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RESEARCH ARTICLE

HIV index testing services in urban Lusaka: a review of medical records [version 1; peer review: 1 approved with reservations, 1 not approved]

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Abstract

Background: As the proportions of people living with HIV (PLHIV) who do not know their HIV infection status decrease, reaching the remaining few who are asymptomatic and not in contact with the health care system becomes a critical challenge. Therefore, reaching the first 90 of the UNAIDS 90-90-90 targets will require effective and efficient HIV testing approaches. The number of PLHIV who know their HIV status and who receive antiretroviral therapy could increase by the expansion of index testing services.

Methods: This project was a retrospective study looking at medical records of HIV positive clients who were elicited for index testing between October and December 2019. It was conducted in three high volume health facilities in Matero Urban sub-district 3 in Lusaka, Zambia.

Results: The HIV test outcomes for index contacts were as follows: 452 index contacts (53.5%) tested HIV negative, 113 index contacts (13.4%) tested HIV positive, 108 index contacts (12.8%) were known HIV positive, and 172 index contacts (20.4%) were not yet tested for HIV. Of the 113 contacts who tested HIV positive, 90 index contacts started anti-retroviral therapy within 7 days (79.6%). The total number of 845 contacts were elicited from 604 index clients, giving a low elicitation ratio of 1:1.4. There was not much difference between gender for elicited contacts (423 men and 422 women). A total number of 565 index contacts were eligible for HIV test. 113 of them tested HIV positive, representing a positivity yield of 20%. Pearson Chi-Square test value was 0.498 and the p value was 0.481. This result is not significant since p value (0.481) is greater than the designated alpha level (0.05).

Conclusions: HIV programs need to explore and address barriers to HIV partner testing services to maximize HIV case identification.

Open Peer Review

Approval Status

	1	2	3
version 3 (revision) 24 Mar 2022			
version 2 (revision) 12 Nov 2021	 view		 view
version 1 30 Sep 2020	 view	 view	

- Soundarya Mahalingam** , Manipal Academy of Higher Education, Mangalore, India
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- Taurayi A. Tafuma** , Zimbabwe Health Interventions, Harare, Zimbabwe
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Keywords

HIV, Index Testing, Services, Lusaka

Any reports and responses or comments on the article can be found at the end of the article.

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Author roles: **Katamba C:** Conceptualization, Data Curation, Formal Analysis, Funding Acquisition, Investigation, Methodology, Project Administration, Resources, Software, Supervision, Validation, Visualization, Writing – Original Draft Preparation, Writing – Review & Editing

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Introduction

According to the 2018 UNAIDS Global AIDS Update¹, there are an estimated 36.9 million people living with HIV (PLHIV). Recently, marked progress on HIV test and treat strategy has been achieved by countries' commitment to achieve the UNAIDS 90-90-90 targets by 2020¹. As of December 2017, three out of every four PLHIV knew their HIV status globally; 90% of HIV-infected individuals are expected to know their HIV status by 2020¹.

According to the ZAMPHIA 2016 fact sheet², only 67.3% of PLHIV (ages 15 – 49) knew their HIV status. In 2017, Zambia had 1.1 million PLHIV and 48,000 new HIV infections³. Without HIV testing services interventions targeted to key populations, including sexual partners of index clients infected with HIV, it will be hard to end the HIV epidemic by 2030⁴.

The cornerstone for achieving the UNAIDS 90-90-90 targets by 2020 begins with PLHIV knowing their status. As the proportions of those living with HIV who do not know their HIV infection status decrease, reaching the remaining few who are asymptomatic and not in contact with the health care system becomes a critical challenge. Therefore, reaching the first 90 goal will require effective and efficient HIV testing approaches. The number of PLHIV who know their HIV status and who receive antiretroviral therapy (ART) could increase by the expansion of index testing services. This will result in the reduction of the number of people who can transmit the virus, and subsequently in reduced new HIV infections.

