Supplementary Table 1 - Factors associated with viral load suppression at one year from ART initiation, adult analysis using strict intention-to-treat method

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Total patients** | **VL < 1000 copies/mL** | **Univariate** | | | **Multivariate** | | |
|  | **N = 27878** | **N = 23140** | **OR** | **95%CI** | **p** | **OR** | **95%CI** | **p** |
| **Age at ART initiation (years)** |  |  |  |  | <0.001 |  |  |  |
| ≤24 | 2245 | 1773 | Ref |  |  | Ref |  |  |
| 25-49 | 20531 | 16974 | 1.27 | (1.14, 1.41) | <0.001 | **1.46** | **(1.30, 1.63)** | **<0.001** |
| ≥50 | 5102 | 4393 | 1.65 | (1.45, 1.88) | <0.001 | **2.01** | **(1.75, 2.30)** | **<0.001** |
| **Sex** |  |  |  |  |  |  |  |  |
| Male | 17342 | 14565 | Ref |  |  | Ref |  |  |
| Female | 10534 | 8573 | 0.83 | (0.78, 0.89) | <0.001 | 1.07 | (0.99, 1.16) | 0.075 |
| Unknown | 2 | 2 |  |  |  |  |  |  |
| **Prior AIDS** |  |  |  |  |  |  |  |  |
| No | 11779 | 9705 | Ref |  |  | Ref |  |  |
| Yes | 2159 | 1725 | 0.85 | (0.76, 0.95) | 0.006 | **0.77** | **(0.68, 0.86)** | **<0.001** |
| Unknown | 13940 | 11710 | 1.12 | (1.05, 1.20) | 0.001 | **0.72** | **(0.62, 0.84)** | **<0.001** |
| **Pre-ART CD4 count (cells/µL)** |  |  |  |  | <0.001 |  |  |  |
| <200 | 10665 | 8590 | Ref |  |  | Ref |  |  |
| 200-349 | 6640 | 5661 | 1.40 | (1.29, 1.52) | <0.001 | **1.38** | **(1.27, 1.50)** | **<0.001** |
| 350-499 | 2770 | 2393 | 1.53 | (1.36, 1.73) | <0.001 | **1.54** | **(1.36, 1.75)** | **<0.001** |
| ≥500 | 2528 | 2160 | 1.42 | (1.26, 1.60) | <0.001 | **1.48** | **(1.30, 1.68)** | **<0.001** |
| Missing | 5275 | 4336 | 1.12 | (1.02, 1.21) | 0.012 | **1.16** | **(1.06, 1.27)** | **0.001** |
| **HIV mode of exposure** |  |  |  |  | <0.001 |  |  |  |
| Homosexual/bisexual | 7004 | 6139 | 1.67 | (1.54, 1.82) | <0.001 | **1.57** | **(1.41, 1.74)** | **<0.001** |
| Heterosexual | 11168 | 9036 | Ref |  |  | Ref |  |  |
| IDU | 1337 | 1017 | 0.75 | (0.66, 0.86) | <0.001 | **0.71** | **(0.62, 0.83)** | **<0.001** |
| Other | 532 | 449 | 1.28 | (1.01, 1.62) | 0.045 | 1.13 | (0.88, 1.45) | 0.320 |
| Unknown | 7837 | 6499 | 1.15 | (1.06, 1.24) | <0.001 | **1.24** | **(1.14, 1.34)** | **<0.001** |
| **Region** |  |  |  |  | <0.001 |  |  |  |
| Asia-Pacific | 1842 | 1719 | 2.87 | (2.38, 3.47) | <0.001 | **2.80** | **(2.30, 3.41)** | **<0.001** |
| Caribbean, Central and South America | 2918 | 2546 | 1.41 | (1.25, 1.59) | <0.001 | **1.48** | **(1.30, 1.69)** | **<0.001** |
| North America | 11677 | 9685 | Ref |  |  | Ref |  |  |
| South Africa | 11441 | 9190 | 0.84 | (0.79, 0.90) | <0.001 | **0.80** | **(0.68, 0.94)** | **0.006** |

Note: Values in bold represent significant covariates in the adjusted model.

