant associations.

**Results:** The analysis revealed that 55.1% of respondents had high comprehensive knowledge of HIV. Moreover, the study found the following significant factors associated with comprehensive HIV knowledge: Women aged 30–34 had an AOR of 1.25 (95% CI: 1.02–1.53) compared to those aged 15–19. Regionally, compared to women in the Awdal region, women in Gedo had an AOR of 0.39 (95% CI: 0.29–0.52), while women in Lower Juba had an AOR of 0.52 (95% CI: 0.38–0.69). Women in nomadic settings had an AOR of 0.61 (95% CI: 0.51–0.74) compared to urban dwellers. Women with higher education had an AOR of 3.04 (95% CI: 1.85–5.00) compared to uneducated women. Women in the highest wealth quintile had an AOR of 1.28 (95% CI: 1.03–1.59) compared to the poorest women.

**Conclusion:** The findings stress the need for public campaigns in rural, nomadic, and urban areas with limited HIV knowledge. Interventions should prioritize improving education access and enhancing media outreach to boost awareness and prevention efforts among Somali women.

**Keywords:** media influence, adjusted odds ratios, comprehensive knowledge of human immunodeficiency virus, currently married women

## Introduction

The HIV epidemic remains a critical global public health issue, with Africa bearing the brunt of its impact.<sup>1–3</sup> Despite significant advancements in HIV prevention and treatment, the continent continues to shoulder a disproportionate share of the global HIV burden. Globally, it is estimated that the HIV virus has infected approximately 76 million people since the onset of the epidemic in 1981.<sup>2–4</sup> The HIV has a significant impact on the African continent, home to over two-thirds of the global population living with the virus, approximately 25.6 million people. Most of those affected reside in low- and middle-income countries. In 2021, eastern and southern Africa had a particularly high prevalence, with 20.6 million people (53%) living with HIV, while western and central Africa accounted for 5 million cases (13%).<sup>1,5</sup> Currently, about

38.4 million people are living with HIV, with two-thirds of these cases in sub-Saharan Africa (SSA). In 2021 alone, there were 1.5 million new infections. The toll of HIV is severe, with 40.1 million lives lost to date, including 650,000 deaths in 2021.<sup>6,7</sup>

Somalia is among the countries with the lowest health indicators globally.<sup>1,8</sup> Over three decades of civil unrest and instability have severely impacted the nation's healthcare system, leading to the internal displacement of over 2.5 million people.<sup>9,10</sup> Moreover, Somalia holds the highest rates of maternal and infant mortality within SSA, despite the region's already high mortality rates.<sup>11–13</sup> In 2023, the HIV estimates for Somalia indicate that approximately 8,200 individuals, including both adults and children, are living with HIV. Among these, 7,200 are adults aged 15 and over, with 4,000 being women and 3,200 men. Additionally, around 1,000 children aged 0 to 14 are living with HIV. The HIV prevalence rate among adults aged 15 to 49 is less than 0.1% for both women and men in this age group.<sup>14</sup>

In many developing countries, including Somalia, reproductive-age women often have limited comprehensive knowledge about HIV, which hampers effective prevention and control efforts. Exposure to mass media such as television, radio, and newspapers<sup>15–17</sup> plays a crucial role in spreading HIV awareness across communities. Media exposure is an effective way to promote education<sup>18–20</sup> about HIV, providing critical information on transmission methods, preventive measures, and encouraging safe practices. Yet, despite the potential of mass media to improve awareness, inadequate knowledge and risky behaviors remain major barriers in combating the spread of HIV, particularly in resource-limited locations.

In Somalia, understanding of HIV transmission and prevention methods is particularly low,<sup>1</sup> especially among semi-nomadic and local agro-pastoralist communities. Knowledge of HIV transmission remains insufficient among the general Somali population, and there has been a lack of comprehensive studies addressing knowledge levels across diverse Somali populations, including both urban and rural areas. This limited understanding contributes to the ongoing spread of HIV, underscoring the need for targeted education efforts that reach all segments of the population. The Somali government has made efforts through the National Strategic Plan (NSP) for HIV/AIDS (2021–2023), which aims to reduce new HIV infections and related mortality by focusing on prevention, care, and strengthening the enabling environment. A key target is to increase HIV awareness among at-risk women from 11.6% to 60%. However, HIV infections remain a concern due to limited healthcare infrastructure, stigma, and insufficient Anti-Retroviral Therapy (ART) coverage.

