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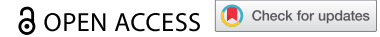


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RESEARCH ARTICLE



Strategies for Optimising Uptake of Assisted Partner Notification Services Among Newly Diagnosed HIV Positive Adults at Ndirande Health Centre, Malawi

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ABSTRACT

UNAIDS Fast-Track goals for 2025 include ensuring that 95% of the people with HIV know their HIV status. In 2019, the Malawi Ministry of Health introduced its approach for achieving this: an active index testing (AIT) policy with assisted partner notification services (APNS). Under this policy, health centers can actively reach out to a contact of newly-diagnosed HIV positive client (the index) to offer voluntary HIV testing services. However, APNS uptake has been sub-optimal at many health facilities. This qualitative study considers strategies to optimize the uptake of APNS among newly-diagnosed HIV positive clients at Ndirande Health Center in Blantyre, Malawi. We conducted in-depth interviews, between February and April 2020, with 24 participants, including new HIV positive index clients, their sexual partners, and key health workers. We employ a maximum variation purposive sampling technique. Thematic inductive and deductive data analysis was done manually according to the social-ecological model. Interviewees discussed various strategies for optimizing APNS uptake among newly diagnosed HIV-infected clients. Interpersonal strategies included maximizing the use of client profiling techniques and sensitization on APNS to create demand. Institutional-level strategies were also suggested, such as providing transportation for home visits, strengthening referral notification approaches, and additional training for health workers. Policy-level recommendations included introducing home-based partner testing and intensifying use of partner notification slips. APNS is a key strategy to maximize HIV case identification. However, achieving optimal APNS in Malawi requires strengthening existing strategies and conducting additional research to identify other APNS strategies tailored to the local context.

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Introduction

UNAIDS Fast-Track goals for 2025 include ensuring that 95% of the people with HIV know their HIV status. One strategy for identifying people living with HIV is assisted partner notification services. In general, health workers are expected to ask HIV-positive “index” clients about their recent sexual partners or drug-injecting partners, so they can be “notified” that they should also seek out HIV testing services.¹ Partner notification services can be passive or assisted. In passive partner notification, the index clients are given partner notification slips to pass on to their partners; in this case, the index clients disclose their HIV status to partners privately and use referral slips to encourage them to seek out HIV testing. With an assisted partner notification approach, health workers take on more responsibility for supporting index clients through the process of disclosing their HIV status to partners and encouraging the partners to receive HIV testing services.¹

The WHO has outlined three assisted partner notification service (APNS) approaches that support consent and confidentiality. One is contract referral (CR), in which the index client enters into a contract with the counselor to disclose his or her HIV status to partner(s). The second approach is provider referral (PR), in which the provider contacts a client’s partner(s) directly, informing them that they have been exposed to HIV and offering voluntary HTS. The third APNS approach is the dual referral (DR) approach. In this case, a trained provider facilitates the index client’s HIV status disclosure to his or her partner(s) and supports their access to voluntary HIV testing services.¹ APNS has significant advantages over passive approaches: by enabling index clients to share responsibility for notifying partners, it drives more effective case finding, increases the proportion of people potentially exposed to HIV who have access to HIV testing, and helps make linkages to treatment for HIV positive people.^{1–7}

Uptake of APNS has varied across sub-Saharan Africa. In parts of East Africa, the uptake of APNS has reportedly

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reached 70%; it tends to be lower in central African countries, including Malawi.^{1,2} However, in 2019 Malawi included APNS in its new Active Index Testing Services (AITS) policy, which directed community- and facility-based HIV testing services to be offered to the sexual partners and children under 12 years of HIV-positive clients when consent is provided by the index client.^{2,3} Malawi's APNS strategy employs trained HIV Diagnostic Assistants (HDAs) to help index clients identify their sexual partners and biological children and invite them for testing; any who do not come are followed up with HIV testing services on an opt-out basis.¹

Other African countries that have successfully implemented APNS have increased the identification of HIV cases by 56–72%.^{1–7} However, Malawi has not seen similar improvements.² Before the introduction of the AITS policy, in 2017, only 1% of those who received HIV testing services in Malawi were there via index testing.⁸ At Ndirande Health Center, where this study was conducted, between June 2018 and December 1, 2019, 1,064 contacts were elicited, and 990 contacts were notified for HIV index testing services. However, despite active phone and physical notifications, only 33% of the contacts were reached with HIV testing services, either when they returned to the facility or being reached in the community through home testing, despite active phone and in-person notifications.⁹