The aim of this study was to review existing medical records in Zambia in order to present existing information on index testing and propose better ways to improve HIV index testing services.

Methods

Study design

This was a retrospective study looking at index registers of clients who tested HIV positive and were elicited for index testing between October and December 2019. The study was conducted between January and February 2020 in three high volume health facilities in Matero sub-district 3 of Lusaka district in Zambia. The study facilities included Matero First Level Hospital, Matero Main Clinic, and George Health Centre. The overview results of the study, which looked at the effectiveness of HIV index testing, were described. The analysis examined index clients' identification, elicitation of index contacts, and testing of index contacts. The main quantitative outcome of interest for this analysis was the success of index testing to improve yield for HIV Testing Services (HTS) among female and male, and across ages among index clients; and secondly ART initiation for positive index contacts.

Sampling

This retrospective phase of our study used a total sample enumeration technique.

The study population comprised all index clients (men and women at the study facilities) who had been diagnosed with

HIV and were elicited for HIV index contact testing during the study period.

Inclusion criteria:

HIV positive clients (index clients or index cases) and their sexual contacts (sexual partners of index clients who have been elicited and offered HIV index testing services). The study participants included:

- HIV positive clients identified through either voluntary counseling and testing (VCT) or provider-initiated counseling and testing (PICT)
- Being documented in HIV index registers
- Having elicited at least one sexual partner

Exclusion criteria:

- Index clients identified through other service entry points other than VCT and PICT
- Clients not documented in index testing registers
- Contacts listed as biological children of index clients

Data sources, variables and collection

Data on the index clients (cases) characteristics (age, gender, contacts, ART status), and the contacts' HIV test outcome (yield, initiation status) were extracted from the HIV index testing registers into a structured pro forma.

Data management and analysis

Data entry and analysis was performed using Statistics Package for Social Science software (SPSS version 16.0). Descriptive statistics were performed to describe the background characteristics of index clients and successful testing of index contacts. Analysis entailed simple frequencies of the main study outcomes and cross-tabulations. The association of index contacts' gender with the HIV test outcome of the index contacts was examined using the Chi Square test.

Ethical considerations

Ethical clearance was sought and obtained from the ERES Converge Zambian Institutional Review Board (IRB) (approval number: Ref. No. 2019-Nov-009), and authority to conduct research was obtained from the National Health Research Authority (approved on 29th January 2020) before the commencement of the study. Informed written consent for this study was waived by the IRB and National Health Research Authority due to the retrospective nature of the study. Index testing services are offered as part of the recommended national HIV testing services. Clients' confidentiality was observed by assigning a serial number to each participant that was known only to the health care provider. Only the client's initials and serial number appeared on the data collection forms.

Results

The total number of index clients included in the study was 604. Matero First Level Hospital leads the participation per facility with 292 participants, followed by George Health Centre and Matero Main Clinic with 164 and 148 participants, respectively. The total number of female participants was 314

(representing 52%) and male participants was 290 (representing 48%) (Table 1).

The age of participating index clients ranged from 16 to 78 years, with mean age calculated at 34 years (SD = 9.1). Out of the total number of 604 participants, 514 clients (85.1%) were married, 85 clients (14.1%) were unmarried, 3 clients were widowed, and 2 clients were divorced.

Concerning the time spent from HIV test to the initiation of ART for index cases: 595 index clients started ART within 7 days (98.5%), 1 index client started ART within a month (0.2%), 1 index client started ART after 1 month (0.2%), and there was no evidence of starting ART for 7 clients (1.2%).

The number of contacts elicited per index client were as follows: 413 clients (68.4%) elicited 1 sexual contact each, 146 clients (24.2%) elicited 2 sexual contacts each, 40 clients (6.6%) elicited 3 sexual contacts each, and 5 clients (0.8%) elicited 4 sexual contacts each (Table 2).

