HHS Public Access
Author manuscript
Int J STD AIDS. Author manuscript; available in PMC 2024 September 17.

Published in final edited form as:
Int J STD AIDS. 2022 April ; 33(5): 485–491. doi:10.1177/09564624221076953.

Reaching 95-95-95 targets: The role of private sector health facilities in closing the HIV detection gap—Kisumu Kenya, 2018

Dickens Onyango[1,2,3], **Walter Mchembere**[4], **Janet Agaya**[4], **Alice Wang**[5], **Kevin P Cain**[6], **Diederick E Grobbee**[3], **Marianne AB van der Sande**[2,3], **Brian Baker**[6], **Courtney M Yuen**[7]

[1]Kisumu County Department of Health, Kisumu, Kenya

[2]Institute of Tropical Medicine, Antwerp, Belgium

[3]Julius Global Health, Julius Center for Health Sciences and Primary Care, University Medical Center Utrecht, Netherlands

[4]Kenya Medical Research Institute, Kisumu, Kenya

[5]United States Centers for Disease Control and Prevention, Atlanta, GA, USA

[6]United States Centers for Disease Control and Prevention, Dar es Salaam, Tanzania

[7]Harvard Medical School, Boston, MA, USA

Abstract

Background: HIV testing efficiency could be improved by focusing on high yield populations and identifying types of health facilities where people with undiagnosed HIV infection are more likely to attend.

Methods: A retrospective cohort analysis of data collected during an integrated TB/HIV active case-finding intervention in Western Kenya. Data were analyzed from health facilities' registers on individuals who reported TB-suggestive symptoms between 1 July and 31 December 2018 and who had an HIV test result within one month following symptom screening. We used logistic regression with general estimating equations adjusting for sub-county level data to identify health facility-level predictors of new HIV diagnoses.

Results: Of 11,376 adults with presumptive TB identified in 143 health facilities, 1038 (9%) tested HIV positive. The median HIV positivity per health facility was 6% (IQR = 2–15%). Patients with TB symptoms were over three times as likely to have a new HIV diagnosis in private not-for-profit facilities compared to those in government facilities (adjusted odds ratio (aOR) 3.40; 95% CI = 1.96–5.90). Patients tested in hospitals were over two times as likely to have a new HIV diagnosis as those tested in smaller facilities (i.e., health centers and dispensaries) (aOR 2.26; 95% CI = 1.60–3.21).

Corresponding author: Dickens Onyango, Kisumu County Department of Health, P.O. BOX 3670-40100, Kisumu, Kenya. macdickens2002@gmail.com.

Declaration of conflicting interests
The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Conclusion: Individuals with presumptive TB who attended larger health facilities and private not-for-profit facilities had a higher likelihood of being newly diagnosed with HIV. Strengthening HIV services at these facilities and outreach to populations that use them could help to close the HIV diagnosis gap.

Keywords

Positivity; HIV antibody; Testing; HIV; Hospitals; Private; Health; Facilities

Background

Finding new HIV cases is important for the achievement of the WHO 95-95-95 targets by 2030.[1] The first of the targets, indicating that 95% of people living with HIV/AIDS (PLWHA) should know their status, is crucial as it is a prerequisite for entry into the HIV care cascade. However, by the end of 2019, over 10% of PLWHA in southern and eastern Africa did not know their status.[2]

An established strategy for increasing detection of HIV is provider-initiated testing and counseling (PITC), whereby all people seeking care in health facilities are offered testing regardless of their reason for seeking care.[3] While this strategy has contributed to the closure of the HIV detection gap, testing yields in health facilities has been falling as more PLWHA are aware of their status, thus decreasing the HIV prevalence in those remaining with unknown status.[4] PITC efficiency could be improved by focusing on high yield populations such as TB-symptomatic adults[5] and by identifying types of health facilities where people with undiagnosed HIV infection are more likely to attend. This may help identify facilities that could best contribute to improved HIV detection through augmented PITC programs or outreach services to the populations served by those facilities. To identify such health facilities, we analyzed data generated from an integrated TB/HIVactive case-finding (ACF) intervention in western Kenya.

Methods

Study design

We conducted a retrospective cohort analysis of HIV testing data collected programmatically during an active TB/HIV case-finding intervention among adults in health facilities in Kisumu County.