There are numerous barriers to the uptake of APNS at individual, social, and health system levels. Individual-level factors include lack of knowledge about APNS, wrong physical addresses and phone numbers, non-disclosure of HIV status by the index clients for fear of intimate partner violence, gender marginalization, stigma and discrimination coupled with family and peer influence, and marriage or relationship instability.^{4–6,10–30} Health system factors contributing to weak implementation and uptake of APNS include inefficient health systems, sub-optimal APNS/AIT counseling information, health worker factors, and inaccessibility of testing facility due to distance.^{4,6,10,11,13–15,17,20,22–24,27,31,32} Strategies to optimize the uptake of APNS designed to address these challenges include: following up with contacts through phone calls and home visits, and maximization of provider referral and dual referral to support disclosure and reduce suspicion amongst sexual partners and couples, respectively.^{5,6,12,16,17,30,33,34} The suboptimal performance of APNS in Malawi indicates a need to identify optimization strategies.

Methods

This descriptive cross-sectional qualitative study was conducted between February and April 2020. We

interviewed clients and providers at Ndirande Health Center, a public health facility in the city of Blantyre, Malawi, about their opinions, perceptions, and experiences of APNS in order to come up with locally relevant strategies for the optimization of APNS.³⁵ During in-depth interviews (IDIs), we explored individual perceptions, opinions, views, experiences, beliefs, and/or motivations on specific APNS uptake.^{36,37} Key informant interviews (KIIs) were used to elicit comments on APNS in the community from well-connected and informed community experts.

Conceptual Framework

Since the barriers to APNS uptake occur at different levels, multi-level strategies are needed to address them. Our study was therefore guided by the social-ecological model (SEM), which recognizes that different factors in the social environment—including interpersonal, community, institutional, and policy factors— influence and shape individual behavior.³⁸ The SEM supported the identification of strategies at multiple levels to influence the uptake of APNS.³⁸

Study Setting

The study was conducted at Ndirande Health Center, a primary health-care institution operating under the auspices of the Blantyre District Health Office. Ndirande Health Center is located approximately 5 km southwest of Blantyre City, which has an adult HIV prevalence of 17.2%, higher than many other cities in Malawi.³⁹ Ndirande Health Center serves a population of approximately 145,187 people.⁴⁰ HIV testing and counseling services are provided to an average of 1,340 clients per month at Ndirande Health Center, and the average HIV test positivity rate is 19.2%.⁴⁰

Sample Selection and Size

The study sample was built around index clients who received APNS between June 2018 and December 2019. The sample also included sexual partners of index clients, including both those who did and those who did not return for HIV partner testing after being notified through APNS. The sample size of 24 participants was determined once data saturation occurred.^{41,42} To achieve maximum variation, we purposively selected index clients who accepted APNS ($n = 9$), sexual partners who accepted APNS ($n = 6$), sexual partners who refused or did not get tested after APNS ($n = 4$), and HIV Diagnostic Assistants (HDAs) who work at the

facility and were trained and experienced in index testing (n = 5).^{43,44}

Sampling

Research assistants used the health center's Voluntary Assisted Partner Notification (VAPN) index register to identify potential study participants: index clients who received HTS at Ndirande Health Center and were confirmed to be HIV positive between June 2018 and December 2019. Purposively selected index clients who had accepted APNS were then contacted in person or telephonically by the research assistants, who offered potential participants the opportunity to hear about the study either at the health facility or elsewhere at their convenience. All index clients who were contacted agreed to participate in the study and provided consent.

The study also included sexual partners of index clients in order to get in-depth information on reasons why they did or did not accept APNS and HIV testing. To recruit sexual partners, we first sought consent from the index clients who had accepted to participate in the study to review their records. We then identified contacts listed in the VAPN register by the index client at the time of accepting APNS. Finally, we purposively selected interviewees from among the HDAs and HTS counselors working at Ndirande Health Center by including only those who were trained in index testing services using the national training curriculum and had been working for more than 3 years.

