**Supplemental Digital Content**

**Table S1. Proportion engaged in each stage of the HIV Care Continuum among all HIV-positive individuals, North West Province, 2014.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Overall** | | **Male** | | **Female** | |
|  | **wtg %\*** | **95% CI** | **wtg %** | **95% CI** | **wtg %** | **95% CI** |
| Previously diagnosed | 65.8 | 57.9-72.9 | 48.4 | 36.5-60.5 | 75.7 | 63.1-85.1 |
| Linked to Care | 63.6 | 55.6-70.9 | 44.0 | 32.1-56.5 | 74.8 | 62.3-84.2 |
| (Ideal linkage) | 35.6 | 27.0-45.3 | 27.8 | 17.4-41.4 | 40.1 | 30.2-50.8 |
| Retained in Care | 49.2 | 42.0-56.5 | 33.1 | 21.4-47.3 | 58.4 | 49.2-67.1 |
| ART-Eligible: Retained | 63.6 | 50.5-76.6 | 33.1 | 19.9-46.2 | 70.0 | 57.1-82.5 |
| Pre-ART: Retained | 11.8 | 0.1-23.2 | 0 | - | 30.2 | 17.5-42.9 |
| On ART | 52.0 | 44.1-59.7 | 35.3 | 23.8-48.8 | 61.5 | 50.3-71.6 |
| Reported Adherent | 46.1 | 37.9-54.5 | 33.1 | 21.8-46.8 | 53.5 | 42.6-64.1 |
| Viral Suppression |  |  |  |  |  |  |
| < 1000 copies/mL | 16.8 | 9.3-24.3 | 7.8 | 0.0-15.5 | 21.9 | 11.9-31.8 |
| < 3000 copies/mL | 31.2 | 22.3-40.1 | 12.9 | 2.1-23.7 | 41.7 | 31.3-52.1 |
| < 5000 copies/mL | 39.7 | 30.0-49.5 | 21.6 | 7.6-35.7 | 50.0 | 39.4-60.7 |

**Table S2. Proportion engaged in each stage of the HIV Care Continuum conditional on achieving previous step, among those previously diagnosed as HIV-positive, linked to care, retained, and on ART, North West Province, 2014.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Overall** | | **Male** | | **Female** | |
|  | **wtg %\*** | **95% CI** | **wtg %** | **95% CI** | **wtg %** | **95% CI** |
| Linked to Care§ | 96.6 | 93.2-98.4 | 90.8 | 80.3-96.0 | 98.8 | 96.0-99.6 |
| (Ideal linkage) | 54.1 | 41.1-66.6 | 57.5 | 37.1-75.6 | 52.9 | 38.3-67.0 |
| Retained in Care*¥* | 77.4 | 68.6-84.3 | 75.2 | 52.0-89.5 | 78.1 | 68.1-85.7 |
| ART-Eligible: Retained | 81.7 | 72.1-88.5 | 85.7 | 68.9-94.2 | 80.4 | 68.6-88.5 |
| Pre-ART: Retained | 56.0 | 28.4-80.3 | 0.0 | - | 68.0 | 35.9-88.9 |
| On ART β | 93.7 | 86.5-97.2 | 99.0 | 94.2-99.9 | 92.0 | 82.5-96.5 |
| Reported Adherent **δ** | 93.1 | 85.0-97.0 | 97.2 | 80.7-99.7 | 91.6 | 80.3-96.7 |
| Viral Suppression**δ** |  |  |  |  |  |  |
| < 1000 copies/mL | 25.7 | 12.5-39.0 | 16.0 | 0.0-34.8 | 29.1 | 13.7-44.5 |
| < 3000 copies/mL | 40.1 | 24.4-55.6 | 18.6 | 0.0-39.3 | 47.5 | 30.3-64.8 |
| < 5000 copies/mL | 51.8 | 34.9-68.6 | 28.8 | 4.7-52.9 | 59.7 | 43.3-76.1 |

*\*Weights account for sampling, non-response, and age/gender of target population;* § *among those who reported previously diagnosis; ¥ among those linked to care;* β*among those retained in care;* **δ***among those currently on ART; includes imputed data*

**Description of HIV-prevalence multiple imputation procedure**

We multiply imputed HIV status for 268 respondents (representing 26.4% of the weighted sample) who did not undergo rapid HIV testing or report having been previously diagnosed as HIV-positive. Imputation was based on the following characteristics: gender, age group, educational attainment, household food security and lifetime number of sex partners. We assumed a missing at random structure conditional on these characteristics. We generated 50 imputed datasets for the analysis using the *mi estimate* procedure in Stata [[1](#_ENREF_1)]. The imputation procedure did not have a large impact on prevalence estimates.

