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Validity of self-report for ascertaining HIV status among circular migrants and permanent residents in South Africa: a cross-sectional, population-based analysis

Rachel R Yorlets[1,2], **Mark N Lurie**[1,2], **Carren Ginsburg**[3,4], **Joseph W Hogan**[2,5], **Nina R Joyce**[1,2,6], **Sadson Harawa**[3], **Mark A Collinson**[3,7], **F Xavier Gómez-Olivé**[3,4,*], **Michael J White**[2,4,8,*]

[1.]Department of Epidemiology, Brown University School of Public Health, Providence, Rhode Island, USA

[2.]Population Studies and Training Center, Brown University, Providence, Rhode Island, USA

[3.]Medical Research Council/Wits Rural Public Health and Health Transitions Research Unit (Agincourt), School of Public Health, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, Gauteng province, South Africa

[4.]Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, Gauteng province, South Africa

[5.]Department of Biostatistics, Brown University School of Public Health, Providence, Rhode Island, USA

Corresponding author Rachel R Yorlets, MPH, Brown University School of Public Health, Department of Epidemiology, 121 South Main Street, Box G-S121-3, Providence, RI 02903, rachel_yorlets@brown.edu, telephone: +1 (717) 476-6571.

*Indicates co-senior authorship

Authors' contributions

RRY conducted analyses and drafted the manuscript. MNL supervised writing and analyses. MNL, CG, MAC, FXGO, and MJW conceived of the study and are co-investigators on The Migration and Health Follow-Up Study (MJW is the PI). JWH advised analyses. NRJ advised analyses and provided critical edits. SH is the field Project Site Manager for MHFUS, and provided field project leadership including training field workers, as well as data collection and management with the support of the research team. All authors reviewed and provided critical revisions to the manuscript.

Declarations

Conflicts of interest

The authors have no conflicts to disclose.

Ethics approval

The Migration and Health Follow-Up Study received ethics clearance from the Mpumalanga Research and Ethics Committee, the University of the Witwatersrand Human Research Ethics Committee (Medical, clearance certificate #M170277), and Institutional Review Board Authorization Agreement #17-46 with Brown University. Written informed consent was obtained for in-person interviews and DBS-HIV testing. Verbal consent was obtained for telephone interviews.

Consent to participate

Written informed consent was obtained for in-person interviews and DBS-HIV testing. Verbal consent was obtained for telephone interviews.

Consent for publication

Not applicable.

Availability of data and material

Available upon request.

Code availability

Available upon request.

[6]Center for Gerontology and Healthcare Research, Brown University School of Public Health, Providence, Rhode Island, USA

[7]South African Population Infrastructure Network (SAPRIN), South African Medical Research Council (SAMRC), Cape Town, Western Cape province, South Africa

[8]Brown University Department of Sociology, Providence, Rhode Island, USA

Abstract

While expanded HIV testing is needed in South Africa, increasing accurate self-report of HIV status is an essential parallel goal in this highly mobile population. If self-report can ascertain true HIV-positive status, persons with HIV (PWH) could be linked to life-saving care without the existing delays required by producing medical records or undergoing confirmatory testing, which are especially burdensome for the country's high prevalence of circular migrants. We used Wave 1 data from The Migration and Health Follow-Up Study, a representative adult cohort, including circular migrants and permanent residents, randomly sampled from the Agincourt Health and Demographic Surveillance System in a rural area of Mpumalanga Province. Within the analytic sample (n=1,918), sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) of self-report were calculated with dried blood spot (DBS) HIV test results as the standard. Among in-person participants (n=2,468), 88.8% consented to DBS-HIV testing. HIV prevalence was 25.3%. Sensitivity of self-report was 43.9% (95% CI: 39.5–48.5), PPV was 93.4% (95% CI: 89.5–96.0); specificity was 99.0% (95% CI: 98.3–99.4) and NPV was 83.9% (95% CI: 82.8–84.9). Self-report of an HIV-positive status was predictive of true status for both migrants and permanent residents in this high-prevalence setting. Persons who self-reported as living with HIV were almost always truly positive, supporting a change to clinical protocol to immediately connect persons who say they are HIV-positive to ART and counselling. However, 56% of PWH did not report as HIV-positive, highlighting the imperative to address barriers to disclosure.