Study setting and intervention

Kisumu County in western Kenya has an estimated adult HIV prevalence of 17.5%,[6] and an estimated 20% of adult PLWHA have not been diagnosed.[7] The annual TB case notification rate is 243 per 100,000 population.[8] The county has 230 health facilities across seven sub-counties.

The ACF intervention was initiated in two sub-counties in June 2016 and progressively expanded to cover the entire county by 2018. At each health facility, a Community Health Volunteer (CHV) actively screened all adults (≥15 years old) who visited the health facility for symptoms that could be consistent with TB (i.e., presence of cough, fever, weight loss, night sweats, or difficulty breathing in the past 4 weeks). Individuals reporting any TB-related symptom were asked to provide sputum and were evaluated for TB. Per national guidelines, they were referred for HIV testing if they did not know their status or had a negative result older than 3 months. Healthcare workers and CHVs ensured that people were registered in the paper "TB-symptomatic adults" registers when they reported any symptom, and that the results of subsequent HIV and TB evaluation procedures were recorded in the registers as they became available.

Study population

Individuals who were registered in the TB-symptomatic adult registers of health facilities receiving the ACF intervention, who were screened for TB symptoms during 1 July through 31 December 2018, and who had a new HIV test result were eligible for inclusion in our analysis. We defined a new HIV test result as one whose date was within 1 month after the TB symptom screening date. We excluded individuals who reported that they were living with HIV (and hence were not re-tested), individuals who were not tested because they reported a recent negative test, individuals who refused testing, and individuals for whom the date of testing could not be determined. We limited our analysis to health facilities with at least one new HIV test recorded in the TB-symptomatic register during the analytic period. Our analysis did not have a pre-determined sample size; we extracted data from all health facilities that received the intervention for an analytic period that was feasible given available resources.

Data collection

HIV test results were abstracted from paper-based facility TB-symptomatic adults registers and stored in an electronic database (RedCap). Data quality assurance measures such as compulsory fields, range checks, and branching logic were in-built into the RedCap database. During abstraction data quality assessments, which entailed verification of RedCap data with hard copy TB-symptomatic registers, were conducted to ensure completeness and accuracy. Characteristics of health facilities were obtained from the Ministry of Health.

Variables

The outcome of interest was new positive HIV test results. Predictor variables were characteristics of health facilities. Health facility level was categorized into Tier 2 (dispensaries and health centers) and Tier 3 (hospitals). Health facility ownership was categorized as public if the facility was owned by the government, private if it was owned by a private company and operating for profit, or private-not-for-profit if it was operating as a non-profit but not owned by the government. In Kenya, 70% of facilities in the private-not-for-profit category, including almost all of those offering HIV services, are operated by faith-based organizations.[9] The location of a health facility was considered urban if it was located within a municipality or a town, and rural if not. Facilities were also categorized by number of annual outpatient department visits; low-volume facilities have fewer than 7500 outpatient visits, medium-volume facilities have 7501–15,000 visits, and high-volume facilities have more than 15,000 visits. Finally, facilities were categorized based on the TB (TB diagnostic testing by GeneXpert MTB/RIF or smear microscopy) and HIV (antiretroviral therapy [ART]) services offered.

Data analysis

Logistic regression was performed with HIV test result as the outcome. Generalized estimating equations were used to account for clustering by health facility; all predictors were thus assessed at the cluster level since only health facility characteristics were considered as predictors. Odds ratios (OR) with robust standard errors were calculated. Bivariate analysis was performed, and predictors with a *p* value of 0.2 or less on bivariate analysis were included in a multivariate analysis. Backwards elimination was used to produce the final multivariable model, except that sub-county was forced into the model to account for possible geographic differences in HIV prevalence. Data were analyzed using Stata Version 14.

Ethical considerations

Ethical approval was obtained from the Kenya Medical Research Institute ethical review committee and the Centers for Disease Control and Prevention Institutional Review Board. A waiver of written informed consent was obtained because procedures were conducted as part of routine clinical care.

