**Supplementary Table 1: Summary and sources of Markov model parameters.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Model parameters** | **Values** | **Sensitivity analysis** | **Sources** |
| **Low value** | **High value** |
| Annual death rate (‰) | 7.13 | 6.21 | 8.84 | Nation Bureau of Statistics [5] |
| Newly HIV infections rate (‰) | 0.024 | 0.10 | 0.41 | Liu XJ, *et al* [6] |
| HIV mortality (%) |  |  |  |  |
| Total HIV population | 2.46 | 2.31 | 2.59 | Liu XJ, *et al* [6] |
| Viral suppression population | 0.56 | 0.32 | 1.02 | Chen Y, *et al* [7] |
| Viral suppression rate (%) |  |  |  |  |
| Rapid group | 73.5 | 68.3 | 82.1 | The present research |
| Conventional group | 61.1 | 57.9 | 66.3 | The present research |
| Viral suppression rate based second-line ART (%) | 73.7 | 69.3 | 79.5 | Li HQ, *et al* [8] |
| Health utility value |  |  |  |  |
|  Health status | 1.00 | 1.00 | 1.00 | Assumption  |
|  HIV/AIDS status | 0.73 | 0.69 | 0.77 | Fan C, et al [9] |
|  Rapid ART status | 0.83 | 0.45 | 1.00 | Honiden S, et al [10] |
| Conventional ART status | 0.83 | 0.45 | 1.00 | Honiden S, et al [10] |
| Death status | 0 | 0 | 0 | Assumption  |
| Average cost ( CNY/years) |  |  |  |  |
| HIV patients | 11810  | 9840 | 14210 | Fan C, et al [9] and Honiden S, et al [10] |
| Rapid group | 11150  | 10050 | 13180 | The present research |
| Conventional group | 12470  | 11460 | 13700 | The present research |

ART: Antiretroviral therapy; CHSY: China Health Statistical Yearbook 2019.

**Supplementary Table 2: Baseline characteristics of HIV patients with rapid ART strategies or conventional ART strategies before PSM.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Characteristics** | **Rapid group (*n =*123)** | **Conventional group (*n =*334)** | **Total (*n =*457)** | **Statistical values** | ***P***-**value** |
| age at registration (years) | 38 (30–53) | 35 (30–49) | 36 (30–50) | -1.178§ | 0.239 |
| Age group (years) |  |  |  | 1.417† | 0.492 |
| 18–29 | 26 (21.1) | 80 (24.0) | 106 (23.2) |  |  |
| 30–50 | 61 (49.6) | 174 (52.0) | 235 (51.4) |  |  |
| >50 | 36 (29.3) | 80 (24.0) | 116 (25.4) |  |  |
| Gender (Male ) | 113 (91.9) | 304 (91.0) | 417 (91.2) | 0.082† | 0.775 |
| BMI (kg/m2)  | 21.73 ± 3.04 | 22.48 ± 3.55 | 22.27 ± 3.43 | 2.081\* | 0.038 |
| CD4+ count (cells/μL) | 204.00 ± 178.31 | 268.50 ± 184.27 | 272.42 ± 184.63 | 3.272\* | 0.001 |
| CD4+ count group  |  |  |  | 14.959† | 0.001 |
| ≤200 (cells/μL) | 60 (48.8) | 101 (30.2) | 161 (35.2) |  |  |
| 201–350 (cells/μL) | 39 (31.7) | 123 (36.8) | 162 (35.4) |  |  |
| >350(cells/μL) | 24 (19.5) | 110 (32.9) | 134 (29.3) |  |  |
| Comorbidity | 16 (13.0) | 6 (1.8) | 22 (4.8) | 24.660† | < 0.001 |
| Initial ART regimens |  |  |  | 0.283† | 0.595 |
| TDF + 3TC + EFV (TLE) | 94 (76.4) | 263 (78.8) | 357 (78.1) |  |  |
| Others | 29 (23.6) | 71 (21.2) | 100 (21.9) |  |  |

Data are presented as n (%), median (interquartile range) or mean ± standard deviation. §Z values. †*χ*2 values. \*t values. ART: Antiretroviral therapy; BMI: Body mass index; CD: cluster of differentiation; HIV: human immunodeficiency virus; TLE: Tenofovir (TDF), plus Lamivudine (3TC), and Efavirenz (EFV).