This study addresses a critical gap by assessing comprehensive knowledge of HIV and its determinants among currently married women aged 15–49 using data from the Somali Health Demographic Survey (SDHS) 2018–19. It will identify regions and groups with limited knowledge, enabling the government to prioritize them for targeted education and healthcare interventions. The findings aim to inform stakeholders and policymakers, supporting the development of initiatives to enhance HIV awareness, thus contributing to the NSP's goals and advancing global efforts to curb the epidemic.

## Methods and Data

This study is cross-sectional in design and utilizes secondary data from SDHS conducted in 2018–2019 by the Ministry of Health (MOH) of the Federal Government of Somalia (FGS) and the Somali National Bureau of Statistics (NBS). This dataset is nationally representative and covers sixteen regions. However, due to security concerns, data from two regions (Lower Shabelle and Middle Juba) and two specific strata (Bay region) were excluded from the analysis.<sup>1,13,21</sup> For more detailed information on the sampling procedures and regional descriptions, readers are referred to the SDHS 2020 Report.

The target population for this study consisted of currently married women aged between 15 and 49 years. Initially, the study aimed to include a comprehensive sample size of 10,324 women within this demographic to ensure robust and representative findings. However, after a rigorous data cleaning process, which involved excluding cases with missing or incomplete information, the final analytic sample was refined to include 6,881 currently married women.

The outcome variable, comprehensive knowledge about HIV, is a composite measure based on nine questions derived from responses provided by women aged 15 to 49 years in the 2018–2019 SDHS. These questions assess the respondent's understanding of HIV transmission and prevention. Specifically, comprehensive knowledge is assessed

based on whether respondents correctly answered “yes” to six questions about HIV transmission and prevention, including queries on “Can HIV be transmitted from mother to her baby during pregnancy?”. Can HIV be transmitted from mother to her baby during delivery? Can HIV be transmitted from mother to her baby by breastfeeding? Does having an uninfected spouse reduce HIV infection chances? Does using a condom reduce HIV infection chances? Is it possible for healthy-looking people to have HIV? Additionally, the respondent must have correctly answered “no” to the following three questions: Can mosquito bites transmit HIV? Can you get HIV by sharing food? Can you get HIV through witchcraft? Based on the total number of correct answers, the outcome variable is categorized into three levels: low (0 to 3 correct answers), medium (4 to 5 correct answers), and high (6 or more correct answers). Numerous studies<sup>2,15,22</sup> have utilized this methodology.

In our study, we incorporated several covariates that are commonly found in similar researches.<sup>3,23,24</sup> These are age; the region; residence; the level of education; the frequency of listening to radio; the frequency of watching television; wealth status; ever used the internet; Owns a mobile telephone; respondent’s employment status.

In this study, we utilized R software version 4.0.2<sup>25</sup> for data management and analysis. We began by generating descriptive statistics to assess the frequency and proportion of the dependent and sociodemographic variables, providing a comprehensive overview of the dataset as shown in Table 1. To explore the relationship between multiple associated factors and levels of comprehensive knowledge (categorized as low, medium, and high), we applied multivariable ordinal logistic regression. This method is well-suited for ordinal outcome variables, where categories have a natural order but unequal intervals, making it particularly effective when the outcome variable has more than two ordered levels. Associated factors with a p-value less than 0.05 were deemed statistically significant at the 5% significance level. Adjusted odds ratios (AORs) with 95% confidence intervals (CIs) were used to evaluate the strength and direction of the associations.

## Results

Table 1 outlines the sociodemographic profile of currently married women in Somalia. Our study included a total of 6,881 currently married women. Regarding comprehensive knowledge of HIV, 16.2% have low knowledge, 28.7% have medium knowledge, and 55.1% have high knowledge. The age distribution is as follows: 7.6% are aged 15–19, 17.7% are aged 20–24, 24.3% are aged 25–29, 19.3% are aged 30–34, 17.0% are aged 35–39, 9.4% are aged 40–44, and 4.7% are aged 45–49.