Keywords

HIV status; internal migration; sociodemographic factors; South Africa

Introduction

In South Africa, the epicentre of the HIV pandemic (1,2), an estimated 92% of persons with HIV (PWH) know their status, and of those, approximately 75% are on antiretroviral treatment (ART) (3). To increase engagement in life-saving HIV care, all PWH first need to know and accurately report their HIV status. Consequently, the United Nations set global targets in 2014 that 95% of all PWH know their diagnosis by 2030, 95% of diagnosed persons engage in ART, and 95% of persons on ART achieve viral suppression (4).

Reaching these targets is challenging in settings like South Africa undergoing rapid urbanisation and high levels of migration: human mobility increases migrants' risk of HIV acquisition (5–7) and death (7–11), reduces their probability of testing (12), delays their diagnosis (13–15), and decreases their care engagement (16,17). Circular migrants—who comprise about 60% of men and 30% of women in some South African settings (17)—move

within-country, often from rural areas, where their families are based, to urban employment opportunities (7,18). Periodic homecomings are usually determined by distance (7,18), and the migratory pattern itself complicates (19–23) HIV testing and disclosure: throughout sub-Saharan Africa, circular migrants are up to less than half as likely to test for HIV compared to their non-migrant counterparts (12,24,25). Migrants' barriers to testing are similar to those of other displaced populations and include challenges related to language, literacy, and indirect costs, such as those for transportation (26). Additionally, migrants' often-overcrowded living conditions limit privacy (26) for home-based testing. PWH not knowing their status has been identified as a reason why the UNAIDS targets were not met in a study in KwaZulu-Natal Province (27); for this same reason, approximately seven million PWH are not on ART in low-resource countries (28). Once someone does learn their status, however, little is known about their ability to report it. If self-report can be used to ascertain a positive HIV status, positive self-report could provide a legitimate basis for immediate linkage to care. Because early ART initiation is critical to health outcomes for PWH (and therefore to their partners) (29), initiating linkage to care based on self-report may yield both immediate and downstream benefits.

Using self-reported status (if feasible) could also reduce retesting, a common phenomenon among already-diagnosed PWH across sub-Saharan Africa (30), and more readily link PWH to treatment. While repeat testing among diagnosed PWH was prevalent (30–32) prior to the universal test and treat (UTT) era that began in 2015 (at which point, persons testing positive were linked to care immediately, regardless of CD4 count) (33,34), post-UTT evidence shows that retesting among diagnosed PWH persists, including in South Africa (35,36). Retesting raises the concerns of PWH not disclosing their diagnosis to counsellors at the time of the repeat test (31), remaining at risk for not starting ART (30), and frequently transferring from one clinic to another as they re-engage in care (37,38).

Reliable self-report would be especially valuable in the South African context, as circular migrants' mobility exacerbates the challenges of verifying their status through producing paper medical records or undergoing confirmatory biomarker testing. Collecting self-reported HIV status from adults is feasible, as demonstrated by past population-based surveys in sub-Saharan Africa (39,40), and yields both individual- and population-level benefits (41). Accurate disclosure empowers PWH to connect to counselling, ART, and social support (42). Additionally, health systems benefit from PWH knowing their status; it allows public health and policy stakeholders alike to monitor ART uptake, levels of viral suppression (43), and warning signs of increasing incidence (44). Collecting self-reported HIV status has been framed as an ethical obligation that will normalise reporting as part of routine surveillance (41), and may ultimately save time and resources if accepted as a valid surrogate for confirmatory biomarker testing (42). Supporting accurate self-report of a positive HIV status among persons who have tested is an essential goal.

To determine if self-reported HIV status can be used as a surrogate for confirmatory testing, one study evaluated the accuracy of self-reported HIV status in South Africa from 2014–2015 and found that self-report was highly predictive of true HIV status (42). However, this population-based sample was comprised of older adults in a rural area (42), and no other evaluations of self-reported HIV status have yet been conducted in South Africa, particularly

among younger adults, who are disproportionately at risk of new HIV infection (12,45). Our analysis aims to address the gap in knowledge regarding the validity of self-reported HIV status within a cohort of younger adults (ages 18–40) that includes high-risk circular migrants.