Abbreviations: OR – odds ratio, 95%CI – 95% confidence interval, IDU – injecting drug use, ART –antiretroviral therapy

Supplementary Table 2 - Factors associated with viral load suppression at one year from ART initiation, paediatric analysis using strict intention-to-treat method

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Total patients** | **VL < 1000 copies/mL** | **Univariate** | | | **Multivariate** | | |
|  | **N=2004** | **N =1491** | **OR** | **95%CI** | **p** | **OR** | **95%CI** | **p** |
| **Age at ART initiation (years)** |  |  |  |  | <0.001 |  |  | **<0.001** |
| <1.5 years | 586 | 364 | Ref |  |  | Ref |  |  |
| 1.5-4 | 446 | 355 | 2.38 | (1.79, 3.16) | <0.001 | **2.37** | **(1.77, 3.17)** | **<0.001** |
| 5-9 | 495 | 405 | 2.74 | (2.07, 3.64) | <0.001 | **2.90** | **(2.15, 3.90)** | **<0.001** |
| 10-14 | 400 | 311 | 2.13 | (1.60, 2.84) | <0.001 | **2.36** | **(1.74, 3.19)** | **<0.001** |
| 15-17 | 77 | 56 | 1.63 | (0.96, 2.76) | 0.071 | **1.82** | **(1.06, 3.13)** | **0.029** |
| **Sex** |  |  |  |  |  |  |  |  |
| Male | 987 | 731 | Ref |  |  | Ref |  |  |
| Female | 1017 | 760 | 1.04 | (0.85, 1.27) | 0.732 | 1.04 | (0.84, 1.28) | 0.730 |
| **Prior AIDS** |  |  |  |  | 0.199 |  |  | 0.613 |
| No | 127 | 111 | Ref |  |  | Ref |  |  |
| Yes | 38 | 30 | 0.54 | (0.21, 1.38) | 0.199 | 0.79 | (0.30, 2.06) | 0.634 |
| Unknown | 1839 | 1350 | 0.40 | (0.23, 0.68) | 0.001 | 0.50 | (0.29, 0.87) | 0.014 |
| **Pre-ART CD4 %** |  |  |  |  | 0.016 |  |  | **<0.001** |
| <10% | 403 | 291 | Ref |  |  | Ref |  |  |
| 10-14% | 231 | 175 | 1.20 | (0.83, 1.74) | 0.330 | 1.45 | (0.99, 2.12) | 0.059 |
| 15-24% | 420 | 356 | 2.14 | (1.52, 3.02) | <0.001 | **2.50** | **(1.76, 3.56)** | **<0.001** |
| ≥25% | 298 | 226 | 1.21 | (0.86, 1.70) | 0.280 | **1.81** | **(1.25, 2.61)** | **0.002** |
| Missing | 652 | 443 | 0.82 | (0.62, 107) | 0.144 | 1.08 | (0.81, 1.43) | 0.617 |
| **HIV mode of exposure** |  |  |  |  | 0.238 |  |  | 0.164 |
| Perinatal | 1610 | 1197 | 1.01 | (0.68, 1.50) | 0.949 | 0.93 | (0.62,1.40) | 0.726 |
| Sexual behaviour | 139 | 103 | Ref |  |  | Ref |  |  |
| Other/Unknown | 255 | 191 | 1.04 | (0.65, 1.67) | 0.861 | 1.02 | (0.63, 1.67) | 0.927 |
| **Region** |  |  |  |  | 0.031 |  |  | 0.384 |
| Asia-Pacific | 229 | 185 | Ref |  |  | Ref |  |  |
| Caribbean, Central and South America | 61 | 49 | 0.97 | (0.48, 1.98) | 0.936 | 1.02 | (0.48, 2.18) | 0.949 |
| South Africa | 1714 | 1257 | 0.65 | (0.46, 0.92) | 0.016 | 0.74 | (0.52, 1.06) | 0.102 |

Note: Values in bold represent significant covariates in the adjusted model.

Abbreviations: OR – odds ratio, 95%CI – 95% confidence interval, ART –antiretroviral therapy

Supplementary Table 3: Factors associated with viral load failure at one year from ART initiation, adult analysis using modified intention-to-treat method