Results

Kisumu County has 230 health facilities, of which 78% ($n = 181$) participated in the TB/HIVactive case-finding program (Figure 1). Participation in the active case-finding program was higher in public (98%; $n = 122/125$) than private not-for-profit facilities (81%; $n = 26/32$) (p-value = .01) and private for-profit facilities (45%; $n = 33/73$) (p-value < .001). This analysis included 143 participating health facilities that recorded at least one new HIV test administered to a patient recorded in the TB-symptomatic adults' register during the analysis period (Table 1). A total of 38,877 individuals with TB-consistent symptoms were identified in these facilities during July–December 2018 (Figure 1). Of these, 9255 (24%) were not tested because they reported already knowing that they were living with HIV, and 10,075 (26%) were not tested because they reported a recent negative HIV test result. We included in the analysis 11,376 individuals with a documented new HIV test result, 1038 (9%) of whom had a positive HIV test. The median number of patients tested per health facility was 117 (interquartile range [IQR] = 72–194) with a median new HIV positivity rate of 6% (IQR = 2–15%).

In bivariate analysis, likelihood of new HIV diagnoses was higher in private-not-for-profit facilities and private for profit than government-owned facilities (Table 2). Tier three facilities (hospitals), TB diagnostic sites, ART sites, facilities located in urban areas and Kisumu Central sub-county were also more likely to have new HIV diagnoses. Patients in Tier three facilities accounted for 30% of the HIV tests, but represented 49% of positive HIV test results in this population. Patients in private for-profit, private not-for-profit, and public facilities accounted for 7%, 12% and 81% of the HIV tests and represented 11%, 17% and 72% of positive HIV results, respectively.

In multivariate analysis, patients tested in private not-for-profit facilities were over three times as likely to have a new HIV diagnosis compared to those tested in government facilities (adjusted OR [aOR] = 3.40; 95% CI = 1.96–5.90). Moreover, the likelihood of new HIV diagnoses remained around twice as high among patients tested in Tier three facilities compared to Tier two facilities (aOR = 2.26; 95% CI = 1.60–3.21).

Discussion

In our study, new HIV diagnoses were recorded for almost one out of every 10 people with TB-consistent symptoms and new HIV test results, but there was substantial variation among health facilities. Patients attending private not-for-profit facilities—a category dominated by facilities operated by faith-based organizations—were three times more likely to test positive than those in government-owned facilities. This finding is consistent with a previous study from Kenya showing that patients diagnosed with TB in the private sector were more likely to have a positive HIV test.[10] Independently of facility ownership, patients in hospitals were twice more likely to test positive than those in health centers and dispensaries. This is consistent with findings from previous studies [11–13] probably because such facilities attend to sicker clientele. Together, these findings suggest that through strengthening HIV testing services in large hospitals and private not-for-profit facilities, along with strengthening targeted outreach to hard-to-reach or underserved populations, more PLWHA can be reached and linked to care who do not yet know their status.

Our findings underscore the importance of better partnership between government HIV programs and private not-for-profit facilities. The healthcare marketplace of many African countries comprises a mix of public and private facilities, with private not-for-profit facilities providing a substantial share of health care services.[14] Clients choose where they seek care based on different preferences, not necessarily attending the health facility closest to their home.[15] Private not-for-profit facilities may be attracting different clientele than government facilities, such as more educated clients or poorer clients.[10,16] In many countries, they are perceived as having greater accessibility, shorter wait times, and fewer problems with medication stockouts .[15,17,18] Yet, basic services that are typically provided free of charge by government programs, such as vaccinations, may be less readily available.[18]

Usage of the private sector for HIV testing is common in many sub-Saharan African countries including Kenya, generally correlating with usage of the private sector for other health conditions.[16] However, there are challenges to ensuring high HIV testing coverage in the private sector. Inconsistent access to government-subsidized ART medications and charging patients for HIV tests have been highlighted as barriers leading to lower coverage of HIV testing among patients diagnosed with TB in the private sector compared to the public sector.[19] Moreover, as donor funding for HIV services decreases, there is emerging evidence that private sector facilities may be more likely to discontinue or reduce HIV services than public sector facilities.[20] Together, these factors underscore the importance of national HIV programs having engagement strategies to ensure that the substantial number of clients using private facilities are continued to be well reached with HIV services as donor support declines.

