Table 1: Acquisition rates, and univariable and multivariable Cox regression model results for time to partnership acquisition (N=587).

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **Events**1,2  N=161 | **Person-years at risk** | **Rate per 100 person-years) (95% CI)** | **Unadj. HR**3 | **CI** | **Adjusted HR**4 | **CI** | **Wald p-value** |
| ART group: Pre-ART | 62 | 597.51 | 10.38 (7.96, 13.30) | 1.00 |  | 1.00 |  |  |
| ART-eligible | 99 | 947.15 | 10.45 (8.50, 12.73) | 1.07 | (0.76, 1.49) | 0.97 | (0.70, 1.35) | 0.87 |
| Sex: Female | 120 | 1138.67 | 10.54 (8.74, 12.60) | 1.00 |  | 1.00 |  |  |
| Male | 41 | 405.98 | 10.10 (7.25, 13.70) | 0.96 | (0.64, 1.42) | 0.62 | (0.41, 0.94) | 0.025 |
| Age (years) :  18-21 | 18 | 64.15 | 28.06 (16.63, 44.35) | 1.89 | (1.18, 3.02) | 1.96 | (1.25, 3.06) | <0.001 |
| 22-29 | 61 | 387.46 | 15.74 (12.04, 20.22) | 1.00 | - | 1.00 |  |  |
| 30-39 | 60 | 573.60 | 10.46 (7.98, 13.46) | 0.73 | (0.51, 1.04) | 0.71 | (0.50, 1.01) |  |
| 40+ | 22 | 519.45 | 4.24 (2.65, 6.41) | 0.28 | (0.16, 0.50) | 0.21 | (0.12, 0.36) |  |
| Partner status at enrolment:  Ongoing partner5 | 100 | 1156.55 | 8.65 (7.04, 10.52) | 1.00 |  | 1.00 |  |  |
| No partner | 61 | 388.11 | 15.72 (12.02, 20.19) | 1.81 | (1.29, 2.52) | 2.50 | (1.84, 3.40) | <0.001 |
| Has previously disclosed HIV status to anyone : No | 25 | 185.13 | 13.50 (8.74, 19.93) | 1.00 |  | 1.00 |  |  |
| Yes | 136 | 1359.53 | 10.00 (8.39, 11.83) | 0.74 | (0.45, 1.20) | 0.58 | (0.37, 0.89) | 0.014 |
| Ever used alcohol  No | 63 | 820.91 | 7.67 (5.90, 9.82) |  |  |  |  |  |
| Yes | 98 | 723.74 | 13.54 (10.99, 16.50) | 1.76 | (1.27, 2.45) | 1.70 | (1.18, 2.44) | 0.004 |
| No. of lifetime partners6: ≤3 | 75 | 907.40 | 8.27 (6.50, 10.36) | 1 | - | 1.0 |  |  |
| >3 | 81 | 600.64 | 13.49 (10.71, 16.76) | 1.63 | (1.18, 2.26) | 1.81 | (1.27, 2.58) | 0.001 |

1 In a few instances, participants reported getting back together during follow-up with the person they had reported as their most recent but not ongoing partnership at enrolment. A few other participants reported a new partner but they never became sexually active with them. These were not considered new acquisitions in the analysis.

2 24 partnerships were concurrent i.e. reported to have started while the participant was in at least one other ongoing partnership.

3 No other variables were significant in univariable models.

4 The final model did not violate the proportional hazards assumption, global test p= 0.09. Fitting a model with Gaussian individual frailties, the estimated variance was not found significantly different from zero (p-value=0.92) suggesting very little variation between individuals.

5 There were two groups of participants with ongoing partners at baseline, those who were recently sexually active and those who were abstaining from sex with their partners for various reasons. The number of new acquisitions, acquisitions rate and 95% CIs for these two groups were: 90/1054.3=8.54 (6.86, 10.5) and 10/102.25=9.78 (4.69, 17.99) respectively and were not statistically different from each other.

6 Missing values for 15 participants.

Table 2: Dissolution rates, and univariable and multivariable Cox regression model results for time to partnership dissolution (N=565 partnerships, 466 participants).

