# **Results**

The study examined the incidence of HIV viral rebound in 932 fisherfolk aged 15 years or older who were receiving antiretroviral therapy and had viral suppression of less than 1000 copies/ml as of January 2019. The sociodemographic, clinical, and health system factors associated with viral rebound were investigated.

## **Socio-demographic characteristics of study participants**

More than half of the participants were females, 572 (61.4%) and aged between 25 and 44 years, 485 (52%). The majority of participants were living in rural areas 655 (70.3%) and reported to be married 527 (56.5%), (Table 1).

**Table 1. Distributions of characteristics of study participants**

| Characteristics | Number of participants (n=932) | (%) |
| --- | --- | --- |
| **Sex** |  |  |
| Female | 572 | 61.4 |
| Male | 360 | 38.6 |
| **Residence** |  |  |
| Rural | 655 | 70.3 |
| Urban | 277 | 29.7 |
| **Age groups (years)** |  |  |
| 15-24 | 29 | 3.1 |
| 25-44 | 485 | 52.0 |
| 45-64 | 387 | 41.5 |
| 65+ | 31 | 3.4 |
| **Marital status** |  |  |
| Married | 527 | 56.5 |
| Single | 165 | 17.7 |
| Widowed | 78 | 8.4 |
| Divorced/separated | 103 | 11.1 |
| No status recorded | 59 | 6.3 |
| **Client Category** |  |  |
| Stable clients | 752 | 80.7 |
| Unstable clients | 180 | 19.3 |
| **ART Adherence** |  |  |
| Good | 918 | 98.5 |
| Poor | 14 | 1.5 |
| **ART Regimen** |  |  |
| DTG-based regimen | 379 | 40.7 |
| Non-DTG-based regimen | 553 | 59.3 |
| **Low-level viremia at baseline (cp/ml)** |  |  |
| ≤50 | 806 | 86.5 |
| 51 – 999 | 126 | 13.5 |
| **Duration on ART (years)** |  |  |
| <5 | 256 | 27.5 |
| 5-8 | 489 | 52.5 |
| >8 | 187 | 20.1 |
| **ART Dispensing** |  |  |
| ≤30 days ART dispensing | 190 | 20.4 |
| >30 days ART dispensing | 742 | 79.6 |
| **WHO Clinical stage** |  |  |
| 1 | 25 | 2.7 |
| 2 | 49 | 5.3 |
| 3 | 609 | 65.3 |
| 4 | 249 | 26.7 |
| **Distance to Health Facility** |  |  |
| 0-10 km | 769 | 82.5 |
| >10 km | 163 | 17.5 |
| **ART Refill model** |  |  |
| Community-based ART refill | 751 | 80.6 |
| Facility-based ART refill | 181 | 19.4 |
| **HIV Care appointment** |  |  |
| Scheduled clinic visit |  |  |
| Unscheduled clinic visit |  |  |

## **Incidence of HIV Viral rebound**

The overall incidence rate of viral rebound was 1.06 per 1000 person-months with 43391 total accumulated person-months of follow-up. The incidence rates were higher among males, clients aged 15–24 years, those living in rural areas, and single individuals (Table 2).