**Supplementary Table 3: Baseline and clinical outcomes characteristics of HIV patients with rapid ART strategies or conventional ART strategies** **after PSM.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Characteristics** | **Rapid group (*n =*113)** | **Conventional group (*n =*113)** | **Total (*n =*226)** | **Statistical values** | ***P***-**value** |
| Age at registration (years) | 38 (30–53.5) | 35 (30–48.5) | 37 (30–51) | -0.613§ | 0.540 |
| Age group |  |  |  | 1.654† | 0.437 |
| 18–29 years | 32 (28.3) | 30 (26.5) | 62 (27.4) |  |  |
| 30–50 years | 47 (41.6) | 56 (49.6) | 103 (45.6) |  |  |
| >50 years | 34 (30.1) | 27 (23.9) | 61 (27.0) |  |  |
| Gender (Male) | 104 (92.0) | 107 (94.7) | 211 (93.4) | 0.643† | 0.423 |
| BMI (kg/m2) | 21.81 ± 3.13 | 22.01 ± 2.91 | 21.91 ± 3.02 | -0.491 | 0.624 |
| CD4+ count (cells/μL)  | 238.95 ± 177.64 | 275.38 ± 187.56 | 257.16 ± 183.17 | -1.499\* | 0.135 |
| CD4+ count group |  |  |  | 3.619† | 0.164 |
| ≤200 (cells/μL) | 52 (46.0) | 38 (33.6) | 90 (39.8) |  |  |
| 201–350 (cells/μL) | 52 (46.0) | 64 (56.6) | 116 (51.3) |  |  |
| >350 (cells/μL) | 9 (8.0) | 11 (9.7) | 20 (8.8) |  |  |
| Comorbidity | 3 (2.7) | 3 (2.7) | 6 (2.7) | < 0.001† | 1.000 |
| Co-infection | 6 (5.3) | 6 (5.3) | 12 (5.3) | < 0.001† | 1.000 |
| Initial ARTregimen |  |  |  | 0.242† | 0.623 |
| TDF + 3TC + EFV (TLE) | 88 (77.9) | 91 (80.5) | 179 (79.2) |  |  |
| Others | 25 (22.1) | 22 (19.5) | 47 (20.8) |  |  |
| Median time from diagnosis to treatment initiation (days) | 5 (3–7) | 25 (14–42) | 8 (5–25) | -13.019§ | < 0.001 |
| Clinical outcomes |  |  |  |  |  |
| Virology suppressionǂ | 83 (73.5) | 69 (61.1) | 152 (67.3) | 3.938† | 0.047 |
| Immunological indicators¶ | 96 (85.0) | 97 (85.8) | 193 (85.4) | 0.035† | 0.851 |

Data are presented as n (%), median (interquartile range) or mean ± standard deviation. ǂHIV-1 RNA < 20 (copies/mL) after 1 year of ART. ¶CD4+ count increases >100 (cells/μL) or >30% after 1 year of ART. §Z values. †*χ*2 values. \*t values. 3TC: Lamivudine; ART: Antiretroviral therapy; BMI: Body mass index; EFV: Efavirenz; HIV: Human immunodeficiency virus; PSM: Propensity score matching; TDF: Tenofovir; TLE: Tenofovirplus Lamivudineand Efavirenz.



**Supplementary Figure 1:** The HIV development process in Markov model in ART status. ART: Antiretroviral therapy.



**Supplementary Figure 2:** Tornado map comparing conventional ART strategy and rapid ART strategy. CNSUC: Average cost of conventional group; CRSUC: Average cost of rapid group; ARTTSUC: Virologic suppression rate of conventional group; RAPIDTSUC: Virologic suppression rate of rapid group; OTHERTSUC: Virologic suppression rate based second-line ART; ESUC: Health utility value of rapid ART status ; SUCTD: HIV mortality of viral suppression population; HIVTD: HIV mortality of total HIV population; NTD: Annual death rate; NTHIV: Newly HIV infections rate; EHIV: Health utility value of HIV/AIDS status; CHIV: Average cost of HIV patients; EV: Expected value; ART: Antiretroviral therapy; ICER: Incremental cost-effectiveness ratio.



**Supplementary Figure 3:** Cost-effectiveness acceptability curve in terms of QALYs for two strategies in probabilistic sensitivity analysis. ART: Antiretroviral therapy; QALYs: Quality-adjusted life years.