Methods

Study setting

The Agincourt Health and Demographics Surveillance System (HDSS), led by the Medical Research Council/Wits University Rural Public Health and Health Transitions Research Unit, is located in the Agincourt sub-district of Mpumalanga Province. Since 1992, the Agincourt HDSS has been conducting an annual census of the population in its 400 square-kilometre study site, recording births, deaths, and in- or out-migrations. As of 2019, the population in the area consisted of 116,000 persons, some of whom are circular migrants (46). The Agincourt HDSS has a high prevalence of HIV and circular migration, presenting an ideal population within which to evaluate the validity of self-reported HIV status among migrants. Within this surveillance population of black South Africans from a Shangaan-speaking origin community, between 2013 and 2017, about 63% of men 30–44 years old and 46% of men 20–29 years old had experience as circular migrants; about 36% of women 20–49 years old had participated in circular migration (17). The Migration and Health Follow-Up Study (MHFUS) cohort, based on a simple random sample of this population, found Agincourt residents to be more likely than their migrant counterparts to use health care (18).

Data source and analytic sample

We used data from Wave 1 of MHFUS, a five-year longitudinal sub-study nested within the Agincourt HDSS platform. Further details of the MHFUS questionnaire and fieldwork process have been reported (18). In brief, a simple random sample of the 2016 Agincourt HDSS census was selected into MHFUS; it included 3,800 participants aged 18–40, including circular migrants and Agincourt permanent residents. Prior to conducting each MHFUS Wave 1 interview, fieldworkers asked respondents to provide two written informed consents: one for the interview and one for both dried blood spot (DBS) collection and an HIV test of the DBS. Only respondents who were able to complete the interview in person were eligible for DBS collection and HIV testing. Interviews were conducted in Shangaan or English.

From February 2018 into early 2019, 3,103 (82%) respondents consented to and completed the MHFUS Wave 1 interview. Most respondents completed the interview in person (n=2,468, 79.5%), and were therefore eligible for consenting to DBS collection and DBS-HIV testing. For migrants who were located remotely (*e.g.,* outside the study site) and could not be located during data collection (n=635, 20.5%), interviews were completed telephonically (Appendix Figure 1). Exclusion criteria limited the analytic sample (n=1,918) to respondents who completed the questionnaire in person, reported a prior HIV test for which they received results, and consented to DBS collection and a DBS-HIV test provided by MHFUS. Comparisons of respondents who were included versus excluded in the analysis

(Appendix Tables 1–2) show that migrants were less likely than their resident counterparts to complete in-person interviews, to consent to DBS-HIV testing, and to have had a prior HIV test (Appendix Figure 2).

Migration status, sociodemographic characteristics, health care utilisation, and HIV history

Migration status was derived from participants' self-reported current usual residence, defined as 'the place where you typically spent four or more nights a week over the past year.' Respondents who reported one of the 31 villages that comprise the Agincourt study site in Mpumalanga Province were categorised as Agincourt residents; respondents for whom current usual residence was outside of these settlements were categorised as migrants. The questionnaire also validated the open question on current usual residence through a series of branched questions asking about the province and village of current residence; both definitions yielded nearly identical counts of the number of migrants and non-migrants.

Participants confirmed their date of birth and sex (which were pre-populated from the Agincourt HDSS survey), and reported the urbanicity of their current usual residence, highest education level completed, employment status, and individual income (South African Rand) for the prior month. Respondents were also asked about frequency and type (*e.g.,* private, public) of health care used in the prior 12 months. We used these data to create a binary variable to define if a participant had made one or more visits to a formal health care provider (*i.e.,* a government clinic/hospital, or private clinic/hospital/provider), versus zero formal care visits, indicating not receiving any care or receiving care exclusively from a traditional healer and/or spiritual prophet in the prior year.

At the end of the interview, fieldworkers used a section dedicated to HIV to ask about prior HIV testing, HIV disclosure, and ART initiation. Participants reported the month and year of their last HIV test, which was used to calculate time since last test.