**Table 1** Sociodemographic Profile of Participants

Variables	Levels	Frequency	Percentage
<b>Comprehensive knowledge of HIV</b>	Low	1115	16.2
	Medium	1975	28.7
	High	3791	55.1
<b>Age in 5-year groups</b>	15–19	521	7.6
	20–24	1221	17.7
	25–29	1669	24.3
	30–34	1330	19.3
	35–39	1168	17.0
	40–44	646	9.4
	45–49	326	4.7

(Continued)

**Table 1** (Continued).

Variables	Levels	Frequency	Percentage
<b>Region</b>	Awdal	397	5.8
	Woqooyi Galbeed	713	10.4
	Togdheer	633	9.2
	Sool	483	7.0
	Sanaag	645	9.4
	Bari	300	4.4
	Nugaal	307	4.5
	Mudug	402	5.8
	Galgaduud	330	4.8
	Hiraan	405	5.9
	Middle Shabelle	235	3.4
	Banadir	1109	16.1
	Bay	153	2.2
	Bakool	133	1.9
	Gedo	327	4.8
	Lower Juba	309	4.5
<b>Residence</b>	Urban	3501	50.9
	Rural	1893	27.5
	Nomadic	1487	21.6
<b>Education</b>	No Education	5394	78.4
	Primary	1022	14.9
	Secondary	333	4.8
	Higher	132	1.9
<b>Frequency of listening to radio</b>	At least once a week	585	8.5
	Less than once a week	252	3.7
	Not at all	6044	87.8
<b>Owns a mobile telephone</b>	Yes	5925	86.1
	No	956	13.9
<b>Employment status</b>	Yes	602	8.7
	No	6279	91.3
<b>Frequency of watching television</b>	At least once a week	848	12.3
	Less than once a week	249	3.6
	Not at all	5784	84.1

(Continued)

**Table 1** (Continued).

Variables	Levels	Frequency	Percentage
<b>Wealth quintile</b>	Poor	1236	18.0
	Second	1143	16.6
	Middle	1301	18.9
	Fourth	1515	22.0
	Highest	1686	24.5
<b>Ever used internet</b>	Yes	982	14.3
	No	5899	85.7

Regionally, most of the currently married women reside in Banadir, which accounts for 16.1% of the population, followed by Woqooyi Galbeed with 10.4%, Sanaag with 9.4%, and Togdheer with 9.2%. On the lower end, smaller percentages of currently married women are found in Bay with 2.2%, Bakool with 1.9%, and Bari with 4.4%.

In terms of residence type, 50.9% live in urban areas, 27.5% in rural areas, and 21.6% are nomadic. Educational attainment shows that 78.4% have no education, 14.9% have primary education, 4.8% have secondary education, and 1.9% have higher education.

Regarding radio listening habits, 87.8% never listen to the radio, 8.5% listen at least once a week, and 3.7% listen less than once a week. Employment status reveals that 91.3% are not currently working, while 8.7% are employed.

In terms of television viewing, 84.1% do not watch TV at all, 12.3% watch at least once a week, and 3.6% watch less than once a week. The wealth quintile distribution is as follows: 18.0% are in the poorest quintile, 16.6% in the second, 18.9% in the middle, 22.0% in the fourth, and 24.5% in the highest quintile. Regarding internet use, 14.3% have ever used the internet, while 85.7% have not.

**Table 2** presents the results of a multivariable ordinal logistic regression analysis assessing factors influencing comprehensive knowledge of HIV among currently married women in Somalia. The analysis identified seven significant variables: age, region, residence, education, frequency of radio listening, wealth, and employment status.

Compared to women aged 15–19, those aged 30–34 have 1.25 times higher odds of possessing higher comprehensive knowledge of HIV (medium or high vs. low). Similarly, women aged 35–39 have 1.24 times higher odds.