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Total patients** | **VL ≥1000 copies/mL** | **Univariate** | | | **Multivariate** | | |
|  | **N = 26153** | **N = 3013** | **OR** | **95%CI** | **p** | **OR** | **95%CI** | **p** |
| **Age at ART initiation (years)** |  |  |  |  | <0.001 |  |  | **<0.001** |
| ≤24 | 2065 | 292 | Ref |  |  | Ref |  |  |
| 25-49 | 19275 | 2301 | 0.82 | (0.72, 0.94) | 0.004 | **0.70** | **(0.62, 0.81)** | **<0.001** |
| ≥50 | 4813 | 420 | 0.58 | (0.50, 0.68) | <0.001 | **0.45** | **(0.38, 0.54)** | **<0.001** |
| **Sex** |  |  |  |  |  |  |  |  |
| Male | 16323 | 1758 | Ref |  |  | Ref |  |  |
| Female | 9828 | 1255 | 1.21 | (1.12, 1.31) | <0.001 | 0.96 | (0.87, 1.05) | 0.358 |
| Unknown | 2 | 0 |  |  |  |  |  |  |
| **Prior AIDS** |  |  |  |  | 0.027 |  |  | **0.008** |
| No | 11027 | 1322 | Ref |  |  | Ref |  |  |
| Yes | 2000 | 275 | 1.17 | (1.02, 1.35) | 0.027 | **1.22** | **(1.05, 1.41)** | **0.008** |
| Unknown | 13126 | 1416 | 0.89 | (0.82, 0.96) | 0.003 | **1.21** | **(1.01, 1.44)** | **0.036** |
| **Pre-ART CD4 count (cells/µL)** |  |  |  |  | <0.001 |  |  |  |
| <200 | 10000 | 1410 | Ref |  |  | Ref |  |  |
| 200-349 | 6241 | 580 | 0.62 | (0.56, 0.69) | <0.001 | **0.63** | **(0.56, 0.69)** | **<0.001** |
| 350-499 | 2631 | 238 | 0.61 | (0.52, 0.70) | <0.001 | **0.58** | **(0.50, 0.68)** | **<0.001** |
| ≥500 | 2363 | 203 | 0.57 | (0.49, 0.67) | <0.001 | **0.52** | **(0.44, 0.62)** | **<0.001** |
| Missing | 4918 | 582 | 0.82 | (0.74, 0.91) | <0.001 | **0.77** | **(0.69, 0.86)** | **<0.001** |
| **HIV mode of exposure** |  |  |  |  | <0.001 |  |  |  |
| Homosexual/bisexual | 6676 | 537 | 0.58 | (0.52, 0.64) | <0.001 | **0.60** | **(0.53, 0.69)** | **<0.001** |
| Heterosexual | 10403 | 1367 | Ref |  |  | Ref |  |  |
| IDU | 1229 | 212 | 1.38 | (1.18, 1.61) | <0.001 | **1.44** | **(1.21, 1.71)** | **<0.001** |
| Other | 504 | 55 | 0.81 | (0.61, 1.08) | 0.148 | 0.91 | (0.68, 1.22) | 0.534 |
| Unknown | 7341 | 842 | 0.86 | (0.78, 0.94) | 0.001 | **0.81** | **(0.74, 0.89)** | **<0.001** |
| **Region** |  |  |  |  | <0.001 |  |  |  |
| Asia-Pacific | 1806 | 87 | 0.38 | (0.31, 0.48) | <0.001 | **0.36** | **(0.28, 0.45)** | **<0.001** |
| Caribbean, Central and South America | 2777 | 231 | 0.68 | (0.59, 0.79) | <0.001 | **0.59** | **(0.50, 0.69)** | **<0.001** |
| North America | 10970 | 1285 | Ref |  |  | Ref |  |  |
| South Africa | 10600 | 1410 | 1.16 | (1.07, 1.25) | <0.001 | **0.97** | **(0.80, 1.18)** | **0.767** |

Note: Values in bold represent significant covariates in the adjusted model.

Abbreviations: OR – odds ratio, 95%CI – 95% confidence interval, IDU – injecting drug use, ART –antiretroviral therapy

Supplementary Table 4: Factors associated with viral load failure at one year from ART initiation, paediatric analysis using modified intention to treat method