Outcome of interest

The outcome of accurate self-report was defined as agreement between self-reported HIV status and DBS-HIV test results. Respondents who reported that they had received the results of a prior HIV test were asked: 'If you wouldn't mind sharing, what was the result of your most recent HIV test?'

Among participants who reported receipt of a prior HIV test result, we retained those who also consented to DBS-HIV testing; this allowed us to compare self-reported HIV status to the DBS-HIV test result. Within the analytic sample (n=1,918), participants who declined to share their HIV status (n=14) were assigned a negative status for their self-reported status for the purposes of our analysis; we assumed that they would not have disclosed a positive status given that they declined to provide any self-report.

Laboratory analysis

In-person respondents who consented to DBS-HIV testing for research purposes had a finger lanced by a trained fieldworker to yield a maximum of five drops of blood. Paper with blood

spots were dried on Whatman 903 TM filter paper at room temperature (about 23°C) for one night and then stored at −20°C until shipped or transported for analysis. HIV status was determined by conducting a Vironostika Uniform 11 (Biomeriuex, France) screening assay, which, if positive, was followed by a confirmatory test via Roche Elecsys, USA. If this second test was also positive, final HIV status was reported as positive (47).

Of note, DBS-HIV tests were administered by fieldworkers who specified the use of results for research purposes (DBS-HIV tests are not considered diagnostic). Participants who consented to DBS-HIV testing were offered a rapid HIV test to be conducted free of charge by a health professional at a post-interview time and place that was convenient to the participant. Participants were informed that this visit would include pre- and post-counselling and receiving results from the rapid test. Participants were able to cancel the appointment if they changed their mind. Toward the end of Wave 1, self-tests were offered instead.

Data analysis

Descriptive statistics were generated. The validity of self-report as a measure of HIV status was evaluated with the DBS-HIV test result as the standard; results were stratified by sex and migrant status.

Validity of self-report as a measure of HIV status was assessed through calculating sensitivity, the probability that a participant self-reports as HIV-positive given that their DBS-HIV test result is positive, and specificity, the probability that a participant self-reports as HIV-negative given that their DBS-HIV test result is negative. Feasibility of using self-report to obtain true HIV status was evaluated through calculating positive predictive value (PPV), the probability of a participant having a positive DBS-HIV test result given a self-reported positive status, and negative predictive value (NPV), the probability of a negative DBS-HIV test result given a self-reported negative status. Weighting the sensitivity of self-report compared to DBS-HIV test to approximate the sensitivity of plasma HIV testing (*i.e.,* multiplying the crude sensitivity times 0.988) did not meaningfully change estimates given the high sensitivity (98.8%) of DBS-HIV testing (48).

We are interested in the characteristics associated with accurate self-report among PWH because this population and their social connections benefit most from HIV status disclosure (and subsequent linkage to HIV care). Within PWH (n=485), we fit simple log-binomial regression models to consider the crude prevalence ratios of accurate self-report (yes/no) by individual-level sociodemographic characteristics, stratified by migrant status.

Fieldworkers collected data using REDCap electronic data capture tools (49,50). We conducted analyses in R (51), and used the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist for reporting (52).

Ethics committee

The Migration and Health Follow-Up Study received ethics clearance from the Mpumalanga Research and Ethics Committee, the University of the Witwatersrand Human Research Ethics Committee (Medical, clearance certificate #M170277), and Institutional Review

Board Authorization Agreement #17–46 with Brown University. Written informed consent was obtained for in-person interviews and DBS-HIV testing. Verbal consent was obtained for telephone interviews.

Results

During MHFUS Wave 1 interviews, 2,192 (88.8%) of the 2,468 in-person respondents consented to both DBS collection and an HIV test (Appendix Table 1, Appendix Figure 2). Valid DBS-HIV test results were available for 2,158 (98.4%) of these participants; two results were indeterminate and 32 (1.5%) could not be matched to participants. Of the participants with valid results, 240 (11.1%) reported that they had never been tested for HIV, and therefore, they were not asked to self-report their HIV status. We retained 1,918 participants in the analytic sample (Appendix Figure 1).

