HIV recency testing, positivity yield, and intimate partner violence among persons newly diagnosed with HIV

Findings from the Rwanda HIV recency evaluation study

PEPFAR
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TABLE OF CONTENTS

LIST OF TABLES AND FIGURES **5**

LIST OF AVAILABLE TOOLS **7**

GLOSSARY OF TERMS **8**

LIST OF ABBREVIATIONS **9**

EXECUTIVE SUMMARY **11**

TOPLINE FINDINGS IN FOCUS 11
OTHER KEY FINDINGS 11
CONCLUSION 13

1. INTRODUCTION **15**

1.1. Case-based Surveillance 15
1.2. Study Overview 15
1.3. Specific Objectives 16

2. STUDY DESIGN, METHODS, AND ANALYSIS **18**

2.1. Sample Frame and Design 18
2.2. Eligibility Criteria and Consent Procedure 19
2.3. Study Implementation 20
2.4. Data Collection 23
2.5. Biomarker Testing 25
2.6. Return of Results 25
2.7. HIV Recent Infection Testing Algorithm (RITA) 25
2.8. Data Processing and Analysis 25
2.9. Strengths and Limitations 26

3. ANALYTIC STUDY POPULATION **29**

3.1 Study Flow Diagram Summary 29
3.2 Population Characteristics 30

4. HIV-POSITIVITY AND RECENCY YIELDS **37**

4.1 Background 37
4.2 Results 37

5. IPV EXPERIENCES AFTER RETURN OF RECENCY TEST RESULTS **45**

5.1 Background 45
5.2 Results 45

6. PARTNER ELICITATION **57**

6.1 Background 57
6.2 Results 57

7. RETESTERS **61**

7.1 Background 61

7.2 RESULTS 61
8. BASELINE VIRAL LOAD 65
8.1 BACKGROUND 65
8.2 RESULTS 65
9. TREATMENT UPTAKE AND VIRAL LOAD SUPPRESSION 70
9.1 BACKGROUND 70
9.2 RESULTS 70
10. USE OF PRE-EXPOSURE PROPHYLAXIS AMONG HIV-NEGATIVE CONTACTS 74
10.1 BACKGROUND 74
10.2 RESULTS 74
11. HEALTH-RELATED QUALITY OF LIFE 77
11.1 BACKGROUND 77
11.2 RESULTS 77
12. HEALTHCARE PROVIDER KNOWLEDGE, ATTITUDES AND PRACTICES 81
12.1 BACKGROUND 81
12.2 RESULTS 81
13. REFERENCES 88

LIST OF TABLES AND FIGURES

TABLE 2.A. TOTAL NUMBER OF SELECTED STUDY HEALTH FACILITIES BY PROVINCE, APRIL 2019 – MARCH 2021 18
FIGURE 2.B. DISTRIBUTION OF SELECTED STUDY FACILITIES (MAP) 18
FIGURE 2.C. ORGANOGRAM OF THE STUDY TEAM 22
FIGURE 2.D COMPARISON OF HIV RECENT INFECTION TESTING ALGORITHM (RITA) 27
FIGURE 3.A CONSORT FLOW DIAGRAM FOR BASELINE INDEX STUDY POPULATION 29
FIGURE 3.B CONSORT FLOW DIAGRAM FOR BASELINE CONTACT STUDY POPULATION 30
TABLE 3.C BASELINE INDEX DEMOGRAPHICS STUDY PARTICIPANTS BY (RITA) STATUS 31
TABLE 3.D BASELINE CONTACT DEMOGRAPHICS INTERVIEW STATUS 33
TABLE 3.E BASELINE CONTACT DEMOGRAPHICS BY HIV STATUS 34
TABLE 3.F HEALTHCARE PROVIDER BASELINE DEMOGRPAHICS 35
TABLE 4.A CASE FINDING OUTCOMES BY RECENT INFECTION TESTING ALGORITHM (RITA) STATUS 38
FIGURE 4.B HIV POSITIVITY YIELD AND RECENCY YIELD AMONG SEXUAL CONTACTS OF INDEX STUDY PARTICIPANTS BY RITA STATUS (N = 789) 39
FIGURE 4.C KNOWN HIV-POSITIVE SEXUAL CONTACTS LINKED TO INDEX STUDY PARTICIPANTS BY RITA STATUS (N = 202) 39
TABLE 4.D CASE FINDING OUTCOMES BY RECENT INFECTION TESTING ALGORITHM RITA STATUS 41
FIGURE 4.E HIV POSITIVE YIELD AND RECENCY YIELD AMONG SEXUAL AND SOCIAL CONTACTS OF INDEX STUDY PARTICIPANTS BY RITA STATUS (N = 844) 42
FIGURE 4.F KNOWN HIV-POSITIVE SEXUAL AND SOCIAL CONTACTS LINKED TO INDEX STUDY PARTICIPANTS BY RITA STATUS (N = 209) 42
FIGURE 4.G DISTRIBUTION OF MONTHS ON ART OF CONTACTS WITH KNOWN HIV INFECTIONS BY RITA STATUS 43
FIGURE 5.A CONSORT FLOW DIAGRAM FOR FOLLOW-UP INDEX STUDY POPULATION 46
TABLE 5.B.1 PREVALENCE OF IPV VICTIMIZATION IN THE PAST 4 WEEKS BY A CURRENT PARTNER BY STUDY VISIT AND RITA STATUS 46
FIGURE 5.B.2 PROPORTION OF INDEX STUDY PARTICIPANTS EXPERIENCING ANY FORM OF IPV VICTIMIZATION IN THE PAST 4 WEEKS BY A CURRENT PARTNER BY STUDY VISIT 47
FIGURE 5.B.3 PROPORTION OF INDEX STUDY PARTICIPANTS EXPERIENCING ANY FORM OF IPV VICTIMIZATION IN THE PAST 4 WEEKS BY A CURRENT PARTNER BY STUDY VISIT AND RITA STATUS 48
TABLE 5.C.1 PREVALENCE OF IPV VICTIMIZATION IN THE PAST 4 WEEKS BY A CURRENT PARTNER AFTER RETURN OF RECENT INFECTION TEST RESULTS, BY RITA STATUS AND SEX 49
FIGURE 5.C.2 PROPORTION OF INDEX STUDY PARTICIPANTS EXPERIENCING ANY FORM OF IPV VICTIMIZATION IN THE PAST 4 WEEKS BY A CURRENT PARTNER AFTER RETURN OF RECENCY TEST RESULTS, BY RITA STATUS AND SEX 50
TABLE 5.D.1 PREVALENCE OF IPV VICTIMIZATION IN THE PAST 4 WEEKS BY A CURRENT PARTNER AFTER RETURN OF RECENT INFECTION TEST RESULTS, BY RITA STATUS AND VIOLENCE DOMAIN 51
FIGURE 5.D.2 PROPORTION OF INDEX STUDY PARTICIPANTS EXPERIENCING ANY FORM OF IPV VICTIMIZATION IN THE PAST 4 WEEKS BY A CURRENT PARTNER AFTER RETURN OF RECENCY TEST RESULTS, BY RITA STATUS AND IPV DOMAIN 52
FIGURE 5.E. SELF-REPORTED REASONS FOR IPV VICTIMIZATION BY STUDY VISIT AMONG THOSE WHO REPORTED VIOLENCE AT ONE OR MORE VISITS[1] 53
TABLE 5.F DEMOGRAPHIC AND SOCIOCULTURAL CHARACTERISTICS OF INDEX STUDY PARTICIPANTS BY REPORTED HISTORY OF BASELINE IPV 54
TABLE 6.A CONTACT TYPE BY RITA STATUS 57
FIGURE 6.B DISTRIBUTION OF CONTACTS REPORTED PER INDEX BY RITA STATUS (N = 1840) 58
TABLE 6.C PLANNED TYPE OF CONTACT REFERRAL BY PROVINCE 59
TABLE 6.D PLANNED TYPE OF CONTACT REFERRAL BY IMPLEMENTATION MODEL AND RITA STATUS 59
TABLE 7.A BASELINE CHARACTERISTICS OF INDEX STUDY PARTICIPANTS BY VIRAL LOAD STATUS 62
FIGURE 8.A DISTRIBUTION OF BASELINE VIRAL LOAD OF INDEX STUDY PARTICIPANTS, BY RITA STATUS (N = 1238) 65
FIGURE 8.B DISTRIBUTION OF BASELINE VIRAL LOAD OF INDEX STUDY PARTICIPANTS ON A LOGARITHMIC SCALE BY RITA STATUS .66
TABLE 8.C MEDIAN BASELINE VIRAL LOAD OF INDEX STUDY PARTICIPANTS BY RITA STATUS AND AGE/SEX SUBGROUPS 67
TABLE 8.D MEDIAN BASELINE VIRAL LOAD OF INDEX STUDY PARTICIPANTS AND RETESTERS BY RITA STATUS AND AGE/SEX SUBGROUPS 68

TABLE 8.E MEDIAN BASELINE VIRAL LOAD OF CONTACTS LINKED TO NEWLY DIAGNOSED INDEX STUDY PARTICIPANTS BY RITA STATUS AND CONTACT TYPE 68
TABLE 9.A VIRAL LOAD SUPPRESSION (VLS) (<1000 COPIES/ML) AT 6-MONTH POST BASELINE 70
TABLE 9.B VIRAL LOAD SUPPRESSION OF INDEX STUDY PARTICIPANTS AT 6-MONTH FOLLOW-UP POST BASELINE 71
TABLE 9.C DEMOGRAPHIC CHARACTERISTICS BY VIRAL LOAD SUPPRESSION STATUS AT 6-MONTH POST BASELINE 71
TABLE 10.A USE OF PRE-EXPOSURE PROPHYLAXIS 75
TABLE 11.A BASELINE WHOQOL DOMAIN SCORES OF INDEX STUDY PARTICIPANTS BY SEX 78
TABLE 11.B BASELINE WHOQOL DOMAIN SCORES OF INDEX STUDY PARTICIPANTS BY RITA STATUS 78
FIGURE 11.C WHOQOL DOMAIN SCORES BY RITA STATUS 79
TABLE 12.A HEALTHCARE PROVIDER TRAINING ON RECENT INFECTION TESTING 81
TABLE 12.B HEALTHCARE PROVIDER BARRIERS AND CHALLENGES TO CASE-BASED SURVEILLANCE AND RECENCY 82
TABLE 12.C HEALTHCARE PROVIDER KNOWLEDGE AND ATTITUDES ON THE IMPACT OF RECENCY TESTING ON STIGMA, MISTREATMENT, AND IPV 84
TABLE 12.D HEALTHCARE PROVIDER KNOWLEDGE AND ATTITUDES ON PRIORITIZING CLIENTS FOR INDEX TESTING 86

LIST OF AVAILABLE TOOLS

Available upon request:

SEMI-STRUCTURED INTERVIEW GUIDE

EXPERIENCE OF INTIMATE PARTNER VIOLENCE BASELINE QUESTIONNAIRE

EXPERIENCE OF INTIMATE PARTNER VIOLENCE FOLLOW-UP QUESTIONNAIRE

DATA ABSTRACTION TOOL

PREP FILE DATA ABSTRACTION TOOL

WHOQOL HIV BREF

HCP ELIGIBILTY SCREENING

HCP BASELINE QUESTIONNAIRE BASELINE

HCP FOLLOW-UP QUESTIONNAIRE

CBS REGISTER

CBS CASE REPORT FORM

GLOSSARY OF TERMS

Antiretroviral: A type of medication used in the treatment of Human Immunodeficiency Virus (HIV).

Antiretroviral therapy: Treatment with antiretroviral (ARV) drugs that inhibit the ability of HIV to multiply in the body, leading to improved health and survival among people living with HIV.

Case-based surveillance: Systematic and continuous collection of demographic and health event data about persons with HIV infection from diagnosis, and if available, throughout clinical care until death.

Contact: Sexual or social contact of index cases.

Index: A newly diagnosed individual identified at a study facility.

Intimate partner violence: Physical, sexual, economic, emotional, or psychosocial injury or hurt perpetrated by an intimate partner.

Human Immunodeficiency Virus: HIV is the virus that causes Acquired Immunodeficiency Syndrome (AIDS). The virus is passed from person to person through blood, semen vaginal fluids, and breast milk. HIV attacks CD4+ T-cells in the body, leaving a person living with HIV vulnerable to illnesses that a healthy immune system would have eliminated.

HIV Viral Load: The concentration of HIV RNA in the blood, usually expressed as copies per milliliter (mL).

HIV Viral Load Suppression: An HIV viral load of less than 1000 copies per mL.

HIV positivity yield: The number of new individuals who tested HIV-positive divided by the total number of individuals or contacts who received HIV testing services and received their test results.

Rapid test for recent infection (RTRI): A rapid test that can help differentiate between recent (i.e. in the past 12 months) and long-term HIV-1 infections in one testing device.

Recent infection: A HIV-1 infection that was likely acquired within the past 12 months.

Recent infection testing algorithm: The combination of baseline viral load results and RTRI results to classify an HIV infection as recent or long-term. A RITA reduces false recent classification when individuals are on ART and virally suppressed or are elite controllers

RITA recent: A recent infection by RTRI plus viral load ≥1000 copies per mL.

RITA long-term: A long-term infection by RTRI plus viral load ≥1000 copies per mL.

Presumed retesters: Persons with RTRI recent or RTRI long-term infections with suppressed viral load (VL <1000 copies/mL) on ART and not newly diagnosed with HIV.

Recency yield: The number of new individuals classified as RITA recent divided by the total number of individuals or contacts who received HIV testing services and received their test results.

Sexual contact: A sexual contact self-reported by the index.

Social contact: A member of his/her social network self-reported by the index.

LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
ART	Antiretroviral Therapy
ARV	Antiretroviral
CBS	Case-based surveillance
CDC	US Centers for Disease Control and Prevention
CGH	Center for Global Health
CTS-2	Conflicts Tactics Scale
DBS	Dried Blood Spot
DGHT	Division of Global HIV and TB
DHIS2	District Health Information System
EMR	Electronic Medical Record
FSW	Female sex workers
GoR	Government of Rwanda
GBV	Gender-based Violence
HITS	Hurt/Insult/Threaten/Scream tool
HF	Health facility
HIV	Human Immunodeficiency Virus
HRQoL	Health-Related Quality of Life
HTS	HIV testing services
ID	Identification number
IPV	Intimate Partner Violence
IRB	Institutional Review Board
mL	Milliliter
MOH	Ministry of Health
MSM	Men who have sex with men
NRL	National Reference Laboratory
ODK	Open Data Kit
PEPFAR	President's Emergency Plan for AIDS Relief
PLHIV	People living with HIV
PNS	Partner notification services
POC	Point-of-care
PrEP	Pre-exposure prophylaxis
PRO	Patient-reported outcome
R/LT	Recent or long term
RBC	Rwanda Biomedical Center
RITA	Recent infection testing algorithm
RNA	Ribonucleic acid
RTRI	Rapid test for recent infection
SOP	Standard Operating Procedures
TND	Target Not Detected
TRACE	Tracking with Recency Assays to Control the Epidemic
UNAIDS	The Joint United Nations Programme on HIV and AIDS
VL	Viral Load
VLS	Viral Load Suppression
WHO	World Health Organization

Executive Summary

TOPLINE FINDINGS

Recent cases were more likely to be linked to sexual contacts with recent infections

Long-term cases were more likely to be linked to contact with known HIV infection

IPV experiences significantly decreased after HIV diagnosis

No increase in IPV experiences after return of recency test results

No difference in IPV experiences between recent and LT cases

EXECUTIVE SUMMARY

TOPLINE FINDINGS IN FOCUS

The Rwanda HIV recency evaluation study was conducted between August 2021 and October 2022. The evaluation aimed to measure the potential association between HIV recency testing 1) on identifying contacts with HIV infections, including those with a recent infection, from newly diagnosed persons living with HIV (PLHIV) (i.e., positivity and recency yields) and 2) on intimate partner violence (IPV) experiences after the return of recency test results to PLHIV. The topline findings are summarized here:

Recency yield higher in index clients with a recent infection

The study found that index clients with a recent infection using a recent infection testing algorithm (RITA) compared to those with a RITA long-term (LT) infection were more likely to be linked to a sexual contact who was classified as recently infected on RITA (Table 4.a; Figure 4.b). The study also found a non-significant trend showing that more sexual contacts were elicited from index clients with a recent infection compared to those with a LT infection(Table 6.a; Figure 6.c). Notably, index clients with a RITA LT infection compared to those with a recent infection were more likely to be linked to contacts with known HIV infections, the vast majority of whom were virally suppressed (Table 4.f; Figure 4.g).

Experience of IPV does not increase after return of recency test results to index clients

The study found that IPV did not increase after return of recency test results to index clients (Table 5.b.1; Figure 5.b.2), and there were no statistical differences in IPV experience between those who received a recent infection result vs. a LT result (Figure 5.b.3; Table 5.c.1; Figure 5.c.2). The study found a relatively high level of baseline IPV experience among study participants, which decreased substantially after enrollment into the study after clients received their HIV test result.

OTHER KEY FINDINGS

Among the index clients, 98 (7.9%) were RITA recent while 1140 (92.1%) were RITA LT (Figure 3.a). Among the 1054 contacts with an HIV test result, 128 were newly diagnosed positive and became an index, 716 had HIV-negative results and 209 were known to have HIV positive results (Figure 3.b). The study separately examined the retesters who were captured as an index client initially as they presented as a newly diagnosed case. The study additionally examined the baseline VL profile of both index clients and their with known HIV infections to understand transmission potential. The study further measured quality of life indicators of index clients as well as knowledge, attitudes and practices of health care workers involved in recency surveillance in Rwanda.

Select index client characteristics:

- RITA recent cases compared to RITA LT index cases were more likely to be under 35 years (72% vs. 60%), female (79% vs. 62%), single (38% vs. 30%), and men who have sex with men (MSM) or female sex worker (FSW) (22% vs. 9%) ($p<0.01$ for all comparisons) (Table 3.c).

Select contact characteristics:

- Contacts linked to newly diagnosed PLHIV were majority <35 years, male, tested in Kigali, casual or cohabitating partners of index cases (Table 3.d).
- There was a tendency for more contacts with a known HIV infection to be linked to index clients with LT infections and they tended to have been on ART longer than those linked to index clients with recent infections (29 vs. 54 months, $p = 0.5$) (Figures 4.c, 4.f, and 4.g).

Select health care provider characteristics:

- 176 healthcare providers (range: 1 to 7 healthcare providers per facility) were surveyed at baseline, including two-thirds reporting having received recency testing training (n = 117). Of those, 172/176 (98%) participated in the 6-month follow-up interview (Table 12.a).
- The majority of healthcare providers that participated in the baseline interview (n = 176) were 35-49 years (70%), female (78%), nurses (61%), had ≥1 year of experience in recency testing (83%) (Table 3.f).

Select retester characteristics:

- Among 1577 persons initially considered as newly diagnosed in the study, 339 (21.4%) were VLS and considered retesters while 1238 (78.6%.) were considered newly diagnosed with unsuppressed VL (Figure 3.a).
- More than half of retesters were <35 years (61.9%), single or cohabitating (66.7%), and had 1 sexual partner in the past 3 months (63.4%) (Table 7.a).
- Compared to newly diagnosed indexes with unsuppressed VL, retesters were more likely to be female (72.3% vs. 63%, p=0.005), a female sex worker (14.2% vs. 9.2%, p=0.02), or reporting ≥2 sexual partners in the past 12 months (48.7% vs. 39.0%, p = 0.004) (Table 7.a).

Baseline VL profile:

- Overall, the minimum VL values were the same among recent and LT groups (min VL=1000 copies/mL) while the maximum VL was 10000000 and 7930000 copies/mL, respectively. There was no statistical difference (p=0.7) in median VL between recent (25350 copies/mL) and LT groups (28300 copies/mL). (Figures 8.a-b; Table 8.c).

Six-month outcomes for index clients:

- Among 1051 newly diagnosed index study participants with 6-month follow-up VL results, nearly all recent and LT index cases were virally suppressed and over 65% had undetectable VL (Table 9.a).

PrEP use among contacts who were HIV-negative:

- PrEP use was low (13.6%) among HIV-negative contacts of newly diagnosed HIV-positive index participants at facilities that offered PrEP (Table 10.a).
- HIV-negative contacts of recent index cases were less likely to use PrEP (1/42, 2.4%) compared to HIV-negative contacts of LT index cases (84/585, 14.4%) (Table 10.a).
- Majority of HIV-negative contacts who used PrEP (n = 85) were female (54/85, 64%), aged 15-34 (63/85, 74%), and presented to a health facility in Kigali City (58/85, 68%). In addition, PrEP use was higher among contacts who were in more established relationships, including married and cohabitating (54/85, 63.5%), as self-reported by the index, compared to less formal relationships, like girlfriend/boyfriend, casual or transactional partners (31/85, 36.5%) (Table 10.a).

Quality of life among index clients:

- Perceptions of overall quality of life (QoL) and his or her health were neutral overall, for both sexes, and by RITA status. Overall QoL scores were highest in the independence and physical domains and lowest in the psychological domain (Table 11.a and Table 11.b).

Knowledge, attitudes, and practices of healthcare providers:

- Nearly all (≥95%) felt capable of explaining recency and case-based surveillance (CBS) to clients and confident in their ability to elicit contacts from index clients at baseline and follow-up. However, over a

third (>35%) did not feel equipped to screen clients for IPV, citing lack of time with clients as the most common reason (>80%) (Table 12.b).

- Nearly all healthcare providers (>94%) believed that partners of clients with a recent infection result are at higher risk for HIV infection than other partners. However, concerns around the risk of negative consequences, including judgement, mistreatment, and IPV are mixed among providers (Table 12.c).
- Over a third (>35% at baseline) to nearly a half (49% at follow-up) of healthcare providers felt that index testing should be prioritized for certain clients, nearly all of whom said clients of recent results should be prioritized (>94%) (Table 12.d).

CONCLUSION

To our knowledge, the study is the first prospective cohort study from sub-Saharan Africa on the use of recency testing done for surveillance and its potential association with HIV positivity and recency yields from index testing, and potential association of return of HIV recency results to clients with experience of IPV. The study additionally provides in-depth profiling of the sexual and social contacts of the index clients, the quality of life of the index clients, and knowledge, attitudes, and practice of healthcare workers providing recency testing in Rwanda. These findings can generate new ideas on the use of recency testing results beyond HIV surveillance use, including considerations for using recency data to inform prevention and testing programs, such as index testing.

INTRODUCTION

1. INTRODUCTION

The Rwanda HIV recency evaluation study was funded by the United States (U.S.) President's Emergency Plan for AIDS Relief (PEPFAR) through the U.S. Centers for Disease Control and Prevention (CDC) under the terms of the Tracking with Recency Assays to Control the Epidemic (TRACE) award: NU2GGH002171.

The study was led by the Government of Rwanda (GoR) through the Rwanda Biomedical Center (RBC) in the Ministry of Health and ICAP at Columbia University, with technical assistance from the CDC.

1.1. Case-based Surveillance

Rwanda's national HIV response efforts use passive and episodic surveillance methods that include participatory surveillance, surveys and community-based reporting systems. In 2018, Rwanda began implementing case-based surveillance (CBS) , to bolster existing passive HIV surveillance methods. The CBS program is comprised of 1) active case-finding methods – to improve the first 95 (knowing HIV status) and 2) routine CBS to track the HIV continuum of care at the individual level – to improve the second and third 95 (on antiretroviral treatment (ART) and virally suppressed, respectively). Case-based surveillance in Rwanda implemented recency testing and viral load (VL) testing as additional components of HIV surveillance initiated once a patient is referred to an ART clinic for treatment. Under CBS, a rapid test for recent infection (RTRI, Asante^{TM} HIV-1 Rapid Recency Assay, Sedia Biosciences, Portland, OR, USA) is conducted for consenting clients 15 years and older who screen positive on Determine^{TM} HIV Early Detect and are subsequently confirmed HIV-positive by the HIV 1/2 Stat-Pak^{TM} assay at participating HIV health facilities. Clients with a recent infection result on the RTRI assay undergo additional VL testing to determine recent infection status as part of a recent infection testing algorithm (RITA); those who test recent on the RTRI and have a VL<1000 copies/mL are classified as RITA recent infections.