**Table 2** Multivariable Ordinal Logistic Regression Analysis of the Variables

Variables	Levels	Estimate	S.E	P-value	AOR	95% CI	
						Lower Bound	Upper Bound
<b>Age</b>	15–19(RC)	–	–	–		–	–
	20–24	0.098	0.102	0.340	1.103	0.902	1.348
	25–29	0.078	0.099	0.431	1.081	0.891	1.311
	30–34	0.224	0.103	0.029	1.251	1.023	1.529
	35–39	0.215	0.105	0.041	1.240	1.009	1.523
	40–44	0.08	0.117	0.492	1.083	0.862	1.361
	45–49	0.213	0.142	0.131	1.238	0.938	1.634

(Continued)

**Table 2** (Continued).

Variables	Levels	Estimate	S.E	P-value	AOR	95% CI	
						Lower Bound	Upper Bound
<b>Region</b>	Awdal (RC)	–	–	–		–	–
	Woqooyi Galbeed	0.238	0.128	0.064	1.269	0.986	1.632
	Togdheer	0.119	0.128	0.355	1.126	0.875	1.448
	Sool	–0.167	0.136	0.219	0.846	0.648	1.104
	Sanaag	–0.218	0.129	0.092	0.804	0.624	1.036
	Bari	–0.365	0.152	0.017	0.694	0.515	0.936
	Nugaal	–0.109	0.157	0.487	0.897	0.659	1.22
	Mudug	–0.281	0.144	0.050	0.755	0.57	1.000
	Galgaduud	–0.138	0.151	0.362	0.871	0.648	1.172
	Hiraan	0.204	0.146	0.162	1.227	0.921	1.633
	Middle Shabelle	–0.437	0.167	0.009	0.646	0.466	0.896
	Banadir	–0.576	0.125	0.000	0.562	0.440	0.718
	Bay	–0.432	0.188	0.022	0.649	0.449	0.939
	Bakool	–0.276	0.201	0.170	0.759	0.511	1.125
	Gedo	–0.944	0.147	0.000	0.389	0.292	0.519
	Lower Juba	–0.652	0.151	0.000	0.521	0.388	0.700
<b>Residence</b>	Urban (RC)	–	–	–		–	–
	Rural	–0.086	0.070	0.218	0.918	0.801	1.052
	Nomadic	–0.490	0.097	0.000	0.613	0.506	0.742
<b>Education</b>	No Education (RC)	–	–	–		–	–
	Primary	0.405	0.075	0.000	1.500	1.294	1.739
	Secondary	0.635	0.137	0.000	1.887	1.443	2.470
	Higher	1.112	0.254	0.000	3.039	1.849	4.997
<b>Frequency of listening radio</b>	At least once a week (RC)	–	–	–		–	–
	Less Than Once a Week	–0.143	0.158	0.367	0.867	0.636	1.182
	Not At All	–0.193	0.095	0.041	0.824	0.685	0.992
<b>Frequency of watching Tv</b>	At least once a week (RC)	–	–	–		–	–
	Less Than Once a Week	–0.041	0.157	0.794	0.960	0.706	1.306
	Not At All	–0.069	0.093	0.462	0.934	0.777	1.121
<b>Owns a mobile telephone</b>	Yes (RC)	–	–	–		–	–
	No	–0.060	0.072	0.407	0.942	0.818	1.085
<b>Wealth</b>	Poor (RC)	–	–	–		–	–
	Second	–0.093	0.085	0.274	0.911	0.771	1.077

(Continued)

Table 2 (Continued).

Variables	Levels	Estimate	S.E	P-value	AOR	95% CI	
						Lower Bound	Upper Bound
	Middle	0.067	0.103	0.517	1.069	0.873	1.308
	Fourth	0.157	0.105	0.133	1.170	0.953	1.437
	Highest	0.248	0.111	0.025	1.282	1.031	1.593
Ever used Internet	Yes (RC)	–	–	–		–	–
	No	–0.170	0.090	0.059	0.843	0.707	1.007
Employment status	Yes (RC)	–	–	–		–	–
	No	–0.191	0.090	0.035	0.827	0.692	0.987

