

# Uptake of HIV Testing Services Among Refugee Men in Kiryandongo Refugee Settlement Camp, Mid-Western Uganda.

## ABSTRACT

**Aims:** HIV testing is a critical checkpoint to late diagnosis and delayed treatment. However, utilization of HIV testing services has not yet reached the desired target, especially for men. This study aimed to determine the level of uptake of HIV testing services and the associated factors among refugee men in the Kiryandongo Refuge Settlement Camp.

**Study design:** Cross-sectional **by mixed methods.**

**Methodology:** The study was conducted by mixed methods. A total of 422 men >18 years were selected using systematic random sampling. Interview administered semi-structured - questionnaires and informant interview guides were used to collect quantitative and qualitative data respectively.

**Results:** The level of uptake of HIV testing services was 32%. **Key factors negatively associated with the testing included social-cultural status ( $P=0.006$ , AOR=3.80) disclosure of positive results ( $P=0.006$ , AOR=0.29), awareness ( $P=0.002$ , AOR=0.14 and  $P=0.000$ , AOD=0.08) respectively, unemployment ( $P=0.015$ , AOR=0.17), religion ( $P=0.043$ , AOD=0.37) and multiple sexual partners ( $P=0.033$ , AOR=0.23).**

**Conclusion:** The level of uptake of HIV testing services among refugee men in the Kiryandongo refugee settlement camp is significantly lower than the national mark. **Targeted testing strategies and sensitization are critical to address the negatively associated factors to inform public health policies accordingly.**

**Keywords:** **HIV Testing services, Kiryandongo Settlement Camp, Refugee Men Uptake**

## 1. INTRODUCTION

By the end of 2023, over 39 million people were living with HIV globally, 65% of whom are in the WHO African Region [<https://www.who.int/news-room/fact-sheets/detail/hiv-aids>], and of these, over 80% of the men had tested. In Uganda, over 1.4 million people are living with HIV, and of these, (1,289,028, 92%) know their status[1].

Three-quarters of the world's refugees are in low- and middle-income countries. [<https://www.unhcr.org/refugee-statistics/>]. Currently, the refugees in Uganda are 1,673,811, and of these, (119,219, 6.9%) are hosted in the Kiryandongo settlement camp [<https://data.unhcr.org/en/country/uga>].

Vulnerable populations like the refugees face both the risk of HIV infection and barriers to HIV testing and as such, only 1.1% of the refugees in Uganda are men living with HIV[2]. Men have a lower tendency to take HIV testing services as compared to women[3, 4]. In as much, inhabitants of refugee camps have peculiar challenges and barriers to HIV testing[5]. While limited data is available on refugee men-specific barriers to HIV testing, the existing literature mentions challenges including refugees tending to prioritize day-to-day survival matters such as food, safety, and shelter over their future health[5]. Therefore, understanding what makes HIV testing possible and impossible can inform interventions to increase HIV testing among refugee men. This study, thus, aimed to establish the level of uptake of HIV testing and the factors associated with HIV testing among refugee men in the Kiryandongo refugee settlement camp to inform targeted interventions and policies to improve HIV testing among the men in such settlements.

## 2. METHODOLOGY

### 2.1 Study area

Kiryandongo refugee camp is located in Bweyale town council, Kibanda Health Sub-District in Kiryandongo District, Mid-western Uganda with a population of 119,219. The settlement is divided into 19 clusters; A, B, C, D, E, F, K, T, S, M, R, I, O, Q, L, N, J, H, and G. The camp has three health facilities; Panyadoli health Centre III, Panyadoli hills health Centre II and Nyakadoti health centre II. (<https://data.unhcr.org/en/country/uga>).

**2.1.1 Study design:** This was a cross-sectional study of mixed methods.

**2.1.1.1 Study population:** This study focused on refugee men >18 years old, living and receiving care at the health facilities in Kiryandongo Refugee Settlement Camp