**Description of ART eligibility phase multiple imputation procedure**

We multiply imputed binary ART eligibility or phase for 75 HIV-positive respondents (representing 38.3% of the weighted sample of HIV-positive individuals) with inadequate information to classify as pre-ART or ART-eligible. Imputation was based on the following characteristics: gender, age group, time since diagnosis, currently on ART, adherence to ART, and PIMA CD4 count. We assumed a missing at random structure conditional on these characteristics. We generated 50 imputed datasets for the analysis using the *mi estimate* procedure in Stata [[1](#_ENREF_1)]. The imputation procedures did not have a large impact on the proportion of participants classified as pre-ART and ART as compared to the collected (complete) data.

**Description of viral load data capture and multiple imputation procedure**

A total of 209 DBS samples were taken from our final analytic sample of 1,044 individuals. Samples were from 174 individuals who had tested or self-reported as HIV positive, 34 individuals who were HIV negative (status had not yet been determined), and 1 individual with indeterminate HIV status. Among the 218 individuals that were tested or self-reported as HIV positive, DBS results were available for 79.8% of the sample (representing 82.9% of the weighted HIV positive sample).

There were 44 HIV-positive individuals for whom we did not obtain a DBS; 36 who previously knew their HIV status and 8 who were newly diagnosed HIV positive. Lack of consent was the primary reason for no DBS (33 prior known positives and 5 newly diagnosed positives did not consent to provide DBS). Among those individuals who provided consent for DBS but did not have results (n=6): one lacked sufficient sample (n=1), the survey team forgot to collect DBS for one participant (n=1), the participant was not available when the team returned for DBS collection at a pre-arranged time (n=1), and the field team failed to indicate the reason for lack of DBS for two participants (n=2).

We multiply imputed binary viral load suppression at three thresholds (viral load < 1000 copies/mL, viral load < 3000 copies/mL, and viral load < 5000 copies/mL) using the following characteristics: gender, age group, time since HIV diagnosis, ART status (currently on ART) and adherence to ART, assuming a missing at random structure conditional on these characteristics. We generated 50 imputed datasets for each viral load threshold variable using the *mi estimate* procedure in Stata [[1](#_ENREF_1)]. Table S3 presents the viral suppression estimates by gender across three estimation approaches: 1) using complete (all collected, primary) data, 2) using complete data with the assumption that those not on ART are also not suppressed at each of the different thresholds, and 3) using our multiply imputed data. The imputation procedures did not have a large impact on estimates of viral load suppression; complete data and imputed data are quite similar, providing additional evidence of robust estimates.

Table S3. Variation in Viral Load Suppression by Estimation Procedure, Suppression Cut-Point, Gender and ART Status, North West Province, South Africa, 2014

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Male | | | Female | | |
| Viral Load Suppression | Complete Data  % (95% CI) | Those not on ART assumed not suppressed\*  % (95% CI) | Imputed data  % (95% CI) | Complete Data  % (95% CI) | Those not on ART assumed not suppressed\*  % (95% CI) | Imputed data  % (95% CI) |
| *HIV-positive Participants* |  |  |  |  |  |  |
| VL<1000 | 7.3 (2.6-18.7) | 7.0 (2.6-17.5) | 7.8 (0.0-15.5) | 20.9 (12.5-32.9) | 19.1 (11.3-30.4) | 21.9 (11.9-31.8) |
| VL<3000 | 11.8 (4.7-26.5) | 11.3 (4.6-25.2) | 12.9 (2.1-23.7) | 40.8 (31.3-51.0) | 37.2 (28.1-47.3) | 41.7 (31.3-52.1) |
| VL<5000 | 20.5 (9.8-38.0) | 19.7 (9.5-36.3) | 21.6 (7.6-35.7) | 50.1 (39.9-60.3) | 45.7 (36.1-55.7) | 50.0 (39.4-60.7) |
| *On ART§* |  |  |  |  |  |  |
| VL<1000 | 17.1 (5.6-42.0) |  | 17.1 (0.0-35.0) | 30.2 (17.6-46.7) |  | 31.6 (17.1-46.0) |
| VL<3000 | 17.1 (5.6-42.0) |  | 19.5 (0.0-39.2) | 49.1 (33.1-65.3) |  | 49.7 (33.6-65.8) |
| VL<5000 | 30.4 (12.6-56.9) |  | 32.5 (8.4-56.6) | 63.5 (46.9-77.3) |  | 62.4 (47.0-77.8) |

*\*Assuming those without VL data are not suppressed if not on ART; Weights account for sampling, non-response, and age/gender of target population. § On ART inclusive of all participants reporting ART initiation and current ART use, not restricted to those classified as retained.*

**References**

*1. Graham, J.W., Missing data analysis: making it work in the real world. Annu Rev Psychol, 2009.* ***60****: p. 549-76.*