Data Collection

From February to April 2020, we used semi-structured interview guides to collect data from the clients, partners and health-care workers.³⁵ While research assistants assisted with client identification, appointment scheduling, and logistical support services, the interviews were conducted by the principal investigator (PI). Interviews were conducted in person in order to elicit a vivid picture of the participant's perspective on the research topic and explore sensitive HIV opinions, beliefs, and motivations.^{36,37,45–47} The interviews, which ranged from 28 to 45 minutes long, were conducted at the health facility, in Chichewa (the local vernacular) based on the preference of the study respondents. All interviews were audio-recorded and stored in the researcher's password-protected computer. The audio recordings of the IDIs and KIIs were listened to a minimum of three times by the PI before transcription. The transcriptions were then translated from Chichewa to English and reviewed several times

to allow for data familiarization. To ensure data credibility, the researcher deployed member checking by reading out summaries of the interviews to the study participants; and to ensure transferability, a detailed account of the methods and setting of the study context are available to allow others to review and replicate our findings.^{35,48}

Data Analysis

We used both deductive thematic analysis with pre-determined themes and inductive thematic analysis to identify new themes in the data that were not originally included in the theoretical framework.^{49,50} Using the transcripts, we identified concepts and organized them into codes.⁵⁰ A coding frame (which included the identified code, descriptor, and an example of the descriptor) was developed to support the development of categories and reviewed by the co-investigator. Themes were then identified both deductively and inductively for the categories by examining the relationships among the categories.^{50,51} We sorted and organized different and related codes from the coding frame, developed them into broader themes, and discarded non-related themes.³⁵ Finally, we ensured there were enough data points to support each theme, collapsed any themes that significantly overlapped, and collected applicable quotes from the interviews.⁵¹

Results

Demographic Characteristics of Study Participants

The interviewees included 19 HTS clients and five HDAs (Table 1). The client interviewees ranged in age from 33 to 48 years (median: 33 years), while the five HDAs ranged in age from 28 to 43 years (median: 41 years). Eleven clients and two HDA interviewees were female. A majority of the interviewees had attained secondary education, resided in urban or semiurban (versus rural) areas and were married (versus single, divorced or widowed). A majority of the client interviewees were self-employed.

Strategies for Optimizing Uptake of APNS/AIT

Interview participants discussed various strategies to optimize the uptake of APNS/AIT among newly-diagnosed HIV positive adults. We have organized their suggestions into individual, institutional, and policy categories as highlighted by the SEM.

Table 1. Demographic characteristics of study (clients and health-care workers).

Variable	Indexes	Sexual partners	HDAs
Gender			
Male	4	4	3
Female	5	6	2
Participant's Age			
18–20	0	0	0
21–30	2	2	1
31–40	4	6	1
41–50	3	2	3
Level of education			
Did not attend school	0	0	0
Primary	3	3	0
Secondary	6	7	5
College	0	0	3
Residence			
Rural	4	4	0
Urban/semi urban	5	6	5
Occupation			
Unemployed	0	0	0
Self-employed	6	8	0
Employed	3	2	5
Marital Status			
Single	0	1	0
Married	7	7	5
Divorced	1	2	0
Widow	1	0	0

Individual-Level Strategies

Client/Contact Profiling. HIV diagnostic assistants (HDAs) suggested utilizing contact profiling (getting contact details for the index client's partners) during the risk assessment component of the HIV testing process. This was offered as a strategy to minimize the likelihood of clients giving incorrect contact information. The interviewees said that some index clients did not want health-care workers to reach out to their contacts for partner notification and HIV testing, particularly if the contact is married to someone else.

They give you the wrong physical address because some of them know that their sexual partner is a married person. So, should they give the correct locator details, the contact might suspect her. For fear of loss of a relationship or financial support, they give wrong details so that he is not traced, notified, and offered a test. [Female respondent, refused APNS]

Health-care workers agreed, noting that clients who provided the wrong locator details were typically the “casual” sex partners of married people. In some cases, the index clients did not want the provider to reach the partner; in other cases, they may not know the sexual contact's address. The health care workers reported that profiling during risk assessment, rather than after providing HIV test results, reduces the risk of index clients giving incorrect locator details.

We used to get contact details after the clients had tested [HIV] positive. Many index clients used to hide their contacts as they became suspicious that we would want

to track them because they are positive. When we started getting contact elicitation and profiling during risk assessment, more clients give us correct details as they feel we just want to explore the risk and help. (HDA)

Sensitization and Demand Creation. Both index clients and partners (including those who refused APNS) commented that they had not received adequate information on APNS and its benefits. Some index clients suggested making more effort to sensitize the community at large on the importance of partner notification and testing. One female index client who accepted APNS said: “*You may need to come through the village headman and make people aware of the policy and importance of partner home testing.*”

The HDAs interviewed agreed on the need to engage communities fully through sensitization and demand creation activities. They also suggested informing clients about APNS during existing morning health talks.

