Open Journal of
Pediatrics & Neonatal Care

Research Article

Where are the HIV Positive Children? A Comparison of Facility and Community Testing Approaches in 14 Public Health Facilities in Five Ugandan Districts

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Submitted: 08 March 2019; **Approved:** 21 March 2019; **Published:** 25 March 2019

Citation this article: Nasuuna E, Babirye L, Namimbi F, Muganzi A, Kigozi J. Where are the HIV Positive Children? A Comparison of Facility and Community Testing Approaches in 14 Public Health Facilities in Five Ugandan Districts. Open J Pediatr Neonatal Care. 2019;4(1): 001-006.

ISSN: 2639-7072

ISSN: 2639-7072

ABSTRACT

Introduction: Uganda has an estimated 95,000 children living with HIV and only 68% are currently in HIV care. Reaching the first 90 in the UNAIDS 90-90-90 strategy for children is still a far off goal considering the national prevalence of 0.5%. In this study, we set out to determine the coverage and yield from HIV testing using different approaches both at the facility and the community.

Methods: A retrospective review of routinely collected data from 14 facilities was conducted. Data was collected on the number of children that attended the facility or community testing point, how many were offered an HIV test and the yield of HIV positive children from that testing point. The data was summarized using percentages and significance determined using chi square tests.

Results: 25,702 (23%) of the 111,813 children that presented to the facility were tested for HIV. Majority were male, 15 to 19 years of age and from the rural facilities. The highest coverage was at the TB clinic with 99% of the children tested. Facility testing had a higher yield compared to community testing 3.5% compared to 0.6% P value 0.001. The highest facility yield of 7% was at the TB clinic followed by the nutrition clinic at 5% P value 0.001. Assisted partner notification, a hybrid strategy that utilized both facility and targeted community outreach had a yield of 21%, others ranged from 2 to 21% P value 0.001.

Conclusion: Assisted partner notification produces the highest yield of positive children. Placing emphasis on testing children at the TB and nutrition clinics can also yield more HIV positive children. HIV programs that need to scale up identification of children could scale up assisted partner notification and facility based testing.

Keywords: HIV testing; Pediatric; Adolescent; Children; Entry point HIV testing; Yield; Coverage

INTRODUCTION

In 2014, UNAIDS released the 90 90 90 strategy as an ambitious target to end the HIV epidemic by 2020 [1]. The first 90 aims to have 90% of all People Living with HIV (PLHIV) know their HIV status [1]. In Uganda, an estimated 81% of PLHIV know their status [2]. This population includes the pediatric and adolescent clients (children) living with HIV [3]. Children if not diagnosed early, have very high mortality that peaks at 80% by 5 years [4].

Uganda has an estimated 95,000 children below 15 years living with HIV and only 68% are currently in HIV care, a figure far below that of adult PLHIV [5]. There is need to find the remaining HIV positive children that are unidentified, test them and enroll them into HIV care [6]. According to the recently concluded Uganda population-based HIV impact assessment, the HIV prevalence among children aged less than 14 years is 0.5% [7]. Due to the low prevalence, the remaining unidentified children will be much harder to find and the testing strategies for adults may not be sufficient [8]. This calls for innovative approaches to identify and test children [8,9].

The World Health Organization (WHO) recommends both facility and community approaches as a way of increasing testing among adolescents and children [10]. The Ministry of Health in Uganda recommends provider initiated counselling and testing for eligible children (those in TB clinic, admitted on the inpatient wards, those in the nutrition clinics and victims of sexual abuse) as well as community testing [11]. There is a paucity of studies in Uganda that report on the effectiveness of these strategies to reach HIV positive children. Two studies in Uganda report on isolated strategies employed to test children and do not directly report on the MOH recommended strategies [12,13]. Studies conducted in other settings to determine the best approaches to HIV testing for children have varying results. One study showed that coverage increases if all children are offered an HIV test and only a few opt out [6]. A meta-analysis of 26 studies showed that inpatient testing and nutrition clinics provided the highest yields [14]. A systematic review recommended the scale up of community based testing as a way to aid early diagnosis [15]. Whilst it is recommended that Provider Initiated Counselling and Testing (PICT) is scaled up to reach the children [16], another study found that using only PICT is not sufficient to find all the unidentified children [17]. A study in Cameroon found better yields if children of HIV positive parents were targeted in PICT [18]. It is important that the strategies that yield the most HIV positive children are determined and scaled up in order to improve on HIV case finding for children.