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Total patients** | **VL ≥1000 copies/mL** | **Univariate** | | | **Multivariate** | | |
|  | **N = 1968** | **N = 477** | **OR** | **95%CI** | **p** | **OR** | **95%CI** | **p** |
| **Age at ART initiation (years)** |  |  |  |  | <0.001 |  |  | **<0.001** |
| <1.5 years | 569 | 205 | Ref |  |  | Ref |  |  |
| 1.5-4 | 441 | 86 | 0.43 | (0.32, 0.58) | <0.001 | **0.43** | **(0.32, 0.58)** | **<0.001** |
| 5-9 | 492 | 87 | 0.38 | (0.29, 0.51) | <0.001 | **0.36** | **(0.26, 0.49)** | **<0.001** |
| 10-14 | 395 | 84 | 0.48 | (0.36, 0.64) | <0.001 | **0.43** | **(0.32, 0.59)** | **<0.001** |
| 15-17 | 71 | 15 | 0.48 | (0.26,0.86) | 0.014 | **0.43** | **(0.23, 0.78)** | **0.006** |
| **Sex** |  |  |  |  |  |  |  |  |
| Male | 977 | 246 | Ref |  |  | Ref |  |  |
| Female | 991 | 231 | 0.9 | (0.73, 1.11) | 0.333 | 0.90 | (0.73, 1.12) | 0.35 |
| **Prior AIDS** |  |  |  |  | 0.199 |  |  | 0.613 |
| No | 127 | 16 | Ref |  |  | Ref |  |  |
| Yes | 38 | 8 | 1.84 | (0.72, 4.73) | 0.199 | 1.28 | (0.49, 3.33) | 0.613 |
| Unknown | 1803 | 453 | 2.33 | (1.36, 3.97) | 0.002 | 1.88 | (1.08, 3.26) | 0.024 |
| **Pre-ART CD4 %** |  |  |  |  | 0.021 |  |  | **<0.001** |
| <10% | 396 | 105 | Ref |  |  | Ref |  |  |
| 10-14% | 228 | 53 | 0.84 | (0.57, 1.23) | 0.366 | 0.70 | (0.47, 1.04) | 0.074 |
| 15-24% | 419 | 63 | 0.49 | (0.35, 0.70) | <0.001 | **0.42** | **(0.29, 0.60)** | **<0.001** |
| ≥25% | 293 | 67 | 0.82 | (0.58, 1.17) | 0.274 | **0.55** | **(0.38, 0.80)** | **0.002** |
| Missing | 632 | 189 | 1.18 | (0.89, 1.57) | 0.242 | **0.90** | **(0.67, 1.21)** | **0.491** |
| **HIV mode of exposure** |  |  |  |  | 0.238 |  |  | 0.164 |
| Perinatal | 1592 | 395 | 1.31 | (0.84, 2.04) | 0.238 | 1.38 | (0.88,2.19) | 0.164 |
| Sexual behaviour | 129 | 26 | Ref |  |  | Ref |  |  |
| Other/Unknown | 247 | 56 | 1.16 | (0.69, 2.00) | 0.575 | 1.16 | (0.68, 1.99) | 0.591 |
| **Region** |  |  |  |  | 0.083 |  |  | 0.384 |
| Asia-Pacific | 229 | 44 | Ref |  |  | Ref |  |  |
| Caribbean, Central and South America | 60 | 11 | 0.94 | (0.45, 1.96) | 0.877 | 0.98 | (0.45, 2.12) | 0.959 |
| South Africa | 1679 | 422 | 1.41 | (1.00, 2.00) | 0.051 | 1.26 | (0.87, 1.80) | 0.217 |

Note: Values in bold represent significant covariates in the adjusted model.

Abbreviations: OR – odds ratio, 95%CI – 95% confidence interval, ART –antiretroviral therapy