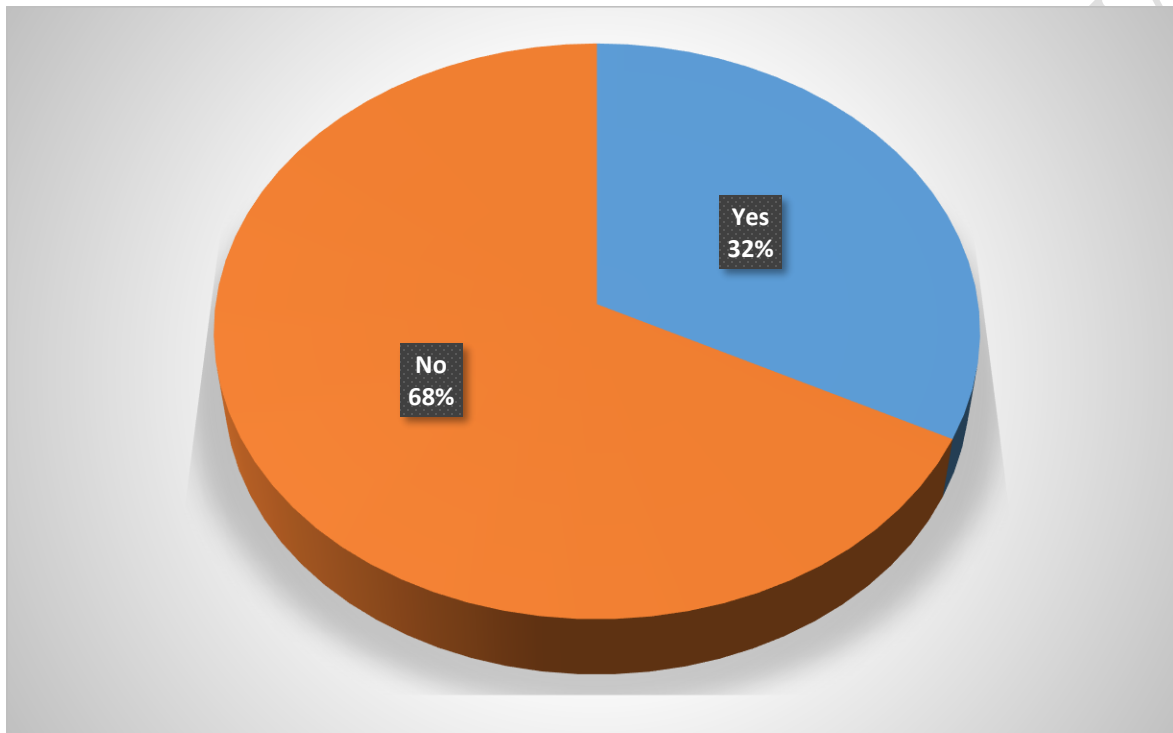
**2.1.1.1.1 Sampling technique:** The eligible participants were enrolled using a systematic random sampling method.

### 3. RESULTS AND DISCUSSION

#### 3.1 The level of uptake of HIV Testing services

Figure 1 shows that uptake of HIV testing services was almost one-third (32%, n=422)

Figure 1: Level of HIV testing services uptake



#### 3.1.1 Factors Associated with the uptake of HIV testing services at bivariate analysis

##### 3.1.1.1 Socio-demographic factors

At bivariate binary logistic analysis, the age, occupation, religion, sexual partners, and distance from the health facility were significantly associated with the uptake of HIV testing services as shown in Table 1, below. Men who were aged 31-45 ( $P=0.01$ ,  $COR=0.55$  (0.34-0.89),  $CI=95\%$ ), 46-60 ( $P=0.000$ ,  $COR=0.15$  (0.07-0.34),  $CI=95\%$ ), and 61-75 ( $P=0.009$ ,  $COR=0.07$  (0.01-0.51),  $CI=95\%$ ) were less likely to uptake the HIV testing services. Men who were Pentecostal ( $P=0.001$ ,  $COR=4.03$  (1.86-9.94),  $CI=95\%$ ) were 4.03 times more likely to uptake HIV testing services. However, men who were Anglican ( $P=0.03$ ,  $COR=0.58$  (0.36-0.95),  $CI=95\%$ ) and those who were SDA ( $P=0.028$ ,  $COR=0.41$  (0.19-0.91),  $CI=95\%$ ) were 0.58 time and 0.41 times respectively less like to uptake the HIV testing services than any other man in the reference category. Men who had 4-6 sexual partners ( $P=0.000$ ,  $COR=0.10$  (0.05-0.22),  $CI=95\%$ ) were 0.1 times less

likely to uptake the HIV testing services than any other man in the reference category. Men who lived at a distance of more than 5km from the health facility ( $P=0.000$ ,  $COR= 0.03$  (0.01-0.07),  $CI=95\%$ ) were 0.03 times less likely to uptake the HIV testing services than any other man in the reference category.