In this study, we set out to determine the coverage and yield of HIV testing at different entry points and to evaluate the testing points and strategies that provide the highest yield both at facility and community level.

METHOD

Study setting

This study was set at 14 high volume public facilities located in both urban and rural areas in five Ugandan districts (Kampala, Kibaale, Kagadi, Kakumiro, and Hoima). These facilities with more than 1000 PLHIV registered are supported by the Infectious Diseases Institute, an implementing partner of the Ministry of Health (MoH). The facilities were purposively selected because of the high volume of patients they have and because they are a part of a project to scale up pediatric and adolescent HIV testing. These sites included one regional referral hospital, one district hospital, and 12 facilities below district hospital level. They have all integrated HIV testing at multiple entry points. The community outreaches are conducted in the catchment areas around the facility, usually within a 10 km radius of the facility.

Program description

In Uganda, all children aged 18 months to 19 years are supposed to be screened prior to accessing an HIV test using the national HIV Testing Services (HTS) screening tool. This tool recommends the testing of children that are symptomatic for HIV, malnourished, have tuberculosis, those with recurrent hospitalizations, victims of sexual abuse, sexually active adolescents and those with HIV positive mothers. An eligible child is one who fulfils any of the criteria above and should be offered an HIV test. The age of consent for an HIV test was lowered to 12 years and diagnostic testing is allowed even when caregivers withhold consent for children very likely to have HIV [11]. Uganda is one of the few countries with such a low age for assent [19]. The HIV testing algorithm in Uganda utilizes DETERMINE (a qualitative immunoassay test) as the screening test, STAT PAK

(an immunochromatographic test) as the confirmatory test and SD Bioline as the tie breaker. The children are tested either at the facility or in the community using the same algorithm and tailored interventions. Community testing in this context is where health workers from the parent facility go out into the community to a particular spot and conduct HIV testing. Each facility has a catchment area and there is usually no overlap. Three hybrid testing strategies proactively following up and testing adolescent sexual partners of index clients (assisted partner notification), extending testing services beyond the routine testing hours (flexi hours) and testing children of newly identified HIV positive clients with unknown HIV status are conducted both at the facility and the community level. In these hybrid strategies, clients for testing are found both at the facility and the community. All this information is gathered from the facility registers and selected tools that capture HIV statuses of the families of the index cases. Coverage was defined as the proportion of children that attended a particular testing point who were offered an HIV test and yield as the proportion of tested children that tested HIV positive.

Study design

This is a descriptive study involving the retrospective review of routinely collected facility data on testing children aged 1.5 to 19 years. Data was collected about the number of children that attended the facility or community testing point, how many were offered an HIV test and the yield of HIV positive children from that testing point. Data officers collected data from the HIV Counseling and Testing (HCT) register, Outpatient Department (OPD) register, nutrition register, Inpatient Pediatric Department (IPD) register, TB register, and the outreach HCT register for the period April 2016 to March 2018. Field reports from the home based counselling and testing were also reviewed to ensure that all clients were recorded.

Data analysis

Data was summarized using proportions which were compared to determine if the differences were statistically significant using chi square tests. Significance was set at 0.05. The independent variables were the care entry points and the outcome measures were coverage and yield at these points. We compared yields at the facility versus the community, coverage and yield at the various care entry points at the facility and the yields from the hybrid strategies that were utilized. The data was analyzed using Excel 2018 (Microsoft office) and Stata 13 (Stata Corp USA).

RESULTS

111,813 children presented to the 14 health facilities. The majority were male (56%), in the 15 to 19 age group (49%) and from the rural areas (66%) (Table 1).

Yield in the facility versus community

Of the 111,813 children that presented to the facility 25,702 (23%) were tested for HIV and 869 (3.4%) tested HIV positive. In the community, 15,711 children were tested, 97 (0.6%) tested HIV positive. *P* value < 0.001 (Figure 1).

Coverage of HIV testing at the different facility entry points

The proportion of children tested for HIV at the different points in the facility showed that the highest coverage was at the TB clinic with 99% of the children tested while at the nutrition clinic 53% were tested, at the inpatient wards 48% were tested, at the outpatient department 42% were tested and the young child clinics registered the lowest coverage at 36% (Figure 2).

HIV testing yield at the different entry points at the facility and in the community

The HIV testing yields at the different testing points in the facility were highest at the TB clinic at 7%, followed by the nutrition clinic at 5%, OPD at 4% and both IPD and YCC had a 1.3% yield. *P* value 0.001.

Table 1: Showing the number and characteristics of children that were tested.