**Abbreviations:** S.E, Standard Error; AOR, Adjusted Odds Ratio; CI, Confidence Interval; RC, Reference category.

Regarding regional differences, compared to women in Awdal, those in Gedo have 61% lower odds of having higher comprehensive knowledge of HIV. Similarly, women in Lower Juba have 48% lower odds of possessing higher comprehensive knowledge of HIV. In terms of residence, compared to urban women, those living in nomadic settings have 39% lower odds of having higher comprehensive knowledge of HIV. Education level also plays a significant role. Compared to women with no education, those with primary education have 1.5 times higher odds of possessing higher comprehensive knowledge of HIV (AOR = 1.50, 95% CI: 1.29, 1.74). Women with secondary education have nearly twice the odds (AOR = 1.89, 95% CI: 1.44, 2.47), and those with higher education have over three times the odds (AOR = 3.04, 95% CI: 1.85, 5.00).

Regarding wealth, women in the highest wealth quintile have 1.28 times higher odds of possessing higher comprehensive knowledge of HIV compared to those in the poorest quintile. Employment status also influences knowledge levels. Compared to employed women, those who are not employed have 17% lower odds of having higher comprehensive knowledge of HIV. Finally, women who do not listen to the radio at all have 18% lower odds of having higher comprehensive knowledge of HIV compared to those who listen at least once a week.

## Discussion

The aim of the current study is to examine the impact of various sociodemographic factors on comprehensive HIV knowledge among currently married women in Somalia. The analysis identified several key variables—age, education, residence, social media (radio) and wealth—as significant determinants of comprehensive HIV knowledge. These findings are consistent with similar research conducted in other SSA countries. In this study, 16.2% of participants had low comprehensive knowledge of HIV, 28.7% had medium knowledge, and 55.1% had high knowledge. However, the 55.1% of respondents with high knowledge is lower than the levels reported in previous studies from other SSA countries,<sup>26</sup> such as Zimbabwe<sup>27</sup> and Tanzania,<sup>28</sup> where higher levels of HIV knowledge were observed.

The results indicate that women aged 30–34 and 35–39 are more likely to have a strong comprehensive understanding of HIV compared to women aged 15–19. This finding aligns with previous studies conducted in Ethiopia, and Liberia, which have shown that older women generally have a better understanding of HIV than younger women.<sup>2,24,26</sup> This study also found that women with primary, secondary, and higher education were more likely to have a comprehensive understanding of HIV compared to women with no formal education. This finding is consistent with previous studies conducted in Liberia,<sup>2</sup> Uganda,<sup>29</sup> Ethiopia<sup>30</sup> and, Nigeria and the Democratic Republic of Congo,<sup>31</sup> which also observed that women with higher education had a better understanding of HIV than those with no formal education. Higher education enhances women's exposure to and comprehension of HIV information.<sup>32</sup>

Moreover, the study found that women from communities with higher wealth levels were more likely to have a comprehensive understanding of HIV compared to those from poorer communities. This finding aligns with previous



studies conducted in Liberia<sup>2</sup> and Ethiopia<sup>30</sup> which have shown that women in higher wealth quintiles (richest) generally have a better understanding of HIV than those in lower wealth quintiles (poorest). One possible explanation is that higher wealth increases access to education and diverse health information, including HIV-related content.<sup>33</sup> Furthermore, our study found that women who do not listen to the radio have 18% lower odds of possessing a higher level of comprehensive knowledge about HIV (medium or high versus low) compared to those who listen at least once a week. This finding aligns with similar research, which shows that women with access to mass media tend to have better HIV knowledge compared to those without. Although these studies were conducted in different populations, such as youth and females, our results are consistent with several studies<sup>15–17</sup> from Sub-Saharan Africa. Television, and radio are crucial tools for disseminating essential information to the public. Lastly, our study found that women residing in urban areas are more likely than those living in nomadic regions to possess a higher level of comprehensive knowledge about HIV (medium or high versus low). This disparity can be attributed to the better access to education, healthcare, and mass media in urban areas, which provides more opportunities to acquire information about HIV. This finding is consistent with similar research conducted in various African countries<sup>18,19</sup> including Ethiopia,<sup>30</sup> Rwanda,<sup>20</sup> and other SSA nations,<sup>1,34</sup> which also indicates that urban women tend to have greater awareness and understanding of HIV compared to their counterparts in nomadic regions.