The mean age of elicited contacts was calculated at 33 years (range, 17–80 years SD = 9.4). From the total number of 845 elicited contacts, 604 contacts were main partners of index cases, 238 contacts were additional partners of index cases, and 3 contacts were casual.

The time spent from elicitation to HIV testing of index contacts varied across participants: 294 index contacts were tested within 7 days (34.8%), 76 index contacts were tested within 14 days (9%), 77 index contacts were tested within a month (9.1%), 133 index contacts were tested after 1 month (15.7%), and 265 index contacts were not yet tested (31.4%).

The HIV test outcomes for index contacts were as follows: 452 index contacts (53.5%) tested HIV negative, 113 index contacts (13.4%) tested HIV positive, 108 index contacts (12.8%) were known HIV positive, and 172 index contacts (20.4%) were not yet tested for HIV. Of the 113 contacts who tested HIV positive, 90 index contacts started ART within 7 days (79.6%). There was no documented evidence of starting ART for 23 HIV positive contacts (20.4%).

The total number of 565 index contacts were tested for HIV and 172 index contacts had not yet been tested for HIV (Table 3). The Pearson Chi-Square test value was calculated at 0.498 and the p value was 0.481.

Discussion

Most index clients (98.5%) had documented evidence of starting ART within 7 days of HIV diagnosis. This demonstrates strongly that the test and start strategy is being implemented to scale in Matero urban sub-district of Lusaka. There was an

Table 1. Number of participants (index cases) by gender, month, and facility.

	Matero Main Clinic		Matero First Level Hospital		George Health Center		Total	
	Male	Female	Male	Female	Male	Female	Male	Female
October 2019	20	26	57	56	26	28	103	110
November 2019	26	28	37	25	26	28	89	81
December 2019	23	25	49	68	26	30	98	123
Total	69	79	143	149	78	86	290	314
Grand total	148		292		164		604	

Table 2. Number of elicited contacts by gender, month, and facility.

	Matero Main Clinic		Matero First Level Hospital		George Health Center		Total	
	Male	Female	Male	Female	Male	Female	Male	Female
October 2019	30	25	113	110	35	34	178	169
November 2019	35	39	45	65	35	27	115	131
December 2019	36	35	52	55	42	32	130	122
Total	101	99	210	230	112	93	423	422
Grand total	200		440		205		845	

Table 3. Contact gender vs contact HIV status cross tabulation.

			Contact HIV status		Total
			Tested	Not tested	
Contact gender	Male	Count	275	89	364
		Expected Count	279.1	84.9	364.0
	Female	Count	290	83	373
		Expected Count	285.9	87.1	373.0
Total		Count	565	172	737
		Expected Count	565.0	172.0	737.0

elicitation of 845 contacts out of 604 cases, giving us a low elicitation ratio of 1:1.4. There was not much difference between gender for elicited contacts (423 males and 422 females).

A total number of 565 index contacts were eligible for HIV test. 113 of them tested HIV positive, representing a positivity yield of 20%. This index testing positivity yield is below the expected yield of above 25% as reported by several other studies⁵⁻¹³. The current linkage rate for positive contacts is 79.6%.

The calculated Chi-Square test value is 0.498 and the p value is 0.481. This result is not significant since p value (0.481) is greater than the designated alpha level (0.05), so we'd accept the null hypothesis that asserts the two variables are independent of each other. Therefore, there is no association between the gender of the contact and their HIV testing status.

Conclusion

HIV index testing services are an effective way for improved HIV case identification. It has yielded a positivity rate of 20% in Matero Urban area of Lusaka. Our recommendation is that HIV programs need to explore and address barriers to HIV partner testing services to maximize HIV case finding.

Data availability

Underlying data

Harvard Dataverse: Cibangu, Katamba, 2020, "Replication Data for: , "HIV INDEX TESTING SERVICES IN URBAN LUSAKA: a review of medical records", <https://doi.org/10.7910/DVN/QOQM3K>¹⁴.