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **Events**1 | **Partnerships-years at risk** | **Rate per 100 partnership-years) (95% CI)** | **Unadj. HR2** | **CI** | **Adjust.**  **HR3** | **CI** | **Wald p-value** |
| ART group: Pre-ART | 76 | 416.88 | 18.23 (14.36, 22.82) | 1.00 |  | 1.00 |  |  |
| ART-eligible | 116 | 642.20 | 18.06 (14.93, 21.66) | 1.01 | (0.75, 1.34) | 0.97 | (0.73, 1.29) | 0.840 |
| Sex: Female | 134 | 736.00 | 18.21 (15.25, 21.56) | 1.00 |  | 1.00 |  |  |
| Male | 58 | 323.08 | 17.95 (13.63, 23.21) | 0.99 | (0.73, 1.37) | 1.07 | (0.73, 1.56) | 0.745 |
| Age (years) :  18-21 | 12 | 42.487 | 28.25 (14.60, 49.34) | 1.05 | (0.61, 1.81) | 0.86 | (0.46, 1.61) | 0.640 |
| 22-29 | 73 | 284.79 | 25.63 (20.09, 32.23) | 1.00 | - | 1.00 |  |  |
| 30-39 | 69 | 425.82 | 16.20 (12.61,20.51) | 0.65 | (0.47, 0.90) | 0.82 | (0.59, 1.14) |  |
| 40+ | 38 | 305.99 | 12.42 (8.79, 17.05) | 0.51 | (0.34, 0.75) | 0.77 | (0.49, 1.23) |  |
| Ever use alcohol (vs No) | 78 | 535.60 | 14.56 (11.51, 18.18) | 1.00 |  | 1.00 |  |  |
| Yes | 114 | 523.48 | 21.78 (17.96, 26.16) | 1.46 | (1.10, 1.94) | 1.38 | (1.02, 1.88) | 0.040 |
| Partner lives:  With participant | 53 | 524.09 | 10.11 (7.58, 13.23) | 1.0 |  | 1.0 |  |  |
| Not with participant | 139 | 530.77 | 26.19 (22.02, 30.92) | 2.48 | (1.81, 3.40) | 1.84 | (1.26, 2.68) | 0.001 |
| Partnership duration4:  Less than 1 year | 88 | 284.64 | 30.92 (24.80, 38.09) | 1.00 |  | 1.00 |  |  |
| 1-5 years | 58 | 297.39 | 19.50 (14.81, 25.21) | 0.67 | (0.48, 0.95) | 0.77 | (0.54, 1.11) | 0.001 |
| More than 5 years | 46 | 477.05 | 9.64 (7.06, 12.86) | 0.34 | (0.24, 0.49) | 0.47 | (0.31, 0.71) |  |
| Relationship quality5:  Lowest quartile | 71 | 275.37 | 25.78 (20.14, 32.52) | 1.00 |  | 1.00 |  |  |
| 2nd quartile | 68 | 425.35 | 15.99 (12.41, 20.27) | 0.63 | (0.45, 0.88) | 0.70 | (0.50, 0.99) |  |
| 3rd quartile | 39 | 281.46 | 13.86 (9.85, 18.94) | 0.54 | (0.37, 0.80) | 0.67 | (0.44, 1.02) |  |
| 4th quartile | 8 | 65.85 | 12.15 (5.24, 23.94) | 0.47 | (0.22, 0.98) | 0.46 | (0.22, 0.96) | 0.061 |

1 Seventy-four participants had more than one relationship at risk of dissolution during the study: 62 with 2 partnerships, 9 with 3 partnerships, two with 4 and one with 5 partnerships. Of the 192 partnerships that dissolved, 133 were ongoing at enrolment among 129 participants, and 59 were new partnerships among 51 participants.

2 Other variables measured at first report of partnership that were significant in univariable models: Having tested HIV positive less than 1 year before enrolment, higher perceived stigma, little reliance on family and friends, and reporting that a condom was used at first sex within the partnership were all associated with a greater hazard of dissolution. Knowing someone on ARVs, complete knowledge about ARVs, knowing their partner’s HIV status, and having disclosed their own HIV status to their partner was associated with a lower hazard of dissolution. Partnerships that started post-enrolment had a significantly higher hazard of dissolution.

3 The final model did not violate the proportional hazards assumption, global test p= 0.48. The estimated variance of individual frailties was not found significantly different from zero (p-value=0.91) suggesting no significant variation between participants.

4 Relationship duration represents how long the partnership had been ongoing at the time of first report of the partnership in the study, and is not time-varying.