**Table 1: Socio-demographic factors associated with the uptake of the HIV testing service**

Factors	Uptake of HIV testing				Crude Odds Ratios (COR) at 95% Confidence Interval (CI)	P-values
	Yes (137)		No (285)			
	F	%	F	%		
<b>Age group</b>						
18-30	89	64.87	113	39.65		
31-45	40	29.20	93	32.63	0.55 (0.34-0.89)	<b>0.010*</b>
46-60	7	5.11	60	21.05	0.15 (0.07-0.34)	<b>0.000*</b>
61-75	1	0.73	19	6.67	0.07 (0.01-0.51)	<b>0.009*</b>
<b>Occupation</b>						
Formal	24	17.52	29	10.18		
Informal	87	63.50	176	61.75	0.59 (0.33-1.09)	0.092
Unemployed	26	18.98	80	28.07	0.39 (0.20-0.79)	<b>0.009*</b>
<b>Marital status</b>						
Single	29	21.71	58	20.35		
Married	96	70.07	216	75.79	0.89 (0.54-1.48)	0.649
Separated/divorced	2	1.46	8	2.81	0.50 (0.10-2.51)	0.399
Widowed	10	3.70	3	1.05	6.67 (0.170-26.11)	0.006
<b>Level of education</b>						
Never educated	22	16.06	45	15.79		
Primary	45	32.85	127	44.56	0.72 (0.39-1.34)	0.303
Secondary	54	39.42	98	34.39	1.13 (0.61-2.07)	0.700
Tertiary	16	11.65	15	5.26	2.81 (0.91-5.21)	0.079
<b>Religion</b>						
Catholic	64	46.72	118	41.40		
Anglican	34	24.82	108	37.89	0.58 (0.36-0.95)	<b>0.030*</b>
Save/Pentecostal	21	15.33	9	3.16	4.03 (1.86-9.94)	<b>0.001*</b>
Muslim	9	6.57	10	3.51	1.65 (0.64-4.29)	0.296
SDA	9	6.57	40	14.04	0.41 (0.19-0.91)	<b>0.028*</b>
<b>Sexual partners</b>						
0-3	120	87.59	159	55.79		
4-6	8	5.84	105	36.84	0.10 (0.05-0.22)	<b>0.000*</b>
7-9	9	6.57	21	7.37	0.57 (0.25-1.28)	0.174
<b>Distance from the health facility</b>						
Less a kilometer	57	41.61	63	22.11		
More than 1km but less than 5km	74	55.47	75	26.32	1.12 (0.69-1.81)	0.643
More than 5km	4	2.92	147	51.58	0.03 (0.01-0.07)	<b>0.000*</b>

### 3.1.1.1.1 Socio-cultural factors

Table 2 shows that the respondent's ability to disclose positive HIV status and negative HIV status, whether a man is wrong or not, a person to pay bills when the respondent is unable to, and the substance taken by the respondents were significantly associated with the uptake of the HIV testing services.

**Table 2: Socio-cultural factors associated with the uptake of the HIV testing services**

Variable	Uptake of HIV testing				Crude Odds Ratios (COR) at 95% Confidence Interval (CI)	P-values
	Yes (137)		No (285)			
	F	%	F	%		
<b>Respondent able to disclose HIV status in case it is negative</b>						
Yes	112	81.25	42	14.74		
No	25	18.25	243	85.26	0.04 (0.02-0.067)	<b>0.000*</b>
<b>In your culture, a man is always;</b>						
Right	43	31.39	212	74.39		
Wrong/somehow right	94	68.61	73	25.65	6.34 (4.06-9.94)	<b>0.000*</b>
<b>A person to come in if the respondent is unable to pay bills</b>						
Parents	60	43.80	74	25.96		
Brother	18	13.14	91	31.93	0.24 (0.13-0.45)	<b>0.000*</b>
Sister	11	8.03	13	4.56	1.04 (0.44-2.60)	0.924
Wife	22	16.06	34	11.93	0.80 (0.42-1.51)	0.486
Friends	5	3.65	52	18.25	0.12 (0.04-0.32)	<b>0.000*</b>
None	4	2.92	6	2.11	0.82 (0.22-3.05)	0.770
Others*6	17	12.41	15	5.26	1.40 (0.64-3.02)	0.396
<b>Use of substance</b>						
Yes	58	42.34	243	85.26		
No	79	57.66	42	14.74	7.88 (4.92-12.63)	<b>0.000*</b>

### 3.1.1.1.1.1 Knowledge and attitude towards the uptake of HIV testing services

Table 3 indicates that awareness about HIV testing services, being educated on HIV/AIDs, a place to go for HIV tests, and having a thought that HIV testing is important are significantly associated with the uptake of HIV testing services among men.