Supplementary Table 5 - Patient characteristics in adults by region

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Region** | | | |
|  | **Asia-Pacific (%)** | **Caribbean, Central and South America (%)** | **North America (%)** | **South Africa (%)** |
| **Total patients = 35561** | N = 2121 (6.0) | N = 3404 (9.6) | N = 14579 (41.0) | N = 15457 (43.5) |
| **Age at ART initiation (years)** |  |  |  |  |
| ≤24 | 181 (8.5) | 409 (12.0) | 1226 (8.4) | 1159 (7.5) |
| 25-49 | 1509 (71.1) | 2623 (77.1) | 9249 (63.4) | 12906 (83.5) |
| ≥50 | 431 (20.3) | 372 (10.9) | 4104 (28.2) | 1392 (9.0) |
| **Sex** |  |  |  |  |
| Male | 1853 (87.4) | 2555 (75.1) | 12042 (82.6) | 5173 (33.5) |
| Female | 268 (12.6) | 849 (24.9) | 2537 (17.4) | 10281 (66.5) |
| Unknown | 0 (0.0) | 0 (0.0) | 0 (0.0) | 3 (0.0) |
| **Prior AIDS** |  |  |  |  |
| No | 667 (31.4) | 981 (28.8) | 388 (2.7) | 13472 (87.2) |
| Yes | 207 (9.8) | 258 (7.6) | 489 (3.4) | 1741 (11.3) |
| Unknown | 1247 (58.8) | 2165 (63.6) | 13702 (94.0) | 244 (1.6) |
| **Pre-ART CD4 count (cells/µL)** |  |  |  |  |
| <200 | 1020 (48.1) | 1405 (41.3) | 3023 (20.7) | 7698 (49.8) |
| 200-349 | 629 (29.7) | 987 (29.0) | 2675 (18.3) | 4351 (28.1) |
| 350-499 | 238 (11.2) | 377 (11.1) | 2517 (17.3) | 433 (2.8) |
| ≥500 | 63 (3.0) | 165 (4.8) | 2900 (19.9) | 245 (1.6) |
| Missing | 171 (8.1) | 470 (13.8) | 3464 (23.8) | 2730 (17.7) |
| **HIV mode of exposure** |  |  |  |  |
| Homosexual/bisexual | 1178 (55.5) | 1287 (37.8) | 6070 (41.6) | 2 (0.0) |
| Heterosexual | 799 (37.7) | 1489 (43.7) | 3473 (23.8) | 8455 (54.7) |
| IDU | 54 (2.5) | 21 (0.6) | 1564 (10.7) | 0 (0.0) |
| Other | 12 (0.6) | 319 (9.4) | 313 (2.1) | 1 (0.0) |
| Unknown | 78 (3.7) | 288 (8.5) | 3159 (21.7) | 6999 (45.3) |

Supplementary Table 6: Patient characteristics in children by region

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Region** | | |
|  | **Asia-Pacific (%)** | **Caribbean, Central and South America (%)** | **South Africa (%)** |
| **Total patients = 2601** | N = 291 (11.1) | N = 75 (2.9) | N = 2235 (85.9) |
| **Age at ART initiation (years)** |  |  |  |
| <1.5 years | 43 (14.8) | 15 (20.0) | 722 (32.2) |
| 1.5-4 | 49 (16.8) | 8 (10.7) | 510 (22.8) |
| 5-9 | 88 (30.2) | 11 (14.7) | 538 (24.1) |
| 10-14 | 97 (33.3) | 14 (18.7) | 393 (17.6) |
| 15-17 | 14 (4.8) | 27 (36.0) | 72 (3.2) |
| **Sex** |  |  |  |
| Male | 143 (49.1) | 36 (48.0) | 1120 (50.1) |
| Female | 148 (50.9) | 39 (52.0) | 1115 (49.9) |
| **Prior AIDS** |  |  |  |
| No | 164 (56.4) | 0 (0.0) | 0 (0.0) |
| Yes | 52 (17.9) | 0 (0.0) | 0 (0.0) |
| Unknown | 75 (25.6) | 75 (100.0) | 2235 (100.0) |
| **Pre-ART CD4 %** |  |  |  |
| <10% | 101 (34.7) | 5 (6.7) | 371 (16.6) |
| 10-14% | 40 (13.8) | 5 (6.7) | 254 (11.4) |
| 15-24% | 71 (24.4) | 20 (26.7) | 445 (19.9) |
| ≥25% | 25 (8.6) | 16 (21.3) | 324 (14.5) |
| Missing | 54 (18.6) | 29 (38.7) | 841 (37.6) |
| **HIV mode of exposure** |  |  |  |
| Perinatal | 267 (91.8) | 50 (66.7) | 1802 (80.6) |
| Sexual behaviour | 4 (1.4) | 11 (14.7) | 169 (7.6) |
| Other\* | 3 (1.0) | 3 (4.0) | 0 (0.0) |
| Unknown | 17 (5.8) | 11 (14.7) | 264 (11.8) |

\* Includes sexual abuse (2), blood transfusion (2) and breastfeeding (2).

**Supplementary Figure 1: Flow chart for adult strict ITT analyses**



Abbreviations: LTFU – loss to follow-up ; VL – viral load.

**Supplementary Figure 2: Flowchart for adult modified ITT analyses**



Abbreviations: LTFU – loss to follow-up ; VL – viral load.

**Supplementary Figure 3: Flow chart for paediatric strict ITT analyses**



Abbreviations: LTFU – loss to follow-up ; VL – viral load.

**Supplementary Figure 4: Flow chart for paediatric modified ITT analyses**



Abbreviations: LTFU – loss to follow-up ; VL – viral load.