Characteristic	Number	Percentage	*P* value
Place of testing			
Facility	23,702	23%	
Community	15,711	-	
Sex			
Male	62,960	56%	< 0.001
Female	48,853	44%	
Age in years			
1.5 to 9	18,709	17%	< 0.001
10 to 19	93104	83%	
Location			
Rural	74,212	66%	< 0.001
Urban	37,601	34%	

Characteristics are only for children that were tested at the facility.

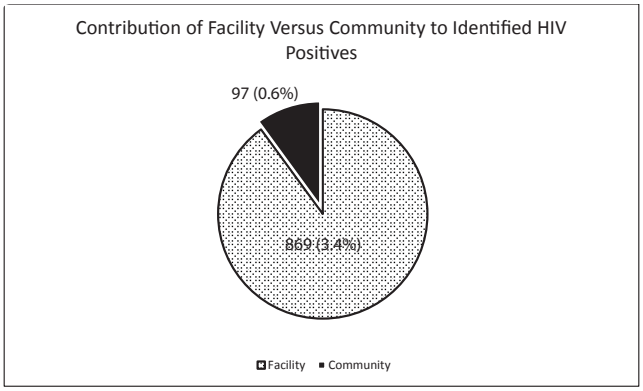

Figure 1: Contribution of facility *vs* Community to identified HIV positive children.

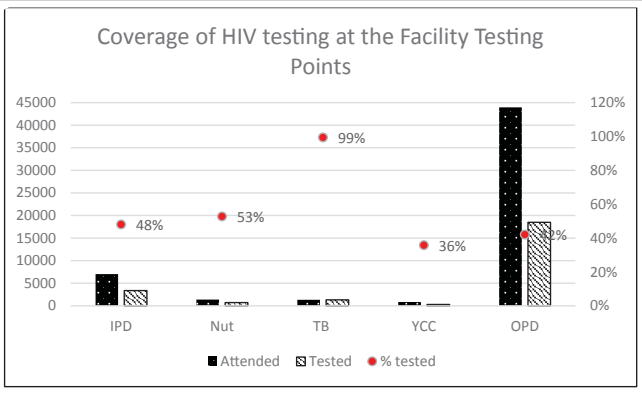

Figure 2: Coverage of HIV testing services at the facility testing points.

The community testing approaches yielded the following: child targeted outreaches 0.5%, immunization outreaches 0%, home based counselling and testing 1% and know your child status campaigns at 0.5%. *P* value < 0.001 (Figure 3).

Yield from the hybrid strategies

Hybrid strategies gave higher yield than the purely community strategies. Assisted partner notification that was targeting the adolescent partners of newly enrolled HIV positive clients gave a 21% yield. Extending the clinic hours beyond the normal working day at the facility and making services accessible over the weekend even at community level yielded 2%. Targeting testing to children of clients that are newly testing positive gave a 4% yield. *P* value < 0.001 (Table 2).

DISCUSSION

In this study, we set out to determine the coverage and yield of HIV testing services for children at different entry points both at the health facility and in the community. We found that yield was much higher at the health facility compared to the community and hybrid strategies that utilized both facility and community testing had differing yields. Whilst it was difficult to determine coverage at community level, coverage of HIV testing at the facility was still suboptimal at all entry points except the TB clinic. The TB and nutrition clinics registered the highest yields at the facility. Overall, the assisted partner notification, a hybrid strategy for older adolescents, had the highest yield at 21%.

We postulate that yields were better at the facility due to the use of the screening tool that aids in the targeting of testing to children who are most likely to have HIV. This is recommended practice that should give better yield [16]. Facility testing could have given a higher as the children who attend the facility are more likely to be sick and could have any of the conditions on the screening tool. Assisted partner notification gave the highest yield as it was targeting an extremely high risk group- sexual partners of HIV positive clients.

It was found that coverage and yield were better at the facility. This is consistent with a study in Zimbabwe that found more children were tested when testing was incorporated into all service points

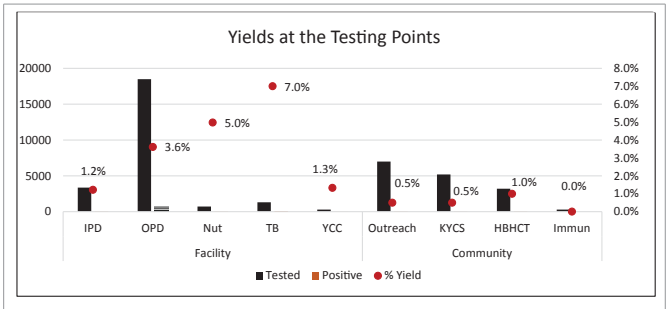

Figure 3: Testing yields at the different testing points at both facility and community.