Our analysis was subject to several limitations. A substantial number ($n = 40$) of private for-profit health facilities declined to participate in the intervention, so our results regarding HIV testing yields in this sector may have been affected by selection bias, which we are unable to address. Our analysis was also restricted to HIV testing in a target population of people with TB-consistent symptoms; therefore, our results do not tell us whether the general patient population of hospitals and private non-profit health facilities are more likely to have undiagnosed HIV, as facilities may differ in the proportions of patients with TB-consistent symptoms, and patients may choose to go to different types of facilities based on their symptomology. Finally, identification of people eligible for HIV testing followed the national algorithm that relies on self-report of HIV testing history, so response bias could have influenced the estimates of the absolute yield of HIV testing in this population. However, it is unlikely to have affected the associations observed between facility type and new HIV diagnoses since this response bias would likely not differ systematically based on health facility characteristics. Finally, routine data sources are prone to data errors and missing data, and while we attempted to ensure accurate abstraction of the information in the paper registers, we were unable to correct errors in the source data.

Conclusions

In conclusion, if the 95-95-95 targets are to be met by 2030, strengthening the partnership between government HIV testing programs and the private not-for-profit health sector could help to diagnose more people with HIV. Models exist for partnerships between government programs and private-not-for-profit facilities that preserve the autonomy of private-not-for-profit but ensure availability of basic services at all health facilities.[10] Leveraging these partnerships can help to substantially reduce HIV incidence and mortality by improving HIV testing yield and identifying PLWHA in a high yield subpopulation, and potentially improving linkage to care for those who do not yet know their status.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This study was supported by the Harvard Medical School Center for Global Health Delivery–Dubai (grant number: 65,234) and the President’s Emergency Plan for AIDS Relief (PEPFAR) through the United States Centers for Disease Control and Prevention (CDC) under the terms of 5U01GH002133-02.

Disclaimer

The findings and conclusions in this manuscript are those of the author(s) and do not necessarily represent the official position of the funding agencies.

References

1. Joint United Nations Programme on HIV/AIDS (UNAIDS). Understanding Fast-Track: Accelerating Action to End the AIDS Epidemic by 2030. Geneva: UNAIDS, https://www.unaids.org/sites/default/files/media_asset/201506_JC2743_Understanding_FastTrack_en.pdf (2015, Accessed 10 December 2021).
2. Joint United Nations Programme on HIV/AIDS (UNAIDS). UNAIDS Data 2020. Geneva: UNAIDS, https://www.unaids.org/sites/default/files/media_asset/2020_aids-data-book_en.pdf (2021, Accessed 10 December 2021).

3. Roura M, Watson-Jones D, Kahawita TM, et al. Provider-initiated testing and counselling programmes in sub-Saharan Africa: a systematic review of their operational implementation. AIDS 2013; 27(4): 617–626. [PubMed: 23364442]
4. De Cock KM, Barker JL, Baggaley R, et al. Where are the positives? HIV testing in sub-Saharan Africa in the era of test and treat. AIDS 2019; 33(2): 349–352. [PubMed: 30557162]
5. Mchembere W, Agaya J, Yuen CM, et al. High yield of new HIV diagnoses during active case-finding for tuberculosis. AIDS 2019; 33(15): 2431–2435. [PubMed: 31764108]
6. National AIDS and STI Control Programme (NASCOP). Preliminary KENPHIA 2018 Report. Nairobi, Kenya: NASCOP, 2020.
7. National AIDS Control Council. Kenya HIV Estimates Report 2018. Nairobi, Kenya: NASCOP, 2018.
8. Ministry of Health. Annual Tuberculosis Report 2019, 2020.
9. Blevins J, Kiser M, Lemon E, et al. The percentage of HIV treatment and prevention services in Kenya provided by faith-based health providers. Dev in Pract 2017; 27(5): 646–657.
10. Mailu EW, Owiti P, Ade S, et al. Tuberculosis control activities in the private and public health sectors of Kenya from 2013 to 2017: how do they compare? Trans R Soc Trop Med Hyg 2019; 113(12): 740–748. [PubMed: 31334760]
11. Govindasamy D, Ferrand RA, Wilmore SM, et al. Uptake and yield of HIV testing and counselling among children and adolescents in sub-Saharan Africa: a systematic review. J Int AIDS Soc 2015; 18(1): 20182. [PubMed: 26471265]
12. Odafe S, Onotu D, Fagbamigbe JO, et al. Increasing pediatric HIV testing positivity rates through focused testing in high-yield points of service in health facilities-Nigeria, 2016–2017. PloS one 2020; 15(6): e0234717. [PubMed: 32559210]
13. Hoenigl M, Mathur K, Blumenthal J, et al. Universal HIV and birth cohort HCV screening in San Diego emergency departments. Sci Rep. 2019;9(1):1–7. [PubMed: 30626917]
14. Olivier J, Tsimpo C, Gemignani R, et al. Understanding the roles of faith-based health-care providers in Africa: review of the evidence with a focus on magnitude, reach, cost, and satisfaction. Lancet. 2015;386(10005):1765–1775. [PubMed: 26159398]
15. Olorunsaiye CZ, Langhamer MS, Wallace AS, et al. Missed opportunities and barriers for vaccination: a descriptive analysis of private and public health facilities in four African countries. Pan Afr Med J. 2017;27(Suppl 3):6.
16. Johnson D and Cheng X. The role of private health providers in HIV testing: analysis of data from 18 countries. Int J Equity Health. 2014;13:36. [PubMed: 24884851]
17. Ron Levey I and Wang W. Unravelling the quality of HIV counselling and testing services in the private and public sectors in Zambia. Health Policy Plan. 2014;29(suppl 1):i30–i37. [PubMed: 25012796]
18. Lee E, Madhavan S and Bauhoff S. Levels and variations in the quality of facility-based antenatal care in Kenya: evidence from the 2010 service provision assessment. Health Policy Plan. 2016;31(6):777–784. [PubMed: 26879091]
19. Hudson M, Rutherford GW, Weiser S, et al. Linking private, for-profit providers to public sector services for HIV and tuberculosis co-infected patients: a systematic review. PLoS One. 2018;13(4):e0194960. [PubMed: 29634772]
20. Wilhelm JA, Paina L, Qiu M, et al. The differential impacts of PEPFAR transition on private for-profit, private not-for-profit and publicly owned health facilities in Uganda. Health Policy Plan. 2020;35(2):133–141. [PubMed: 31713608]