We need to support demand creation activities. For us to reach out to all eligible contacts, we need the community to know the importance and benefits of partner tracing and testing services, just as the community knows about partners' notification in tuberculosis and sexually transmitted infections programs. (HDA)

Screening for Intimate Partner Violence before APNS.

Clients and HDAs alike indicated that intimate partner violence (IPV) is one of the key barriers to uptake of

APNS and suggested that screening for IPV should be a key strategy to increase the uptake of APNS. Interviewees noted that IPV—including threats of violence, physical beatings, verbal abuse and forcing them to leave the marital home—mostly happened to women. One interviewee said:

He regularly says that I am a prostitute whilst it's him womanizing. So, if he does this when there is no problem, what about bringing him the issue that I tested HIV positive? [Female index, did not disclose]

Some women who had been victims of IPV, often as a result of gender marginalization and other controlling behaviors, reported that their male spouses refused APNS because it had not initially given them approval to undergo an HIV test at the facility. One male respondent who had refused APNS corroborated this, saying:

I didn't allow her to go to the facility for HIV testing, as I discussed with her at length [only] on malaria testing. I only approved of malaria testing and she ended up doing HIV testing which contributed to the quarrel and end of the marriage.

HDAs suggest strengthening IPV screening during HTS in order to determine appropriate methods of notification to support disclosure while minimizing the risk of violence. HDAs felt that this approach would encourage more indices to disclose their HIV results and support their partner to get tested.

We agree with the index to notify his sexual partner, but sometimes the partner does not turn up as a result of non-disclosure for fear of being beaten. In this case, we do minimize IPV risk by screening all indices for intimate partner violence before they are offered APNS. (HDA)

Institutional-Level Strategies

Adequate Funding for Contact Tracing and Testing.

Health-care workers often do not reach out to all eligible contacts because of inadequate resources. Ensuring that adequate and timely funds are provided to support home tracing and community testing of partners emerged as a potential strategy for the optimization of APNS. Interviewees suggested an increase in the home tracing transport allowance so that they could reach sexual partners who were located far from the facility. One stated: “*Contact self-return for testing at the facility is not good. Here, we need to look at improving the home tracing transport allowance so that we can reach out to contacts daily.*” (HDA)

Optimization of Provider Referral Notification Approach.

The need to optimize the facility's provider

referrals has emerged as another key strategy to increase the uptake of assisted partner notification. This was further supported by an assertion made by index client respondents who had accepted APNS; they stated that provider referral would help reduce IPV as a result of disclosure about HTS. Some further suggested that women who test HIV positive should not be allowed to disclose to their husband alone; instead, whenever a female client tests HIV positive, health-care workers should contact the husband by phone, reach out to him to book an appointment and support the notification process.

If a married wife comes alone to test and she is diagnosed HIV positive, the health care worker should get contact details of her husband and reach out to him after some two days. Invite him to the hospital or pay him a home visit for notification rather than leave the wife to do the notification. [Female client, accepted APNS]

Health-care workers suggested that focusing on provider referrals (over other APNS methods) would increase the uptake of APNS and enable them to safely reach more sexual partners with HTS. One HDA said:

When you go through the registers, it is evident that many sexual partners were reached with HIV partner notification and testing services through provider referral—unlike contract referral or dual referral. We are confident this is the right way to go.

Training Providers. Both HDAs and clients reported the need to increase the availability of knowledgeable providers to provide quality counseling and reduce waiting times for HIV testing at the facility. This would entail training more providers to conduct active index testing, including equipping them with skills required to increase uptake of APNS, including client motivation to enhance index clients' acceptance of APNS, contact elicitation, and partner testing. One HDA elaborated:

We need updated index testing knowledge through training, standard operating procedures, and peer sessions so that providers have the right skills to provide quality index testing and motivational counselling to the clients.

It was further suggested that health-care workers should be better trained on confidentiality during APNS. Index clients and sexual partners interviewed reported that perceived confidentiality on the part of the health-care workers is a key facilitator of APNS uptake. The HDAs also highlighted the importance of upholding high standards of confidentiality whenever they are providing index testing services:

Not only should our confidentiality be limited to non-disclosure of the index identity, but should be maintained in all conversations and at all levels of service provision such as during contacts elicitation, phone and physical tracing, home, and facility testing and results for our clients. (HDA)

Policy-Level Strategies

Optimization of Home Partner Testing. Home tracing and testing were mentioned as a key approach that health-care workers use to increase the uptake of APNS. In the HDAs' experience, more sexual partners accepted HIV testing when the HDAs actively reached out to them by phone and offered home testing (compared with inviting them to the health facility for testing). As one HDA described, *"Most of the contacts who do not return to the facility for HIV testing, after two weeks are found when we conduct home tracing as stated in the policy. It is a better option to offer home testing for all contacts and offer facility testing for those that would opt so."* Thus, health-care workers suggested optimizing home tracing and testing as a key strategy.