It is evident from our discussion that a high proportion of women possess low knowledge about HIV transmission, influenced by several factors, including limited educational access, reduced media exposure, socioeconomic challenges, and geographic disparities. Women who are uneducated, live in rural or nomadic areas, have less access to social media, and belong to poorer socioeconomic backgrounds tend to demonstrate lower levels of knowledge about HIV transmission.

This study has both strengths and limitations. A major strength is its use of nationally representative data from the SDHS 2018–19, which provides robust insights into comprehensive knowledge of HIV among currently married women in Somalia. However, the findings may not be fully representative of the entire Somali population, as the study excludes the Lower Shabelle and Middle Juba regions and two strata of the Bay region due to security issues. Potential recall bias is also a limitation, as participants' responses are self-reported and may be influenced by memory inaccuracies or social desirability. Despite this limitation, this study is pioneering in exploring the impact of various sociodemographic factors on comprehensive knowledge of HIV among currently married women in Somalia. The use of national DHS data and a substantial sample size enhances the reliability of the findings.

## Conclusion

The purpose of this study was to explore the impact of various sociodemographic factors on comprehensive knowledge of HIV among currently married women in Somalia. The analysis revealed several significant variables affecting HIV knowledge. Specifically, age, education, residence, and wealth were found to significantly influence the level of comprehensive knowledge. Women in older age groups, those with higher levels of education, and those in higher wealth quintiles exhibited greater comprehensive knowledge of HIV.

Regionally, women in Gedo, and Lower Juba had lower odds of possessing comprehensive knowledge compared to those in Awdal. Additionally, women residing in nomadic settings and those who did not listen to the radio were less likely to have higher HIV knowledge.

Based on these findings, policymakers should implement targeted educational interventions for women, particularly those who are younger or have lower levels of formal education, to enhance their understanding of HIV transmission and prevention. Additionally, robust health communication strategies utilizing platforms like radio and television are essential for disseminating critical information in rural and underserved regions. Addressing socioeconomic disparities through empowerment initiatives can further increase awareness and access to health information and services. Moreover, localized interventions, including community health programs and mobile health initiatives, are vital to ensure equitable access to HIV resources, especially in regions with lower knowledge levels, such as Gedo, and Lower Juba.



## Data Sharing Statement

The study utilizes secondary data from the SDHS 2018–19, a publicly available dataset that can be requested from the Somali National Bureau of Statistics (SNBS) at this link (<https://microdata.nbs.gov.so/index.php/catalog/50>).

## Ethical Considerations

The study received ethical approval from the Human Research Ethics Review Committee at Jamhuriya University of Science and Technology's Research & Development Office (Reference: JUREC0091/FMHS00306/052024). It was conducted in accordance with the principles and guidelines outlined in the Declaration of Helsinki.

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## Disclosure

The authors report no conflicts of interest in this work.