Most participants in the analytic sample were women (57.4%), currently in a rural area (78.5%), Agincourt residents (73.8%), unemployed (61.1%), and without individual-level income in the prior month (60.4%) (Table 1). Over half had a secondary education or higher (53.3%). Sociodemographic characteristics of PWH were overall similar, but a lower proportion of true positives had a secondary education or higher (34.7%) compared to false negatives (47.8%). True negatives had the highest proportion of respondents with secondary or higher education (57.3%).

The prevalence of HIV in the analytic sample was 25.3%, and 56.1% of PWH misreported their status. While self-report had a low sensitivity (43.9%, 95% CI: 39.5–48.5), PPV was high (93.4%, 95% CI: 89.5–96.0) (Table 2). While crude performance of self-report varied little by migrant status, self-report was more sensitive among women (47.0%, 95% CI: 41.8–42.3) than among men (34.7%, 95% CI: 26.3–43.8).

A higher proportion of true positives had known their status for a year or more (96.0%) compared to false negatives, most of whom (72.1%) had known their status for under a year (Table 3). A higher proportion of true positives had previously disclosed their status (87.8%) than false negatives (35.3%). Most true positives reported a history of ART (88.2%), while most false negatives reported no history of ART (97.4%). A higher proportion of false negatives had not engaged in formal health care in the prior year (85.9%) compared to true positives (59.9%).

In the interest of identifying barriers for those in need of HIV care, simple regressions were conducted within PWH (n=485) (Table 4). Among both migrants and non-migrants, prevalence of accurate self-report was lower among men living with HIV and PWH with secondary or higher education, but higher among PWH who had known their test results for a year or more and PWH who had used formal health care in the prior year. Prior disclosure was considered to be a source of simultaneous equation bias.

Discussion

Self-report of HIV positivity was highly predictive of true status in this high-prevalence setting. We found a higher PPV of self-report among migrants than among Agincourt

residents. These findings are salient to developing migrant-relevant HIV clinical protocols within a health system designed for stable catchment populations, particularly given migrants' heightened HIV risk and reduced ability to verify their status.

We found that using self-report as a measure of HIV status was feasible in this high-prevalence population, as indicated by the high PPV. PPV was highest among migrants: nearly all migrants who self-reported as HIV-positive are positive. Additionally, PPV was higher in women than men, potentially reflective of men's reduced engagement in health care (43,53) and women's exposure to antenatal care, which includes HIV counselling and testing. The high PPV (93.4%) and relatively high NPV (83.9%) in this young-age sample aligns with Rohr *et al.*'s finding of a high PPV (94.1%) and NPV (87.2%) of self-reported HIV status among older adults in rural South Africa. Both analyses support the conclusion that confirmatory biomarker testing following self-report of a positive HIV status is not essential (42). Persons who self-report as HIV-negative can be linked immediately to preventative counselling and confirmatory testing (42). Applying this evidence to clinical protocol would remove the delays and demands of confirmatory biomarker testing, increasing prompt linkage to ART and decreasing onward transmission risk (29). Additionally, resources currently used for repeat testing for already-diagnosed PWH could be redirected to the necessary expansion of HIV testing (27) for the approximately 24% of adult PWH in South Africa who are undiagnosed (6).

However, most diagnosed PWH did not self-report as positive. While data on self-reported HIV status are limited, evidence from sub-Saharan Africa suggests that misreporting predominantly reflects barriers to HIV disclosure as opposed to differing sensitivities of diagnostic tests or seroconversion timing (54). PWH in South Africa have identified that supportive environments and personal readiness are critical to disclosure (55,56). PWH who have known their status for longer may be more likely to have disclosed their status to someone in their life, enabling them to disclose (54) to a fieldworker; this was borne out in our findings. Additionally, heightened risk and prevalence of HIV among migrant communities may reduce stigma – a well-recognised barrier to disclosure (57–60) in South Africa – ultimately creating an environment in which migrants living with HIV are supported in sharing their status. Future MHFUS waves will collect measures of HIV stigma.