**Table 3: Association between uptake of HIV testing and knowledge and attitude towards HIV testing**

Factor	Uptake of HIV testing				Crude Odds Ratios (COR) at 95% Confidence Interval (CI)	P-values
	Yes (137)		No (285)			
	F	%	F	%		
<b>Awareness of the respondent about HIV testing services in the health facilities in the settlement camp</b>						
Yes	130	94.89	99	34.74		
No	7	5.11	186	65.25	0.03 (0.01-0.06)	<b>0.000*</b>

<b>The respondent has never been educated on HIV/AIDs.</b>						
Yes	124	90.51	85	29.82		
No	13	9.49	200	70.18	0.04 (0.02-0.08)	<b>0.000*</b>
<b>A place to go when the respondent wants to test for HIV/AIDs</b>						
Health facility	119	86.86	89	31.23		
Don't know	8	5.84	189	66.32	0.03 (0.01-0.07)	<b>0.000*</b>
Wait for mass testing to take place	7	5.11	4	1.04	1.30 (0.37-4.68)	0.675
Others*2	3	2.19	3	1.05	0.74 (0.37-3.79)	0.726
<b>Do you think HIV testing is important?</b>						
Yes	127	92.70	41	14.39		
No	10	7.30	244	85.61	0.01 (0.01-0.03)	<b>0.000*</b>

### 3.1.1.1.1.1 Factors associated with the uptake of HIV testing services at multivariate analysis

After adjusting for the confounding factors at multilevel binary logistic regression analysis, occupation, religion, sexual partners, ability to disclose positive HIV status, a man being right or not, education on HIV/AIDs, and thought whether HIV testing is important maintained their statistical significance as shown in table 4 below. Unemployed men ( $P=0.015$ , AOR=0.17 (0.04-0.71), CI=95%) were 0.17 times less likely to uptake the HIV testing services. Men who were Anglican ( $P=0.043$ , AOD=0.37 (0.14-0.97), CI=95%) were 0.37 times less likely to uptake HIV testing services compared to men from any other religion. Men who had 4-6 sexual partners ( $P=0.033$ , AOR=0.23 (0.06-0.89), CI=95%) were 0.23 times less likely to uptake HIV testing than any other men in the reference category. Men who were unable to disclose their HIV status when positive ( $P=0.006$ , AOR=0.29 (0.12-0.69), CI=95%) were 0.29 times less likely to uptake the HIV testing services compared to men who were able to disclose their HIV status. Men who thought that the man was always wrong ( $P=0.006$ , AOR=3.80 (1.46-9.88), CI=95%) were 3.80 times less likely to uptake HIV testing services than men who thought that a man is always right. Men who had never been educated on HIV/AIDs ( $P=0.002$ , AOR=0.14 (0.04-0.49), CI=95%) were 0.14 less likely to uptake HIV testing services than men who had ever been educated on HIV/AIDs.

Men who never thought that HIV testing was important ( $P=0.000$ , AOD=0.08 (0.02-0.21), CI=95%) were 0.08 times less likely to uptake HIV services compared to those who thought that HIV testing was important.

**Table 4: Factors associated with the uptake of HIV testing services at multivariate analysis**

Factors	Uptake of HIV testing				Adjusted Odds Ratios (COR) at 95% Confidence Interval (CI)	P-values
	Yes (137)		No (285)			
	F	%	F	%		
<b>Age group</b>						
18-30	89	64.87	113	39.65		
31-45	40	29.20	93	32.63	0.86 (0.29-2.54)	0.779
46-60	7	5.11	60	21.05	0.97 (0.20-4.76)	0.966