The GoR Ministry of Health (MOH) uses two approaches to recency testing: 1) point-of-care (POC) RTRI testing at 23 health centers and one private clinic where RTRI testing is conducted at the on-site laboratory facility and samples that test RTRI recent are sent to the National Reference Laboratory (NRL) or hub lab for additional viral load (VL) testing, and 2) recency testing at 516 non-POC testing sites where samples are collected and sent to District Hospitals (DH) or VL testing hubs for both RTRI and VL testing. All 68 testing laboratories including 23 POC health centers, 13 VL testing hubs, 30 DH, the NRL and one private clinic provide services to support all 584 activated CBS sites.

1.2. Study Overview

The Rwanda HIV recency evaluation study was conducted between August 2021 and October 2022 to measure the potential association between HIV recency testing on 1) identifying contacts with HIV infections, including those with a recent infection, from newly diagnosed persons living with HIV (PLHIV) (i.e., positivity and recency yields) and on 2) intimate partner violence (IPV) experiences after the return of recency test results to PLHIV. The study collected data from participating index clients and their contacts through semi-structured interviews and abstraction of routinely collected clinical data. In addition, all specimens of study participants with a new diagnosis of HIV underwent a RTRI and a baseline viral load (VL). A venous blood sample was also collected for VL testing for contacts with known HIV infections that returned to receive services as part of partner notification. Lastly, healthcare providers were invited to complete a voluntary questionnaire at the time of study start and again at a 6-month follow-up to assess knowledge, attitudes, and experience with recency testing and partner/index testing as part of the national active CBS program.

The study adds evidence from sub-Saharan Africa on potential association between HIV recency testing and HIV positivity and recency yields among contacts of recent and long-term (LT) index clients and IPV experience of index clients after return of recency test results that can inform recency surveillance programs in the region going forward. Firstly, the study provides an important data point on whether partner elicitation and yield of new HIV positive cases, including with those with recent infections, among contacts of recent vs LT index cases differ in programmatically significant ways. Further, this study provides key insights on whether returning recency test results to individuals leads to increased experience of IPV, an important concern many ministries of health implementing recency surveillance have expressed.

1.3. Specific Objectives

The goal of this project is to evaluate the effect of recency testing on HIV positivity and recency yields and IPV experience after return of recency test results among newly diagnosed PLHIV.

Primary Objectives:

1. To compare the HIV positivity yield between contacts of recent versus LT index cases
2. To compare IPV experience associated with the return of recency test results between recent versus LT index cases

Secondary Objectives:

1. To compare the HIV status of contacts linked to recent versus LT index cases who are (1) newly diagnosed HIV-positive recent (recency yield) versus LT cases, 2) known HIV-positive, and (3) and HIV-negative
2. To compare the number of elicited contacts linked to recent versus LT index cases
3. To compare baseline VL of recent versus LT index cases
4. To compare treatment uptake and viral load suppression (VLS) status at 6 months of recent versus LT index cases
5. To compare health-related quality of life (HRQoL) indices of recent versus LT index cases
6. To assess healthcare providers' knowledge, attitudes, and practices pertaining to recency testing and return of results and barriers to recency implementation

We also describe the sociodemographic and behavioral characteristics of participants who self-reported naïve to ART with no prior HIV diagnosis who were virally suppressed. These individuals were presumed retesters and excluded from the main cohort.

STUDY DESIGN, METHODS, AND ANALYSIS

2. STUDY DESIGN, METHODS, AND ANALYSIS

The Rwanda HIV recency evaluation study was a 6-month prospective cohort study of newly diagnosed HIV-positive persons (index cases) who participated in CBS and recency testing and their elicited adult contacts. Facility-based healthcare provider surveys at study start and 6 months after were also conducted.

2.1. Sample Frame and Design

The study used a stratified cluster probability sample design to select a total of 60 health facilities (HF) covering all five provinces (Eastern, Kigali City, Northern, Southern, and Western). The number of HF selected per province was proportional to the total number of recent infections identified on the recent infection testing algorithm (RITA) during the two years prior to study start. Within each province, HF with the larger number of recent infections were selected in rank order (Table 2.a, Figure 2.b).

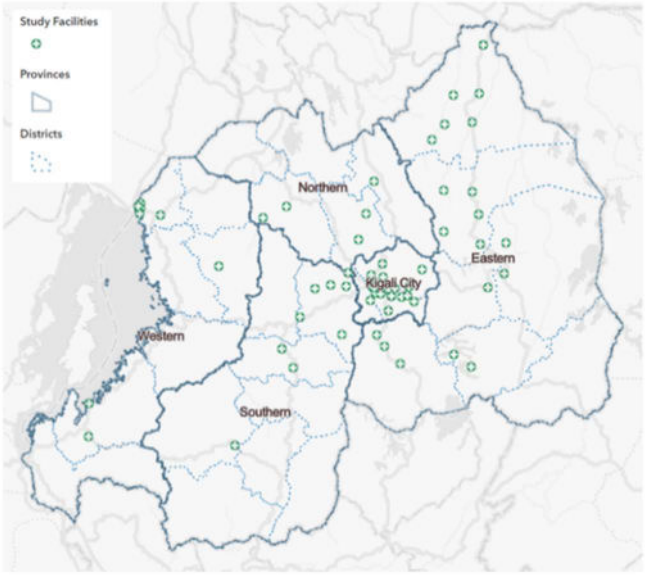
Table 2.a. Total number of selected study health facilities by province, Rwanda April 2019 – March 2021

Province	# Recent	% of Recent	# Facilities Selected[1,2]
Eastern	174	31.1	19
Kigali City	181	32.4	19
Northern	57	10.2	6
Southern	77	13.8	8
Western	70	12.5	8
Total	**559**	**100**	**60**

[1] Sampling frame excludes certain facility types including facilities not implementing CBS at the time of sampling, prisons, refugee camps, district, provincial, military, and referral hospitals.

[2] One selected site was replaced due to becoming a COVID-19 treatment center prior to study start. A second site was replaced during activation because it was determined that the facility had not begun implementing CBS. For each case, the next site within the same province with the largest total number of recent infections was selected.

Figure 2.b. Distribution of selected study facilities (map), Rwanda 2021–2022



The study was powered to detect a 20% difference (average of published literature) in HIV positivity yield and a difference in mean number of IPV events of 0.4 over a 6-month period between recent vs. LT index cases [1-4]. A total sample of approximately 88 recent infections was required to achieve at least 80% for both primary objectives.

2.2. Eligibility Criteria and Consent Procedure

ELIGIBILITY CRITERIA

In the Rwanda evaluation study, the criteria for study participation were as follows:

Index	Contact	Healthcare Provider
• Aged ≥15 years • Be newly diagnosed with HIV • Ability to speak and understand English or Kinyarwanda • Consented to be part of CBS and recency surveillance under routine active CBS protocol • Give voluntary, written informed consent	• Aged ≥15 years • Elicited by an index client during partner notification services (PNS) • Sexual and social contacts • Ability to speak and understand English or Kinyarwanda • Give voluntary, written (or verbal, if reached via phone) informed consent	• Aged ≥18 years • Be currently employed at a health facility where recent infection surveillance was initiated for at least 6 months • Be involved in recency testing and/ or active CBS procedures (i.e., enrolled at least 1 individual for recency testing and into CBS) • Have at least 3 months of experience with CBS and recency • Give voluntary written informed consent for data collection via a self-administered questionnaire

Exclusion criteria

Index	Contact
• Male participants who are received at the HF as a couple do not receive the IPV section of the interview and are excluded from the IPV analysis	• Child contacts and contacts who the index confirms are a IPV risk during PNS are excluded from participation

Individual consent procedures

An electronic informed consent form was administered using a tablet to all study participants. Additionally, two printed hardcopies were available. One hardcopy consent was signed by participants who consented to participate in the study and kept with the study team as a Rwanda National Ethics Committee requirement. The study allowed participants to opt into receiving a blank hardcopy of their consent form. If the participant chose to receive a copy of the form, the second hardcopy was handed to the participant.

Index participants provided informed consent for four interviews at regular monthly clinic visits and to abstract routinely collected healthcare information from their clinical records.

Contact participants received in person provided informed consent to participate in one interview and to abstract healthcare information that is collected as part of the healthcare services they receive, including test results, treatment, and risk behaviors. Contacts received at the HF who were known positive additionally gave permission to draw a venous blood sample for study specific VL testing. Newly diagnosed contacts with HIV infections who opted out or did not provide consent to recency testing but agreed to participate in the evaluation study, provided consent

as a contact elicited by an index case only (vs. providing consent as an index case). Contacts that did not return to the HF in person provided consent for one telephone interview.

In Rwanda, a waiver for the requirement of parental informed consent is in place to allow minors who are at least 15 years of age to consent for recency testing. A waiver is also in place to allow emancipated minors between 15-17 years or self-disclosed female sex workers (FSW) under the age of consent to participate in partner elicitation and notification [5]. A waiver of parental informed consent was granted in accordance with 45CFR 46.116 (d) by the ethical review boards who approved this study.

Healthcare providers provided consent to participate in two interviews: the first at study start and the second at 6-months thereafter.

The study protocol, consent forms, and questionnaires were reviewed and approved by Rwanda National Ethics Committee (RNEC), the in-country ethical and regulatory body, and the institutional review boards of Columbia University Medical Center and CDC.

2.3. Study Implementation

Training of study staff

Research assistants received training on both the contents of the data collection instruments and tablet use. The training curriculum included:

- Human subject's protection (ICH Good Clinical Practice E6 (R2) certification received through online training course, Global Health Training Centre)
- The objectives of the study
- Eligibility criteria, screening, and enrolment
- Counselling of participants during enrolment and consent
- Informed consent process and completion of the consent form
- The completion of data collection forms for the study
- RTRI test procedures
- The preparation, packaging, and storage of blood specimens for VL, including dried blood spot (DBS), if not routinely done
- The secure and timely transport of specimens
- Human and physical procedures and protections to ensure the security and confidentiality of data
- The return of results, including appropriate training on:
    1. Accurate and clear counselling messages on what 'recent infection' means and implications for disclosure of status to partners
    2. Assessment of risk for intimate partner and gender-based violence (GBV)
    3. Assessment of client's psychological well-being pre- and post- recency testing
    4. Referral systems for individuals to receive psychosocial support as needed
- Training for data collection (record abstraction, semi-structured interviews, and other methodologies)
- Training on adverse event reporting
- Training for HF implementers
- Training for laboratory
- Training for data management and analysis
- Training for data security, privacy and confidentiality

Training of facility-level personnel

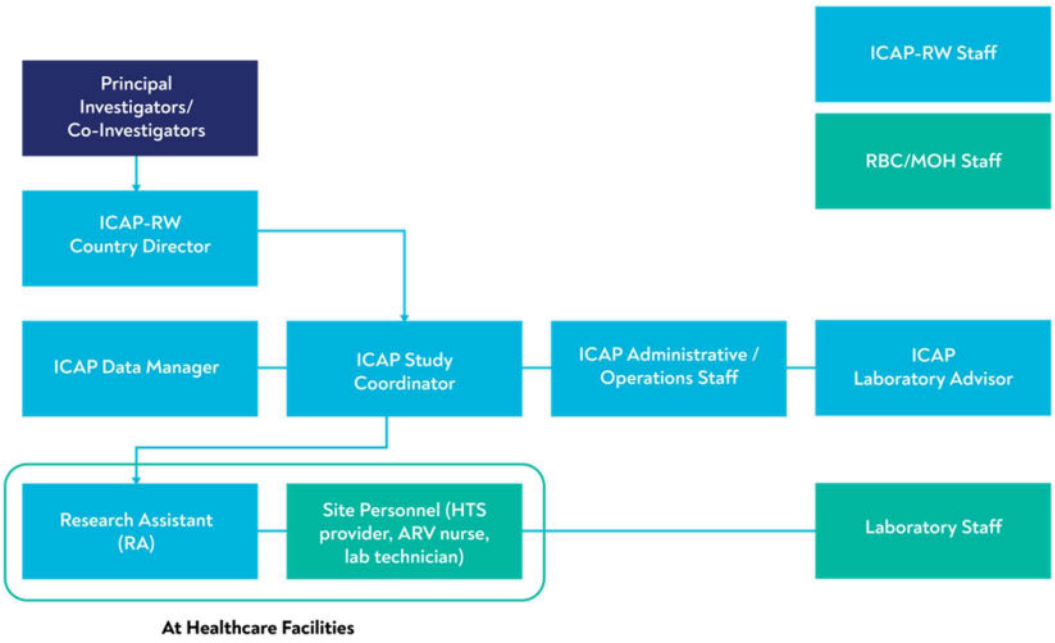
Facility-level personnel were trained at their respective facilities and oriented on study objectives, procedures, and their role in the study. Trained staff included heads of health centers, nurses in-charge of HIV, social health workers, laboratory technicians and data managers. The training curriculum included:

- Human subject's protection
- The objectives of the study
- Eligibility criteria, screening and enrolment
- Counselling of participants during enrolment and consent
- The preparation, packaging and storage of blood specimens for VL, including DBS, if not routinely done
- The secure and timely transport of specimens
- Human and physical procedures and protections to ensure the security and confidentiality of data
- The return of results, including appropriate training on:
    1. Accurate and clear counselling messages on what 'recent infection' means and implications for disclosure of status to partners
    2. Assessment of risk for intimate partner and GBV
    3. Assessment of client's psychological well-being pre- and post- recency testing
    4. Referral systems for individuals to receive psychosocial support as needed

Study staff

Site activation and data collection started in August 2021 and was completed in October 2022. A total of 50 trained research assistants was responsible for one or more health facilities within their assigned catchment area. Research assistants spoke Kinyarwanda in addition to English and/or French and were supervised by a study coordinator, data manager, and laboratory advisor. Facility-level personnel liaised closely with RAs. Principle investigators, co-investigators and the ICAP-Rwanda Country Director guided and oversaw study implementation and compliance, monitored study progress, performed data quality checks, and provided technical support at the central level (Figure 2.c).

Figure 2.c. Organogram of the study team[1]



Facility sensitization

In collaboration with RBC HIV Division personnel, ICAP-RW Country Office study personnel visited study facilities to sensitize facility personnel before data collection began. Before study initiation, a formal letter from RBC was sent to all study facilities to introduce the study and inform them of the incoming research assistants. Teams visited each facility prior to initiation of data collection as part of study activation activities. During study activation, healthcare providers involved in HIV services and Heads of HF were trained on study objectives and procedures that required close collaboration with research assistants.

Supervision

Research assistants were continuously overseen by the ICAP-RW study coordinator, data manager, and laboratory advisor as well as periodically monitored by national and international teams with representation from collaborating institutions (i.e., ICAP-NY and regional teams, RBC, and CDC-Rwanda). ICAP-RW monitoring teams visited facilities at least once every 2 months but as much as biweekly in high volume sites (e.g., Kigali study facilities), or as the need arose, and provided direct supervision as well as verified results and performed data quality checks on the collected data. The NRL or hub labs were closely monitored on a weekly basis and visited by the ICAP-RW lab advisor as needed (e.g., pending test results, supply issues, turn-around-time requiring follow-up). The ICAP-RW lab advisor also supported teams by organizing supplies and transport of blood samples when required. During each onsite visit, an entry and exit meeting with HIV clinic personnel and the head of health facility was conducted to inform them of the study progress, highlight challenges identified, and discuss corrective measures to address study implementation challenges.

Direct supervision at study facilities were complemented by continuous training and mentorship via virtual training platforms and weekly calls lead by ICAP-RW study personnel. In addition, daily monitoring forms completed by research assistants, online monitoring tools and analytic reports were reviewed by ICAP-RW, ICAP-HQ/regional technical staff to track study milestones, data quality and completeness.

[1] Two selected RAs were assigned to hub labs and served as lab focal personnel. All other RAs were assigned to ≥1 healthcare facility within their assigned catchment area.

The national and international monitoring teams from ICAP-HQ/regional, RBC, and CDC-Rwanda observed and assessed the quality of study procedures, including adherence to protocol and standard operating procedures (SOPs), and identified and responded to challenges with data collection. Regular debriefing sessions were held between the study coordinator and monitoring teams. Monitoring reports were circulated to collaborating institutions to respond to any issues.

Electronic data monitoring

Data-driven, real-time monitoring ensured that the study remained on track and reached targets despite resurgences of COVID-19 during the study period. A weekly data monitoring report was established to monitor the progression of the study. The report summarized data uploaded to the study server daily. The report monitored participant enrolments and refusals by facility and by week, attrition over time with each follow-up visit, biomarker result availability for recency and VL, and overall progress toward the achievement of our overall target sample size. Completeness and data quality of routinely collected data was monitored using separate reports.

2.4. Data Collection

Questionnaire data were collected on mobile tablet devices using applications programmed in Open Data Kit (ODK), an open-source mobile data collection application. The District Health Information System (DHIS2) tracker application and backend database was used to abstract routinely collected clinical information from paper-based and electronic systems.

Index cases

Each index visit is aligned with routine active CBS visits. At each visit, IPV and HRQoL interviews were administered with the index client at multiple timepoints, including before and after the return of their HIV diagnosis and before/after return of their recency test result. Interviews were conducted at the baseline visit and during follow-up visits at 1, 2, and 6-months after the initial visit. Index interviews collected information on self-reported experiences of control, economic, emotional, physical, or sexual violence from a current or past partner over a 4-week recall period. Violence items included in the questionnaire were selected from validated instruments used in international settings following a targeted social harm instrument review, including items used to assess physical and sexual violence in the Rwanda DHS violence module [6-12]. Interviews also collected information on specific domains from the WHOQOL-BREF HIV, which is a patient-reported outcome instrument (PRO) validated for use with PLHIV [13]. Males received at the facility at the same time as their partner did not receive questions regarding IPV but in lieu received the full WHOQOL-HIV-BREF questionnaire. In addition, routine program data was abstracted from paper-based (e.g., HIV CBS register; CBS patient file) and electronic sources (e.g., EMR/OpenMRS) over the study period, starting with the baseline visit. This included collecting key information regarding the index case (e.g., enrolment date, age, sex, elicited contacts, recency and VL test results, etc.) and information reported by the index on each elicited contact (e.g., age, sex, relationship to the index, and the HIV status of contacts, as well as their risk of IPV to the index). At the end of each interview, research assistants completed an IPV referral plan checklist and offered information and services to participants according to the indicated response plan, including referral to IPV counseling, one-stop GBV service centers at district hospitals or via a hotline.

Contact cases

Contacts of index participants were interviewed once to assess HIV status and treatment and prevention experience. Interviews were conducted either in-person when a contact returned for HIV testing as part of PNS or by phone if consent was given following repeated invitations by facility personnel (i.e., a maximum of three times over the course of three months as part of routine PNS).

Contacts who tested or self-reported HIV-negative were asked questions about pre-exposure prophylaxis (PrEP) referral and initiation, plans for repeat testing and adherence. Known HIV-positive contacts were asked about their diagnosis date, treatment initiation date, facility where treatment is sought, and treatment adherence. Contacts who accepted the invitation to visit the HF but refused routine HIV testing services were considered status unknown contacts and were asked about their self-reported HIV status andself-testing. Then if they self-reported HIV-negative, they were asked questions on their PrEP referral and initiation, and scheduling for repeat testing.

Outcome information of the contact notification process including their HIV test result, from the HIV CBS register was abstracted from all contacts. In addition, information from the PrEP register or PrEP medical file were abstracted for HIV-negative contacts who were interviewed in person at study facilities where PrEP was in use. Information was also abstracted from the EMR/OpenMRS or CBS patient file for known HIV-positive contacts to collect clinical and treatment information. Newly diagnosed HIV-positive contacts of an already enrolled index case were enrolled in the study as an index if consent was given.

Healthcare providers

The healthcare provider interview collected information on experience, training, and responsibilities, and included questions on implementation barriers and challenges to recency testing, barriers to accepting PNS before and after COVID-19, knowledge, attitudes, and experiences with recency testing and case finding.

2.5. Biomarker Testing

Venous blood (~4 mL) was collected from consenting participants enrolled in CBS for RTRI and VL testing. Point-of-care (POC) RTRI testing facilities conducted RTRI testing at the site and sent samples to NRL for VL testing. Non-POC RTRI testing facilities sent samples for testing to district hospitals or hub labs where RTRI and VL testing were conducted. For the purposes of the study, plasma from the venous blood sample used for RTRI testing was used for baseline VL testing for all index participants tested for recency on the assay regardless of their RTRI result (i.e., all specimens of persons with a RTRI recent or LT result). By contrast, in routine CBS, only RTRI recents have their VL measured at baseline (Figure 2.d). For contacts with known HIV infections that were received at the facility during routine care, an additional 4 mL venous blood sample was collected for VL testing during routine specimen collection. Viral load testing was conducted from plasma by measuring HIV-1 RNA copies using the Roche COBAS® platform and the COBAS®AmpliPrep/COBAS® TaqMan® HIV-1 Test v2.0 according to manufacturer's instructions. Handling, storage, transportation, and specimen disposal were conducted according to the national guidelines and SOPs.

2.6. Return of Results

The return of recency test results is routinely delayed until confirmatory VL testing is complete. Viral load results are normally returned within 14 days to the antiretroviral therapy (ART) clinic and to the patient within one month during the next scheduled appointment. At POC RTRI testing facilities, results are returned immediately to clients with a LT result (vs. within one month during the next scheduled visit). For the study, a waiver was granted to ensure that the return of recent and LT test results occurred at approximately the same time across all clients receiving services at study facilities to allow us to examine incremental changes over time in experience of IPV between a client's HIV diagnosis and recency testing results. Thus, under this waiver the return of results for clients with a RTRI LT result across POC RTRI study facilities was delayed to the next scheduled visit.

2.7. HIV Recent Infection Testing Algorithm (RITA)

To help classify persons newly diagnosed with HIV-1 infection as either recent or LT, study specimens were tested for recent infection according to a RITA that included a RTRI test and a baseline VL test. Specimens that tested RTRI recent (low antibody avidity) with unsuppressed VL (HIV RNA ≥1000 copies/mL) were classified as RITA recent infections meaning an infection acquired approximately within the past 6-12 months. Specimens that tested RTRI LT (high antibody avidity) with unsuppressed VL (HIV RNA ≥1000 copies/mL) were classified as RITA LT infections meaning an infection acquired more than 12 months ago. Specimens with suppressed VL were presumed retesters on ART and not newly diagnosed and excluded from the main analysis for primary objectives one and two.

2.8. Data Processing and Analysis

All study data were collected on tablets, transmitted to secure databases located on RBC-designated servers. Abstracted data, including laboratory biomarker data were cleaned and merged with the questionnaire database using unique study identification numbers (ID). Contacts reported by newly diagnosed participants were identified and linked using abstracted contact data, and study interview and testing data was linked where available to determine eligibility and consent status as well as to determine whether each contact was reached, consented,

and/or tested. Intimate partner violence outcomes were computed by grouping IPV questions into violence domains and summarising the total number of times IPV was experienced within each domain, and finally summarised into overall counts and binary indicators of whether violence was experienced within each domain or in any domain.

Analyses of characteristics of study participants, yield, experience of IPV with return of test results, elicitation, baseline VL, treatment uptake and VLS after 6 months of treatment, HRQoL, and healthcare provider knowledge, attitudes and practices were conducted using R (R Core Team, 2022) [14].

Demographic and behavioural characteristics of persons with recent infection and LT infection were compared using Fisher exact tests to assess for statistical significance ($p<0.05$). Continuous variables (e.g., elicitation, VL) were compared using the Wilcoxon rank sum test to assess for differences. Fischer exact tests were used to compare HIV-positive and recency yields among contacts of recent vs. LT study participants over a 6-month period. For IPV, unless otherwise, noted, claims of statistically significant ($p<0.05$) comparisons in the report were based upon using Fischer exact tests for differences in proportions. Participants with missing data were excluded from analysis, unless otherwise specified.

Clustering by facility was not accounted for due to small counts per facility [15].