While this is a cross-sectional analysis of Wave 1 data, temporality is encoded in the collection of migration status: migration status based on current usual residence in the prior year precedes the self-report of HIV status at the time of interview. Our analysis considers respondents' time since last HIV test, but we do not know if this is a surrogate for time since initial diagnosis (which is relevant for enabling disclosure), if migrants test for HIV more or less often than Agincourt residents, or if frequency of HIV testing affects disclosure. Another consideration in the measurement of self-reported status, as Rohr *et al.* noted (42), is our wording choice: 'If you wouldn't mind sharing, what was the result of your most recent HIV test?' (Different wording may elicit different responses.) Lastly, migrants were less likely to be included in our final sample: they were less likely to complete in-person interviews, consent to DBS-HIV testing, and have had a prior HIV test (Appendix, Figure 2); we note that sociodemographic characteristics are similar across participants who were

included versus excluded at each stage, aside from characteristics that were a surrogate for migrant status (*i.e.,* urbanicity of settlement, employment). Our estimated PVP and NPV is likely generalisable to the young adult population of the Agincourt HDSS with the assumption that it shares a similar HIV prevalence (61).

Conclusions

Self-report of HIV status was highly predictive of true status in both migrants and permanent residents in this high-prevalence population. Persons who self-reported as living with HIV were almost always truly positive, suggesting that clinical protocol can be altered to immediately connect persons who say they are HIV-positive to ART and counselling. In addition to the individual- and population-level health benefits of timely linkage to life-saving HIV care, eliminating the requirement of verifying a self-reported positive status can save time and resources for both health facilities and communities (including circular migrant communities). Alongside these changes, interventions are urgently needed to enable PWH who have undergone testing to disclose their status.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1.

Respondents' sociodemographic characteristics (n=1918)

Characteristic	Analytic Sample (n=1918)	True Positives (n=213)	False Negatives (n=272)	True Negatives (n=1418)	False Positives (n=15)
Age (mean, standard deviation) *	27.96 (5.81)	31.93 (5.09)	30.54 (5.11)	26.84 (5.61)	30.67 (5.60)
Sex					
Female	1100 (57.4)	171 (80.3)	193 (71.0)	727 (51.3)	9 (60.0)
Male	818 (42.6)	42 (19.7)	79 (29.0)	691 (48.7)	6 (40.0)
Urbanicity of current residence					
Urban (city or town)	413 (21.5)	36 (16.9)	48 (17.6)	327 (23.1)	2 (13.3)
Rural	1505 (78.5)	177 (83.1)	224 (82.4)	1091 (76.9)	13 (86.7)
Migrant status					
Migrant	503 (26.2)	49 (23.0)	64 (23.5)	388 (27.4)	2 (13.3)
Non-migrant	1415 (73.8)	164 (77.0)	208 (76.5)	1030 (72.6)	13 (86.7)
Education (highest level completed)					
Elementary or lower	896 (46.7)	139 (65.3)	142 (52.2)	605 (42.7)	10 (66.7)
Secondary or higher	1022 (53.3)	74 (34.7)	130 (47.8)	813 (57.3)	5 (33.3)
Employment status					
Employed	747 (38.9)	84 (39.4)	121 (44.5)	535 (37.7)	7 (46.7)
Unemployed	1171 (61.1)	129 (60.6)	151 (55.5)	883 (62.3)	8 (53.3)
Individual income (South African Rand, prior month)					
R0	1158 (60.4)	125 (58.7)	154 (56.6)	871 (61.4)	8 (53.3)
R1 - R6400	568 (29.6)	81 (38.0)	89 (32.7)	392 (27.6)	6 (40.0)
> R6400	192 (10.0)	7 (3.3)	29 (10.7)	155 (10.9)	1 (6.7)

n (column %)

* Three participants' ages were reported in their interviews to be one to two years outside the 18–40 year-old recruitment age, previously recorded in the sampling frame.

Table 2.