61-75	1	0.73	19	6.67	0.36 (0.01-10.00)	0.549
<b>Occupation</b>						
Formal	24	17.52	29	10.18		
Informal	87	63.50	176	61.75	0.60 (0.17-2.15)	0.433
Unemployed	26	18.98	80	28.07	0.17 (0.04-0.71)	<b>0.015*</b>
<b>Religion</b>						
Catholic	64	46.72	118	41.40		
Anglican	34	24.82	108	37.89	0.37 (0.14-0.97)	<b>0.043*</b>
Save/Pentecostal	21	15.33	9	3.16	0.39 (0.09-1.69)	0.208
Muslim	9	6.57	10	3.51	4.88 (4.81-49.53)	0.180
SDA	9	6.57	40	14.04	0.41 (0.10-1.76)	0.233
<b>Sexual partners</b>						
0-3	120	87.59	159	55.79		
4-6	8	5.84	105	36.84	0.23 (0.06-0.89)	<b>0.033*</b>
7-9	9	6.57	21	7.37	4.14 (0.67-25.44)	0.126
<b>Distance from the health facility</b>						
Less a kilometer	57	41.61	63	22.11		
More than 1km but less than 5km	74	55.47	75	26.32	1.07 (0.45-2.57)	0.874
More than 5km	4	2.92	147	51.58	0.21 (0.04-1.08)	0.062
<b>Ability to disclose status in case it is positive</b>						
Yes	105	75.64	20	7.02		
No	32	23.36	265	92.98	0.29 (0.12-0.69)	<b>0.006*</b>
<b>In your culture, a man is always;</b>						
Right	43	31.39	212	74.39		
Wrong/somehow right	94	68.61	73	25.65	3.80 (1.46-9.88)	<b>0.006*</b>
<b>A person to come in if the respondent is unable to pay bills</b>						
Parents	60	43.80	74	25.96		
Brother	18	13.14	91	31.93	0.33 (0.10-1.06)	0.063
Sister	11	8.03	13	4.56	0.97 (0.16-6.03)	0.973
Wife	22	16.06	34	11.93	1.18 (0.30-4.61)	0.813
Friends	5	3.65	52	18.25	0.19 (0.03-1.26)	0.085
None	4	2.92	6	2.11	4.88 (0.27-89.72)	0.286
Others*6	17	12.41	15	5.26	1.27 (0.24-6.59)	0.777
<b>Use of substance</b>						
Yes	58	42.34	243	85.26		
No	79	57.66	42	14.74	1.03 (0.40-2.68)	0.944
<b>Awareness of HIV testing services</b>						
Yes	130	94.89	99	34.74		
No	7	5.11	186	65.25	0.93 (0.18-4.82)	0.929
<b>Educated about HIV/AIDS</b>						
Yes	124	90.51	85	29.82		
No	13	9.49	200	70.18	0.14 (0.04-0.49)	<b>0.002*</b>
<b>A place to go when the respondent wants to test for HIV/AIDS</b>						
Health facility	119	86.86	89	31.23		

Don't know	8	5.84	189	66.32	1.48 (0.31-7.09)	0.625
Wait for mass testing to take place	7	5.11	4	1.04	0.72 (0.10-5.29)	0.749
Others*2	3	2.19	3	1.05	0.88 (0.07-10.64)	0.921
<b>Do you think HIV testing is Important?</b>						
Yes	127	92.70	41	14.39		
No	10	7.30	244	85.61	0.08 (0.02-0.21)	<b>0.000*</b>

### 3.2 DISCUSSION

In this study, the level of uptake of HIV testing services among the men was 32% which is far lower than the national standard of 92%[1]. This result is even extremely lower than (84%) of a similar study conducted in central Uganda[6]. This discrepancy could be due to unique study settings. The lowest level of uptake of the HIV testing services (32%) we report, is indeed a public health concern and a challenge to the UNAID fast-track target[7]. It is important to note, nonetheless, that restricted populations such as refugee camps are not defined as key populations in Uganda.

Our results show that unemployed men ( $P=0.015$ , AOR=0.17 (0.04-0.71), CI=95%) were 0.17 times less likely to uptake HIV testing services. This finding is similar to previous reports from in other African countries[8, 9]. Unemployment is a potential risk for HIV infection for, most people in that status are vulnerable to and tend to engage in risky behaviors either for survival or consolation and comfort.

A previous study in central Uganda indicated that Catholics were more likely to have ever tested for HIV in their lifetime [6]. We report that Anglican Christians were less likely to accept HIV testing compared to their counterparts. Our finding is in phase with the previous reports highlighted above. Different religions differ in doctrines which influence the practices and life choices of the respective members.

Our results show that men who had 4-6 sexual partners ( $P=0.033$ , AOR=0.23 (0.06-0.89), CI=95%) were 0.23 times less likely to uptake HIV testing than their counterparts. Having multiple sexual partners has been considered as a characteristic of risky sexual behavior which puts people at risk of contracting sexually transmitted diseases. Previous related studies reported that men who exhibit risky sexual behavior were more likely to get tested for HIV[10, 11]. This was probably because men who have risky sexual behavior are apprehensive about their HIV test results and are more curious to know their HIV status compared to men without sexual risky behavior. However, this was not the case with the current study probably because the setting has restricted movements in and out of the camp, and most of the men in the camp perceived having multiple sexual partners as normal.