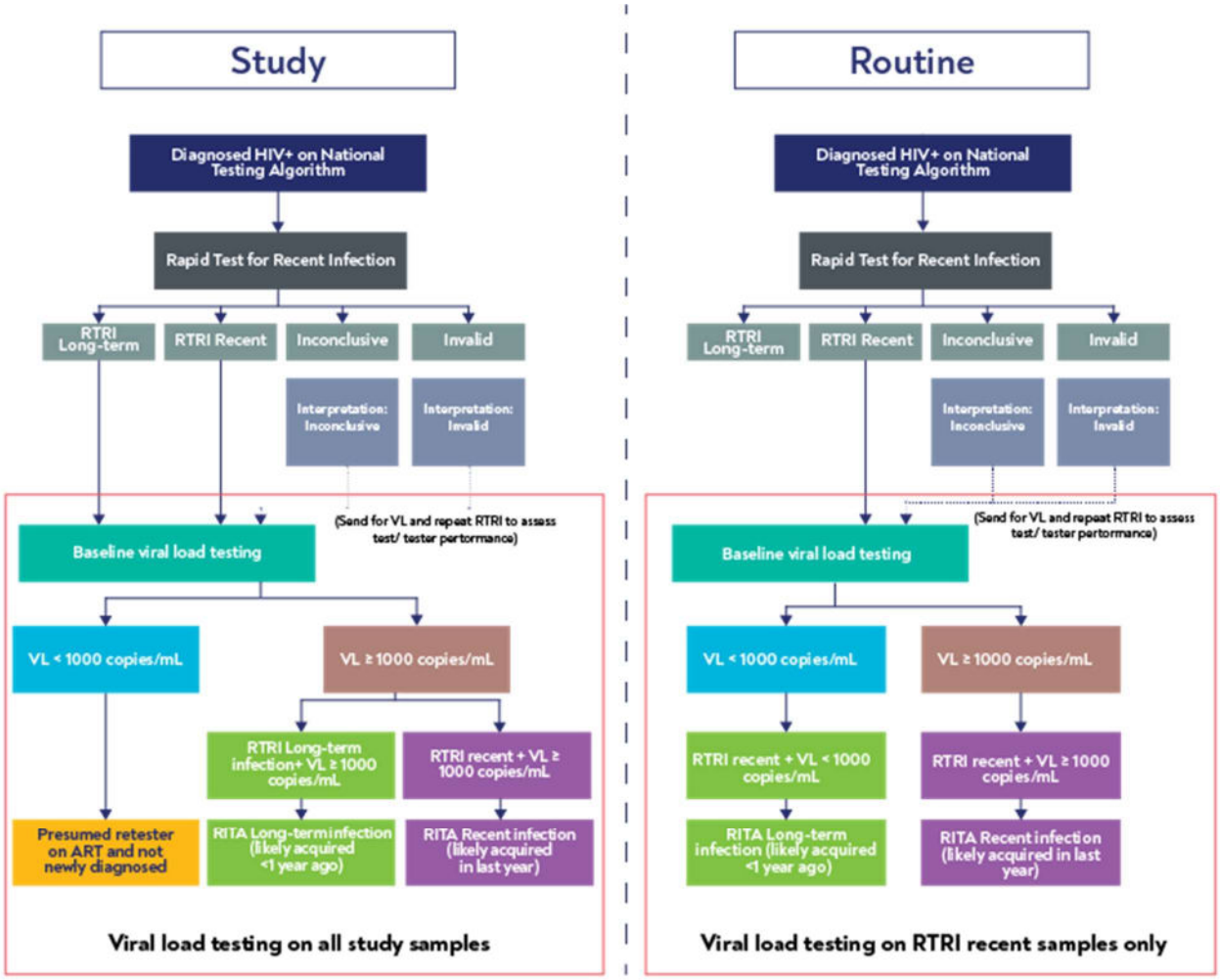
2.9. Strengths and Limitations

The study adds evidence from sub-Saharan Africa on HIV positivity and recency yields among contacts of recent and long-term (LT) index clients and IPV experience of index clients after return of recency test results that can inform programmatic use of recency testing data in the region going forward. Firstly, the study provides an important data point on whether partner elicitation and yield of new HIV-positive cases, including with those with recent infections, among contacts of recent vs LT index cases differ in programmatically significant ways. Further, this study provides key insights on whether returning recency test results to individuals is associated with increased experience of IPV, an important concern many ministries of health implementing recency surveillance have.

This study has several other strengths, including meeting sample size targets, longitudinal follow-up with limited attrition, the use electronic data collection limiting missing data and of validated instruments to measure IPV. Enrolling a sufficiently large sample of recent infections is challenging, especially in a context like Rwanda that is near HIV epidemic control with few new HIV infections.

There are also limitations to consider. First, the study lacked power to detect the observed difference in HIV positivity yield between the two arms (recent vs. LT). Furthermore, the study is limited by incomplete risk behavior data abstracted from routine clinical records. Finally, the generalizability of the evidence generated from this study may be limited, as the results are based on a Rwandan cohort. Our results may not apply to other countries implementing recent infection testing.

Figure 2.d Comparison of HIV Recent Infection Testing Algorithm (RITA), Rwanda 2021–2022



ANALYTIC STUDY POPULATION

3. ANALYTIC STUDY POPULATION

This chapter describes how the analytic study population was derived from the eligible population of index cases and their contacts. The characteristics of the study population are also described here.

3.1 Study Flow Diagram Summary

Figure 3.a summarizes the flow from 1648 potentially eligible individuals newly diagnosed with HIV individuals screened to the final index study population of 1238. An additional 339 were VLS (VL < 1000 copies/mL) and thus presumed to be retesters already on ART and not newly diagnosed. These individuals were excluded from the main analyses (Figure 3.a).

Figure 3.b summarizes the flow from 1840 potentially eligible contacts listed and screened to the final contact study population of 1082. Among the 1082 contacts, 28 were interviewed by phone and 1054 were returned to the facility for an interviewed and were tested in person.

Additionally, 176 healthcare providers (1–7 healthcare providers per facility) were recruited and enrolled into the study across the 60 study facilities. Of those, 172 (98%) also completed the 6-month follow-up interview.

Figure 3.a CONSORT flow diagram for baseline index study population, Rwanda 2021–2022

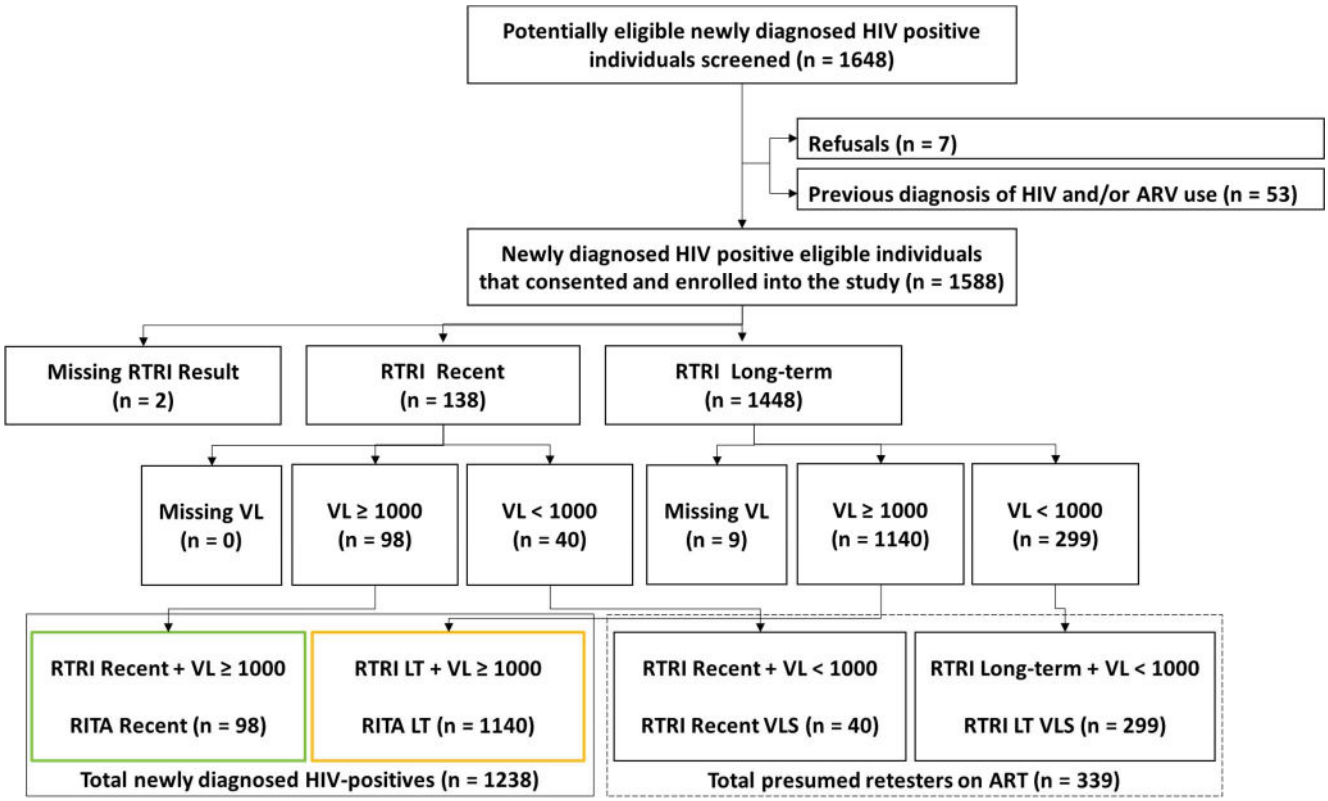
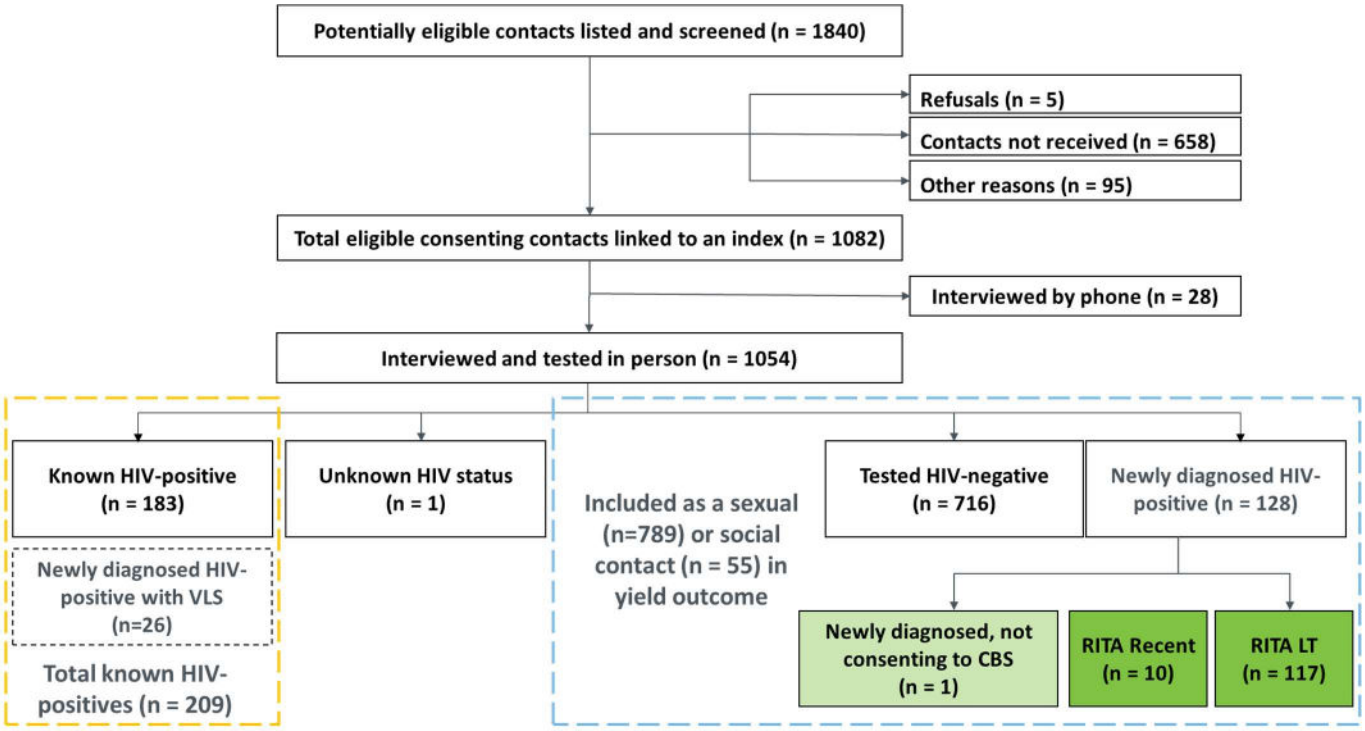


Figure 3.b CONSORT flow diagram for baseline contact study population, Rwanda 2021–2022



3.2 Population Characteristics

This section summarizes the basic demographic and socioeconomic population characteristics of index and contact study participants. First, the demographic characteristics of newly diagnosed index participants by RITA status included in the main analysis are described in Table 3.c. Among 1238 participants included in the analysis, 779 (62.9%) were female with 759 (61.3%) of participants aged 15-34 years. Ninety-eight (7.9%) participants were recently infected with HIV (<12 months) and 1140 were long-term infected (≥12 months). Approximately half presented for testing in Kigali City. Most participants were single or cohabitating with a partner (68.2%), did not arrive at the facility as part of a couple (71.2%), and had one or more sexual partners in the last 3 months (85.4%),. RITA recent cases compared to RITA LT index cases were more likely to be under 35 years (72.4% vs. 60.4%), female (78.6% vs. 61.6%), pregnant (33.8% vs. 27.8%), single (37.8% vs. 29.6%), and men who have sex with men (MSM) or female sex worker (FSW) (22.4% vs. 8.7%) ($p<0.01$ for all comparisons).

Table 3.c: Baseline characteristics of index study participants by recent infection testing algorithm (RITA) status, Rwanda 2021–2022

Among adults aged 15 years and older newly diagnosed HIV-positive who consented to case-based surveillance and recency testing

Characteristic	Total (n = 1238), n (%)	RITA Recent[1] (n = 98), n (%)	RITA Long-term[1] (n = 1140), n (%)	P value
RITA Result				
Recent	98 (7.9)	98 (7.9)	-	
Long Term	1140 (92.1)	-	1140 (92.1)	
Age at diagnosis (years)				
15-34	759 (61.3)	71 (72.4)	688 (60.4)	0.008
35-49	408 (33.0)	19 (19.4)	389 (34.1)	
50+	71 (5.7)	8 (8.2)	63 (5.5)	
Sex				
Male	459 (37.1)	21 (21.4)	438 (38.4)	0.001
Female	779 (62.9)	77 (78.6)	702 (61.6)	
Pregnancy status[2]				
Pregnant	219 (28.4)	26 (33.8)	193 (27.8)	0.002
Not pregnant	552 (71.6)	51 (66.2)	501 (72.2)	
Province				
Eastern	342 (27.6)	28 (28.6)	314 (27.5)	0.0005
Kigali City	609 (49.2)	36 (36.7)	573 (50.3)	
Northern	48 (3.9)	14 (14.3)	34 (3.0)	
Southern	105 (8.5)	11 (11.2)	94 (8.2)	
Western	134 (10.8)	9 (9.2)	125 (11.0)	
Population group				
General population female	665 (53.7)	57 (58.2)	608 (53.3)	<0.0001
General population male	452 (36.5)	19 (19.4)	433 (38)	
Female sex worker	114 (9.2)	20 (20.4)	94 (8.3)	
Men who have sex with men	7 (0.6)	2 (2)	5 (0.4)	
Marital status				
Single	374 (30.2)	37 (37.8)	337 (29.6)	0.008
Married	159 (12.8)	21 (21.4)	138 (12.1)	
Cohabiting	470 (38.0)	25 (25.5)	445 (39.0)	
Widowed	49 (4.0)	2 (2.0)	47 (4.1)	
Divorced/separated	186 (15.0)	13 (13.3)	173 (15.2)	
Arrived at the facility as part of a couple				
Yes	357 (28.8)	20 (20.4)	337 (29.6)	0.06
No	881 (71.2)	78 (79.6)	803 (70.4)	
Employment				
Employed	541 (43.7)	45 (45.9)	496 (43.5)	0.7
Unemployed	697 (56.3)	53 (54.1)	644 (56.5)	
Number of sexual partners in the past 3 months				

0	181 (14.6)	12 (12.2)	169 (14.8)	0.1
1	812 (65.6)	59 (60.2)	753 (66.1)	
2+	245 (19.8)	27 (27.6)	218 (19.1)	
Number of sexual partners in the past 12 months				
0	77 (6.2)	2 (2.0)	75 (6.6)	0.06
1	678 (54.8)	49 (50.0)	629 (55.2)	
2+	483 (39.0)	47 (48.0)	436 (38.2)	
Had sex without a condom in the past 12 months				
Yes	1180 (95.4)	97 (99.0)	1083 (95.1)	0.15
No	57 (4.6)	1 (1.0)	56 (4.9)	
Health-related quality of life, n (mean ± SD)[3]				
Overall quality of life	1237 (2.9 ± 0.9)	98 (2.8 ± 0.9)	1139 (2.9 ± 0.9)	0.33
General health perception	1233 (3.2 ± 0.9)	98 (3.1 ± 0.9)	1135 (3.2 ± 0.9)	0.30
Physical	1237 (14.8 ± 3.4)	98 (14.7 ± 3.5)	1139 (14.8 ± 3.4)	0.72
Psychological	1237 (12.6 ± 1.5)	98 (12.5 ± 1.5)	1139 (12.6 ± 1.5)	0.60
Independence	1237 (15.2 ± 2.8)	98 (15.0 ± 2.6)	1139 (15.3 ± 2.8)	0.33
Social relationships	1237 (14.0 ± 2.8)	98 (13.9 ± 2.7)	1139 (14.0 ± 2.8)	0.66
Number of clinic visits during study follow-up (mean ± SD)	5.11 ± 1.45	5.11 ± 1.54	5.11 ± 1.45	0.7

[1]Number (%) unless otherwise indicated.

[2]Eight female participants had missing pregnancy status.

[3]Used the WHOQOL-HIV BREF instrument to produce scores among all index participants in the following domains: physical, psychological, level of independence, and social relationships. In addition, included in this instrument were two items that examine general quality of life. Domain scores were calculated by computing the mean score of items within each domain; items are rated on a Likert scale where 1 indicates low, negative perceptions and 5 indicates high, positive perceptions. Mean scores were multiplied by 4, so that scores ranged between 4 and 20. One participant did not answer all questions required to compute scores. Five participants had missing data for the general health perception question.

The 98 recent and 1140 LT newly diagnosed people included in this analysis identified 1840 sexual and social contacts as part of index testing, including 1054 that returned to the facility for interviews and were HIV tested. Table 3.d summarizes the baseline demographic characteristics of the contacts. Contacts linked to newly diagnosed PLHIV were majority <35 years, male, tested in Kigali, causal or cohabitating partners of index cases.

Table 3.d: Baseline characteristics of sexual and socials contacts by interview status, Rwanda 2021–2022

Among sexual and social contacts aged 15 years and older named by the HIV-positive index cases during routine partner notification services

Characteristic	Potentially eligible contacts (n = 1840), n (%)	Interviewed and tested in person (n = 1054), n (%)	P value
RITA Result			
Recent	-	10 (6.5)	
Long Term	-	143 (93.5)	
Age at diagnosis (years)			
15-34	1073 (58.3)	624 (59.2)	0.1
35-49	654 (35.5)	355 (33.7)	
50+	113 (6.1)	75 (7.1)	
Sex			
Male	1134 (61.6)	600 (56.9)	< 0.001
Female	706 (38.4)	454 (43.1)	
Province			
Eastern	489 (26.6)	283 (26.9)	< 0.001
Kigali City	987 (53.6)	509 (48.3)	
Northern	84 (4.6)	65 (6.2)	
Southern	131 (7.2)	84 (8.0)	
Western	149 (8.1)	113 (10.7)	
Relationship type of contact(s) as reported by index			
Spouse/husband/fiancé	203 (11.0)	150 (14.2)	< 0.001
Girlfriend/Boyfriend	178 (9.7)	89 (8.4)	
Cohabiting	378 (20.5)	260 (24.7)	
Casual partner	842 (45.8)	433 (41.1)	
Someone who pays me to have sexual relations	94 (5.1)	43 (4.1)	
Someone I pay to have sexual relations	43 (2.3)	17 (1.6)	
Member of social network	101 (5.5)	61 (5.8)	
Other – PWID, TG etc.	1 (0.05)	1 (0.09)	

The 1054 contacts interviewed and tested in person are further described by HIV test status in Table 3.e.

Table 3.e: Baseline characteristics of sexual and social contacts by HIV status, Rwanda 2021–2022

Among sexual and social contacts aged 15 years and older named by the HIV-positive index cases during routine partner notification services

Characteristic	Total (N = 1054)[1], n (%)	Known HIV-positive (N = 209), n (%)	Tested HIV-negative (N = 716), n (%)	Newly diagnosed HIV-positive (N = 128), n(%)	P value[2]
RITA Result[3,4]					
Recent	10 (6.5)			10 (7.9)	0.2
Long Term	143 (93.5)	26 (100.0)		117 (92.1)	
Age at diagnosis (years)					
15-34	624 (59.2)	95 (45.5)	451 (63.0)	78 (60.9)	< 0.001
35-49	355 (33.7)	92 (44.0)	219 (30.6)	43 (33.6)	
50+	75 (7.1)	22 (10.5)	46 (6.4)	7 (5.5)	
Gender					
Male	600 (56.9)	91 (43.5)	430 (60.1)	79 (61.7)	< 0.001
Female	454 (43.1)	118 (56.5)	286 (39.9)	49 (38.3)	
Province					
Eastern	283 (26.9)	55 (26.3)	190 (26.5)	38 (29.7)	0.9
Kigali City	509 (48.3)	107 (51.2)	346 (48.3)	56 (43.8)	
Northern	65 (6.2)	10 (4.8)	47 (6.6)	8 (6.2)	
Southern	84 (8.0)	17 (8.1)	55 (7.7)	12 (9.4)	
Western	113 (10.7)	20 (9.6)	78 (10.9)	14 (10.9)	
Relationship type of contact(s) as reported by index					
Spouse/husband/fiancé	150 (14.2)	37 (17.7)	83 (11.6)	30 (23.4)	< 0.001
Girlfriend/boyfriend	89 (8.4)	13 (6.2)	67 (9.4)	9 (7.0)	
Cohabiting	260 (24.7)	76 (36.4)	125 (17.5)	59 (46.1)	
Casual partner	433 (41.1)	70 (33.5)	341 (47.6)	21 (16.4)	
Someone who pays me to have sexual relations	43 (4.1)	3 (1.4)	38 (5.3)	2 (1.6)	
Someone I pay to have sexual relations	17 (1.6)	3 (1.4)	12 (1.7)	2 (1.6)	
Member of social network	61 (5.8)	7 (3.3)	49 (6.8)	5 (3.9)	
Other – PWID, TG etc.	1 (0.1)		1 (0.1)		

[1] One contact did not have a final HIV status determined.

[2] P values computed using Fisher's test.

[3] The 26 long term, contacts with known HIV infetions were determined to be known positive based on the results of viral load testing.

[4] One newly diagnosed contact did not have a final recency test result.

Finally, the characteristics of 176 surveyed healthcare providers as part of one of the secondary study objectives are described in Table 3.f. The majority of healthcare providers that participated in the baseline interview (n = 176) were 35-49 years (70%), female (78%), nurses (61%), had ≥1 year of experience in recency testing (83%).