Extended data

Harvard Dataverse: Replication Data for: HIV index testing services in urban Lusaka: a review of medical records, <https://doi.org/10.7910/DVN/FSHCQ6>¹⁵.

This project contains the following underlying data:

- Data collection tool

Data are available under the terms of the [Creative Commons Zero "No rights reserved" data waiver](#) (CC0 1.0 Public domain dedication).

Acknowledgments

I would like to acknowledge the Lusaka Provincial Health Office (LPHO) management, the Lusaka District Health Office leadership, the Matero Health Management team for their guidance and support, and PEPFAR through the LPHO/CDC CoAg during this study. I am also grateful to Dr. Monde Muyoyeta for her supervisory support.

References

- UNAIDS, Joint United Nations Programme on HIV/AIDS, GLOBAL AIDS UPDATE: **Miles to go: closing gaps; breaking barriers; righting injustices**. 2018. [Reference Source](#)
- ZAMBIA POPULATION-BASED HIV IMPACT ASSESSMENT ZAMPHIA 2015–2016. [Reference Source](#)
- <https://www.avert.org/professionals/hiv-around-world/sub-saharan-africa/zambia>.
- Katbi M, Adegboye A, Adedoyin A, *et al.*: **Effect of clients Strategic Index Case Testing on community-based detection of HIV infections (STRICT study)**. *Int J Infect Dis*. 2018; **74**: 54–60. [PubMed Abstract](#) | [Publisher Full Text](#)
- Partner and Family based Index case testing. A Standard Operating Procedure (SOP)**. [Reference Source](#)
- Plotkin M, Kahabuka C, Christensen A, *et al.*: **Outcomes and Experiences of Men and Women with Partner Notification for HIV Testing in Tanzania: Results from a Mixed Method Study**. Open access publication, published online on 31 October 2017. *AIDS Behav*. 2018; **22**(1): 102–116. [PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- Gari S, Malungo JRS, Martin-Hilber A, *et al.*: **HIV testing and tolerance to gender based violence: a cross-sectional study in Zambia**. *PLoS One*. 2013; **8**(8): e71922. [PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- World Health Organization: **HIV status disclosure to sexual partners: rates, barriers, and outcomes for women**. Geneva; 2003. [Reference Source](#)
- Obermeyer CM, Osborn M: **The utilization of testing and counseling for HIV: a review of the social and behavioral evidence**. *Am J Public Health*. 2007; **97**(10): 1762–1774. [PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- Selvaraj K, Kumar AMV, Chawla S, *et al.*: **Are partners of HIV-infected people being tested for HIV? A mixed-methods research from Gujarat, India**. *Public Health Action*. 2017; **7**(1): 46–54. [PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- Skovdal M, Campbell C, Madanhire C, *et al.*: **Masculinity as a barrier to men's use of HIV services in Zimbabwe**. *Global Health*. 2011; **7**: 13. [PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- Obermeyer CM, Sankara A, Bastien V, *et al.*: **Gender and HIV testing in Burkina Faso: an exploratory study**. *Soc Sci Med*. 2009; **69**(6): 877–884. [PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- Brown LB, Miller WC, Kamanga G, *et al.*: **HIV partner notification is effective**

and feasible in sub-Saharan Africa: opportunities for HIV treatment and prevention. *J Acquir Immune Defic Syndr*. 2011; 56(5): 437–442.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)

14. Katamba C: "HIV INDEX TESTING SERVICES IN URBAN LUSAKA: a review of medical records". Harvard Dataverse, V1, UNF:6:gUfvE+tw9Om3xSJZ99B8Q==

[fileUNF], 2020.