Men who were unable to disclose their HIV status when positive ( $P=0.006$ , AOR=0.29 (0.12-0.69), CI=95%) were 0.29 times less likely to uptake the HIV testing services. Our finding agrees with previous reports[9] It is established that fear of HIV-related stigma is a critical barrier to HIV testing. Evidence has shown that

there is a need to set up strategies that enhance the disclosure of HIV status to partners at both the individual level and facility level[8].

This study reports that men who thought that the man is always wrong ( $P=0.006$ , AOR=0.29 (0.12-0.69), CI=95%) were 3.80 times more likely to uptake HIV testing services than men who thought that a man is always right. Men who perceived that they were not always right perhaps easily accepted the advice from the health workers which increased their likelihood of up taking HIV testing services. This is reported for the first time.

We report that men who had never been educated on HIV ( $P=0.002$ , AOR=0.14 (0.04-0.49), CI=95%) were 0.14 less likely to uptake HIV testing services. Previous studies among youths in Sub-Saharan Africa reported that those with comprehensive knowledge of HIV were more likely to be tested for HIV[10, 11]. Being knowledgeable and knowing the benefits of treatment enhances the uptake of HIV testing services. In addition, it minimizes misconceptions about HIV which has been reported to be possibly hurting HIV testing and counseling.

Men who never thought that HIV testing was important ( $P=0.000$ , AOR=0.08 (0.02-0.21), CI=95%) were 0.08 times less likely to uptake HIV services. This finding is in phase with previous reports[10, 11]. This could be linked to the low perception of risk as most of the respondents perceived that HIV infection is basically for Ugandans and therefore, it cannot affect them. Therefore, putting more emphasis on risk communication within the refugee settlement could improve the uptake of HIV testing services among men in the settlement.

## CONCLUSION

The level of uptake of HIV testing services among refugee men in the Kiryandongo refugee settlement camp is significantly lower than the national mark ever recorded in Uganda. Social–demographic and cultural as well awareness factors are attributed to the level of uptake. Targeted testing strategies and sensitization are critical to address the negatively associated factors to inform public health policies accordingly.

## ETHICAL CONSIDERATIONS

The study was reviewed and approved by the Uganda Christian University Research Ethics Committee, REC Number: UG-REC-026.

### Disclaimer (Artificial intelligence)

Option 1: Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

## REFERENCES

1. <Uganda - HIV-AIDS-factsheet-2023.pdf>.
2. <Uganda Refugee - RUPHIA - 2023.pdf>.
3. <Magala et al.pdf>.
4. Quinn, C., et al., Who are the missing men? Characterizing men who never tested for HIV from population-based surveys in six sub-Saharan African countries. *J Int AIDS Soc*, 2019. **22**(10): p. e25398.
5. O'Laughlin, K.N., et al., Feasibility and acceptability of home-based HIV testing among refugees: a pilot study in Nakivale refugee settlement in southwestern Uganda. *BMC Infect Dis*, 2018. **18**(1): p. 332.
6. Nangendo, J., et al., Prevalence, associated factors and perspectives of HIV testing among men in Uganda. *PLoS One*, 2020. **15**(8): p. e0237402.
7. <UNAIDS East-south-africa-engaging-men.pdf>.
8. Hlongwa, M., et al., Mapping evidence of intervention strategies to improving men's uptake to HIV testing services in sub-Saharan Africa: A systematic scoping review. *BMC Infect Dis*, 2019. **19**(1): p. 496.
9. Hlongwa, M., et al., Barriers to HIV testing uptake among men in sub-Saharan Africa: a scoping review. *Afr J AIDS Res*, 2020. **19**(1): p. 13-23.
10. Adugna, D.G. and M.G. Worku, HIV testing and associated factors among men (15-64 years) in Eastern Africa: a multilevel analysis using the recent demographic and health survey. *BMC Public Health*, 2022. **22**(1): p. 2170.
11. Sabo, K.G., et al., Factors influencing HIV testing uptake in Sub-Saharan Africa: a comprehensive multi-level analysis using demographic and health survey data (2015-2022). *BMC Infect Dis*, 2024. **24**(1): p. 821.