Table 2: Testing yields from hybrid strategies.

Strategy	No. Tested	HIV Positive	% Yield	*P* values
Index client testing	1142	47	4%	< 0.001
Assisted partner notification	182	38	21%	
Flexi hours	1516	29	2%	

at the facility [20]. In this study as well, the positive children were likely to have TB or be malnourished. Another study conducted in four national referral hospitals in Uganda found that nutrition and inpatient wards had the highest yield [21]. Provider initiated counselling and testing at the facility through utilization of the screening tool increased coverage of testing since children are not routinely offered HIV testing. This is similar to the findings from a study conducted in Zimbabwe where all the older children were routinely offered an HIV test with a yield of 4.5% [6]. It is also similar to findings from a study in Cameroon where PICT was either targeted to children of positive patients or to all children attending the facility. The yields were higher in the targeted group at 3.5% compared to the general population at 1.6% [18]. Therefore, it is important that HIV programs that need to identify more HIV positive children screen them prior to offering an HIV test.

Community testing gave the lowest yields in this study. This is consistent with a study done in Uganda that showed that community outreaches yielded 0.3% [21]. Although we were unable to determine the coverage of HIV testing at the community, a study in Uganda showed that home based testing had high uptake but low prevalence [22]. This was true for this cohort as well as for another home based study in Kenya that showed increased uptake of testing with a low yield of 0.8% among the adolescents [23]. In rural Swaziland, it was found that community outreaches were very effective in increasing uptake of testing for children but there is no yield reported for this study [24]. One study that called for evaluation of community approaches as a way of improving early diagnosis also got very low yields from the community [15]. A meta-analysis of over 126 studies found that the lowest yields came from the community [25]. Our findings and the studies above contradict those of a study done in Malawi where the yield from the community testing was 3.6%. There is no evidence that targeting was done in order to achieve such a high yield [26]. It is of utmost importance that a community screening tool is developed that can identify children that need a test in order to improve on the testing yield. Additionally, based on national prevalence surveys, the community has much higher proportion of HIV negative children compared to the facility, which significantly lowers the sensitivity of non-targeted HTS interventions in the community [5,25]. The yield from community testing is directly related to the prevalence in that region and Uganda has a low prevalence of 0.5% [25]. We found a yield of 0.5% from the know your child status campaigns. In these campaigns, HIV positive parents are requested to test their children of unknown HIV status. This yield is much lower than that from a Kenyan study that found a yield of 7.4% and another in Cameroon that found a yield of 3.5% [18,27] in this population. It is possible in this study that not all children that attended were biological children of the index clients leading to the observed low yield.

In this study, the hybrid strategies that incorporated both facility and community testing gave yields above the national prevalence. An argument was made by Lightfoot et al that PITC at health facilities is not enough to reach all the unidentified HIV positive children [17]. They call for community and home based interventions. We observed that if targeting is done and a particular population at high risk is tested, a good yield is achieved. This has been shown when testing sexual partners of HIV positive clients as is in the assisted partner notification [22,25,28].

LIMITATIONS

This data was routinely collected as part of facility activities to

identify HIV positive children. As such the quality of data cannot be ascertained. All effort was made to verify all the data that was collected. We were unable to adequately determine the testing points that are more favorable to younger children compared to adolescents. This could have informed interventions to reach that particular population. There was no effort made to understand the barriers to testing at either facility or community level that could have explained the findings as this information is not routinely collected. This is very important as they have been known to affect coverage and access to services [29,30].

CONCLUSION

From the facilities and communities studied, it is evident that there is a higher yield of HIV positive children at the facility compared to the community and particular intervention such as assisted partner notification have very high yields. At the facility, testing points such as TB and nutrition clinics gave the highest yield. A good number of the HIV positive children can be found at the facility and increasing coverage of testing services at the high yield points such as TB and nutrition could lead to improved identification. HIV programs that need to scale up identification of children could scale up facility based testing, better targeting as well as use of the assisted partner notification.

ETHICAL CONSIDERATIONS

Ethical approval for retrospective analysis and dissemination of results from this routine program data was sought from the School of Medicine Research Ethics Committee at Makerere University College of Health Sciences and the Uganda National Council of Science and Technology (UNCST). Since this was a retrospective analysis of de-identified data a waiver of consent was also sought from the same IRB.

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