5 The highest quartile represents the 25% of partnerships with the greatest reported social support from their partner, a proxy for higher relationship quality.

Table 3: Univariable and multivariable logistic regression models of the odds of sexual activity in the last month among partnerships that were ongoing in the month before interview (N=640 partnerships, 515 participants, 2363 observations1)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **N (% reporting outcome)** | **Unadj OR2** | **95% CI** | **Adjust. OR3** | **95% CI** | **Wald p-value** |
| ART group: Pre-ART | 956 (82) | 1.00 |  | 1.00 |  |  |
| ART-eligible | 1407 (80) | 0.80 | (0.58, 1.09) | 0.51 | (0.31, 0.81) | 0.005 |
| Time (months): first report of partnership | 613 (76) | 1.00 |  | 1.00 |  |  |
| ≥6 months after first report | 1750 (85) | 3.13 | (2.47, 3.97) | 1.35 | (0.88, 2.07) | 0.17 |
| Interaction: ART group \* Time4 | - | - | - | 1.79 | (1.05, 3.05) | 0.031 |
| Sex : Female | 1646 (80) | 1.00 |  | 1.00 |  |  |
| Male | 717 (83) | 1.23 | (0.89, 1.71) | 0.70 | (0.47, 1.03) | 0.071 |
| Age (years) :  18-21 | 98 (67) | 0.51 | (0.26, 1.02) | 0.52 | (0.25, 1.10) | 0.094 |
| 22-29 | 651 (77) | 1.00 | - | 1.00 |  |  |
| 30-39 | 972 (82) | 1.43 | (1.00, 2.04) | 1.28 | (0.86, 1.89) |  |
| 40+ | 642 (83) | 1.38 | (0.93, 2.04) | 1.33 | (0.84, 2.11) |  |
| Condom used at last sex:  Yes | 1923 (84) | 1.00 |  | 1.00 |  | <0.001 |
| No, but has used condoms with partner | 209 (75) | 0.49 | (0.33, 0.73) | 0.57 | (0.37, 0.88) |  |
| No, never used condoms with partner | 231 (56) | 0.15 | (0.11, 0.21) | 0.23 | (0.15, 0.34) |  |
| Partner had sex with others in last 6 months:  No | 1329 (86) | 1.00 |  | 1.00 |  | <0.001 |
| Yes / I think so | 1034 (74) | 0.42 | (0.33, 0.53) | 0.57 | (0.43, 0.75) |  |
| Partner lives:  With participant | 1269 (87) | 1.00 |  | 1.00 |  | <0.001 |
| Not with participant | 1094 (73) | 0.35 | (0.27, 0.46) | 0.39 | (0.28, 0.54) |  |
| Recently argued:  No | 1864 (80) | 1.00 |  | 1.00 |  | 0.009 |
| Yes | 499 (82) | 1.13 | (0.84, 1.51) | 1.56 | (1.12, 2.17) |  |
| Want more children:  No | 1603 (80) | 1.00 |  | 1.00 |  | 0.001 |
| Yes | 760 (82) | 1.34 | (1.02, 1.77) | 1.67 | (1.23, 2.27) |  |
| Know partner’s HIV status: No | 824 (72) | 1.00 |  | 1.00 |  | 0.077 |
| Yes | 1539 (85) | 2.52 | (1.94, 3.28) | 1.33 | (0.97, 1.81) |  |
| Partnership type:  Ongoing at enrolment | 1950 (81) | 1.00 |  | 1.00 |  | 0.001 |
| New | 413 (82) | 1.63 | (1.14, 2.35) | 1.98 | (1.33, 2.96) |  |

175 partnerships contributing to this analysis were ongoing at first report but had no further follow-up of the participant or no further report of that partnership and therefore could not contribute to the time to dissolution analysis (Table 2).

2In univariable analysis, higher odds of having sex in last month was also associated with being employed, having self-initiated testing for a reason other than being sick, having disclosed HIV status to partner and higher relationship quality. In contrast, spending little or no time with friends, and the involvement of alcohol in last sex were associated with lower odds of having sex in the last month.

3Also adjusted for clinic where recruitment for the study occurred. Estimated random effects variance =1.061 (24% of total variance).

4 The estimated odds ratio of sexual activity for the ART-eligible group after 1st report compared to the pre-ART group after 1st report is aOR 0.91 (0.61, 1.34); calculated by exponentiating the sum of the ART group main effect and interaction effect coefficients.