Table 3.f: Healthcare provider characteristics at baseline and follow-up visits, Rwanda 2021–2022

Among healthcare providers aged 18 years and older involved in recency testing and case-based surveillance

Characteristic	Baseline[1] (n = 176)	Follow-up[1] (n = 171)	P value
Age at enrollment (in years)			
18-34	31 (17.6)	28 (16.4)	0.8
35-49	124 (70.5)	119 (69.6)	
50+	21 (11.9)	24 (14.0)	
Sex			
Male	38 (21.6)	35 (20.5)	0.8
Female	138 (78.4)	136 (79.5)	
Role			
Social Worker	62 (35.2)	58 (33.9)	>0.9
ART Nurse	108 (61.4)	106 (62.0)	
Clinical Mentor	1 (0.6)	1 (0.6)	
Other[2]	5 (2.8)	6 (3.5)	
Facility RTRI Testing Type			
Non-point-of-care	115 (65.3)	112 (65.5)	>0.9
Point-of-care	61 (34.7)	59 (34.5)	
Years providing HTS			
<1 year	9 (0.1)	4 (2.3)	0.2
≥1 year	167 (94.9)	167 (97.7)	
Years providing recency testing			
<1 year	30 (17.0)	11 (6.4)	0.002
≥1 year	146 (83.0)	160 (93.6)	
Number of clients tested per week, median (IQR)	1.0 (1.0, 2.0)	1.0 (1.0, 2.0)	0.3
Years providing active case finding and index testing			
<1 year	35 (19.9)	6 (3.5)	<0.001
≥1 year	141 (80.1)	165 (96.5)	
Number of clients interviews as part of ACF per week, median (IQR)	8 (4, 15)	7 (3, 12)	0.1
Number of index clients for which partner notification services were conducted per week, median (IQR)	3.0 (2.0, 5.0)	3.0 (2.0, 5.0)	0.077
Received training on recent infection testing			
Yes	117 (66.5)	125 (73.1)	0.2
No	59 (33.5)	46 (26.9)	

[1] Number (%) unless otherwise indicated

[2] Clinical officer, Counselor, Nurse Midwife, Psychologist

HIV POSITIVITY AND RECENCY YIELDS

4. HIV-POSITIVITY AND RECENCY YIELDS

4.1 Background

This chapter compares HIV positivity and HIV recency yields among RITA recent vs. RITA LT study participants over a 6-month period after study enrolment. Sexual and social contacts were elicited at baseline and during subsequent clinic visits, following routine partner notification and index testing services, and their HIV test results were abstracted from routine registers. HIV positivity yield was defined as the number of new HIV-positive contacts identified among all contacts tested for HIV. HIV recency yield was defined as the number of contacts with a RITA recent result identified among all contacts tested for HIV. Contacts with known HIV infections were also identified but were excluded from these yield calculations. Meaningful differences in HIV positivity or recency yields by RITA status could help focus prevention programming to clients and groups of clients that are part of high yield networks of sexual and/or social contacts.

4.2 Results

In total, there were 1738 sexual contacts and 102 social network members identified as part of index testing by the 1238 newly diagnosed index cases (98 RITA recent and 1140 RITA LT). Table 4.a and Figure 4.b summarize the case finding outcomes, including HIV-positivity and HIV recency yields, by RITA status, among the 1738 sexual contacts identified. Of the 1738 sexual contacts, 202 were already known HIV-positive (15 RITA recent and 187 RITA LT) and 789 contacts or 45% were received at the facility and tested for HIV with a HIV test result available (75 RITA recent and 714 RITA LT). Of those, 123 were HIV positive (15.5%). When stratifying by recency status of the linked index cases, sexual contacts linked to RITA recent index cases had a HIV positivity yield of 20.0% (95% CI: 12.5% to 30.4%) compared to 15.1% (95% CI: 12.7% to 17.9%) in sexual contacts linked to RITA LT cases ($p = 0.3$). Of the 789 sexual contacts who tested for HIV, 9 were RITA recent (1.1%), and when stratifying by the recency status of the linked index case, sexual contacts linked to RITA recent index cases represented a HIV recency yield of 4.0% (95% CI: 1.4% to 11.1%) compared to 0.8% (95% CI: 0.4% to 1.8%) in sexual contacts linked to RITA LT cases ($p = 0.045$).

Table 4.a: Case finding outcomes by recent infection testing algorithm (RITA) status, Rwanda 2021–2022

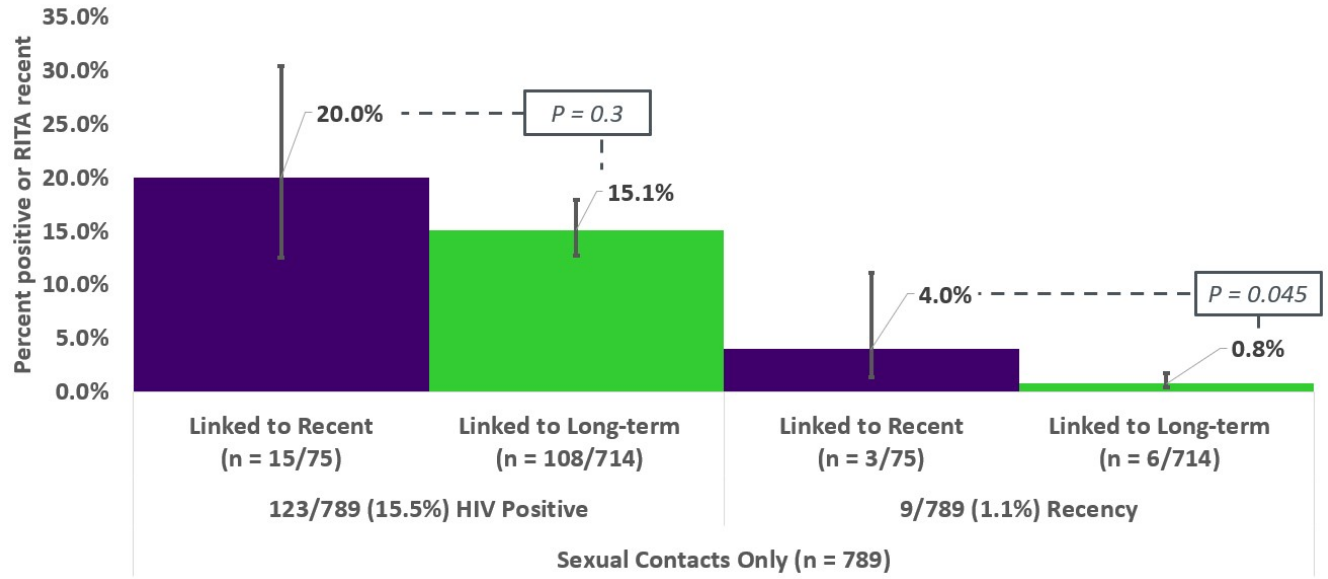
Among sexual contacts of newly diagnosed HIV-positive index study participants

	Total (n = 1238)	RITA Recent (n = 98)	RITA Long-term (n = 1140)	P value[1]
Total contacts eligible per case-based surveillance, N	1738	164	1574	
Invited, n (% of contacts elicited, 95% CI)	1495 (86.0, 84.3-87.6)	141 (86.0, 79.8-90.5)	1354 (86.0, 84.2-87.6)	1
Interviewed by phone (% of contacts elicited, 95% CI)	27 (1.6, 1.1-2.3)	3 (1.8, 0.6-5.2)	24 (1.5, 1.0-2.3)	0.7
Reached in person, n (% of those invited, 95% CI)	1110 (74.2, 72.0-76.4)	108 (76.6, 69.0-82.8)	1002 (74.0, 71.6-76.3)	0.2
Not reached, n (% of those invited, 95% CI)	358 (23.9, 21.9-26.2)	30 (21.3, 15.3-28.7)	328 (24.3, 22.0-26.6)	0.2
Already known positive, n (% of those reached, 95% CI)	202 (18.2, 16.0-20.6)	15 (13.9, 8.6–21.7)	187 (18.7, 16.3–21.2)	0.2
Not tested (% of those reached, 95% CI)	19 (1.7, 1.1-2.7)	2 (1.9, 0.5-6.5)	17 (1.7, 1.1-2.7)	0.3
Tested, n (% of those reached, 95% CI)	889 (80.1, 77.6-82.3)	91 (84.3, 76.2-89.9)	798 (79.6, 77.0-82.0)	0.3
Consented to the study (% of tested, 95% CI)	789 (88.8, 86.5-90.7)	75 (82.4, 73.3-88.9)	714 (89.5, 87.2-91.4)	0.1
New negative, n (% of those consented, 95% CI)	666 (84.4, 81.7-86.8)	60 (80.0, 69.6-87.5)	606 (84.4, 82.1-87.3)	0.3
New positive, n (% of those consented, 95% CI)	123 (15.6, 13.2-18.3)	15 (20.0, 12.5–30.4)	108 (15.1, 12.7–17.9)	0.3
RITA Recent (% of those consented, 95% CI)	9 (1.1, 0.6-2.2)	3 (4.0, 1.4–11.1)	6 (0.8, 0.4–1.8)	0.045

[1] Uses Fisher's exact tests.

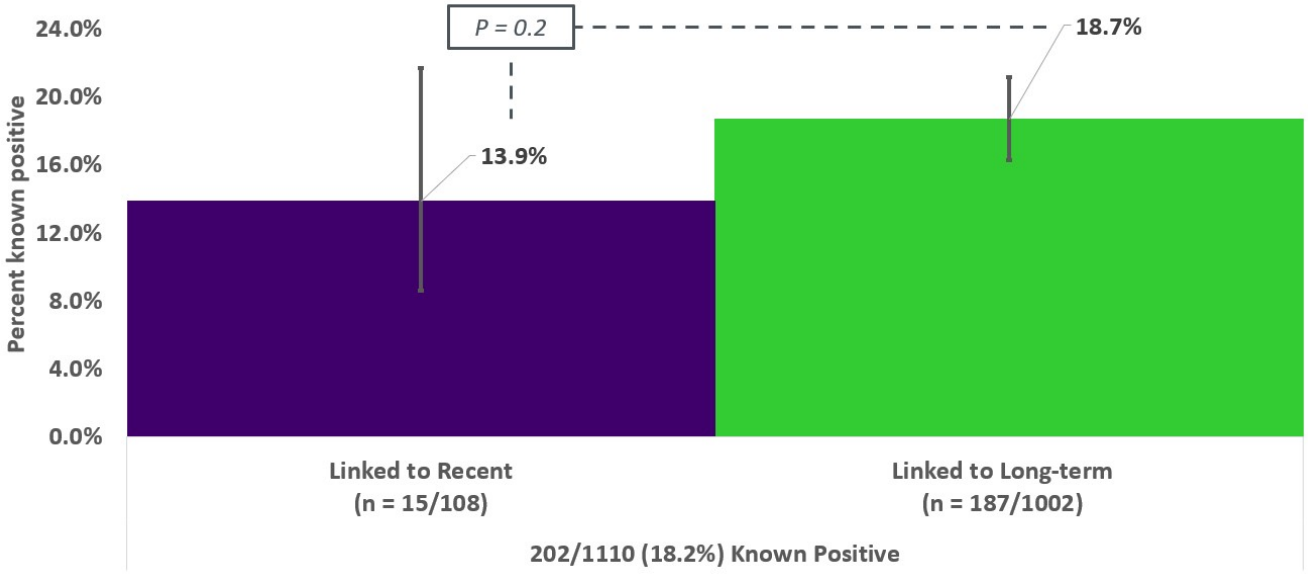
[2] Uses Wilson confidence intervals (CI).

Figure 4.b HIV positivity yield and recency yield among sexual contacts of index study participants by recent infection testing algorithm (RITA) status (n = 789), Rwanda 2021–2022



The 202 sexual contacts with known HIV diagnosis were excluded for the HIV and recency yield calculations. Nonetheless, the number of known HIV-positive sexual contacts identified among all contacts reached in person, by RITA status, is described in Figure 4.c. In brief, 18.7% (95%CI: 16.3% to 21.2%) of sexual contacts linked to RITA LT cases were known positive compared to 13.9% (95% CI: 8.6% to 21.7%) of sexual contacts linked RITA recent cases (p=0.2).

Figure 4.c Known HIV-positive sexual contacts linked to index study participants by recent infection testing algorithm (RITA) status (n = 202), Rwanda 2021–2022



HIV positivity and recency yield calculations also considered the inclusion of the 102 social network members identified. Table 4.d and Figure 4.e summarize the case finding outcomes, including HIV positivity and HIV recency yields, by RITA status,

among the 1738 sexual contacts and 102 social network members identified combined. Of the 1840 sexual and social contacts, 209 were already known HIV-positive (15 RITA recent and 194 RITA LT) and 844 contacts or 46% were received at the facility and tested for HIV with a HIV test result available (81 RITA recent and 763 RITA LT). Of those, 128 were HIV positive (15.2%), and sexual contacts linked to RITA recent index cases had a HIV positivity yield 18.5% (95% CI: 11.6% to 28.3%) compared to 14.8% (95% CI: 12.5% to 17.5%) in sexual contacts linked to RITA LT cases ($p = 0.4$). Of the 844 sexual and social contacts who were tested for HIV, 10 were RITA recent (1.2%) and sexual and social contacts linked to RITA recent index cases represented a HIV recency yield of 3.7% (1.3% to 10.3%) compared to 0.9% (95% CI: 0.4% to 1.9%) in sexual and social contacts linked to RITA LT cases ($p = 0.06$).

Table 4.d: Case finding outcomes by recent infection testing algorithm (RITA) status, Rwanda 2021–2022

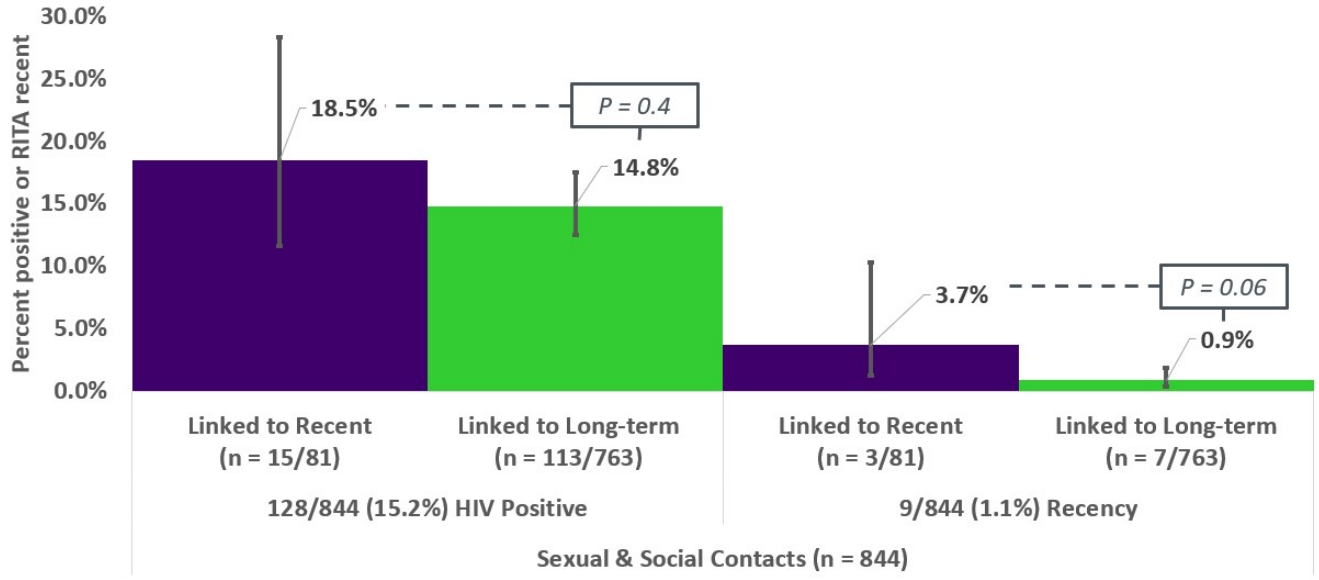
Among sexual and social contacts of newly diagnosed HIV-positive index study participants

	Total (n = 1238)	RITA Recent (n = 98)	RITA Long-term (n = 1140)	P value[1]
Total contacts eligible per case-based surveillance, N	1840	176	1664	
Invited, n (% of contacts elicited, 95% CI)	1585 (86.1, 84.5-87.6)	152 (86.4, 80.5-90.7)	1,433 (86.1, 84.4-87.7)	1
Interviewed by phone (% of contacts elicited, 95% CI)	28 (1.5, 1.1-2.2)	3 (1.7, 0.6-4.9)	25 (1.5, 1.0-2.2)	0.7
Reached in person, n (% of those invited, 95% CI)	1185 (74.8, 72.6-76.8)	119 (78.3, 71.1-84.1)	1066 (74.4, 72.1-76.1)	0.3
Not reached, n (% of those invited, 95% CI)	372 (23.5, 21.4-25.6)	30 (19.7, 14.2-26.8)	342 (23.9 (21.7-26.1)	0.3
Already known positive, n (% of those reached, 95% CI)	209 (17.6, 15.6-19.9)	15 (12.6, 7.8–19.8)	194 (18.2, 16.0–20.6)	0.2
Not tested, n (% of those reached, 95% CI)	20 (1.7, 1.1-2.6)	2 (1.7, 0.5-5.9)	18 (1.7, 1.1-2.7)	0.2
Tested, n (% of those reached, 95% CI)	956 (80.7, 78.3-82.8)	102 (85.7, 78.3, 90.9)	854 (80.1, 77.6-82.4)	0.2
Consented to the study (% of tested, 95% CI)	844 (88.3, 86.1-90.2)	81 (79.4, 70.6-86.1)	763 (89.3, 87.1-91.2)	0.005
New negative, n (% of those consented, 95% CI)	716 (84.8, 82.3-87.1)	66 (81.5, 71.7-88.4)	650 (85.2, 82.5-87.5)	0.4
New positive, n (% of those consented, 95% CI)	128 (15.2, 12.9-17.7)	15 (18.5, 11.6–28.3)	113 (14.8,12.5–17.5)	0.4
RITA Recent (% of those consented, 95% CI)	10 (1.2, 0.6-2.2)	3 (3.7, 1.3–10.3)	7 (0.9, 0.4–1.9)	0.06

[1] Uses Fisher's exact tests.

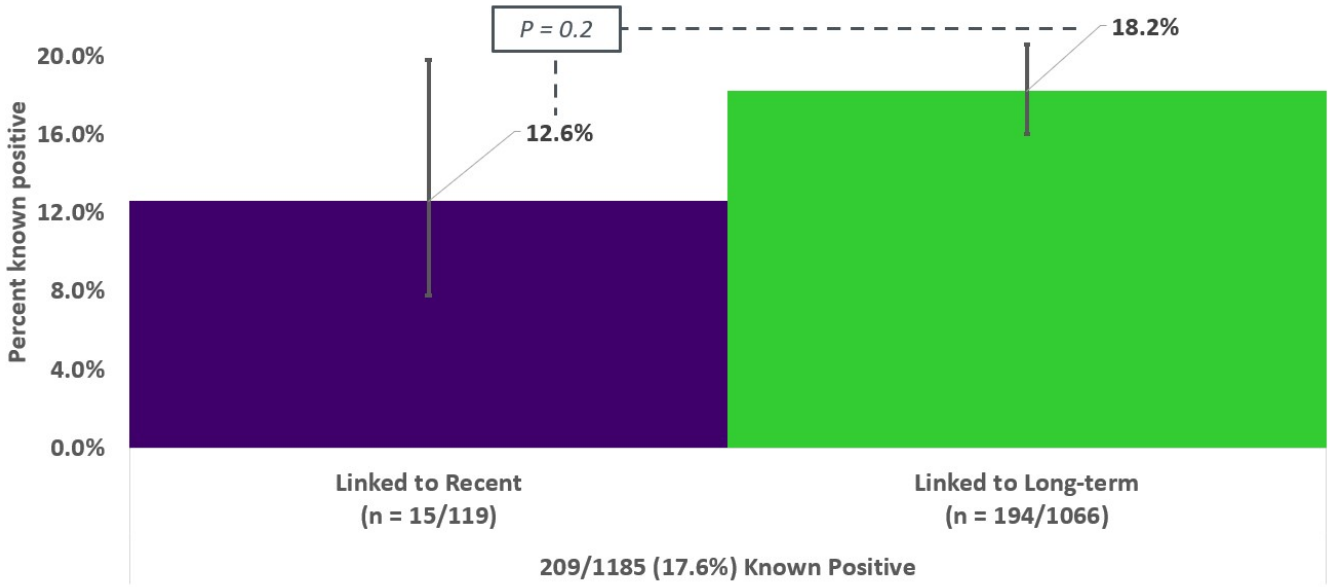
[2] Uses Wilson confidence intervals (CI).

Figure 4.e HIV positive yield and recency yield among sexual and social contacts of index study participants by recent infection testing algorithm (RITA) status (n = 844), Rwanda 2021–2022



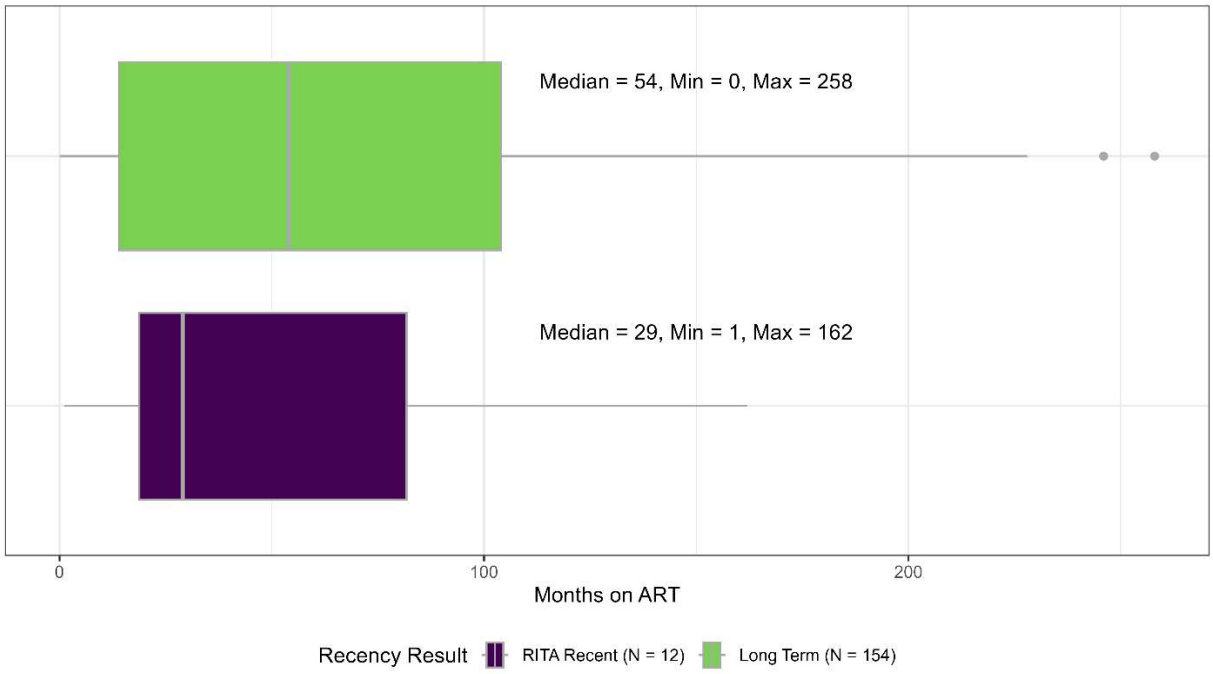
In Table 4.f, the number of known HIV-positive sexual and social contacts identified among all contacts reached in person, by RITA status, is summarized where 18.2% (95% CI: 16.0% to 20.6%) of sexual and social contacts linked to RITA LT cases were known positive compared to 12.6% (95% CI: 7.8% to 17.8%) of sexual and social contacts linked RITA recent cases (p=0.2).

Figure 4.f Known HIV-positive sexual and social contacts linked to index study participants by recent infection testing algorithm (RITA) status (n = 209), Rwanda 2021–2022



Lastly, the distribution of months on ART among known HIV-positive contacts is presented in Figure 4.g. While there was no statistical difference in median months on ART among known HIV-positive contacts with ART initiation dates available who were linked to recent (12) vs. LT (n = 154) indexes, those linked to LT cases had a longer median time on ART compared to those linked to recent indexes (29 vs. 54 months, p = 0.5).

