## Qualitative Results

Seventeen EDARP healthcare providers, which included clinical officers, nurse counsellors, HIV counselors, and outreach workers, were interviewed for this study. Nearly all indicated that recent infection testing was acceptable to providers and clients, and feasible in terms of the additional time needed for specimen collection and post-test counselling, though it is important to recognize how issues with the recency assay and the subsequent halting of data collection mid-implementation affected provider perspectives. For many clients, providers were only able to return viral load results, as the results from the assay were not available in time for their next scheduled appointment; therefore, perspectives on the utility of recent infection testing were sometimes limited to the return of baseline viral load results. Some providers reported challenges with recent infection testing that were related to the delay in receiving the recency results. In these cases, it was difficult to parse out their perspectives regarding the utility of recent infection testing due to the unexpected delays in returning results.

## Perspectives of providers on value of recent infection testing

The majority of providers identified benefits to clinical care and management associated with recent infection testing (n=14). Nearly half claimed that returning the recency results improved adherence to treatment; of these, seven described how explaining the impact of treatment on viral load count reiterated the importance of drug adherence to their clients. Four providers noted that having a baseline measurement of viral load helped monitor their clients’ progress on ART and allowed for early detection of treatment failure. More than one third (n=6) reported that recency testing facilitated partner notification and contact tracing “to cut the channel of infection”, especially among clients with a recent infection “as they start thinking backwards” to identify their sexual partners in the last twelve months. Over half of providers described how returning recent infection test results helped to identify clients who posed as new diagnoses, which allowed them to administer a more appropriate treatment regimen. A few providers explained that discussing recency of infection encouraged client disclosure and “opening up”, which strengthened client-provider rapport. One provider noted that recent infection testing could be used to identify areas where transmission was happening, which could help inform planning for outreach testing programs.

Laboratory delays led to a situation where the study was halted for six weeks and staff did not have recency results available for people when they expected them. In order to be able to give patients some results they began returning baseline viral load results. Health care workers reported that this was helpful, as some people were interested in their viral load and keen to reduce it through adherence to treatment. It then became difficult to separate discussion of specific utility of the recency test, from utility of the recency pilot process which included viral load reporting. For example, a health care worker explained that she found recency results useful ‘*because especially on the side of the viral load, because they are tied with the viral load actually, it will help us show the client where their levels are…*’ (RECN03\_Site 3).

Reports of patients’ **motivations to initiate and adhere to treatment** in response to reporting of recent/long term test results varied, with health care providers giving examples of how they used both to emphasise the need for treatment. For example for a long-standing infection they could explain that the virus has been in the body for a long time, hence the need to begin treatment:

*‘you explain to them that since they have had the virus for a long their immune system is being weakened in turn this will give them pressure to take ARVs’* (RECN1\_Site 1)

Conversely a test result indicating recent infection could be used to encourage conversation about viral load, disease progression, and the importance of adherence to treatment.

Some health care workers were wary of potential negative impacts of returning recency test results for treatment initiation and adherence, for example ‘*you are a bit sensitive and careful giving them the result, because maybe that can contribute to them defaulting’* (RECN05\_Site 5). They explained there was a risk that patients with recent infection may delay initiating care.

Some health care workers also reported that the recency testing process helped them to identify patients who posed as new diagnoses, but had previously been tested and initiated treatment, for example  *‘it has been assisting us to capture the clients who have been on care elsewhere and now they come, pose as new’* (RECN03\_Site 3). This could help clinic staff to link patient’s current and previous records,

Health care workers also gave examples of situations where recency testing could help to facilitate partner referral, for example people with long term infections passing on details of former partners to health care workers for follow-up. A health care worker in Kenya explained that when clients receive a long term result from recency testing they ‘*start thinking backwards’*, to identify previous partners, enabling health workers to ‘*reach out to networks and get so many other clients*’ (RECN05\_Site 5).

The issue of the volume of blood required was also raised by health care workers. For example one noted that it was difficult for them to explain to the client ‘*the samples you need to get, because it’s not only one, we have the other samples, the client feels they are…it’s so much’* (RECN12\_Site 10*).* She went on to explain that while this was a challenge it was not necessarily a barrier: ‘*as you start doing the blood, the client says, hey, this is a lot of blood, but we still manage*’.Another health care worker explained that a patient declined to participate because they did not want to have more blood taken after other samples had already been taken during their clinic visit:

‘*when he or she comes, we prick twice, we prick again and then when the client now has accepted we are supposed to also do taking blood. So the client was saying “no you are pricking me a lot, so for many prickings, no”.* ’ (RECN01\_Site 1)

This has potential ethical implications for how independently decisions about testing are made, and implications for take-up in other settings.

## Perspectives of study participants on value of recent infection testing

Providers reported mixed views on the value study participants placed on their recency test results. Perception of negative participant perspective was attributed to disinterest (n=4), risk of re-traumatization (n=2), and fear of interpersonal conflict (n=1). This following quote was particularly insightful regarding the potential psychological harm of recency testing:  *"*[I] may suspect who infected me and that one will not help me in any way but destruct my mind and other things". Another participant stated that knowing their recency test result was “not helpful at all, not a good experience” and did not want it to happen to anyone.