Table 4: Logistic regression models of the odds of unprotected sex in the last month among partnerships that reported sexual activity in the month before interview (N=551 partnerships, 457 participants, 1902 observations)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **N (% reporting outcome)** | **Unadj. OR1** | **(95% CI)** | **Adjust. OR2** | **95% CI** | **p-value** |
| ART group: Pre-ART | 782 (21) | 1.00 |  | 1.00 |  |  |
| ART-eligible | 1120 (11) | 0.35 | (0.23, 0.53) | 1.10 | (0.57, 2.12) | 0.77 |
| Time (months): first report of partnership | 408 (23) | 1.00 |  | 1.00 |  |  |
| ≥6 months after first report | 1494 (13) | 0.44 | (0.32, 0.62) | 1.11 | (0.67, 1.85) | 0.69 |
| Interaction: ART group \* Time4 |  |  |  | 0.23 | (0.11, 0.47) | <0.001 |
| Sex : Female | 1315 (17) | 1.00 |  | 1.00 |  |  |
| Male | 587 (11) | 0.50 | (0.30, 0.83) | 0.82 | (0.47, 1.41) | 0.47 |
| Age (years) :  18-21 | 66 (29) | 2.63 | (0.91, 7.57) | 2.38 | (0.82, 6.93) | 0.09 |
| 22-29 | 505 (17) | 1.00 | - | 1.00 |  |  |
| 30-39 | 799 (16) | 0.98 | (0.59, 1.66) | 0.95 | (0.55, 1.65) |  |
| 40+ | 532 (11) | 0.66 | (0.37, 1.21) | 0.59 | (0.31, 1.13) |  |
| Alcohol involved in last sex**3**: No | 1798 (14) | 1.00 |  | 1.00 |  | <0.001 |
| Yes | 104 (34) | 4.32 | (2.46, 7.60) | 3.29 | (1.79, 6.05) |  |
| Gender norms5:  Lowest quartile | 661 (18) | 1.00 |  | 1.00 |  | <0.001 |
| 2nd quartile | 449 (20) | 1.23 | (0.84, 1.80) | 1.17 | (0.78, 1.75) |  |
| 3rd quartile | 395 (10) | 0.42 | (0.26, 0.68) | 0.44 | (0.27, 0.72) |  |
| 4th quartile | 397 (9) | 0.36 | (0.21, 0.63) | 0.38 | (0.22, 0.66) |  |
| Disclosed HIV status to partner: No | 250 (27) | 1.00 |  | 1.00 |  | 0.001 |
| Yes | 1652 (13) | 0.32 | (0.20, 0.50) | 0.43 | (0.25, 0.72) |  |
| Partner lives:  With participant | 1105 (16) | 1.00 |  | 1.00 |  | 0.009 |
| Not with participant | 797 (14) | 0.77 | (0.52, 1.14) | 0.56 | (0.37, 0.87) |  |
| Partner insists to have sex when participant doesn’t want to: No | 1472 (13) | 1.00 |  | 1.00 |  | 0.071 |
| Yes | 430 (21) | 1.63 | (1.12, 2.37) | 1.44 | (0.97, 2.13) |  |
| Want more children:  No | 1281 (13) | 1.00 |  | 1.00 |  | 0.001 |
| Yes | 621 (20) | 1.98 | (1.38, 2.84) | 1.92 | (1.31, 2.82) |  |
| Partner performed physical act of violence to participant:  No | 1806 (15) | 1.00 |  | 1.00 |  | 0.063 |
| Yes | 96 (24) | 2.69 | (1.42, 5.08) | 1.94 | (0.96, 3.91) |  |

1In univariable analysis, higher odds of unprotected sex in the last month was also associated with higher levels of perceived stigma and spending little or no time with friends. In contrast, being a male participant, having disclosed HIV status to at least one person and knowing partner’s HIV status were associated with lower odds of unprotected sex.

2 Estimated random effects variance =2.014 (38% of total variance).

3 This partnership-level variable was time-varying and varied in who within the partnership had taken alcohol (male or female partner or both) but numbers were too small to explore according to who had taken it separately. On average, 75% of the reports of alcohol at last sex across visits were that the partner had taken alcohol.

4 The estimated odds ratio of unprotected sex in the last month for the ART-eligible group after 1st report compared to the pre-ART group after 1st report is aOR 0.26 (0.15, 0.43); calculated by exponentiating the sum of the ART group main effect and interaction effect coefficients.