Figure 4.g Distribution of months on ART of contacts with known HIV infections by index recent infection testing algorithm (RITA) status , Rwanda 2021–2022



IPV EXPERIENCES AFTER RETURN OF RECENCY TEST RESULTS

5. IPV EXPERIENCES AFTER RETURN OF RECENCY TEST RESULTS

5.1 Background

Intimate partner violence is defined as physical, sexual, economic, emotional, or psychosocial injury or hurt perpetrated by an intimate partner. It can occur before, during or after testing for HIV. It may be the result of the threat of force, actual force, and relationship power dynamics.

In this study, interviewer-administered questions on self-reported experiences of violence victimization from a current partner in the past 4 weeks were used to collect data at baseline, 1-month, 2-months, and 6-months, including before/after return of HIV diagnosis (baseline vs. 1st follow up visit), and before/after return of recency test results (1st vs. 2nd/3rd follow up visits). Experiences of violence by a current partner were asked using a questionnaire comprised of 17 violence items selected from validated instruments following a targeted social harm instrument review. Questions were adapted from the extended Hurt/Insult/Threaten/Scream (HITS) tool, the Revised Conflict Tactics Scales (CTS-2), the Rwanda Demographic and Health Surveys, and the Violence Against Women Surveys, which measure lifetime experience of physical, emotional, and sexual violence [6-12].

The questionnaire quantified IPV in 5 domains: physical, sexual, emotional, control, and economic. Physical violence (5-items) is defined as getting pushed, shaken, slapped, having something thrown at you, your arm twisted, or hair pulled, being punched, kicked, dragged, or beaten, choked, drowned, or burned. It also includes getting attacked with a knife, gun, or other weapon. Sexual violence (2-items) is defined as being physically forced to have sexual intercourse or being forced with threats or in any way to perform unwanted sexual acts. Emotional abuse (3-items) is defined as being humiliated, threatened, or insulted. Controlling behaviours (4-items) were defined as a range of acts of jealousy or anger, accusations of being unfaithful, and isolation from sources of support including friends and family. Economic violence (3-items) was defined as any act or behaviour which caused economic harm to the individual, including restricting their spending, forcing one to give up or refuse a job for money, or refusing to provide money for household expenses.

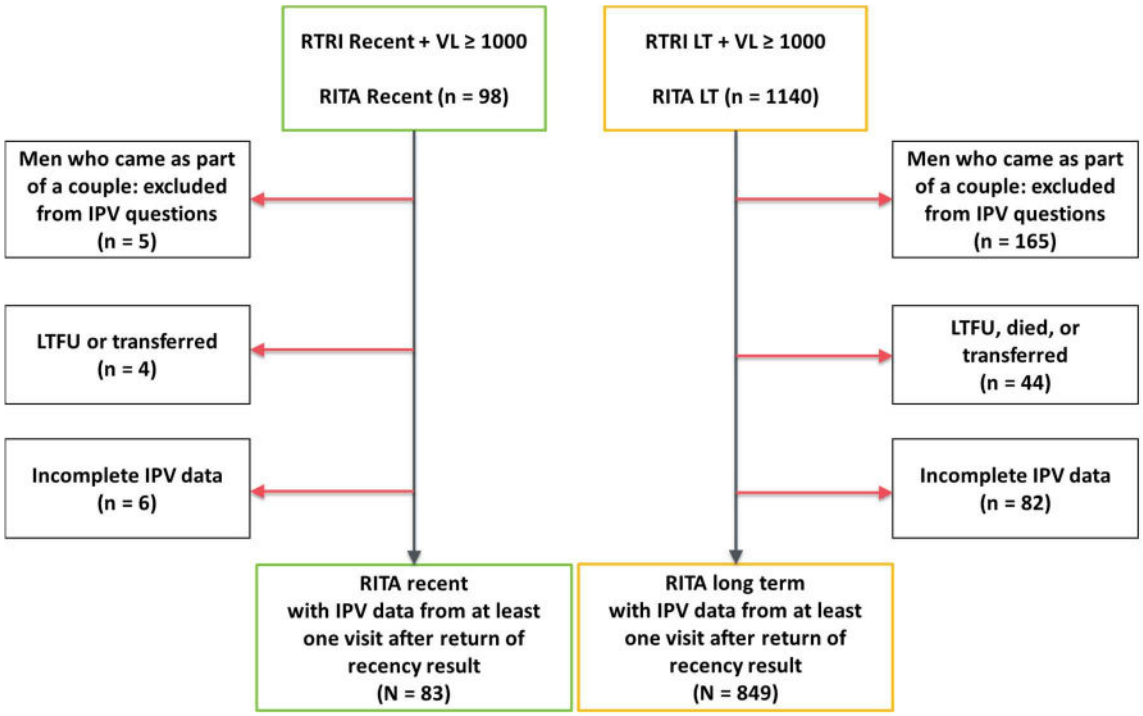
This chapter reports the prevalence of IPV victimization reported by study participants with IPV data from one or more visits after the return of recency test results. This chapter also compares the proportion of index participants experiencing IPV before and after return of recency test results between RITA recent and RITA LT indexes, overall, by sex, and by violence domain. Self-reported reasons for violence by study visit are also described. Generating evidence pertaining to IPV experiences after return of recency test results can offer the program needed information on whether to continue with returning recency test results to individuals.

Results pertaining to IPV victimization from a past partner, IPV perpetration or IPV experiences following disclosure of recency test results to partners are not presented here.

5.2 Results

Figure 5.a summarizes the flow from 1238 index study population at baseline to the follow-up index study population of 932 included in the analysis of primary objective 2. In total, 932 of 1238 newly diagnosed PLHIV with IPV data from ≥1 visits after return of recent infection test results were included in the main IPV analysis. Of those 849 (91%) had a LT infection and 83 (9%) had a recent infection. The remaining 306 newly diagnosed PLHIV were excluded either because they were male and arrived as part of a couple and thus did not receive IPV questions, were lost to follow-up (LTFU), died, transferred to non-study facility, or had incomplete IPV data.

Figure 5.a CONSORT flow diagram for follow-up index study population, Rwanda 2021–2022



Tables and figures 5.b.1–5.b.4 report estimated prevalence of IPV victimization by study visit overall and by RITA status. Overall, the prevalence of IPV was higher at baseline before HIV diagnosis compared to after HIV diagnosis (29.8% vs. 17.6%, p<0.001). Prevalence of IPV did not increase after return of HIV recency test results (17.6% vs. 16.1%, p=0.4). When comparing results by RITA status, no statistical or meaningful differences in IPV victimization experience were observed at baseline (25.3% vs 30.2%, p = 0.5), after HIV diagnosis (13.6% vs 18.0%, p = 0.4) or after return of recency test results at follow up visit 2 or 3 (26.5.3% vs 23.3%, p = 0.6) between recent and LT index participants.

Table 5.b.1 Prevalence of IPV victimization in the past 4 weeks by a current partner by study visit and recent infection testing algorithm (RITA) status, Rwanda 2021–2022

Among newly diagnosed HIV-positive index study participants with IPV data from ≥1 visits after return of recency test results

Interview visit	Total		RITA Recent		RITA Long-Term	
	n[1]	% (95% CI)[2]	n	% (95% CI)	n	% (95% CI)
Baseline	890	29.8 (26.9-32.9)	79	25.3 (17.0-35.9)	811	30.2 (27.1-33.5)
First Follow-Up (Month 1)	890	17.6 (15.3-20.3)	81	13.6 (7.8-22.7)	809	18.0 (15.5-20.8)
Second Follow-Up (Month 2)	893	16.8 (14.5-19.3)	82	15.9 (9.5-25.3)	811	16.9 (14.5-19.6)
Third Follow-Up (Month 6)	813	15.3 (12.9-17.9)	75	18.7 (11.5-28.9)	738	14.9 (12.5-17.7)

[1] Number (n) represents the total number of individuals with a valid response for follow up visit 2 or 3 and does not necessarily represent the number of unique individuals with IPV data from at least one visit after return of recency test results.
[2] CIs computed using the Wilson interval for binomial proportions.

Figure 5.b.2 Proportion of index study participants experiencing any form of IPV victimization in the past 4 weeks by a current partner by study visit, Rwanda 2021–2022

Figure 5.b.3 Proportion of index study participants experiencing any form of IPV victimization in the past 4 weeks by a current partner by study visit and recent infection testing algorithm (RITA) status, Rwanda 2021–2022

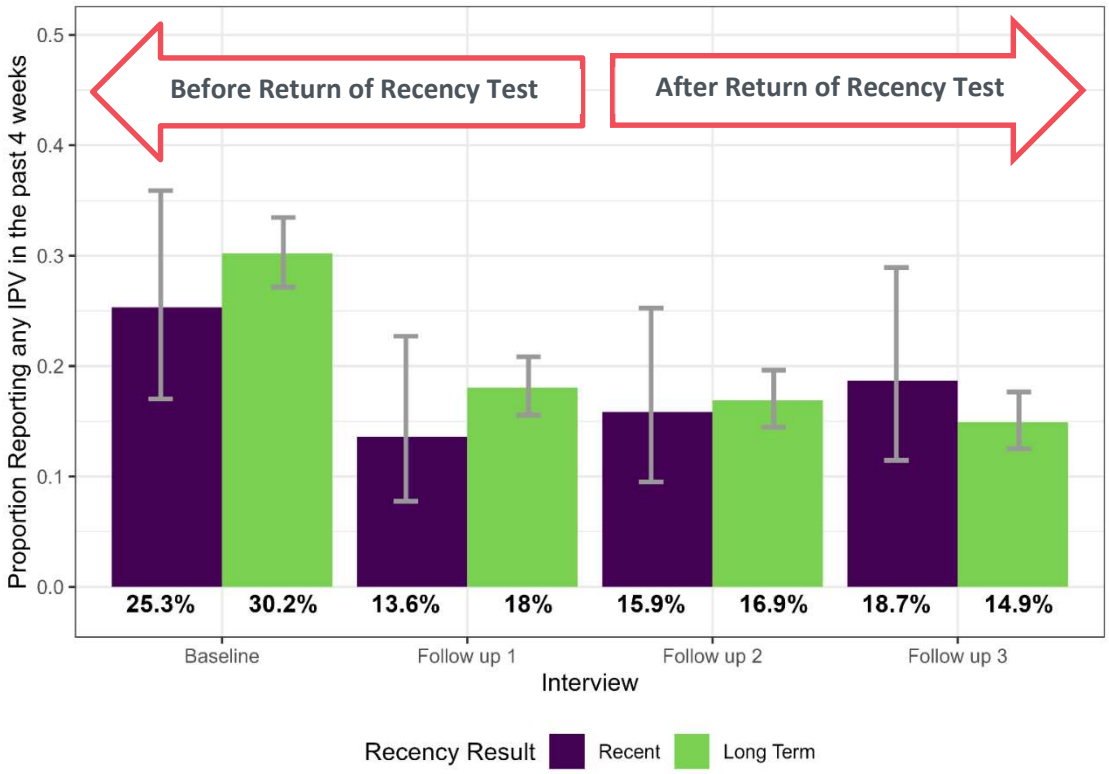


Table 5.c.1 Prevalence of IPV victimization in the past 4 weeks by a current partner after return of recent infection test results, by recent infection testing algorithm (RITA) status and sex, Rwanda 2021–2022

Among newly diagnosed HIV-positive index study participants with IPV data from ≥1 visits after return of recent infection test results

Interview visit	Total				Male				Female			
	RITA Recent (N= 83)		RITA Long-Term (N= 849)		RITA Recent (N= 15)		RITA Long-Term (N= 222)		RITA Recent (N= 68)		RITA Long-Term (N= 627)	
	n	%	n	%	n	%	n	%	n	%	n	%
After return of recent infection result (Follow-up visit 2 or 3)	22	26.5 (18.2-36.9)	198	23.3 (20.6-26.3)	2	13.3 (3.7-37.9)	40	18 (13.5-23.6)	20	29.4 (19.9-41.1)	158	25.2 (22-28.7)

Note: The study was powered to detect overall differences before/after return of recency test results and may lack power to detect small differences in IPV experiences between recent and LT indexes in subpopulation analyses.

The study found similar results by sex; prevalence of IPV victimization by RITA status and sex is presented in Figure 5.c.2. There were no statistical or meaningful differences in IPV experience observed among men (13.3% vs 18.0%, p = 1.0) or among women (29.4% vs 25.2%, p = 0.6).

Figure 5.c.2 Proportion of index study participants experiencing any form of IPV victimization in the past 4 weeks by a current partner after return of recency test results, by recent infection testing algorithm (RITA) status and sex, Rwanda 2021–2022

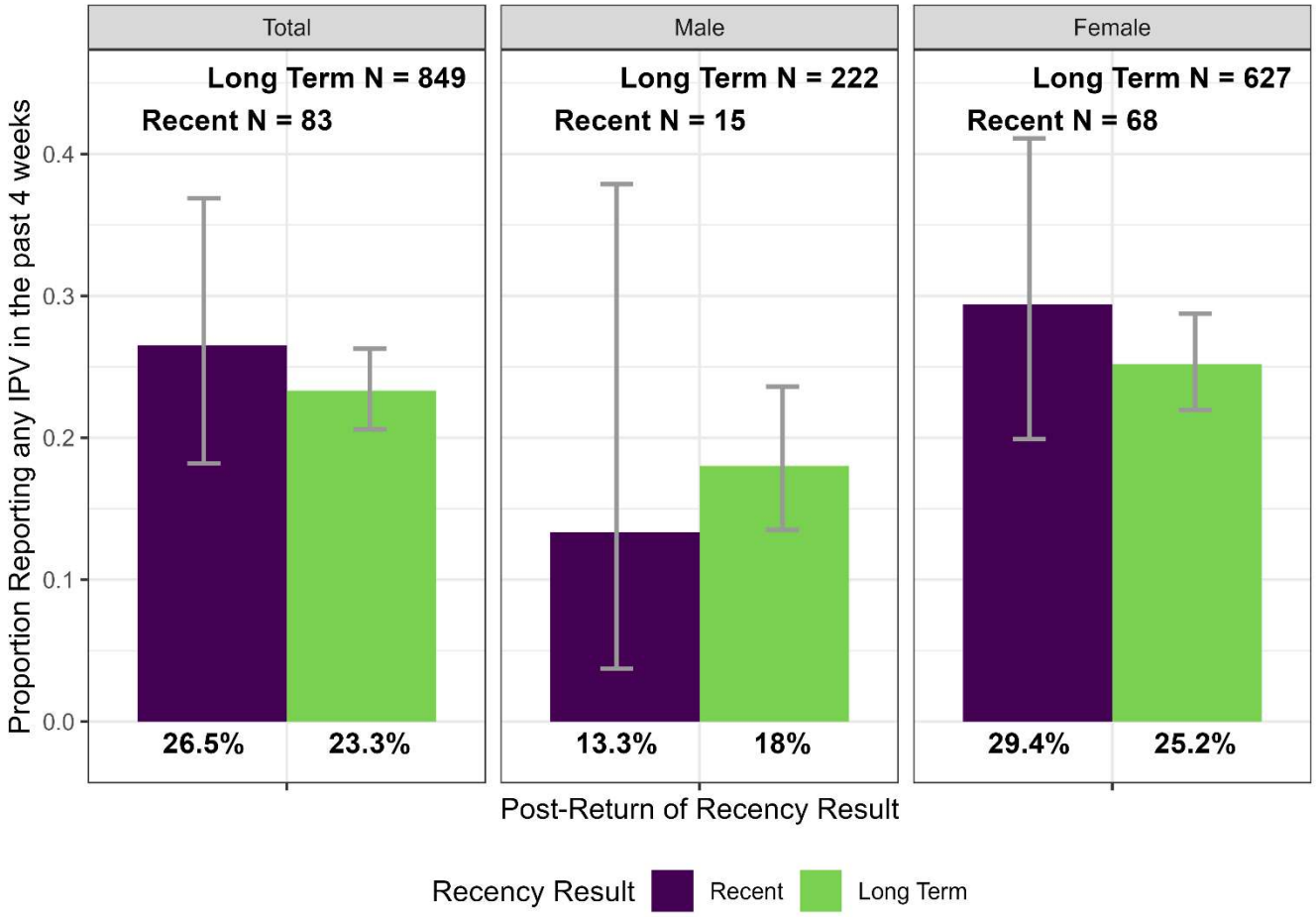


Table 5.d.1 presents results on prevalence of IPV victimization stratified by IPV domain. No statistical or meaningful differences in IPV experience were observed across the 5 domains of IPV ($p > 0.05$ for all comparisons).

Table 5.d.1 Prevalence of IPV victimization in the past 4 weeks by a current partner after return of recent infection test results, by recent infection testing algorithm (RITA) status and violence domain, Rwanda 2021–2022

Among newly diagnosed HIV-positive index study participants with IPV data from ≥1 visits after return of recent infection test results

IPV Domain	RITA Recent Infections (N = 83)		RITA Long-Term Infections (N = 849)	
	n	% (95% CI)[1]	n	% (95% CI)
After return of recent infection result (Follow-up visit 2 or 3)				
Control	17	20.5 (13.2-30.4)	146	17.2 (14.8-19.9)
Economic	4	4.8 (1.9-11.7)	77	9.1 (7.3-11.2)
Emotional	8	9.6 (5-17.9)	107	12.6 (10.5-15)
Physical	2	2.4 (0.7-8.4)	51	6 (4.6-7.8)
Sexual	5	6 (2.6-13.3)	36	4.2 (3.1-5.8)
Any	22	26.5 (18.2-36.9)	198	23.3 (20.6-26.3)

[1] Confidence intervals computed using Wilson binomial interval.

Figure 5.d.2 Proportion of index study participants experiencing any form of IPV victimization in the past 4 weeks by a current partner after return of recency test results, by recent infection testing algorithm (RITA) status and IPV domain, Rwanda 2021–2022

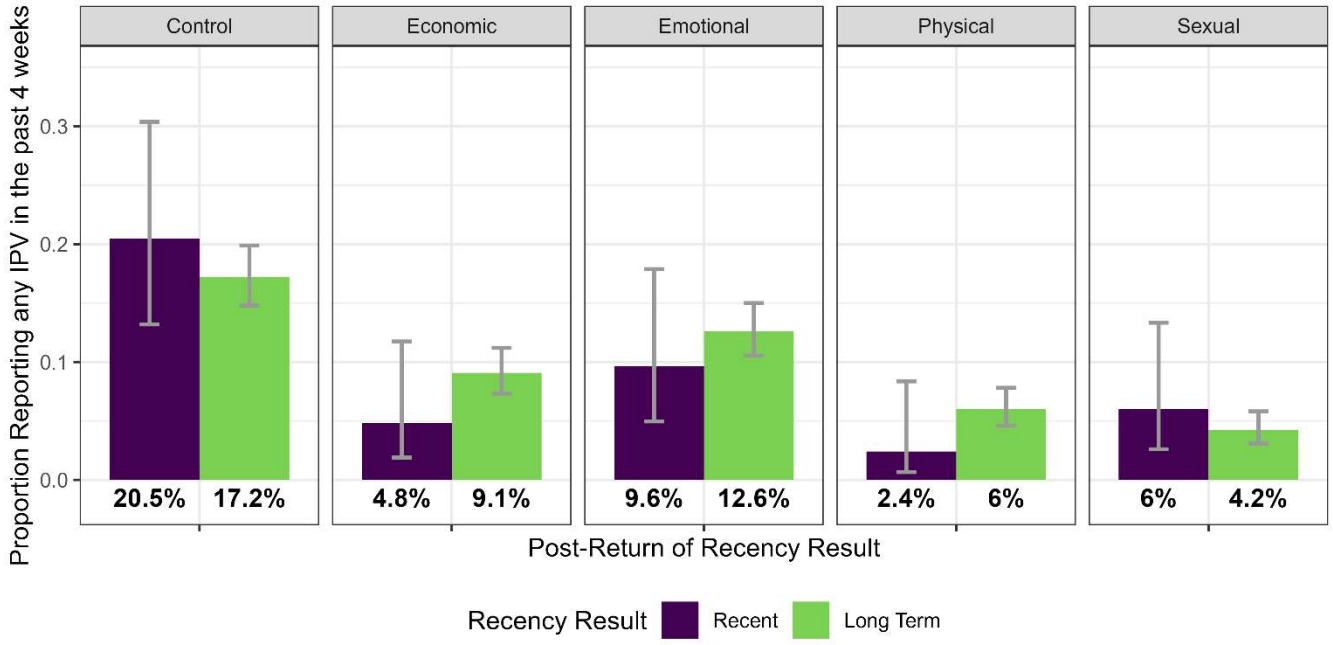
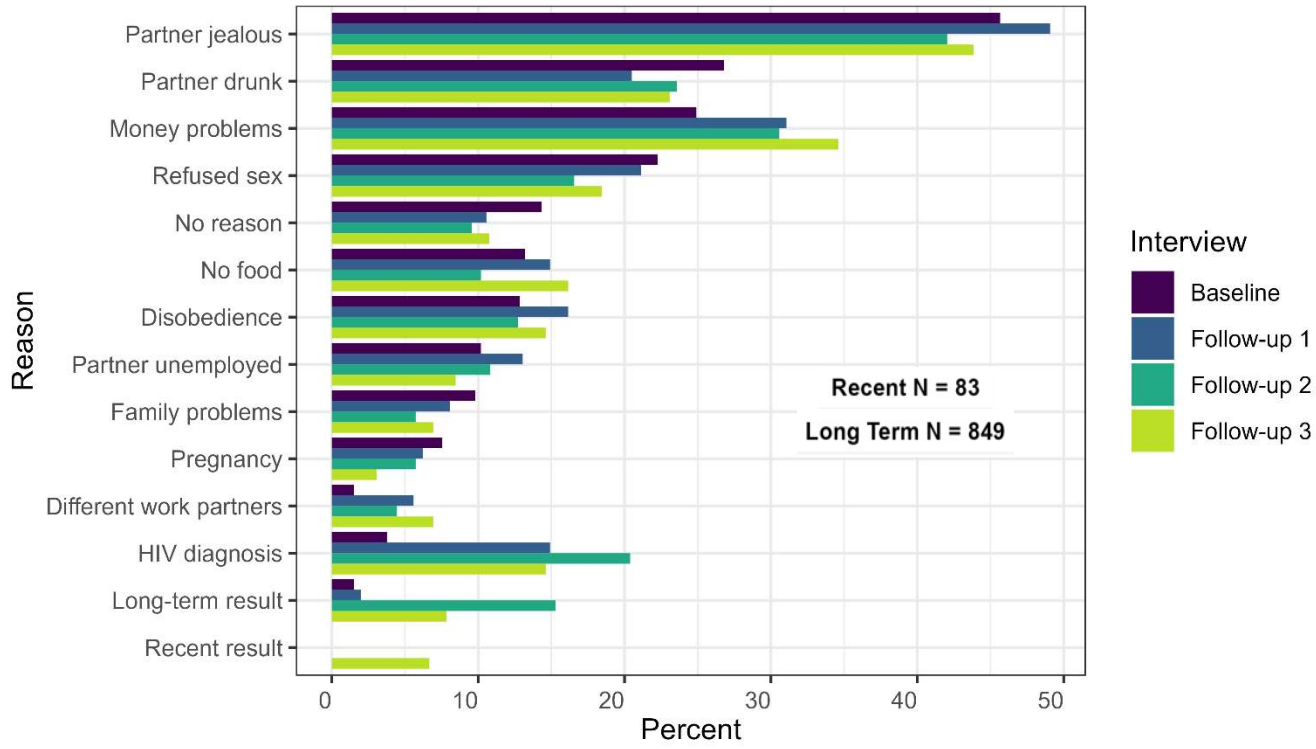


Figure 5.e describes self-reported reasons for violence by study visit. At each visit, for those who reported IPV, the study questionnaire asked about the cause(s) or reason(s) for violence in a 'select all that apply' format. Among those who reported violence at one or more visits (n = 402), only 1 RITA recent case stated that their recency test result was a reason for the violence they experienced. This individual also reported many other reasons for violence, including money problems, their HIV diagnosis, partner unemployment and being pregnant.