Perception of positive participant perspective was attributed to improved treatment adherence (n=5), higher rates of partner notification and testing (n=3), and lifestyle changes (n=1). The results of the viral load test appear to have been particularly valuable to study participants, as providers reported that they were “always keen on their medications, unlike the others who did not have a baseline VL” and were “very eager to see their virus go down”. One provider provided an anecdote to illustrate the importance a study participant placed on viral load suppression:

*“When he went to Bungoma, he didn’t know the drugs he was taking, but he went to the hospital and explained where he was taking his drugs and he even explained …’and my viral load is high and I don’t want to miss my drugs because I have a high viral load’ . Bungoma district called us and we proved that he was our patient and they gave him the drugs….so you see it is helping him to adhere. PT4 ”*

Participants with a recent infection appeared to have been encouraged by the results of their viral load test. One participant claimed that knowing his/her recency status was important because it indicated that his/her “immunity is still strong”, enabled behavior change, and encouraged him/her to recruit friends to prevent onward transmission.

## Provider perspectives on risk of violence due to recent infection testing

No adverse events were reported, though many providers acknowledged the potential of recency test results to instigate conflict or violence (n=11). One provider recounted her experience with a study participant who learned that he was recently infected: “the way he was expressing himself it’s like he went to confront the lady”*.* Another reported that a participant refused recency testing because he was afraid he “might kill the person who infected [him]”. Several reported that persons with long-term infections did not attend post-test counselling with their partners, as they feared being blamed for transmission.

A health care worker described reporting back recency results as ‘*reactivating a wound that healed’* (RECN11\_Site 10), some time after the patient had recovered from the initial shock of their HIV diagnosis. Creating a negative focus in the past by looking back to identify a possible source of HIV infection could disrupt the positive messages of HIV counselling. This made it more difficult to focus on acceptance, and moving forward with life.

#### Blame and anger

Thinking about who could have infected them could be upsetting for an individual, and could lead to blame and anger. Respondents discussed feelings of unhappiness, ‘bitterness’, ‘stress’ and ‘un-forgiveness’. A study participant who had received a positive recent infection test result explained in the follow-up questionnaire: ‘*I felt bad because I know who infected me and probably he did it knowingly….not helpful at all, not a good experience’* (PT2).

Within relationships, learning who has been infected for longer and potentially infected their partner could be a source of disruption and conflict. A different study participant in Kenya explained: ‘*knowing that I was recently infected gave me an idea of who infected me …I got so bitter and did not want to see him anymore. I cut my links with him and do not want to see him ever again*’ (PT1).

Health care workers emphasised that knowledge of a recency result which enabled people to identify who could have infected them could lead to violence. A health care provider described a specific case of a man who was diagnosed with HIV and enrolled in the study. When he participated in recency testing and learned he had been infected within the last six months, he was able to identify who infected him. When he left the clinic "*the way he was expressing himself it’s like he went to confront the lady’* RECN07\_Site 7

#### Risk mitigation

Some health care providers reported highlighting that the recency test does not tell patients specifically who infected them, for example: ‘*It is good to accept the result, and not go about trying to find who infected you so that they don’t have those issues with having those fights or conflicts at home’* (RECN10\_Site 9). Another health care provider explained that she advised patients ‘*sex is something you consented to, so no need to confront another person and then you’ll end up in court or jail’* (RECN11\_Site 10). The main message of counselling was to initiate and adhere to treatment ‘*moving on with life, not really focusing on past’* (RECN02\_Site 2). Counselling could help people to move away from ‘looking backwards’, attributing blame and feeling angry, to looking forwards and moving on with their lives.

## Provider comfort in discussing HIV recency in a healthcare setting

Most providers felt comfortable discussing HIV recency in a healthcare setting (n=13), which they attributed to training and mentorship. Seven providers reported feeling stressed at times, primarily due to fear of how the clients will react to their test result (n=4). One provider emphasized the vulnerability of newly diagnosed clients: “Now you are giving them another piece of information which they did not expect.” Identified challenges were related to clients’ comprehension of recency test results, including language, illiteracy, and limited emotional capacity to process additional clinical information after their HIV diagnosis. During post-test counseling, the main message communicated to study participants was the importance of “moving on with life, not really focusing on past”.

## Provider perspective on feasibility of integrating HIV recency testing into routine HTC services

The amount of time providers reported was needed to perform recency testing and counselling varied significantly, and ranged from less than ten minutes to over one hour. The least amount of time reported was needed for recency testing and counselling was seven minutes: three minutes to explain the purpose of the test and specimen collection procedures, two minutes to perform phlebotomy and prepare the DBS cards, and two minutes to return test results. The most amount of time reported was needed for recency testing and counselling was ninety minutes, but this was inclusive of all routine HTC procedures, including testing, counselling, and introduction to medication and care. Over half of providers reported that recency testing required an additional thirty minutes or less per client (n=9). The amount of time recommended for training also varied significantly among providers, ranging from a few hours over the course of an afternoon to one week. Off-site trainings were preferable to those conducted on-site. Prior to scale-up of recency testing, providers recommended educating the community on the value of testing for recency, ensuring availability of supplies needed to collect venous blood and prepare DBS specimens, and training additional clinical staff to perform recency procedures, including phlebotomy. It is important to recognize that training, which includes refresher courses and mentorship, was mentioned by nearly all providers.

## Provider recommendations to improve partner notification for persons with recent infection

Providers encouraged partner notification during post-test counselling. For clients unwilling to disclose their HIV status, providers asked their permission to make an anonymous phone call to their partner(s) and invite them for HIV testing or use community health workers to conduct door-to-door testing, with the objective of targeting the partners’ households. In all circumstances, providers emphasized the need for discretion for clients who are not ready to disclose their status.