<http://www.doi.org/10.7910/DVN/QOQM3K>

15. Katamba C: "Replication Data for: HIV index testing services in urban Lusaka: a review of medical records". Harvard Dataverse, V1, 2020.
<http://www.doi.org/10.7910/DVN/FSHCQ6>

Open Peer Review

Current Peer Review Status: ? ✖

Version 1

Reviewer Report 27 October 2021

<https://doi.org/10.5256/f1000research.29114.r95883>

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Taurayi A. Tafuma

Zimbabwe Health Interventions, Harare, Zimbabwe

This area of study is very important at this moment where it is difficult to identify HIV positive Clients who do not know their status. However, the author needs to do a lot of literature review so that, as per the aim of this study, they can make recommendations. At this moment, the aim of the study is not in line with the findings and the analysis done. I also recommend that the title be reviewed and be improved to be in line with the narrative.

Introduction and Method:

- This study did not have phases so delete term phase under-sampling.
- The study population is non-specific - when do we consider someone to be a man or woman vs a boy or a girl? Best to use age categories, as this study reached out to 16-year-olds who are girls and boys.
- Clarify the exclusion criteria used, especially non-consideration of PICT and VCT index cases.
- Review the sentence on Data sources "...the contacts' HIV test outcome (yield, ...)". Is yield an outcome or do you want HIV status? Please clarify.
- The variables tracked will not provide the best ways to improve index case testing. The approach is disjointed with what the study aim is like.

Results section:

- Being that we have a table with the results, the writer is expected to summarise the results in the narrative rather than repeat them as they are in the table.
- Generally, the author should rework this result section for a better presentation.
- Good paragraph on time spent from elicitation to HIV testing.

- The statistical powering is not clear and not sure if it is adding any value to the paper.

Discussion:

- The discussion is not elaborate enough.
- The writer also started discussing the test and start strategy - how linked is this to index case testing?
- There is no extrapolation on the findings, and this limits the assessment of these results.

Conclusion

- This is not supported by the results. Also, there seem to be no proposed ways to improve index case testing, and this could have been derived from the results. However, from the results provided so far, this paper is not in a position to provide ways to improve index case testing.

General:

- The writer needs to perform a detailed literature review for the introduction and discussion.
- There is so much literature on index case testing and this author should redo this paper

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Partly

Are sufficient details of methods and analysis provided to allow replication by others?

No

If applicable, is the statistical analysis and its interpretation appropriate?

No

Are all the source data underlying the results available to ensure full reproducibility?

Partly

Are the conclusions drawn adequately supported by the results?

No

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: HIV, MNCH, GBV, Health Emergencies

I confirm that I have read this submission and believe that I have an appropriate level of expertise to state that I do not consider it to be of an acceptable scientific standard, for reasons outlined above.

Reviewer Report 03 August 2021

<https://doi.org/10.5256/f1000research.29114.r90213>

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Basavaprabhu Achappa

Department of Medicine, Kasturba Medical College and Hospital, Manipal Academy of Higher Education, Mangalore, Karnataka, India

1. The article is a well thought out study and focuses upon the importance of contact tracing and testing in PLHIV.
2. The article needs to mention details of informed consent taken from the PLHIV while approaching their contacts for testing for HIV.
3. The study design, methods, and data collection is appropriate.
4. The details of sampling, sample size calculation, and the details of contact tracing in cases where the partners were not the only contacts needs to be elaborated upon.
5. Statistics needs to be detailed. Here the null hypothesis and the Chi square does not correlate with the aim of the study. Further statistics to assess the number of new cases identified by contact tracing and its statistical significance needs to be done.
6. Discussion needs to be rewritten. No recent references have been alluded to or compared with.
7. Conclusions mention 'HIV index testing services are an effective way for improved HIV case identification'. This statement needs to be proven appropriately with statistics.

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

Yes

Are all the source data underlying the results available to ensure full reproducibility?

No

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Medical Education, HIV and pediatric HIV, Pediatric Allergy

We confirm that we have read this submission and believe that we have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however we have significant reservations, as outlined above.

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