Figure 5.e. Self-reported reasons for IPV victimization by study visit among those who reported violence at one or more visits[1], Rwanda 2021–2022



[1]Percentages for each study visit may exceed 100% because respondents were asked to select all reasons that applied.

Table 5.f compares baseline characteristics of index study participants who reported IPV at baseline to those who did not report IPV at baseline. The majority of those who reported baseline IPV were 15-34 years (69.2%), female (82.8%), and tested at a facility in a province outside Kigali City (60.5%). In addition, a greater proportion of index study participants who reported IPV at baseline compared to those who did not arrived at the facility as part of a couple (22.8% vs. 14.9%), tried but failed to end a relationship (26.1% vs 12.0%), were married/cohabiting (51.2% vs 33.2%), had two or more sexual partners in the past 4 weeks (18.2% vs 10.6%), 3 months (25.7% vs 18.5%), and 12 months (42.9% vs 38.2%), and more likely to have sex without a condom in the past 12 months (98.3% vs 93.4%).

Table 5.f: Demographic and sociocultural characteristics of index study participants by reported history of baseline IPV, Rwanda 2021–2022

Among adults aged 15 years and older newly diagnosed HIV-positive who consented to case-based surveillance and recency testing

Characteristic	Reported IPV at baseline n (%)	Did not report IPV at baseline n (%)	P value[1]
RITA Result			
Recent	37 (9.0)	52 (9.0)	1.0000
Long Term	376 (91.0)	527 (91.0)	
Age at diagnosis (years)			
15-34	286 (69.2)	340 (58.7)	< 0.001
35-49	120 (29.1)	193 (33.3)	
50+	7 (1.7)	46 (7.9)	
Sex			
Male	71 (17.2)	185 (32.0)	< 0.001
Female	342 (82.8)	394 (68.0)	
Pregnancy status			
Pregnant	99 (28.9)	105 (26.6)	0.509
Not pregnant	243 (71.1)	289 (73.4)	
Province			
Eastern	135 (32.7)	135 (23.3)	< 0.001
Kigali City	163 (39.5)	327 (56.5)	
Northern	24 (5.8)	22 (3.8)	
Southern	23 (5.6)	56 (9.7)	
Western	68 (16.5)	39 (6.7)	
Arrived at the facility as part of a couple			
Yes	94 (22.8)	86 (14.9)	0.0019
No	319 (77.2)	493 (85.1)	
Employment			
Employed	216 (52.3)	322 (55.6)	0.3322
Unemployed	197 (47.7)	257 (44.4)	
Relationship dissolution			
Ended a relationship	55 (14.8)	77 (21.4)	< 0.001
Tried but failed to end a relationship	97 (26.1)	43 (12.0)	
Did not end a relationship	220 (59.1)	239 (66.6)	
Lost to follow-up			
1-2 study visits	11 (2.7)	49 (8.5)	< 0.001
>2 study visits	402 (97.3)	530 (91.5)	
Baseline relationship status			
Married/cohabiting	211 (51.2)	192 (33.2)	< 0.001
Not married/not cohabiting	149 (36.2)	335 (57.9)	
Female sex worker	52 (12.6)	52 (9.0)	
Reported number of sexual partners in the past 4 weeks at baseline			

0	55 (13.3)	224 (38.8)	< 0.001
1	283 (68.5)	293 (50.7)	
2+	75 (18.2)	61 (10.6)	
Reported number of sexual partners in the past 3 months at baseline			
0	28 (6.8)	119 (20.6)	< 0.001
1	279 (67.6)	353 (61.0)	
2+	106 (25.7)	107 (18.5)	
Reported number of sexual partners in the past 12 months at baseline			
0	6 (1.5)	50 (8.6)	< 0.001
1	230 (55.7)	308 (53.2)	
2+	177 (42.9)	221 (38.2)	
Had sex without a condom in the past 12 months			
Yes	406 (98.3)	541 (93.4)	< 0.001
No	7 (1.7)	38 (6.6)	
Health-related quality of life, n (mean ± SD)[2]			
Overall quality of life	3.59 (0.83)	3.71 (0.86)	0.018
General health perception	3.18 (0.39)	3.13 (0.39)	0.096
Physical	3.74 (0.65)	3.83 (0.70)	0.019
Psychological	3.39 (0.69)	3.57 (0.71)	< 0.001
Independence	2.75 (0.87)	3.03 (0.91)	< 0.001
Social relationships	3.59 (0.83)	3.71 (0.86)	0.018

[1] p values for categorical variables computed using Fisher test.
[2] p values for difference in medians computed using Wilcoxon rank sum test.

PARTNER ELICITATION

6. PARTNER ELICITATION

6.1 Background

This chapter describes findings on elicitation among recent vs. LT index study participants over a 6-month period after study enrolment. Sexual and social contacts were elicited at baseline and during subsequent clinic visits, following routine partner notification and index testing services. The proportion, median number, and elicitation ratio, which we defined as the number of contacts elicited per index participant during the study period, for both sexual and social contacts, were calculated.

6.2 Results

The study enrolled 98 RT and 11140 LT newly diagnosed index cases who identified 1840 sexual and social contacts. Table 6.a reports on elicitation among study participants by RITA status. The 1238 index cases listed a total of 1738 sexual contacts (94.5%) and 102 (5.5%) were members of a social network. Of the 1738 sexual contacts, 164 were linked to the 98 RITA recent cases and 1574 were linked to 1140 RITA LT cases. Furthermore, for every RITA recent index case, 1.67 sexual contacts were elicited compared to 1.38 contacts per RITA LT index case (p = 0.06).

Table 6.a: Contact type by recent infection testing algorithm (RITA) status, Rwanda 2021–2022

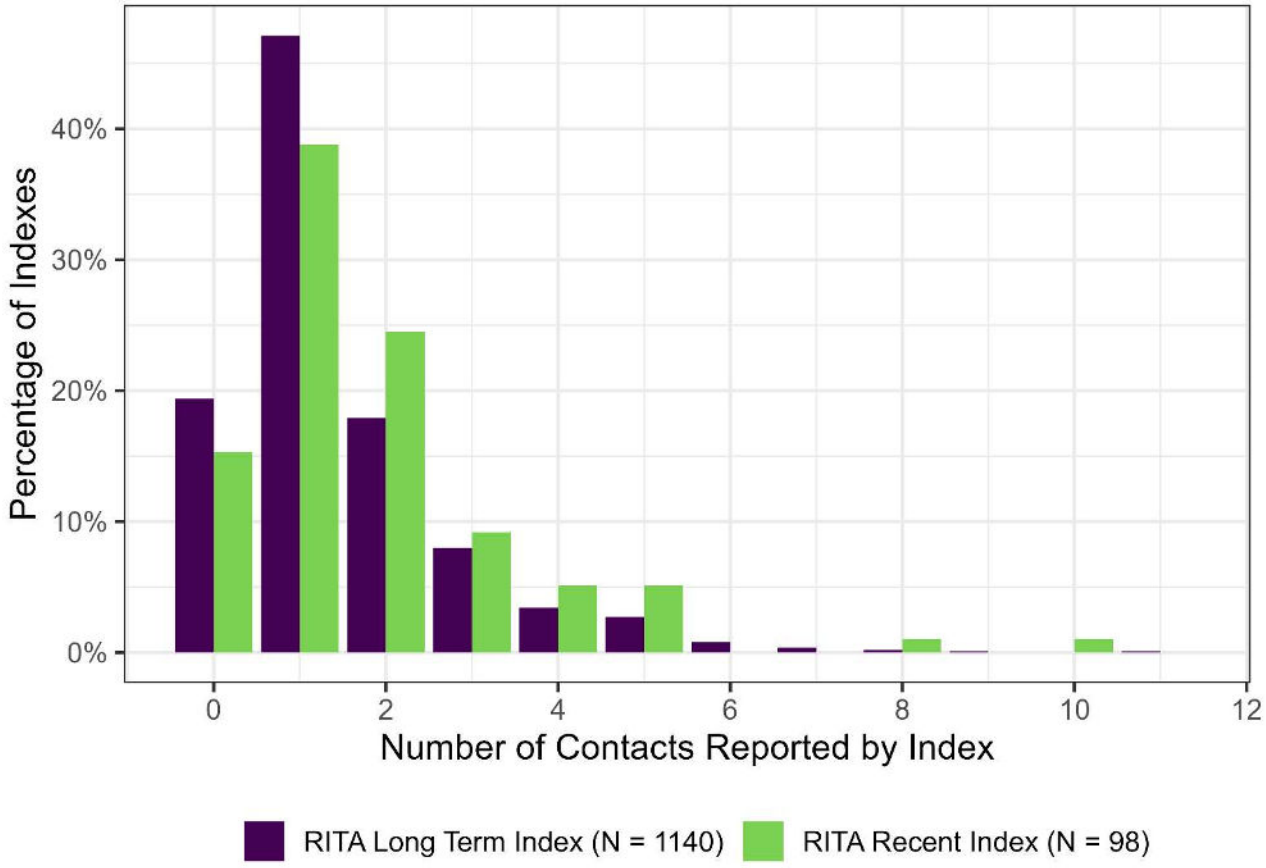
Among all potentially eligible sexual and social contacts of newly diagnosed HIV-positive index study participants

	Total (n = 1238)	RITA Recent (n = 98)	RITA Long-term (n = 1140)	P value[1]
Total contacts eligible per CBS, N	1840	176	1664	
Sexual (% of total)	1738 (94.5)	164 (93.2)	1574 (94.6)	
Sexual contact: index ratio	1.4	1.67	1.38	
Number of contacts per index (median)	1	1	1	0.06
Member of social network (% of total)	102 (5.5)	12 (6.8)	90 (5.4)	
Social contact: index ratio	0.082	0.12	0.079	
Number of contacts per index (median)	0	0	0	0.1

[1] Wilcoxon rank sum test

In Figure 6.b the distribution of contacts reported per index by RITA status is described. To sum up, the number of contacts reported by the index is displayed on the x-axis and the percentage of indexes that reported that number of contacts is displayed on the y-axis with the purple bars representing the distribution of contact reported by recent indexes and the green bars representing the distribution of contacts reported by long-term indexes. The distribution of contacts reported per index suggest that RITA recent index cases report a greater number of contacts compared to RITA LT indexes, with 45.9% (95% CI: 36.4% to 55.8%) of RITA recent indexes vs. 34.1% (95% CI: 31.4% to 36.9%) of RITA LT indexes reporting two or more contacts (p = 0.021).

Figure 6.b Distribution of contacts reported per index by recent infection testing algorithm (RITA) status (n = 1840), Rwanda 2021–2022



Contact referral methods used to elicit contacts during partner notification by province or implementation model (i.e., POC vs. non-POC) are presented in Tables 6.c and 6.d. Provider-initiated referrals was highest in Kigali (40.7%) and lowest in Northern (25.9%) and Western (24.2%) provinces (Table 6.c). Providers participating in recency testing at POC HF were more likely to be involved with contact referrals compared to providers at non-POC HF (48.8% vs 29.6%, $p < 0.001$). Further, at POC HF, there appears to be a slight tendency towards contacts of recent indexes being more likely to be referred by providers compared to contacts of LT indexes (56.9% vs. 48.2%, $p = 0.25$) (Table 6.d).

Table 6.c: Planned type of contact referral by province, Rwanda 2021–2022

Among all potentially eligible sexual and social contacts of newly diagnosed HIV-positive index study participants (n = 1840)

	Total (n = 1238)	**Kigali** (n = 609)	**Northern** (n = 48)	**Eastern** (n = 342)	**Southern** (n = 105)	**Western** (n = 134)
Total contacts eligible per CBS, N	1840	986	85	489	131	149
Client referral	924 (50.2)	470 (47.7)	56 (65.9)	247 (50.5)	65 (49.6)	86 (57.7)
Provider referral	692 (37.6)	401 (40.7)	22 (25.9)	193 (39.5)	40 (30.5)	36 (24.2)
Dual referral	184 (10.0)	99 (10.0)	4 (4.7)	34 (7.0)	23 (17.6)	24 (16.1)
Family testing	2 (0.1)	2 (0.2)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Social network testing	1 (0.1)	0 (0.0)	1 (1.2)	0 (0.0)	0 (0.0)	0 (0.0)
HIV status is already known	22 (1.2)	7 (0.7)	2 (2.4)	8 (1.6)	3 (2.3)	2 (1.3)
Referral not planned, risk of violence	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
	15 (0.8)	7 (0.7)	0 (0.0)	7 (1.4)	0 (0.0)	1 (0.7)

Table 6.d: Planned type of contact referral by implementation model and index recent infection testing algorithm (RITA) status, Rwanda 2021–2022

Among all potentially eligible sexual and social contacts of newly diagnosed HIV-positive index study participants (n = 1840)

		Tested at point-of-care facility [2]			**Tested at non-point-of care facility [2]**		
	Total (n = 1238)	Total (n = 458)	RITA Recent (n = 26)	RITA Long-term (n = 432)	Total (n = 780)	RITA Recent (n = 72)	RITA Long-term (n = 708)
Total contacts eligible per CBS[1], N	1840	771	51	720	1069	125	944
Client referral	924 (50.2)	298 (38.7)	12 (23.5)	286 (39.7)	626 (58.6)	82 (65.6)	544 (57.6)
Provider referral	692 (37.6)	376 (48.8)	29 (56.9)	347 (48.2)	316 (29.6)	32 (25.6)	284 (30.1)
Dual referral	184 (10.0)	86 (11.2)	10 (19.6)	76 (10.6)	98 (9.2)	10 (8.0)	88 (9.3)
Family testing	2 (0.1)	2 (0.3)	0 (0.0)	2 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)
Social network testing	1 (0.1)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.1)	0 (0.0)	1 (0.1)
HIV status is already known	22 (1.2)	7 (0.9)	0 (0.0)	7 (1.0)	15 (1.4)	0 (0.0)	15 (1.6)
Referral not planned, risk of violence	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Missing information	15 (0.8)	2 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

[1] Eligible contacts included in the analysis excludes children and those at risk of IPV.

[2] Point-of-care study sites (n = 15) conducted RTRI testing at the on-site laboratory facility and sent RTRI recent samples to the National Reference Laboratory or testing hub for additional VL testing. Non-point-of-care study sites (n = 45) sent samples directly to the District Hospital or VL testing hub for both RTRI and VL testing.

The distribution by referral type is significantly different ($p < 0.001$) in an overall comparison of contacts reported at POC versus non-POC sites, and also when comparing referral type among contacts of recent indexes and contacts of LT indexes separately. The referral type distribution is not statistically different when comparing by recency status alone.

RETESTERS

7. RETESTERS

7.1 Background

This chapter describes the characteristics of virally suppressed index participants initially considered as newly diagnosed who were presumed retesters already on ART and excluded from the main analysis. Retesters were defined as those with a with VLS (1000 copies/mL) at baseline. While the study was focused on newly diagnosed people, examining data on presumed retesters already on ART who were excluded from the main analysis remain an important group to examine that may provide valuable information to inform the HIV testing program. Repeat HIV testing among people who self-report naïve to ART with no prior HIV diagnosis is a challenge for national HIV programs to identify new HIV infections, monitor progress to treatment targets, and improve case finding among the unaware.

7.2 Results

Among the 1577 persons initially considered as newly diagnosed in the study, 339 (21.4%) were VLS and presumed retesters on ART and not newly diagnosed with HIV while 1238 (78.6%) were considered newly diagnosed with HIV with unsuppressed VL. This equates to one in five study participants being virally suppressed suggesting that retesting in non-treatment naïve HIV clients is common in Rwanda. Table 7.a compares the baseline demographic characteristics of virally suppressed retesters (VL<1000 copies/mL) excluded from the main analysis to newly diagnosed PLHIV with unsuppressed VL included in the main analysis. Among 1577 persons initially considered as newly diagnosed in the study, 339 (21.4%) were VLS and considered retesters while 1238 (78.6%) were newly diagnosed with unsuppressed VL.

More than half of retesters were <35 years (61.9%), single or cohabitating (66.7%), and had 1 sexual partner in the past 3 months (63.4%). Compared to newly diagnosed indexes with unsuppressed VL, retesters were more likely to be female (72.3% vs. 62.9%, p=0.005), a female sex worker (14.2% vs. 9.2%, p=0.02), or reporting ≥2 sexual partners in the past 12 months (48.7% vs. 39.0%, p = 0.004). There were no statistically significant differences in other demographic characteristics assessed. Understanding reasons for retesting among those on ART and virally suppressed may benefit the HIV program and inform appropriate clinical and counseling approaches.

Table 7.a: Baseline characteristics of index study participants by viral load status, Rwanda 2021–2022

Among adults aged 15 years and older newly diagnosed HIV-positive who consented to case-based surveillance and recency testing

Characteristic	Total (n =1577), n (%)	Presumed retesters on ART and not newly diagnosed (RTRI Recent or Long-term + VL < 1000) (n = 339), n (%)	Newly diagnosed HIV-positive (RTRI Recent or Long-term + VL ≥1000) (n = 1238), n (%)	P value
RTRI result				
Recent	138 (8.8)	40 (11.8)	98 (7.9)	.03
Long Term	1439 (91.2)	299 (88.2)	1140 (92.1)	
Age at diagnosis (years)				
15-34	969 (61.4)	210 (61.9)	759 (61.3)	0.96
35-49	517 (32.8)	109 (32.2)	408 (33.0)	
50+	91 (5.8)	20 (5.9)	71 (5.7)	
Sex				
Male	553 (35.1)	94 (27.7)	459 (37.1)	0.001
Female	1024 (64.9)	245 (72.3)	779 (62.9)	
Pregnancy status				
Pregnant	283 (27.6)	64 (26.1)	219 (28.1)	0.57
Not pregnant	741 (72.4)	181 (73.9)	560 (71.9)	
Province				
Eastern	443 (28.1)	101 (29.8)	342 (27.6)	0.56
Kigali City	761 (48.3)	152 (44.8)	609 (49.2)	
Northern	63 (4.0)	15 (4.4)	48 (3.9)	
Southern	132 (8.4)	27 (8.0)	105 (8.5)	
Western	178 (11.3)	44 (13.0)	134 (10.8)	
Population group				
General population female	862 (54.7)	197 (58.1)	665 (53.7)	0.003
General population male	545 (34.6)	93 (27.4)	452 (36.5)	
Female sex worker	162 (10.3)	48 (14.2)	114 (9.2)	
Men who have sex with men	8 (0.5)	1 (0.3)	7 (0.6)	
Marital status				
Single	477 (30.2)	103 (30.4)	374 (30.2)	0.95
Married	204 (12.9)	45 (13.3)	159 (12.8)	
Cohabiting	593 (37.6)	123 (36.3)	470 (38.0)	
Widowed	65 (4.1)	16 (4.7)	49 (4.0)	
Divorced/separated	238 (15.1)	52 (15.3)	186 (15.0)	
Arrived at the facility as part of a couple				
Yes	450 (28.5)	93 (27.4)	357 (28.8)	0.64
No	1127 (71.5)	246 (72.6)	881 (71.2)	
Employment				
Employed	875 (55.5)	178 (52.5)	697 (56.3)	0.22
Unemployed	702 (44.5)	161 (47.5)	541 (43.7)	

Number of sexual partners in the past 3 months				
0	223 (14.1)	42 (12.4)	181 (14.6)	0.17
1	1027 (65.1)	215 (63.4)	812 (65.6)	
2+	327 (20.7)	82 (24.2)	245 (19.8)	
Number of sexual partners in the past 12 months				
0	90 (5.7)	13 (3.8)	77 (6.2)	0.004
1	839 (53.2)	161 (47.5)	678 (54.8)	
2+	648 (41.1)	165 (48.7)	483 (39.0)	
Had sex without a condom in the past 12 months				
Yes	1507 (95.7)	327 (97.0)	1180 (95.4)	0.22
No	67 (4.3)	10 (3.0)	57 (4.6)	

BASELINE VIRAL LOAD

8. BASELINE VIRAL LOAD

8.1 Background

Unlike routine CBS procedures, where baseline VL is conducted only on those that test RTRI recent, all specimens of persons with a new diagnosis of HIV identified through routine HIV testing and a RTRI result (recent or long-term) were sent for VL testing in this study. Plasma from the venous blood sample used for RTRI testing was used for baseline VL testing. For known HIV-positive contacts that were received at the facility during routine care, an additional 4 mL venous blood sample was collected for VL testing during routine specimen collection. Viral load testing was conducted from plasma by measuring HIV-1 RNA copies using the Roche COBAS® platform and the COBAS®AmpliPrep/COBAS® TaqMan® HIV-1 Test v2.0. This chapter describes the baseline VL results of our index study participants; as a sensitivity analysis the presumed retesters on ART that were virally suppressedare also included to parallel the routine setting where VL testing is not performed on individuals that test RTRI LT. Additionally, the measured VL of contacts with known HIV infection of study index cases is described.

8.2 Results

The following tables and figures present VL data among study participants. Figures 8.a and 8.b compare baseline HIV VL levels among cases of recent vs. LT index study participants on linear and logarithmic scales, respectively. Overall, the min VL values were the same among recent and LT groups (min VL=1000 copies/mL) while the max VL was 10000000 and 7930000 copies/mL, respectively. There was no statistical difference (p=0.7) in median VL between recent (25350 copies/mL) and LT groups (28300 copies/mL), suggesting that transmission potential is the same among both groups. Nonetheless, other behavioral and sociodemographic factors associated with recency may lend to increased transmission and early opportunities for targeted intervention. The distribution above 1000 copies/mL on the logarithmic scale was similar among recent and LT groups.