Intensified Issuance of Partner Notification Slip. The Malawi AIT policy currently uses a partner notification slip to support the notification process. Interviewees felt this was a useful approach, noting that the partner notification slip can assist with disclosure by providing information on important topics that the index client may forget to mention. HDAs and index clients interviewed reported that the partner notification slips may even motivate some contacts to come to the facility for testing. One index client who had accepted APNS mentioned:

My husband did not seem to understand and agree with me when I notified him by word of mouth. When I produced the notification slip, he believed my results accepted and asked me to accompany him for testing.

Intensified use of partner notification slips would therefore support notification processes, especially when the index client discloses the HIV results himself or herself.

Discussion

This study used semi-structured qualitative interviews to elicit suggestions of strategies for optimizing the uptake of APNS among newly diagnosed HIV-infected clients at Ndirande Health Center in Blantyre, Malawi. This study builds on previous research on the topic by including the perspectives of sexual partners who refused APNS, in addition to those of health-care providers

and clients who accepted HIV testing. By doing so, it contributes to the existing discourse on possible strategies and enables Ndirande Health Center to develop strategies relevant to the local context.

The various strategies discussed by the clients and health workers interviewed have been categorized into three levels: individual, institutional, and policy. Individual strategies include improving client profiling techniques to obtain correct information on contacts, creating demand for APNS in the community through sensitization, and improving screening for IPV. Institutional-level strategies mentioned were as follows: funding transportation for home visits, strengthening providers' approach to referral notification, and additional training to expand availability of and improve HTS. At the policy level, the strategies mentioned include expanding home-based HTS and intensifying use of partner notification slips.

Several of these strategies have been studied in other contexts. Client sensitization to increase awareness of APNS would help index clients initiate discussions with their sexual partners on HIV disclosure and testing. This approach is supported by findings from other countries. Studies conducted in Kenya and Mexico reported low APNS uptake among contacts of index clients who did not have adequate information as they were not aware of the importance of APNS.^{33,52} Research in Malawi, Kenya, and Mozambique found that demand creation and sensitization in community gatherings increased engagement and resulted in clients perceiving APNS as safe and effective.^{22,24,53,54} Similarly, the HDAs we interviewed suggested sensitizing clients about APNS through morning health talks. Further, our study also suggests that health-care workers should provide adequate information directly to index clients during counseling on how to notify their sexual partners about their HIV test result and encourage partner testing. In order to implement this, policymakers must develop a communication strategy to provide a guiding framework and support health-care workers with standardized information and messaging for use at facilities and in communities.

Our interviewees described provider referral as a key strategy to increase the uptake of APNS—this finding is aligned with findings from systematic reviews and other studies conducted in sub-Saharan Africa that found that provider referral maximizes case identification when compared with dual or contract referral.^{1,5,6,15,30,33} Our study, like other studies conducted in Kenya and Cameroon, also found that optimization of provider referral is preferable in situations where IPV is a risk.^{16,31,55} Our findings also

corroborate findings from other studies that show that provider referral supports index clients who are not comfortable doing partner notifications on their own including.^{1,5,15–17}

Our findings suggest that more sexual partners of female index cases were reached when IPV screening is used in tandem with a provider referral approach, as compared with contract referral and bringing partners to the facility. IPV screening has been widely reported to reduce the risk of gender-based violence^{5,20,30,31}; this and other studies show that it also enhances the uptake of APNS, the likelihood of disclosure to partners, and ultimately partner testing.^{4–6,8–10,14,17–26} Given that more women seek HIV testing and thus become index cases, and because women are more likely to accept APNS, our study further suggests that provider referral can significantly mitigate the risk of IPV.⁵⁶

Another finding from this study that home partner tracing and testing is a strategy for increasing uptake of APNS, is consistent with results from studies conducted in Kenya, Malawi, and Zambia.^{5,12,33} In those contexts, tracing partners telephonically and at their homes resulted in an increased number of contacts being reached and agreeing to be tested for HIV. Respondents in those studies expressed some concern that home testing could endanger confidentiality, particularly if neighbors assumed that they were HIV positive; however, in our setting, where distance to the health facility poses significant access challenges, home tracing and testing may be justified.