## References

1. Mohamud LA, Hassan AM, Nasir JA. Determinants of HIV/Aids knowledge among females in Somalia: findings from 2018 to 2019 SDHS data. *HIV/AIDS Res Palliat Care*. 2023;15:435–444. doi:10.2147/HIV.S414290
2. Seifu BL, Eshun G, Tesema GA, Kyei-Arthur F. Comprehensive knowledge about HIV/AIDS and associated factors among reproductive age women in Liberia. *BMC Public Health*. 2024;24(1):1–10. doi:10.1186/s12889-024-18105-9
3. Tsegaw M, Mulat B, Shitu K, Barrow A. Comprehensive HIV knowledge and associated factors among reproductive-age women: analysis of the Gambia Demographic and Health Survey 2019/2020. *Health Res Policy Syst*. 2024;22(1):1–9. doi:10.1186/s12961-024-01128-4
4. KFF. The Global HIV/ AIDS Epidemic. 2024. Available from: <https://www.kff.org/global-health-policy/fact-sheet/the-global-hiv-aids-epidemic/>. Accessed December 14, 2024.
5. World Health Organization. Global HIV Programme. Key facts HIV. HIV data and statistics. World Health Organization; 2022.
6. World Health Organization. HIV and AIDS. 2024. Available from: <https://www.who.int/news-room/fact-sheets/detail/hiv-aids>. Accessed December 14, 2024.
7. Joint United Nations Programme on HIV/AIDS (UNAIDS). Fact sheet 2024 - Latest global and regional HIV statistics on the status of the AIDS epidemic. 2024. Available from: <https://www.unaids.org/en>. Accessed December 14, 2024.
8. Organização Mundial de Saúde. World Health Statistics 2022 (Monitoring Health of the SDGs). 2022.
9. Unfpa. So many mouths to feed: addressing high fertility in Famine-Stricken Somalia. 2012. Available from: <https://www.unfpa.org/news/so-many-mouths-feed-addressing-high-fertility-famine-stricken-somalia>. Accessed 12 April, 2024.
10. Morrison J, Malik SMMR. Population health trends and disease profile in Somalia 1990–2019, and projection to 2030: will the country achieve sustainable development goals 2 and 3?. *BMC Public Health*. 2023;23(1):66. doi:10.1186/s12889-022-14960-6
11. Aden JA, Ahmed HJ, Östergren PO. Causes and contributing factors of maternal mortality in Bosaso District of Somalia. A retrospective study of 30 cases using a Verbal Autopsy approach. *Glob Health Action*. 2019;12(1):1672314. doi:10.1080/16549716.2019.1672314
12. Gele AA, Shrestha M, Sheikh NS, Qureshi SA. Pregnant and powerless: exploring barriers to contraceptive use among women in Mogadishu, Somalia. *Health Serv Res Manag Epidemiol*. 2022;9:233339282211170.
13. Mohamud LA Understanding the fertility transition in Somalia through proximate determinants of fertility. GC University Lahore; 2023. Available from: [https://www.researchgate.net/publication/383948351\\_Understanding\\_The\\_Fertility\\_Transition\\_In\\_Somalia\\_Through\\_Proximate\\_Determinants\\_Of\\_Fertility](https://www.researchgate.net/publication/383948351_Understanding_The_Fertility_Transition_In_Somalia_Through_Proximate_Determinants_Of_Fertility). Accessed December 14, 2024.
14. UNAIDS. HIV/AIDS Somalia. 2023. Available from: <https://www.unaids.org/en/regionscountries/countries/somalia>. Accessed December 14, 2024.
15. Fenny AP, Crentsil AO, Asuman D. Determinants and distribution of comprehensive HIV/AIDS knowledge in Ghana. *Glob J Health Sci*. 2017;9(12):32. doi:10.5539/gjhs.v9n12p32
16. Mumtaz GR, Hilmi N, Majed EZ, Abu-Raddad LJ. Characterising HIV/AIDS knowledge and attitudes in the Middle East and North Africa: systematic review and data synthesis. *Glob Public Health*. 2020;15(2):275–298. doi:10.1080/17441692.2019.1668452
17. Guure C, Owusu S, Dery S, Da-Costa Vroom FB, Afagbedzi S. Comprehensive Knowledge of HIV and AIDS Among Ghanaian Adults from 1998 to 2014: A Multilevel Logistic Regression Model Approach. *Scientifica*. 2020;2020. doi:10.1155/2020/7313497
18. Corno L, De Walque D. Socioeconomic determinants of stigmatization and HIV testing in Lesotho. *AIDS Care*. 2013;25(Suppl 1):S108–S113. doi:10.1080/09540121.2012.736937
19. Stephenson R. A community perspective on young people's knowledge of HIV/AIDS in three African countries. *AIDS Care*. 2009;21(3):378–383. doi:10.1080/09540120802241889