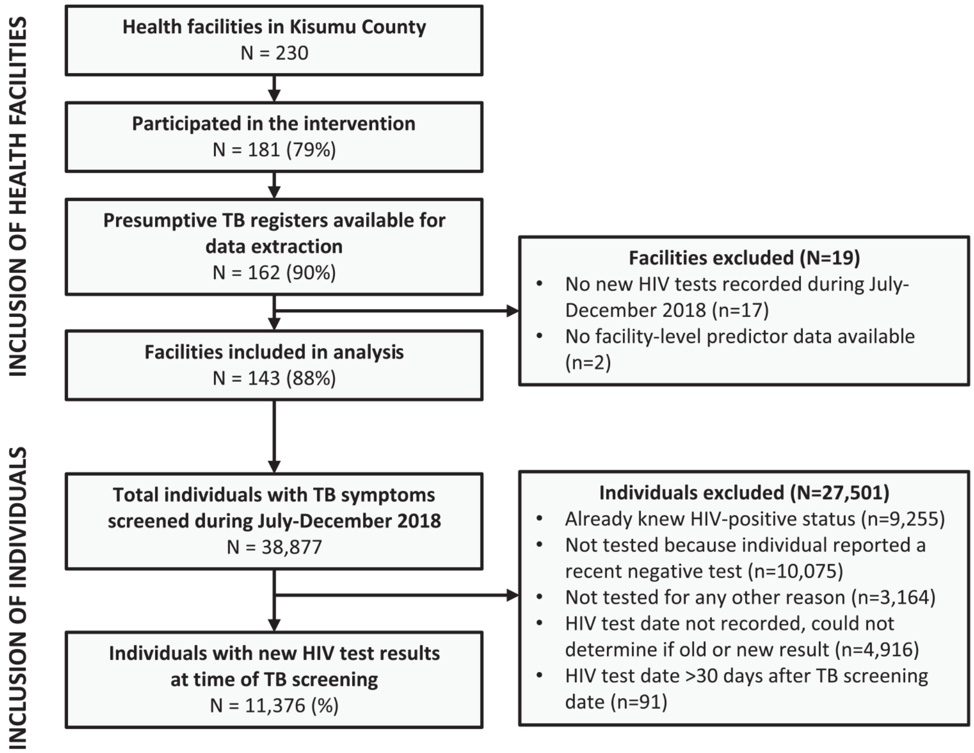

Figure 1.

Inclusion of health facilities and individuals in analysis.

Table 1.

Characteristics of health facilities implementing active case-finding for TB in western Kenya and median HIV test positivity among TB-symptomatic adults, 2018 (n = 143).