5 The highest quartile represents the 25% of the cohort with the most equitable gender norms.

Table 5: Univariable and multivariable negative binomial models of the number of sex acts in the last month among partnerships that were ongoing in the month before interview (N=640 partnerships, 515 participants, 2370 observations)1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable** | **Unadj. IRR2** | **(95% CI)** | **Adjust.IRR3** | **95% CI** | **p-value** |
| ART group: Pre-ART | 1.00 |  | 1.00 |  |  |
| ART-eligible | 0.93 | (0.83, 1.03) | 0.77 | (0.65, 0.91) | 0.002 |
| Time (months): first report of partnership | 1.00 |  | 1.00 |  |  |
| ≥6 months after first report | 1.54 | (1.41, 1.68) | 1.22 | (1.07, 1.38) | 0.002 |
| Interaction: ART group \* Time4 |  |  | 1.26 | (1.07, 1.50) | 0.007 |
| Sex : Female | 1.00 |  | 1.00 |  |  |
| Male | 1.14 | (1.02, 1.27) | 1.02 | (0.92, 1.14) | 0.71 |
| Age (years) :  18-21 | 0.85 | (0.66, 1.11) | 0.89 | (0.78, 1.13) | 0.220 |
| 22-29 | 1.00 | - | 1.00 |  |  |
| 30-39 | 1.09 | (0.96, 1.23) | 1.00 | (0.89, 1.12) |  |
| 40+ | 1.02 | (0.89, 1.17) | 0.89 | (0.78, 1.01) |  |
| Gender norms5:  Lowest quartile | 1.00 |  | 1.00 |  | <0.001 |
| 2nd quartile | 0.78 | (0.71, 0.85) | 0.85 | (0.78, 0.93) |  |
| 3rd quartile | 0.72 | (0.65, 0.80) | 0.76 | (0.69, 0.84) |  |
| 4th quartile | 0.74 | (0.67, 0.82) | 0.80 | (0.72, 0.90) |  |
| Frequency of condom use with this partner in last 6m:  Always | 1.00 |  | 1.00 |  | <0.001 |
| Never / sometimes | 0.74 | (0.69, 0.80) | 0.86 | (0.79, 0.93) |  |
| Partner insists to have sex when participant doesn’t want to:  No | 1.00 |  | 1.00 |  | 0.044 |
| Yes | 0.86 | (0.78, 0.94) | 0.91 | (0.83, 1.00) |  |
| Partner had sex with others in last 6 months:  No | 1.00 |  | 1.00 |  | <0.001 |
| Yes / I think so | 0.75 | (0.70, 0.81) | 0.86 | (0.80, 0.93) |  |
| Where partner resides:  With participant | 1.00 |  | 1.00 |  | <0.001 |
| Not with participant | 0.72 | (0.66,0.78) | 0.75 | (0.68, 0.82) |  |
| Want more children:  No | 1.00 |  | 1.00 |  | 0.003 |
| Yes | 1.11 | (1.02, 1.20) | 1.13 | (1.04, 1.23) |  |
| Partnership type:  Ongoing at enrolment | 1.00 |  | 1.00 |  | <0.001 |
| New | 1.18 | (1.05, 1.32) | 1.24 | (1.11, 1.39) |  |

1The number of observations for each variable is reported in table 3 as the same partnership observations contribute to both analyses.

2Variables found significant in univariable analysis only: higher incidence rate ratio (IRR) associated with being male, knowing anyone on ARVs before enrolment, higher levels of perceived stigma, complete ARV knowledge, spending little or no time with family, knowledge of partner’s HIV status, having disclosed HIV status to partner, >3 lifetime partners and higher relationship quality scores. Lower IRR was associated with greater reliance on family/friends when having a serious problem and the participant had ever performed a physical act of violence to their partner.

3 Also adjusted for clinic where recruitment for the study occurred. Estimated random effects variance =0.098.

4 The estimated incidence rate ratio of the number of sex acts in the last month for the ART-eligible group after 1st report compared to the pre-ART group after 1st report is aIRR 0.97, 95% CI (0.88, 1.08); calculated by exponentiating the sum of the ART group main effect and interaction effect coefficients.

5 The highest quartile represents the 25% of the cohort with the most equitable gender norms.