Figure 8.a: Distribution of baseline viral load of index study participants, by recent infection testing algorithm (RITA) status (n = 1238), Rwanda 2021–2022

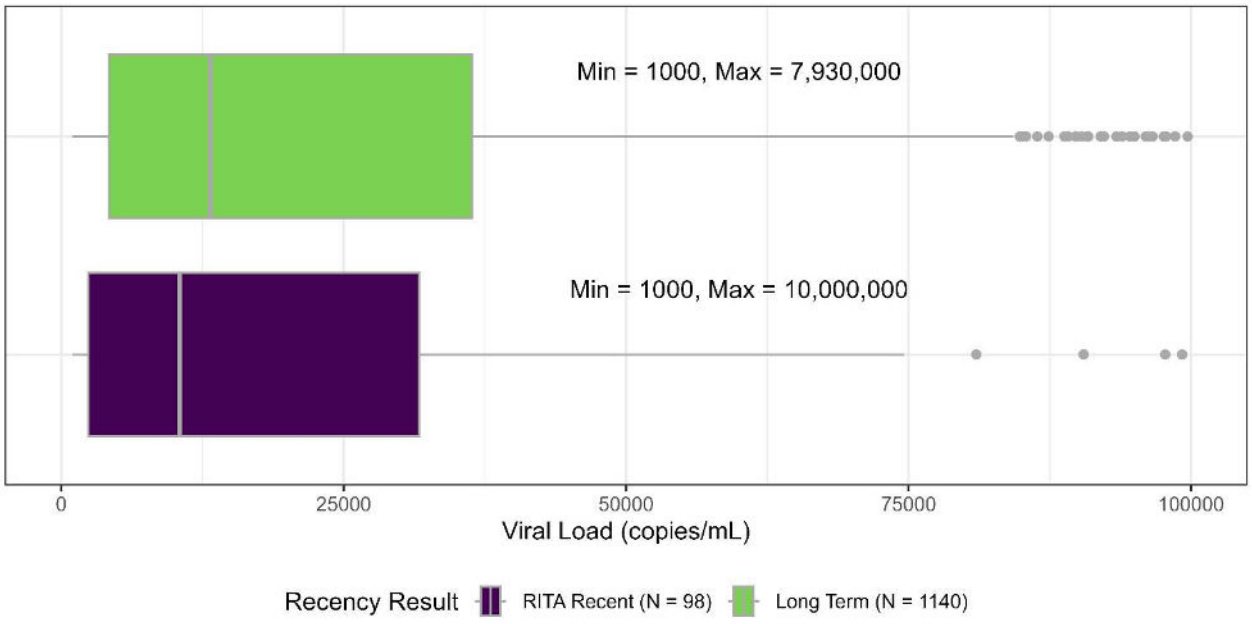
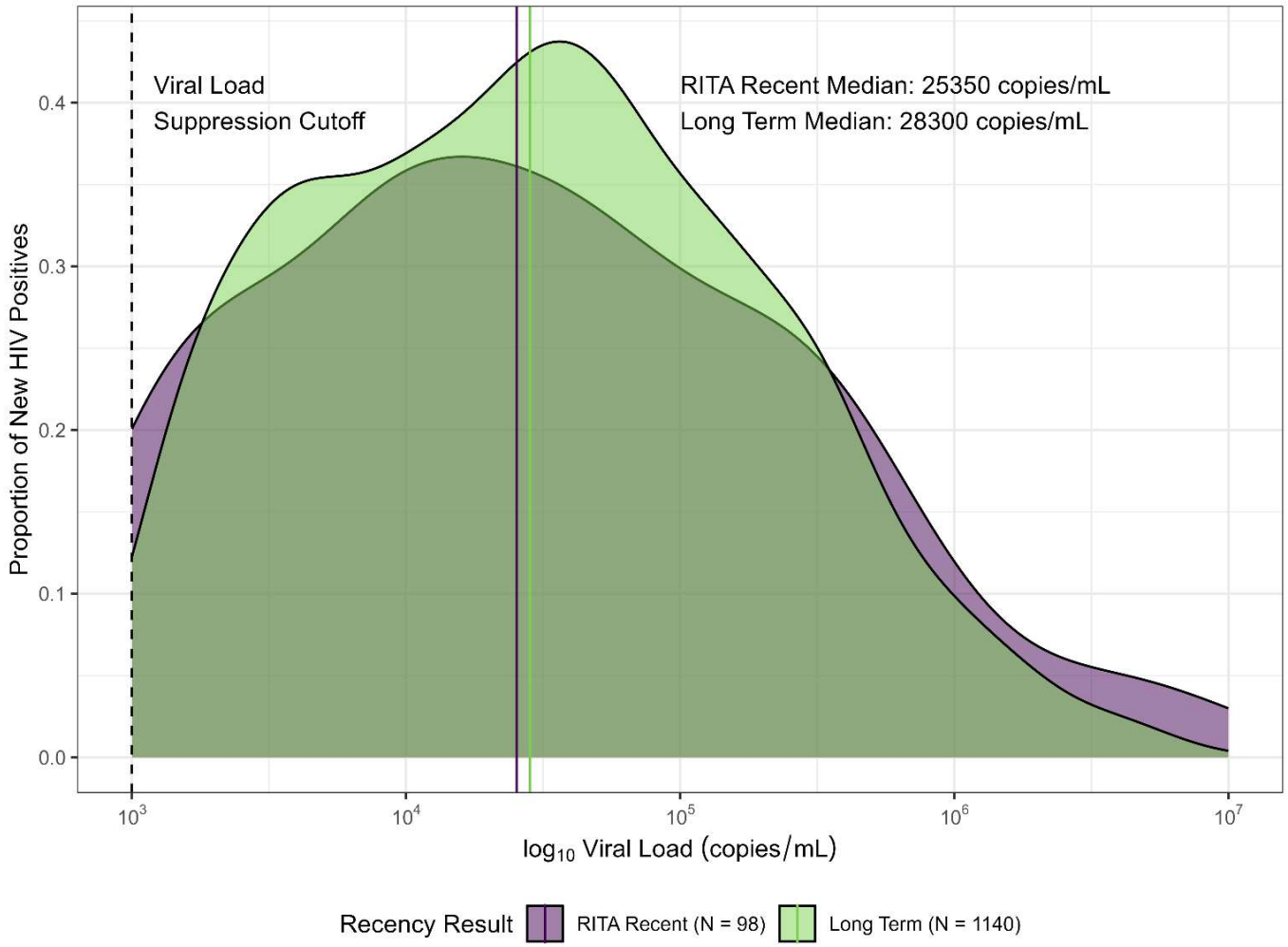


Figure 8.b: Distribution of baseline viral load of index study participants on a logarithmic scale, by recent infection testing algorithm (RITA) status, Rwanda 2021–2022



Baseline VL levels are further disaggregated by age and sex in Table 9.c. There were no statistical differences between recent and LT groups in age and sex disaggregated analyses

Table 8.c: Median baseline viral load of index study participants by recent infection testing algorithm (RITA) status and age/sex subgroups, Rwanda 2021–2022

Among adults aged 15 years and older newly diagnosed HIV-positive who consented to case-based surveillance and recency testing (n = 1238)

		RITA Recent (N = 98)					RITA Long-term (N = 1140)					
Age Group	Sex Group	N	Min	Max	Median VL (copies/mL)	VL IQR	N	Min	Max	Median VL (copies/mL)	VL IQR	P value[1]
Total	Total	98	1000	10000000	25350	6582-131750	1140	1000	7930000	28300	6385-120420	0.7
Total	Male	21	1000	10000000	25100	2110-233782	438	1000	7930000	48650	9678-186802	0.4
Total	Female	77	1000	4602279	25600	6901-116000	702	1072	4466836	21540	5623-77411	0.5
15-34	Male	8	1000	1258925	27528	5424-261000	203	1000	7930000	36500	8500-126447	0.8
15-34	Female	63	1000	4602279	21600	6181-98470	485	1080	1980000	20700	5130-66500	0.8
35-49	Male	8	1010	10000000	16836	5891-681062	202	1160	5550000	525680	9976-222388	0.7
35-49	Female	11	1778	331131	90500	26086-232442	187	1072	4466836	22531	6372-104849	0.2
50+	Male	5	1210	233782	73559	2110-107000	33	4260	2130000	79400	42600-247000	0.3
50+	Female	3	3610	332000	50119	26865-191060	30	1250	4180000	43350	15362-294290	0.95

[1] Wilcoxon rank sum test

In routine CBS, VL is not done on those that test RTRI LT. Table 8.d describes the distribution of baseline VL levels by recency status including the 339 presumed retesters on ART that were virally suppressed. In this context, there is a statistically significant difference in median VL among recent vs. LT indexes where recent women have higher baseline VL levels compared to LT women (<0.01 for all comparisons).

Table 8.d: Median baseline viral load of index study participants and retesters by recent infection testing algorithm (RITA) status and age/sex subgroups, Rwanda 2021–2022

Among adults aged 15 years and older newly diagnosed HIV-positive who consented to case-based surveillance and recency testing and virally suppressed retesters (n = 1577)

		RITA Recent (N = 98)					RITA Long-term (N =1479)					
Age Group	Sex Group	N	Min	Max	Median VL (copies/mL)	VL IQR	N	Min	Max	Median VL (copies/mL)	VL IQR	P value[1]
Total	Total	98	1000	10000000	25350	6582-131750	1479	TND	7930000	12300	1315-70900	< 0.001
Total	Male	21	1000	10000000	25100	2110-233782	532	TND	7930000	26150	2488-136684	0.5
Total	Female	77	1000	4602279	25600	6901-116000	947	TND	4466836	8650	921-46737	< 0.001
15-34	Male	8	1000	1258925	27528	5424-261000	250	TND	7930000	20846.5	1793-95750	0.5
15-34	Female	63	1000	4602279	21600	6181-98470	648	TND	1980000	8109	993-44425	< 0.001
35-49	Male	8	1010	10000000	16836	5891-681062	242	TND	5550000	29900	3350-188720	0.7
35-49	Female	11	1778	331131	90500	26086-232442	256	TND	4466836	9655	756-58400	0.01
50+	Male	5	1210	233782	73559	2110-107000	40	TND	2130000	67753	10427-173767	0.8
50+	Female	3	3610	332000	50119	26865-191060	43	TND	4180000	16500	688-144000	0.4

[1] Wilcoxon rank sum test

Table 8.e presents median baseline VL levels among the contacts of recent vs. LT index study participants. Among known HIV-positive contacts linked to newly diagnosed study participants, the min VL values were the same among recent and LT groups (min VL=TND or <20 copies/mL) while the max VL was 14780 and 9251587 copies/mL, respectively. There was no statistical difference (p=0.9) in median VL between recent (TND or <20 copies/mL) and LT groups (TND or <20 copies/mL).

Table 8.e: Median baseline viral load of contacts linked to newly diagnosed index study participants by recent infection testing algorithm (RITA) status and contact type, Rwanda 2021–2022

Among adults aged 15 years and older newly diagnosed HIV-positive who consented to case-based surveillance and recency testing (n = 1238)

	RITA Recent Index (n = 98)					RITA Long-term Index (n = 1140)					P value[1]
Contact type	N	Min	Max	Median VL	VL IQR	N	Min	Max	Median VL	VL IQR	
Total positive	30	TND	831246	1316	26 – 17720	304	TND	9251587	348	TND – 28046	0.5
Already known positive	13	TND	14780	TND	TND – 219	168	TND	9251587	TND	TND – 63	0.9
Recent	3	1010	831246	1122	1066 – 416184	7	1778	233782	17378	10198 – 58050	0.4
Long-term	14	188	247000	13832	4393 – 105814	129	TND	4290000	25700	2239 – 85114	0.9
Negative	66	-	-	-	-	661	-	-	-	-	
Unknown	133	-	-	-	-	1271	-	-	-	-	

[1]Wilcoxon rank sum test

TREATMENT UPTAKE AND VIRAL LOAD SUPPRESSION

9. TREATMENT UPTAKE AND VIRAL LOAD SUPPRESSION

9.1 Background

Viral load suppression is a key indicator of treatment success in HIV-positive individuals. In Rwanda, as per WHO and in-country HIV guidelines, patients are considered to have suppressed VL when their VL is under 200 HIV RNA copies/mL [5]. For the purposes of the study, VLS is defined as less than 1000 HIV RNA copies/mL. This definition of VLS has been used by UNAIDS, PEPFAR, as well as across PHIA surveys across countries and subnational areas [16, 17]. It should however be noted that, to improve treatment monitoring in people living with HIV, WHO has since lowered the threshold for viral suppression, defining it as <50 copies/mL, while the threshold for treatment failure remains at 1000 HIV RNA copies/mL or more [18]. This chapter describes VLS among index study participants 6-months after study enrolment.

9.2 Results

In total, 1051 index study participants completed 6-month follow-up and had VL results available to be analysed (recent = 87; LT = 964). The remaining 187 index study participants had missing 6-month VL results for the following reasons: participant was lost to follow up (n =129), sample was not received at the testing laboratory (n = 5), sample was rejected at the testing hub (n = 5), VL testing failed (n = 3), or other reasons (n=45). Table 9.a presents VLS data among the 1051 index study participants. Nearly all recent and LT indexes were VLS with 94.3% and 93.7% respectively. Over 65% had undetectable VL across both groups (recent & LT) overall.

Table 9.a: Viral load suppression (VLS) (<1000 copies/mL) of index study participants at 6-month post baseline, Rwanda 2021–2022

Among adults aged 15 years and older newly diagnosed HIV-positive who consented to case-based surveillance and recency testing (n = 1051)

	RITA Recent (n = 87)	RITA Long-term (n = 964)
Min, Max VL	TND – 31600	TND – 1930000
Median VL (LQ - UQ)	TND (TND - 45)	TND (TND - 42)
% VL suppressed	94.3	93.7
% undetectable VL	66.7	65.7

Viral load test (VL) results were abstracted from case reporting forms during routine clinic visits and deduplicated. In cases where multiple VL results were recorded, the later result was used. In some cases, the true follow up time was slightly more or less than six months.

In a subgroup analysis of 209 pregnant women with 6-month follow-up VL results (Table 9.b), VLS was 91.3% among recent indexes and 92.5% among LT indexes. Over 73% had undetectable VL across both groups (recent and LT). Findings suggest good treatment uptake, adherence and VLS among index clients enrolled into the study, including pregnant women; treatment outcomes do not appear to differ based on recent infection status at diagnosis.

Table 9.b: Viral load suppression of index study participants at 6-month follow-up post baseline, Rwanda 2021–2022

Among newly diagnosed HIV-positive pregnant index cases (n = 209)

	RITA Recent (n = 23)	RITA Long-term (n = 186)
Min, Max VL	TND – 31600	TND – 189000
Median VL (LQ - UQ)	TND (TND – 32.8)	TND (TND – 21.8)
% VL suppressed	91.3	92.5
% undetectable VL	73.9	73.1

Viral load test (VL) results were abstracted from case reporting forms during routine clinic visits and deduplicated. In cases where multiple VL results were recorded, the later result was used. In some cases, the true follow up time was slightly more or less than six months.

Sixty-six index study participants had unsuppressed VL results at 6-months. Table 9.c describes the demographic characteristics of index study participants with 6-month VL results available by VL suppression status. Unsuppressed participants were majority 15-34 years (71.2%), female (63.6%). The most common population group was general population (84.9%), followed by FSW (15.2%); the majority of were either single (48.5%) or cohabiting (28.8%).

Table 9.c: Baseline characteristics of index study participants by viral load suppression status at 6-month follow-up post baseline, Rwanda 2021–2022

Among adults aged 15 years and older newly diagnosed HIV-positive who consented to case-based surveillance and recency testing

Characteristic	Total (n = 1051), n (%)	Suppressed 6-month VL (n = 985), n (%)	Unsuppressed 6-month VL (n = 66), n (%)	P value
RITA Result				
Recent	87 (8.3)	82 (8.3)	5 (7.6)	1.000
Long Term	964 (91.7)	903 (91.7)	61 (92.4)	
Age at diagnosis (years)				
15-34	637 (60.6)	590 (59.9)	47 (71.2)	0.21
35-49	348 (33.1)	332 (33.7)	16 (24.2)	
50+	66 (6.3)	63 (6.4)	3 (4.6)	
Sex				
Male	366 (34.8)	342 (34.7)	24 (36.4)	0.8
Female	685 (65.2)	643 (65.3)	42 (63.6)	
Pregnancy status				
Pregnant	199 (29.1)	185 (28.8)	14 (33.3)	0.6
Not pregnant	486 (70.9)	458 (71.2)	28 (66.7)	
Province				
Eastern	293 (27.9)	280 (28.4)	13 (19.7)	0.33
Kigali City	516 (49.1)	476 (48.3)	40 (60.6)	
Northern	41 (3.9)	39 (4.0)	2 (3.0)	
Southern	85 (8.1)	82 (8.3)	3 (4.6)	
Western	116 (11.0)	108 (11.0)	8 (12.1)	
Population group				
General population female	590 (56.1)	558 (56.7)	32 (48.5)	0.257
General population male	360 (34.3)	336 (34.1)	24 (36.4)	

Female sex worker	95 (9.0)	85 (8.6)	10 (15.2)	
Men who have sex with men	6 (0.6)	6 (0.6)	0 (0.0)	
Marital status				
Single	302 (28.7)	270 (27.4)	32 (48.5)	0.013
Married	145 (13.8)	139 (14.1)	6 (9.1)	
Cohabiting	406 (38.6)	387 (39.3)	19 (28.8)	
Widowed	48 (4.6)	47 (4.8)	1 (1.5)	
Divorced/separated	150 (14.3)	142 (14.4)	8 (12.1)	
Arrived at the facility as part of a couple				
Yes	318 (30.3)	301 (30.6)	17 (25.8)	0.49
No	733 (69.7)	684 (69.4)	49 (74.2)	
Employment				
Employed	587 (55.9)	557 (56.6)	30 (45.5)	0.1
Unemployed	464 (44.2)	428 (43.5)	36 (54.6)	
Number of sexual partners in the past 3 months				
0	143 (13.6)	133 (13.5)	10 (15.2)	0.25
1	708 (67.4)	669 (67.9)	39 (59.1)	
2+	200 (19.0)	183 (18.6)	17 (25.8)	
Number of sexual partners in the past 12 months				
0	57 (5.4)	54 (5.5)	3 (4.6)	0.327
1	592 (56.3)	560 (56.9)	32 (48.5)	
2+	402 (38.3)	371 (37.7)	31 (47.0)	
Had sex without a condom in the past 12 months				
Yes	1007 (95.8)	944 (95.8)	63 (95.5)	0.753
No	44 (4.2)	41 (4.2)	3 (4.6)	
Health-related quality of life, n (mean ± SD)[2]				
Overall quality of life	1050 (2.9 ± 0.9)	985 (2.9 ± 0.9)	65 (3.0 ± 1.0)	0.77
General health perception	1047 (3.2 ± 0.9)	982 (3.2 ± 0.9)	65 (3.1 ± 1.1)	0.74
Physical	1049 (14.9 ± 3.4)	984 (14.9 ± 3.4)	65 (14.5 ± 3.7)	0.44
Psychological	1049 (12.6 ± 1.5)	984 (12.6 ± 1.5)	65 (12.7 ± 1.7)	0.35
Independence	1049 (15.3 ± 2.7)	984 (15.3 ± 2.7)	65 (15.2 ± 2.9)	0.62
Social relationships	1049 (14.1 ± 2.7)	984 (14.1 ± 2.7)	65 (14.0 ± 2.9)	0.53

[1]Number (%) unless otherwise indicated.

[2]Used the WHOQOL-HIV BREF instrument to produce scores among all index participants in the following domains: physical, psychological, level of independence, and social relationships. In addition, included in this instrument were two items that examine general quality of life. Domain scores were calculated by computing the mean score of items within each domain; items are rated on a Likert scale where 1 indicates low, negative perceptions and 5 indicates high, positive perceptions. Mean scores were multiplied by 4, so that scores ranged between 4 and 20. One participant did not answer all questions required to compute scores. Five participants had missing data for the general health perception question.

Viral load (VL) results were abstracted from case reporting forms during routine clinic visits and deduplicated. In cases where multiple VL results were recorded, the later result was used. In some cases, the true follow-up time was slightly more or less than six months.

USE OF PRE-EXPOSURE PROPHYLAXIS AMONG CONTACTS WITH HIV-NEGATIVE RESULTS

10. USE OF PRE-EXPOSURE PROPHYLAXIS AMONG HIV-NEGATIVE CONTACTS

10.1 Background

Pre-exposure prophylaxis (PrEP) has emerged as a key component of HIV prevention strategies and can help prevent HIV among individuals with substantial risk, including contacts with negative HIV results of newly diagnosed index cases. As part of the study, contacts who tested or self-reported HIV-negative were asked questions about PrEP referral and initiation, and plans for repeat testing and adherence. Additionally, information was also abstracted from PrEP registers or PrEP medical files at study facilities where PrEP was in use. Understanding PrEP uptake and retention can guide efforts to scale-up PrEP in programmatically efficient ways. PrEP use among eligible people in Rwanda is still at a low level with fewer than 200 facilities offering PrEP services among 583 health facilities with HIV treatment services nationally. Priority is given to the following populations: FSW, serodiscordant couples (partners with unsuppressed VL), MSM, and adolescent girls and young women. This chapter describes use of PrEP among contacts who are HIV-negative linked to index study participants with unsuppressed VL that were included in the main analysis.

10.2 Results

Of the 60 study facilities, 50 (85%) offered PrEP. Table 10.a compares the characteristics of 627 HIV-negative contacts linked to virally unsuppressed index study participants who used PrEP to those who did not use PrEP at the 50 facilities that offered PrEP. Of the 627 HIV-negative contacts, 42 (6.7%) were linked to recent index cases and 585 (93.3%) were linked to LT index cases. Overall, PrEP use was low (85/627, 13.6%) among HIV-negative contacts of newly diagnosed HIV-positive index participants. HIV-negative contacts of recent index cases were less likely to use PrEP (1/42, 2.4%) compared to HIV-negative contacts of LT index cases (84/585, 14.4%), which may suggest a potential benefit to expandcurrent eligiblity criteria to reach at-risk populations with PrEP such as HIV-negative contacts of recent index cases . Majority of HIV-negative contacts who used PrEP (n = 85) were female (54/85, 64%), aged 15-34 (63/85, 74%), and presented to a health facility in Kigali City (58/85, 68%). In addition, PrEP use was higher among contacts who were in more established relationships, including married and cohabiting (54/85, 63.5%), as self-reported by the index, compared to less formal relationships, like girlfriend/boyfriend, casual or transactional partners (31/85, 36.5%).

Table 10.a: Use of pre-exposure prophylaxis, Rwanda 2021–2022

Among HIV-negative sexual and social contacts of newly diagnosed HIV-positive index study participants seen at facilities offering PrEP (n = 627)

Characteristic	Total (n = 627), n (%)	No PrEP (n = 542), n (%)	Used PrEP (n = 85), n (%)	P value[1]
RITA Result of Index				
Recent	42 (6.7)	41 (97.6)	1 (2.4)	0.032
Long Term	585 (93.3)	501 (85.6)	84 (14.4)	
Age (years)				
15-34	388 (61.9)	325 (83.8)	63 (16.2)	0.035
35-49	200 (31.9)	180 (90.0)	20 (10.0)	
50+	39 (6.2)	37 (94.9)	2 (5.1)	
Sex				
Male	366 (58.4)	335 (91.5)	31 (8.5)	<0.001
Female	261 (41.6)	207 (79.3)	54 (20.7)	
Province				
Eastern	161 (27.7)	143 (88.8)	18 (11.2)	0.015
Kigali City	346 (55.2)	288 (83.2)	58 (16.8)	
Northern	15 (2.4)	15 (100.0)	0 (0.0)	
Southern	48 (7.7)	47 (97.9)	1 (2.1)	
Western	57 (9.1)	49 (86.0)	8 (14.0)	
Relationship type of contact(s) as reported by index				
Spouse/husband/fiancé	69 (11.0)	46 (66.7)	23 (33.3)	<0.001
Girlfriend/Boyfriend	61 (9.7)	59 (96.7)	2 (3.3)	
Cohabiting	112 (17.9)	81 (72.3)	31 (27.7)	
Casual partner	294 (46.9)	267 (90.8)	27 (9.2)	
Someone who pays me to have sexual relations	37 (5.9)	36 (97.3)	1 (2.7)	
Someone I pay to have sexual relations	12 (1.9)	11 (91.7)	1 (8.3)	
Member of social network	41 (6.5)	41 (100.0)	0 (0.0)	
Other – PWID, TG etc.	1 (0.2)	1 (100.0)	0 (0.0)	

The 'Total' column percentage is the distribution of the variable in our data. However, the row percentage is the distribution of a particular category of a variable across the two PrEP groups. Percentages are reported as column percentages in the 'Totals' column, and as row percentages otherwise.

HEALTH-RELATED QUALITY OF LIFE

11. HEALTH-RELATED QUALITY OF LIFE

11.1 Background

Health-related quality of life (HRQoL) information was collected to explore the potential effect of HIV diagnosis and recency test result on the participant's quality of life. We used the WHOQOL-HIV BREF instrument during interviews with index study participants to assess changes in HRQoL that may be associated with HIV diagnosis and recency testing results. The WHOQOL-HIV BREF is based on the WHOQOL-BREF, the shorter form of the WHOQOL-100 instrument which has undergone extensive pilot and field testing in centers across the world. The WHOQOL-HIV BREF consists of a total of 31 items, including two general questions on overall quality of life (How would you rate your quality of life?) and general health perceptions (How satisfied are you with your health?), and 29 specific questions that measure HRQoL in six domains (physical (n=4), psychological (n=5), level of independence (n=4), social relationships (n=4), environment (n=8), and spirituality (n=4)). All index study participants received items specific to 4 domains: physical, psychological, level of independence, and social relationships. Males received at the facility at the same time as their partner did not receive IPV questions but in lieu received additional WHOQOL-HIV BREF items specific to 2 other domains: environment and spirituality. Individual items are rated on a 5-point Likert scale where 1 indicates low, negative perceptions and 5 indicates high, positive perceptions. Negatively phrased items were reverse coded so that all scores are scaled in a positive direction, meaning that higher scores denote higher quality of life. For the two general questions on overall quality of life and general health perceptions, the 5-point Likert scale for the single item was used as the HRQoL score and they ranged from 1-5. For the six domain scores, the mean score of 4-8 items within each domain was used to calculate the domain score; each item contributes equally to the score of the domain. The mean score in each domain indicates the individual's perception of their satisfaction with each aspect of their life, relating it with quality of life. Mean scores were multiplied by 4 to make domain scores comparable with the scores used in the WHOQOL-100 instrument. Scores ranged between 4 and 20. This chapter describes HRQoL scores among the newly diagnosed HIV-positive index study population.