20. Deynu M, Nutor JJ. Determinants of comprehensive knowledge on mother-to-child transmission of HIV and its prevention among childbearing women in Rwanda: insights from the 2020 Rwandan demographic and health survey. *BMC Public Health*. 2023;23(1):1–14. doi:10.1186/s12889-022-14925-9
21. Mohamud LA, Nasir JA. Role of proximate determinants on the fertility rate among currently married women in Somalia via Bongaart's model: findings from 2018–19 SDHS data. *Sci Rep*. 2024.
22. Iqbal S, Maqsood S, Zafar A, Zakar R, Zakar MZ, Fischer F. Determinants of overall knowledge of and attitudes towards HIV/AIDS transmission among ever-married women in Pakistan: evidence from the Demographic and Health Survey 2012–13. *BMC Public Health*. 2019;19(1):1–14. doi:10.1186/s12889-019-7124-3
23. Nwosu CM Level of education and comprehensive knowledge about HIV/AIDS among women aged 15–49 years in Southern Nigeria. 2024.
24. Terefe B, Jember MM, Liyew B. Comprehensive knowledge of mother-to-child HIV/AIDS transmission, prevention, and associated factors among reproductive-age women in East Africa: insights from recent demographic and national health surveys. *BMC Womens Health*. 2024;24(1):1–9. doi:10.1186/s12905-024-03173-1
25. Akbar N, Aslam M, Holm J, Ghulam P. The 2022 Pakistani references from birth to 60 months for length/height, weight and body mass index. *Acta Paediatrica*. 2023;112:1249–1258. doi:10.1111/apa.16770
26. Terefe B, Techane MA, Assimamaw NT. Comprehensive knowledge, attitudes, behaviors, and associated factors of HIV/AIDS in Gondar City public health facilities among HIV testing and counselling service users, Northwest Ethiopia, 2022; an ordinal logistic regression analysis. *HIV/AIDS Res Palliat Care*. 2023;15:713–726. doi:10.2147/HIV.S441447
27. Masaka A, Dikeleko P, Moleta K, et al. Determinants of comprehensive knowledge of mother to child transmission (MTCT) of HIV and its prevention among Zimbabwean women: analysis of 2015 Zimbabwe Demographic and Health Survey. *Alexandria J Med*. 2019;55(1):68–75. doi:10.1080/20905068.2019.1667114
28. Wangwe PJT, Nyasinde M, Charles DSK. Counselling at primary health facilities and level of knowledge of antenatal attendees and their attitude on prevention of mother to child transmission of HIV in Dar-es Salaam, Tanzania. *Afr Health Sci*. 2013;13(4):914–919. doi:10.4314/ahs.v13i4.8
29. Estifanos TM, Hui C, Tesfai AW, et al. Predictors of HIV/AIDS comprehensive knowledge and acceptance attitude towards people living with HIV/AIDS among unmarried young females in Uganda: a cross-sectional study. *BMC Womens Health*. 2021;21(1):1–13. doi:10.1186/s12905-021-01176-w
30. Agegnehu CD, Geremew BM, Sisay MM, et al. Determinants of comprehensive knowledge of HIV/AIDS among reproductive age (15–49 years) women in Ethiopia: further analysis of 2016 Ethiopian demographic and health survey. *AIDS Res Ther*. 2020;17(1). doi:10.1186/S12981-020-00305-Z
31. Gebremedhin SA, Youjie W, Tesfamariam EH. Predictors of HIV/AIDS knowledge and attitude among young women of Nigeria and Democratic Republic of Congo: cross-sectional study. *J AIDS Clin Res*. 2017;8(3). doi:10.4172/2155-6113.1000677
32. Mahande MJ, Phimemon RN, Ramadhani HO. Factors associated with changes in uptake of HIV testing among young women (aged 15–24) in Tanzania from 2003 to 2012. *Infect Dis Poverty*. 2016;5(1):1–12. doi:10.1186/s40249-016-0180-3
33. Marmot M. The influence of income on health: views of an epidemiologist. *Health Aff*. 2002;21(2):31–46. doi:10.1377/hlthaff.21.2.31
34. Teshale AB, Yeshaw Y, Alem AZ, et al. Comprehensive knowledge about HIV/AIDS and associated factors among women of reproductive age in sub-Saharan Africa: a multilevel analysis using the most recent demographic and health survey of each country. *BMC Infect Dis*. 2022;22(1):1–10. doi:10.1186/S12879-022-07124-9/TABLES/5

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