Characteristic	Number of facilities	(%)	Number of TB-symptomatic adults	Median (IQRa) number of TB-symptomatic adults tested	Median (IQR[a]) number with positive results	Median (IQR[a]) % HIV test positivity
Ownership						
Government	102	(71)	9266	120 (77–206)	3(1–8)	5 (2–10)
Private not-for-profit	23	(16)	1327	98 (65–171)	5(2–11)	17 (5–39)
Private for-profit	18	(13)	783	77 (51–87)	4 (1–6)	10 (2–25)
Health facility level						
Tier 2[b]	117	(82)	7968	108 (65–154)	3(1–6)	5 (2–10)
Tier 3[c]	26	(18)	3408	446 (104–881)	12 (4–23)	16 (11–24)
TB diagnostic site						
Yes	94	(66)	8417	120 (77–206)	5(2–11)	9 (5–19)
No	49	(34)	2959	102 (49–171)	1(1–3)	3 (1–5)
ART site						
Yes	132	(92)	10,962	119 (76–194)	4(2–8)	7 (2–17)
No	11	(8)	414	47 (33–65)	1(0–3)	3 (0–5)
Facility setting						
Rural	97	(68)	7177	110 (66–163)	3(1–6)	5 (2–9)
Urban	46	(32)	4199	154 (85–474)	5(2–15)	12 (4–25)
Facility volume						
High (>15000 OPD cases/year)	22	(15)	2615	446 (85–881)	11(4–27)	16 (8–22)
Medium (7501–15000 cases/year)	45	(32)	4551	124 (102–200)	5(2–8)	5(2–12)
Low (≤7500 OPD cases/year)	76	(53)	4210	83 (49–124)	2(1–5)	5 (2–12)
Total	143	(100)	11,376	117 (72–194)	4(1–8)	6 (2–15)

[a]Interquartile range.

[b]Dispensaries/health centers.

[c]Hospitals.

Table 2.

Bivariate and multivariate analysis of health facility characteristics associated with the yield of new HIV diagnoses (*N* = 11,376).

Facility characteristic	Positive/tested (% HIV-positive out of tested) (%)	OR (95% confidence interval)	Adjusted OR (95% confidence interval)
Ownership			
Government	746/9266 (8)	1	1
Private not-for-profit	179/1327 (14)	3.19 (1.76–5.78)	3.40 (1.96–5.90)
Private for- profit	113/783 (14)	1.98 (1.13–3.47)	1.56 (0.96–2.53)
Facility level			
Tier 2 (dispensaries/health centers)	526/7968 (7)	1	1
Tier 3 (hospitals)	512/3408 (15)	2.25 (1.48–3.40)	2.26 (1.60–3.21)
TB diagnostic site			
No	106/2959 (4)	1	1
Yes	932/8417 (11)	3.24 (1.99–5.28)	1.22 (0.68–1.85)
ART site			
No	20/414 (5)	1	1
Yes	1018/10962 (9)	2.23 (1.03–4.83)	5.24 (2.54–10.81)
Facility setting			
Rural	428/7177 (6)	1	1
Urban	610/4199 (15)	2.71 (1.79–4.10)	1.56 (0.96–2.52)
Facility volume			
Medium (7,501–15,000 OPD cases/year)	288/4551 (6)	1	1
High OPD (>15,000 cases/year)	441/2615 (17)	2.56 (1.59–4.10)	0.85 (0.47–1.53)
Low (≤7500 OPD cases/year)	309/4210 (7)	1.22 (0.73–2.04)	0.78 (0.52–1.17)
Sub-county			
Muhoroni	99/1705 (6)	1	1
Kisumu central	377/2212 (17)	3.06 (1.51–6.20)	3.16 (1.68–5.91)
Kisumu east	76/637 (12)	1.73 (0.89–3.36)	1.91 (1.06–3.42)
Kisumu west	130/1027 (13)	1.97 (1.01–3.83)	2.13 (1.23–3.68)
Seme	51/1048 (5)	0.71 (0.37–1.36)	0.84 (0.45–1.54)
Nyando	157/2686 (6)	0.99 (0.47–2.11)	1.08 (0.54–2.16)
Nyakach	148/2061 (7)	1.31 (0.64–2.68)	1.25 (0.64–2.43)