11.2 Results

Table 11.a presents WHOQoL scores overall and by sex. Perceptions of overall quality of life and his or her health were neutral overall and for both sexes. Across the 4 domains asked to all index study participants (i.e., physical, psychological, level of independence, and social relationships), overall QoL scores were highest in the independence and physical domains and lowest in the psychological domain. In addition, women reported lower QoL scores in every domain except for psychological.

Table 11.a: Baseline WHOQOL domain scores of index study participants by sex, Rwanda 2021–2022

Among adults aged 15 years and older newly diagnosed HIV-positive who consented to case-based surveillance and recency testing

Variable Description	Total			Male			Female		
	N[1]	Mean (SD)	Median (IQR)	N[1]	Mean (SD)	Median (IQR)	N[1]	Mean (SD)	Median (IQR)
Overall Quality of Life[2]	1237	2.9 (0.9)	3 (2-4)	459	3.0 (0.9)	3 (2-4)	778	2.9 (0.9)	3 (2-4)
General Health Perceptions[3]	1233	3.2 (0.9)	3 (2-4)	458	3.3 (0.9)	3 (3-4)	775	3.1 (1.0)	3 (2-4)
Physical	1236	14.8 (3.4)	15 (12-18)	458	15.0 (3.5)	15 (12-18)	778	14.8 (3.3)	15 (12-18)
Psychological	1236	12.6 (1.5)	13 (11-14)	458	12.4 (1.6)	13 (11-14)	778	12.7 (1.5)	13 (12-14)
Independence	1236	15.2 (2.8)	15 (14-17)	458	15.3 (3.0)	16 (13-17)	778	15.2 (2.7)	15 (14-17)
Social Relationships	1236	14.0 (2.8)	14 (12-16)	458	14.3 (2.9)	14 (13-16)	778	13.9 (2.8)	14 (12-16)
Environment[4]	169	12.8 (2.3)	12 (12-14)	169	12.8 (2.3)	12 (12-14)	0	NA	NA
Spirituality[4]	169	15.3 (2.9)	16 (13-18)	169	15.3 (2.9)	16 (13-18)	0	NA	NA

[1] Counts for each row exclude participants who did not give valid responses to the associated items,

[2] Asked participants to rate their overall perception of quality of life on a 5-point Likert scale where 1 = very poor, 2 = poor, 3 = neither poor nor good, 4 = good, and 5 = very good.

[3] Asked participants to rate their overall perception of his or her health on a 5-point Likert scale where 1 = very dissatisfied, 2 = dissatisfied, 3 = neither satisfied nor dissatisfied, 4 = satisfied, 5 = very satisfied.

[4]Questions in the environmental and spirituality domains were only asked of male partners who arrived as part of a couple.

WHOQoL domain scores were similar by RITA status and are summarized in Table 11.b. Perceptions of overall quality of life and his or her health were neutral across both groups. Further, domain scores among recent vs. LT indexes were nearly identical across the four domains received by all study participants; scores were highest in the independence and physical domains and lowest in the psychological domain.

Table 11.b: Baseline WHOQOL domain scores of index study participants by recent infection testing algorithm (RITA) status, Rwanda 2021–2022

Among adults aged 15 years and older newly diagnosed HIV-positive who consented to case-based surveillance and recency testing

Variable Description	Total			RITA Recent			RITA Long-term		
	N[1]	Mean (SD)	Median (IQR)	N[1]	Mean (SD)	Median (IQR)	N[1]	Mean (SD)	Median (IQR)
Overall Quality of Life[2]	1237	2.9 (0.9)	3 (2-4)	98	2.8 (0.9)	3 (2-3)	1139	2.9 (0.9)	3 (2-4)
General Health Perceptions[3]	1233	3.2 (0.9)	3 (2-4)	98	3.1 (0.9)	3 (2-4)	1135	3.2 (0.9)	3 (2-4)
Physical	1236	14.8 (3.4)	15 (12-18)	98	14.7 (3.5)	15 (12-18)	1138	14.9 (3.4)	15 (12-18)
Psychological	1236	12.6 (1.5)	13 (11-14)	98	12.5 (1.5)	13 (11-14)	1138	12.6 (1.5)	13 (11-14)
Independence	1236	15.2 (2.8)	15 (14-17)	98	15.0 (2.6)	15 (14-17)	1138	15.3 (2.8)	16 (14-17)
Social Relationships	1236	14.0 (2.8)	14 (12-16)	98	13.9 (2.7)	14 (12-16)	1138	14.0 (2.8)	14 (12-16)
Environment[4]	169	12.8 (2.3)	12 (12-14)	5	13.4 (2.3)	14 (12-14)	164	12.8 (2.3)	12 (11-14)
Spirituality[4]	169	15.3 (2.9)	16 (13-18)	5	17.2 (2.5)	18 (17-19)	164	15.2 (2.9)	16 (13-18)

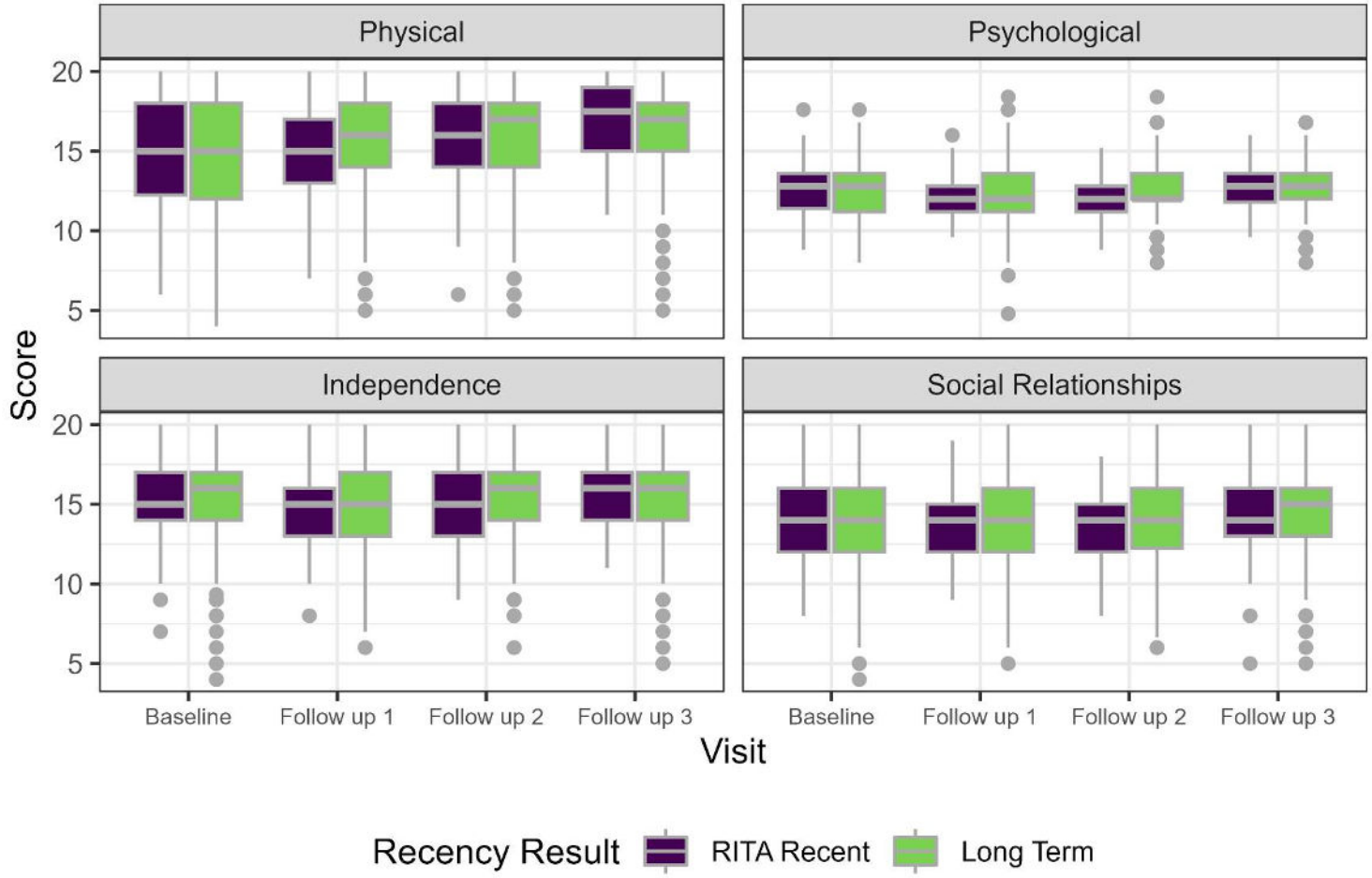
[1]Counts for each row exclude participants who did not give valid responses to the associated items.

[2] Asked participants to rate their overall perception of quality of life on a 5-point Likert scale where 1 = very poor, 2 = poor, 3 = neither poor nor good, 4 = good, and 5 = very good.

[3] Asked participants to rate their overall perception of his or her health on a 5-point Likert scale where 1 = very dissatisfied, 2 = dissatisfied, 3 = neither satisfied nor dissatisfied, 4 = satisfied, 5 = very satisfied.
[2] Questions in the environmental and spirituality domains were only asked of male partners who arrived as part of a couple.

The distributions of WHOQoL domain scores across study visits are presented in Figure 11.c. Distributions of QoL domain scores remained equivalent between recent vs. LT indexes study visit except perhaps in the physical domain where median scores appear to increase with each visit.

Figure 11.c: WHOQOL domain scores of index study participants over time by recent infection testing algorithm (RITA) status, Rwanda 2021–2022



HEALTHCARE PROVIDER KNOWLEDGE, ATTITUDES AND PRACTICES

12. HEALTHCARE PROVIDER KNOWLEDGE, ATTITUDES AND PRACTICES

12.1 Background

Healthcare providers were assessed at baseline and during a 6-month follow-up interview on knowledge, attitudes, and experience with recency testing and partner/index testing. The tables and figures in this chapter describe potential barriers to carrying out recency procedures, to client participation in recency and index testing, perceptions of the effect of recency testing and return of results on stigma, mistreatment and IPV, and attitudes around prioritization of clients. In Rwanda, there is no existing guidance for healthcare providers on using recency testing results to prioritize index testing for clients.

12.2 Results

In total, 176 healthcare providers (range: 1 to7 healthcare providers per facility) were surveyed at baseline, and of those, 171/176 (97%) participated in the 6-month follow-up interview. The training received by enrolled healthcare providers is summarized in Table 12.a. Over two-thirds of healthcare reporting having received some sort of recency testing training at baseline (117/176, 66.5%) and follow up (125/171, 73.1%) ; over half reported receiving a 5-day active CBS training.

Table 12.a: Healthcare provider training on recent infection testing, Rwanda 2021–2022

Among healthcare providers aged ≥18 years involved in recency testing and active case-based surveillance who received training on recency testing

Characteristic	Baseline[1] (n = 117), n (%)	Follow-up[1] (n = 125), n (%)	P value
Months since most recent recency testing training, mean (SD)	16 (12)	23 (15)	<0.001
Training format of most recent recency testing training[2]			
5-day active case-based surveillance training	64 (54.7)	70 (56.0)	0.8
3-day training on recent infection testing	20 (17.1)	25 (20.0)	0.6
On-site training by colleagues	29 (24.8)	47 (37.6)	0.036
On-site training by recent infection site supervisor	29 (24.8)	33 (26.4)	0.8
Other	2 (1.7)	1 (0.8)	0.6

[1] Number (%) unless otherwise indicated.

[2] Percentages will not add up to 100% as respondents can select more than one training format.

Table 12.b describes the barriers and challenges to implementing CBS and recency faced by the health providers. While most providers felt equipped to identify and approach eligible clients for recency and CBS, most (89%) noted that other responsibilities prevent them from approaching eligible clients at least some of the time at baseline compared to less than a quarter (23%) during follow-up ($p < 0.001$). Nearly all (≥95%) felt capable of explaining recency and CBS to clients and confident in their ability to elicit contacts from index clients at baseline and follow-up. However, over a third (>35%) did not feel equipped to screen clients for IPV, citing lack of time with clients as the most common reason (>80%).

Table 12.b Healthcare provider barriers and challenges to case-based surveillance and recency, Rwanda 2021–2022

Among healthcare providers aged ≥18 years involved in recency testing and active case-based surveillance

Characteristic	Baseline (n = 176), n (%)	Follow-up (n = 171), n (%)	P value
Healthcare providers feel equipped to identify and approach eligible clients for recency and CBS			
Yes	155 (88.1)	159 (93.0)	0.2
No	20 (11.3)	11 (6.4)	
Don't know	1 (0.6)	1 (0.6)	
Healthcare providers are able to explain recency and CBS to eligible clients			
Yes	171 (97.2)	163 (95.3)	0.6
No	3 (1.7)	6 (3.5)	
Don't know	2 (1.1)	2 (1.2)	
Frequency that other responsibilities keep providers from approaching eligible clients for inclusion in recency and CBS			
Always	11 (6.3)	1 (0.6)	<0.001
Often	63 (35.8)	0 (0.0)	
Sometimes	82 (46.6)	38 (22.2)	
Rarely	0 (0.0)	28 (16.4)	
Never	20 (11.4)	104 (60.8)	
Healthcare providers believe that eligible clients are willing to participate and consent to recency testing and CBS			
Yes	162 (92.0)	159 (93.0)	0.2
No	14 (8.0)	9 (5.3)	
Don't know	0 (0.0)	3 (1.8)	
Healthcare providers feel confident in their ability to elicit contacts from index clients			
Yes	171 (97.2)	164 (95.9)	0.5
No	5 (2.8)	7 (4.1)	

Healthcare providers believe that clients feel comfortable sharing contacts with them			
Yes	129 (73.3)	122 (71.3)	0.7
No	45 (25.6)	45 (26.3)	
Don't know	2 (1.1)	4 (2.3)	
Healthcare providers are equipped to screen clients for intimate partner violence related to their contacts			
Yes	105 (59.7)	97 (56.7)	0.7
No	61 (34.7)	66 (38.6)	
Don't Know	10 (5.7)	8 (4.7)	
What do you sometimes need in order to screen clients for intimate partner violence related to their contacts?[1]			
I need more time with index clients	49 (80.3)	55 (83.3)	0.7
I need strategies to ask about IPV from all aspects of the index client's life	27 (44.3)	30 (45.5)	0.9
I need ways to ensure the privacy of my index client during our conversation	25 (41.0)	29 (43.9)	0.7
I feel uncomfortable asking clients about their experience with violence	5 (8.2)	7 (10.6)	0.6
Other	9 (14.8)	6 (9.1)	0.3
Frequency healthcare providers are able to reach and invite contacts to the facility as part of partner notification services			
Always	66 (37.5)	46 (26.9)	0.12
Often	50 (28.4)	62 (36.3)	
Sometimes	53 (30.1)	52 (30.4)	
Rarely	6 (3.4)	5 (2.9)	
Never	1 (0.6)	4 (2.3)	
Don't know	0 (0.0)	2 (1.2)	
Number of attempts made to reach a contact in the first week, mean (IQR)	2.00 (1.00, 3.00)	2.00 (1.00, 2.00)	0.023
Healthcare providers continue to outreach to contact after the first week			
Yes	169 (96.0)	156 (91.2)	0.1
No	7 (4.0)	13 (7.6)	
Unknown	0 (0.0)	2 (0.6)	
Frequency outreach is re-attempted[2]			
Weekly	110 (65.1)	106 (68.0)	0.8
Monthly	54 (32.0)	47 (30.1)	
Every three months	5 (3.0)	3 (1.9)	

Percentages may not add up to 100% due to rounding.

[1]Only asked of healthcare providers who answered 'No' to the question, 'Do you always have what you need to screen clients for intimate partner violence related to their contacts?' (n = 61 at baseline; n = 66 at follow-up).

[2]Only asked of healthcare providers who answered 'Yes' to the question, 'In practice, do you keep trying to reach the contact after the first week?' (n = 169 at baseline; n = 156 at follow-up).

Healthcare provider perceptions around the impact of recency testing on stigma, mistreatment and IPV are described in Table 12.c. Nearly all healthcare providers (>94%) believed that partners of clients with a recent infection result are at higher risk for HIV infection than other partners. However, concerns around the risk of negative consequences, including judgement, mistreatment, and IPV are mixed among providers.

Table 12.c Healthcare provider knowledge and attitudes on the impact of recency testing on stigma, mistreatment, and IPV, Rwanda 2021–2022

Among healthcare providers aged ≥18 years involved in recency testing and active case-based surveillance

Characteristic	Baseline (n = 176), n (%)	Follow-up (n = 171), n (%)	P value
Others may judge a client for having a recent infection result			
Yes	71 (40.3)	80 (46.8)	0.2
No	101 (57.4)	83 (48.5)	
Don't know	4 (2.3)	8 (4.7)	
A client who has a recency testing result is more likely to be judged by others than a client who does not receive recency testing			
Yes	N/A	48 (28.1)	
No	N/A	109 (63.7)	
Don't know	N/A	14 (8.2)	
A client who has a recent infection result is more likely to be judged by others than a client with a long-term infection result			
Yes	N/A	48 (28.1)	
No	N/A	113 (66.1)	
Don't know	N/A	10 (5.8)	
Others may treat a client differently for having a recent infection result			
Yes	74 (42.0)	59 (34.5)	0.4
No	94 (53.4)	105 (61.4)	
Don't know	8 (4.5)	7 (4.1)	
A client who has a recency testing result is more likely to be mistreated by others than a client who does not receive recency testing.			
Yes	N/A	46 (26.9)	
No	N/A	115 (67.3)	
Don't know	N/A	10 (5.8)	
A client who has a recent infection result is more likely to be mistreated by others than a client with a long-term infection result.			
Yes	N/A	44 (25.7)	
No	N/A	117 (68.4)	
Don't know	N/A	10 (5.8)	

A client who has a recency testing result is at greater risk for intimate partner violence than a client who does not receive recency testing.			
Yes	100 (56.8)	84 (49.1)	0.3
No	67 (38.1)	80 (46.8)	
Don't know	9 (5.1)	7 (4.1)	
A client who has a recent infection result is at greater risk for intimate partner violence than a client with a long-term infection result.			
Yes	84 (47.7)	72 (42.1)	0.094
No	76 (43.2)	91 (53.2)	
Don't know	16 (9.1)	8 (4.7)	
The partners of a client with a recent infection result are at higher risk for HIV infection than other partners.			
Yes	174 (98.9)	161 (94.2)	0.027
No	1 (0.6)	7 (4.1)	
Don't know	1 (0.6)	3 (1.7)	

Percentages may not add up to 100% due to rounding.

Finally, Table 12.d describes healthcare providers attitudes around prioritizing certain types of clients for index testing. In summary, over a third (>35% at baseline) to nearly a half (49% at follow-up) of healthcare providers felt that index testing should be prioritized for certain clients, nearly all of whom said clients of recent results should be prioritized (>94%). Over half of providers (≥56%) reported prioritizing certain clients for index testing themselves, and among those who did, over two-thirds reported always prioritizing clients with recent infection results. The most common reasons for prioritizing clients with recent infection were that clients with recent infection are more likely to infect others (≥94%), it is easier to ask about contacts (49%), and they are more likely to respond to invitations (≥36%). Similar findings were noted when healthcare providers were asked about whether their colleagues prioritize certain types of clients for index testing.

Table 12.d Healthcare provider knowledge and attitudes on prioritizing clients for index testing, Rwanda 2021–2022

Among healthcare providers aged ≥18 years involved in recency testing and active active-based surveillance

Characteristic	N	Baseline (n = 176), n (%)	Follow-up (n = 171), n (%)	P value
In your opinion, should index testing ever be prioritized for certain clients?	176		171	
Yes		62 (35.2)	84 (49.1)	0.005
No		113 (64.2)	83 (48.5)	
Unknown		1 (0.6)	4 (2.3)	
What type of clients should be prioritized?	62		84	
Clients with recent results		58 (93.5)	84 (100.0)	0.03
Clients with long-term results		0(0.0)	0(0.0)	
Other		4 (6.5)	0 (0.0)	
How often should index testing among clients with <u>recent results</u> be prioritized?	58		84	
Always		45 (77.6)	67 (79.8)	0.13
Often		10 (17.2)	17 (20.2)	
Sometimes		3 (5.2)	0 (0.0)	
Do you ever prioritize certain clients for index testing?	176		171	
Yes		98 (55.7)	108 (63.2)	0.02
No		78 (44.3)	59 (34.5)	
Unknown		0 (0.0)	4 (2.3)	
How often do you prioritize clients with <u>recent results</u> for index testing?[1]	51		71	
Always		34 (66.7)	48 (67.6)	0.7
Often		13 (25.5)	17 (23.9)	
Sometimes		3 (5.9)	6 (8.5)	
Never		1 (2.0)	0 (0.0)	
Why do you prioritize clients with <u>recent results</u> for index testing?	51		71	
I am busy, and my caseload is heavy		3 (5.9)	10 (14.1)	0.2
Prioritized clients are more likely to infect others		48 (94.1)	69 (97.2)	0.6
It's easier to ask about the contacts of prioritized clients		25 (49.0)	35 (49.3)	>0.9
Contacts of prioritized clients are more likely to respond to invitations		27 (52.9)	26 (36.6)	0.063
Other		2 (3.9)	2 (2.8)	>0.9
How do you prioritize index testing among clients with recent results?	51		71	
Spend additional time eliciting partner contact information		47 (92.2)	66 (93.0)	>0.9
Spend greater time contacting partners		37 (72.5)	56 (78.9)	0.5

Assign index testing responsibilities with more experienced staff		26 (51.0)		25 (35.2)	0.071
Follow-up with client more frequently to inquire about partner notification		42 (82.4)		55 (77.5)	0.4
Reminding the index case they may have been infected in the last year and are more likely to infect others		34 (66.7)		42 (59.2)	0.3
Other		0 (0.0)		0 (0.0)	
Do your colleagues ever prioritize index testing services for certain clients?	176		171		
Yes		100 (56.8)		104 (60.8)	0.2
No		69 (39.2)		55 (32.2)	
Unknown		7 (4.0)		12 (7.0)	
What type of client do your colleagues prioritize?	100		104		
Clients with recent results		93 (93.0)		101 (97.1)	0.091
Clients with long-term results		1 (1.0)		2 (1.9)	
Other		6 (6.0)		1 (1.0)	
How often do your colleagues prioritize clients with <u>recent results</u> for index testing?	93		101		
Always		52 (55.9)		59 (58.4)	0.5
Often		27 (29.0)		32 (31.7)	
Sometimes		14 (15.1)		9 (8.9)	
Rarely		0 (0.0)		1 (1.0)	
Why do your colleagues prioritize clients with <u>recent results</u> for index testing?	93		101		
My colleagues am busy, and their caseloads are heavy		18 (19.4)		20 (19.8)	>0.9
Prioritized clients are more likely to infect others		86 (92.5)		99 (98.0)	0.09
It's easier to ask about the contacts of prioritized clients		51 (54.8)		51 (50.5)	0.5
Contacts of prioritized clients are more likely to respond to invitations		44 (47.3)		41 (40.6)	0.3
Other		1 (1.1)		0 (0.0)	0.5
How do your colleagues prioritize index testing?	100		104		
Spend additional time eliciting partner contact information		90 (90.0)		95 (91.3)	>0.9
Spend greater time contacting partners		67 (67.0)		80 (76.9)	0.5
Assign index testing responsibilities with more experienced staff		45 (45.0)		46 (44.2)	0.071
Follow-up with client more frequently to inquire about partner notification		42 (82.0)		70 (67.3)	0.7
Reminding the index case they may have been infected in the last year and are more likely to infect others		57(57.0)		55(52.9)	0.6

[1] The total number of healthcare providers with valid responses to this question may be less than the total number of healthcare providers who reported that clients with recent results should be prioritized due to missing responses in baseline (n = 7) and follow-up (n = 13).
Percentages may not add up to 100% due to rounding.

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