Performance of self-reported HIV status (n=1918)

	Sensitivity	Specificity	Positive Predictive Value	Negative Predictive Value
Overall	43.9 (39.5–48.5)	99.0 (98.3–99.4)	93.4 (89.5–96.0)	83.9 (82.8–84.9)
Sex				
Female	47.0 (41.8–52.3)	98.8 (97.7–99.4)	95.0 (90.8–97.4)	79.0 (77.4–80.6)
Male	34.7 (26.3–43.9)	99.1 (98.1–99.7)	87.5 (75.3–94.2)	89.7 (88.5–90.9)
Migrant status				
Migrant	43.4 (34.1–53.0)	99.5 (98.2–99.9)	96.1 (85.8–99.0)	85.8 (83.8–87.7)
Non-migrant	44.1 (39.0–49.3)	98.8 (97.9–99.3)	92.7 (87.9–95.6)	83.2 (81.9–84.4)

% (95% confidence interval)

Table 3.

Respondents' health care use and disclosure (n=1918)

Health care use and disclosure	Analytic Sample (n=1918)	True Positives (n=213)	False Negatives (n=272)	True Negatives (n=1418)	False Positives (n=15)
Years since last HIV test					
< 1 year	1309 (68.2)	66 (31.0)	196 (72.1)	1039 (73.3)	8 (53.3)
1 year or more	607 (31.6)	147 (96.0)	76 (27.9)	377 (26.6)	7 (46.7)
Missing	2 (0.1)	0 (0.0)	0 (0.0)	2 (0.1)	0 (0.0)
Have you ever informed someone of your HIV status?					
Yes	855 (44.6)	187 (87.8)	96 (35.3)	561 (39.6)	11 (73.3)
No	1059 (55.2)	26 (12.2)	174 (64.0)	855 (60.3)	4 (26.7)
Don't know	4 (0.2)	0 (0.0)	2 (0.7)	2 (0.1)	0 (0.0)
Self-reported history of ART					
Yes	210 (10.9)	187 (87.8)	7 (2.6)	6 (0.4)	10 (66.7)
No	1701 (88.7)	25 (11.7)	265 (97.4)	1406 (99.2)	5 (33.3)
Don't know	1 (0.1)	0 (0.0)	0 (0.0)	1 (0.1)	0 (0.0)
Missing	6 (0.3)	1 (0.5)	0 (0.0)	5 (0.4)	0 (0.0)
Self-reported current ART (asked if yes, history of ART)					
Yes	201 (95.7)	183 (97.9)	7 (100.0)	1 (16.7)	10 (100.0)
No	9 (4.3)	4 (2.1)	0 (0.0)	5 (83.3)	0 (0.0)
Health care use in last year					
Any formal health care *	979 (51.0)	183 (85.9)	163 (59.9)	621 (43.8)	12 (80.0)
No formal health care	939 (49.0)	30 (14.1)	109 (40.1)	797 (56.2)	3 (20.0)

n (column %)

* Formal health care is defined as one or more visits for any reason to a government clinic, government hospital, or private clinic/hospital/provider.

ART=antiretroviral treatment

Table 4.

Simple regressions of accurate self-report on characteristics of PLWH (n=485)

	Migrants (n=113)			Non-migrants (n=372)		
Characteristic	**Unadjusted PR**	**95% CI**	**SE**	**Unadjusted PR**	**95% CI**	**SE**
Age (mean, standard deviation)	1.06	(1.06–1.10)	0.02	1.02	(1.00–1.05)	0.01
Sex						
Female	Reference			Reference		
Male	0.71	(0.41–1.24)	0.28	0.75	(0.55–1.02)	0.16
Education (highest level completed)						
Elementary or lower	Reference			Reference		
Secondary or higher	0.91	(0.59–1.40)	0.22	0.68	(0.53–0.88)	0.13
Employment status						
Unemployed	Reference			Reference		
Employed	0.95	(0.61–1.48)	0.22	0.86	(0.67–1.11)	0.13
Years since last HIV test						
< 1 year	Reference			Reference		
1 year or more	2.54	(1.55–4.19)	0.25	2.64	(2.04–3.42)	0.13
HIV status disclosure in the past	3.63	(1.58–8.34)	0.42	5.67	(3.76–8.54)	0.21
Formal health care use, last year	2.07	(1.28–3.36)	0.25	2.94	(1.83–4.72)	0.24