Implementing home testing initiatives requires timely and adequate provision of funds to support providers conducting provider referral home visits for partner HIV testing. The importance of resources for home tracing and HIV testing was also identified in studies in Malawi, Tanzania, and Cameroon; these found that provision of adequate funds to support home tracing increased notification and identification of cases through APNS.^{2,5,14,16,31,33,57,58} Furthermore, interrupted or poor funding has a significant negative impact on health-care worker mobility and motivation, which resulted in a lower percentage of sexual partners being notified and tested for HIV.^{5,16} In our study, health-care workers suggested increasing the home tracing transport allowance to enable them to reach more of their index clients' sexual partners. Such a client-centered approach would support increased case identification and APNS uptake.

Improving health workers' APNS skills through training was another key strategy that our interviewees believe could increase the uptake of APNS. Studies conducted across Africa have found that increased health-care worker training and skills can improve capacity to

elicit contacts and increase the volume of testing.^{10,11,14,27,31,33} These studies have also found that clients' lack of trust in health-care workers providing APNS in public health centers can decrease partner HIV testing uptake.^{31,33} However, adequately training health-care workers on key skills—such as how to build rapport, assure confidentiality, and convey potential benefits of HIV testing—can result in increased uptake and completion of HIV index testing services.^{31,33} Our study suggests that training for health-care workers should include more emphasis on profiling, integration of AIT into general HTS during risk assessment, and contact elicitation skills—these skills are currently absent from the national AIT training standards.⁵⁴ This training approach would increase health-care workers' knowledge on skills that are essential to increase the number of contacts elicited and reached with APNS.

Finally, our findings on the importance of partner notification slips are also consistent with other studies in Africa. Various studies have reported that the use of partner notification slips/testing invitation cards increases the proportion of sexual partners, particularly among men, reporting for partner HIV index testing services.^{5–7,10,19,33} Our study's findings suggest that Ndirande Health Center should strengthen the use of partner notification slips, particularly when the index client is doing partner notification and disclosure, as indicated in both the contract and dual referral methods.

Limitations

The major limitation of our methodology was the potential for recall bias. Most of our client interviewees were interviewed a year after accepting APNS. Therefore, their responses may have been influenced by any experiences in the interim. This study also did not address other related concerns; in particular, we did not explore whether clients were successfully linked to HIV treatment after testing HIV positive, a step that might influence whether they were willing to engage in APNS.

Conclusion

APNS for HIV index testing is a major public health intervention that, if effectively implemented, would strengthen Malawi's ability to attain the first UNAIDS Fast Track target: ensuring that 95% of the people living with HIV know their HIV statuses. This in turn would contribute to the country's overall ambition of HIV epidemic control. However, to move toward epidemic control, the Ndirande Health Center (and all other Malawian health-care facilities) needs to achieve optimal APNS uptake. Our findings suggest that this endeavor requires

further strengthening of those strategies that are currently working (such as provider referral, IPV screening and home tracing and testing), addressing identified barriers to APNS at the individual, institutional and policy levels, and researching and contextualizing new strategies to support increased identification of all HIV positive clients.⁵⁹

Abbreviations

APNS	Assisted partner notification services
AIT	Active index testing
IPV	Intimate partner violence
IDIs	In-depth interviews
KIIs	Key informant interviews

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Authors' Contributions

PCP conceptualized, designed the study, developed interview guides, conducted IDIs and KIIs, analysed data and drafted the manuscript. MN supported the scheduling of all IDIs & KIIs. ALNM supervised the study and reviewed the manuscript.

Availability of Data and Materials

All data sets used in the study are available from the corresponding author upon request.

Ethics Approval And Consent To Participate

The ethical approval and oversight for conducting this research were obtained from Malawi's College of Medicine Research and Ethics Committee (COMREC-P.12/19/2898)

on January 23, 2020. Permission to conduct the study at Ndirande Health Centre was provided by the Blantyre District Health Office, BT DHO/MED/9. The study abided by the ICH-GCP principles of respect for privacy and confidentiality of study participants and confirmed that the rights, safety, and wellbeing of study participants should prevail over the interest of science and society.

Written consent to participate in the study was provided by all study participants before their interviews (all participants happened to be literate). All interviews with study participants at the health facility were conducted on weekends to ensure privacy. To enhance privacy, we used codes, rather than names, for all study participants. All audio recordings and transcripts were saved in password-protected computers with access limited to the study team only.

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