**Table 2. Distributions of incidence rates of HIV viral rebounds by socio-demographic characteristics**

| Variable | Person-time | Number of rebound | Incidence rates per 1000 person-months (95% CI) |
| --- | --- | --- | --- |
| Overall | 33786.63 | 46 | 1.36 (0.996-1.816) |
| **Sex** |  |  |  |
| Female | 20807 | 25 | 1.20 (0.78 – 1.77) |
| Male | 12980 | 21 | 1.62 (1.00-2.47) |
| **Residency** |  |  |  |
| Rural | 23751 | 34 | 1.43 (0.99 – 2.00) |
| Town | 10034 | 12 | 1.20 (0.68-2.09) |
| **Age groups (years)** |  |  |  |
| 15-24 | 1001 | 3 | 3.00 (0.618-8.76) |
| 25-44 | 15653 | 23 | 1.47 (0.931 – 2.20) |
| 45-64 | 13621 | 15 | 1.10 (0.62-1.82) |
| 65+ | 1165 | 2 | 1.72 (0.26 – 3.74) |
| **Marital status** |  |  |  |
| Married | 19223 | 27 | 1.36 (0.44 – 3.17) |
| Single | 5855 | 12 | 2.05 (1.06 – 3.58) |
| Widowed | 2924 | 2 | 0.68 (0.08 – 2.47) |
| Divorced/separated | 3680 | 5 | 1.36 (0.44 – 3.17) |
| **Client Category** |  |  |  |
| Stable clients | 27602 | 21 | 0.76(0.47-1.16) |
| Unstable clients | 6185 | 25 | 4.07(2.62-5.97) |
| **ART Adherence** |  |  |  |
| Good | 33254 | 45 | 1.35(0.99-1.81) |
| Poor | 532 | 1 | 1.88(0.05-10.5) |
| **ART Regimen** |  |  |  |
| DTG-based regimen | 13841 | 15 | 1.08(0.61-1.79) |
| Non-DTG-based regimen | 19945 | 31 | 1.55(1.06-2.21) |
| **Low-level viremia at baseline (cp/ml)** |  |  |  |
| ≤50 | 29296 | 40 | 1.37(0.98-1.86) |
| 51 – 999 | 4490 | 6 | 1.34(0.49-2.91) |
| **Duration on ART (years)** |  |  |  |
| <5 | 17758 | 23 | 1.30(0.82-1.94) |
| 5-8 | 9202 | 15 | 1.63(0.91-2.69) |
| >8 | 6827 | 8 | 1.17(0.51-2.31) |
| **ART Dispensing** |  |  |  |
| ≤30 days ART dispensing | 6631 | 22 | 3.32(2.08-5.02) |
| >30 days ART dispensing | 27156 | 24 | 0.88(0.57-1.32) |
| **WHO Clinical stage** |  |  |  |
| 1 | 912 | 0 | 0(0-4.44) |
| 2 | 1736 | 4 | 2.30(0.63-5.90) |
| 3 | 22044 | 31 | 1.41(0.96-2.00) |
| 4 | 9094 | 11 | 1.21(0.60-2.16 |
| **Distance to Health Facility** |  |  |  |
| 0-10 km | 27861 | 33 | 1.18(0.82-1.66) |
| >10 km | 5926 | 13 | 2.19(1.17-3.75) |
| **ART Refill model** |  |  |  |
| Community-based ART refill | 6871 | 2 | 0.29(0.04-1.05) |
| Facility-based ART refill | 26916 | 44 | 1.63(1.19-2.19) |
| **HIV Care appointment** |  |  |  |
| Scheduled clinic visit | 27514 | 36 | 1.31(0.92-1.81) |
| Unscheduled clinic visit | 6273 | 10 | 1.59(0.76-2.93) |

## **Factors associated with HIV Viral rebound following initial viral suppression**

In multivariable analysis, being an unstable client (aHR 4.61 (95% CI 1.95-10.90; p=0.001) and living more than 10 km from a health facility (aHR,2.59 (95% CI 1.30-5.18; p=0.007) were independently associated with HIV Viral rebound.

However, ages older than 24 years, being stable on ART, having ART dispensing of less or more than 30 days, living near health facilities, facility patient volume, ART refill models, and being on any HIV care appointments category were not significantly associated with a viral rebound (Table 3).

**Table 3. Multivariable analysis of factors associated with HIV viral rebound**

| Variable | Viral rebound, n (%) | Crude hazard ratio (95% CI) | p-value | Adjusted hazard ratio (95% CI) | p-value |
| --- | --- | --- | --- | --- | --- |
| **Age group (years)** |  |  |  |  |  |
| 15-24 | 3 (6.5) | Ref | - | Ref | - |
| 25-44 | 23 (54.4) | 0.46 (0.14-1.53) | 0.203 | 0.36(0.11-1.23) | 0.10 |
| 45-64 | 15 (34.8) | 0.38 (0.11-1.31) | **0.**126 | 0.45 (0.13-1.59) | 0.2 |
| 65+ | 2 (4.3) | 0.50 (0.08-3.01) | 0.449 | 0.46 (0.07-2.81 | 0.4 |
| Missing | 3 (6.52) |  |  |  |  |
| **Client category** |  |  |  |  |  |
| Stable | 21 (45.7) | Ref | - | Ref | - |
| Unstable | 25 (54.3) | 4.87 (2.71-8.76) | <0.001 | 5.19 (2.16-12.5) | **0.001\*** |
| **ART Dispensing** |  |  |  |  |  |
| ≤30 days ART dispensing | 22 (47.8) | Ref | - | Ref | - |
| >30 days ART dispensing | 24 (52.2) | 0.30 (0.17-0.54) | <0.001 | 0.86 (0.36-2.02) | 0.7 |
| **Distance to Health Facility** |  |  |  |  |  |
| 0-10 km | 33 (71.7) | Ref | - | Ref | - |
| >10 km | 13 (28.3) | 1.75 (0.92-3.34) | 0.088 | 2.20 (1.09-4.43) | **0.027\*** |

**Table 3. (Continued)**

| Variable | Viral rebound, n=46 (%) | Crude hazard ratio (95% CI) | p-value | Adjusted hazard ratio (95% CI) | p-value |
| --- | --- | --- | --- | --- | --- |
| **ART Refill model** |  |  |  |  |  |
| Community-based ART refill | 2 (4.4) | Ref | - | Ref | - |
| Facility-based ART refill | 44 (95.6) | 0.19(0.05-0.77) | 0.021 | 0.34 (0.08-1.48) | 0.174 |
| **HIV Care appointment** |  |  |  |  |  |
| Scheduled clinic visit | 36 (78.26) | Ref | **-** | - | - |
| Unscheduled clinic visit | 10 (21.73) | 1.13 (0.56-2.29) | 0.732 | 0.53 (0.24-1.17) | 0.12 |