**Appendix C.**

**Additional Results.**

**Table C1. Results of progression model simulation for all monitoring strategies evaluated.**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Letter on Figure C1 | ART initiation threshold (CD4 cell/ul) | Monitor strategy | Viral load switching threshold (copies/ml) | Monitoring frequency (months) | HIV deaths | Mean discounted life years | Mean discounted QALYs | Mean discounted cost (2008 USD) | ICER ($/QALY) |
| A | 200 | None | N/A | N/A | 654,658 | 11.490 | 9.901 | 5,712 | Reference |
| B | 200 | Clinical | N/A | 6 | 606,386 | 12.323 | 10.657 | 11,425 | ext dom |
| C | 200 | CD4 | N/A | 6 | 589,698 | 12.747 | 11.032 | 12,979 | dom |
| D | 200 | Confirmatory | 10,000 | 6 | 593,562 | 12.637 | 10.930 | 11,997 | dom |
| E | 200 | Confirmatory | 1,000 | 6 | 591,374 | 12.701 | 10.987 | 12,341 | ext dom |
| F | 200 | Virologic | 10,000 | 12 | 586,443 | 12.859 | 11.138 | 13,331 | dom |
| G | 200 | Virologic | 1,000 | 12 | 571,029 | 13.108 | 11.372 | 15,216 | dom |
| H | 200 | Virologic | 10,000 | 6 | 585,538 | 12.900 | 11.176 | 14,284 | dom |
| I | 200 | Virologic | 1,000 | 6 | 568,690 | 13.156 | 11.416 | 16,332 | dom |
| J | 350 | None | N/A | N/A | 630,801 | 11.720 | 10.093 | 5,876 | 857 |
| K | 350 | Clinical | N/A | 6 | 581,042 | 12.557 | 10.852 | 11,792 | ext dom |
| L | 350 | CD4 | N/A | 6 | 563,341 | 12.995 | 11.24 | 13,475 | ext dom |
| M | 350 | Confirmatory | 10,000 | 6 | 567,307 | 12.884 | 11.137 | 12,496 | 6,341 |
| N | 350 | Confirmatory | 1,000 | 6 | 565,410 | 12.941 | 11.189 | 12,835 | 6,506 |
| O | 350 | Virologic | 10,000 | 12 | 560,393 | 13.091 | 11.331 | 13,846 | 7,123 |
| P | 350 | Virologic | 1,000 | 12 | 545,404 | 13.343 | 11.566 | 15,758 | 8,135 |
| Q | 350 | Virologic | 10,000 | 6 | 559,402 | 13.137 | 11.374 | 14,845 | ext dom |
| R | 350 | Virologic | 1,000 | 6 | 542,339 | 13.399 | 11.619 | 16,935 | 22,219 |
| S | 500 | None | N/A | N/A | 629,559 | 11.722 | 10.093 | 5,883 | dom |
| T | 500 | Clinical | N/A | 6 | 579,721 | 12.562 | 10.855 | 11,814 | dom |
| U | 500 | CD4 | N/A | 6 | 561,847 | 12.996 | 11.239 | 13,503 | dom |
| V | 500 | Confirmatory | 10,000 | 6 | 565,730 | 12.883 | 11.135 | 12,521 | dom |
| W | 500 | Confirmatory | 1,000 | 6 | 563,654 | 12.944 | 11.190 | 12,861 | ext dom |
| X | 500 | Virologic | 10,000 | 12 | 559,149 | 13.092 | 11.331 | 13,873 | dom |
| Y | 500 | Virologic | 1,000 | 12 | 544,110 | 13.343 | 11.565 | 15,784 | dom |
| Z | 500 | Virologic | 10,000 | 6 | 558,295 | 13.132 | 11.368 | 14,867 | dom |
| AA | 500 | Virologic | 1,000 | 6 | 541,415 | 13.396 | 11.615 | 16,961 | dom |
| BB | Instant | None | N/A | N/A | 629,546 | 11.722 | 10.093 | 5,882 | dom |
| CC | Instant | Clinical | N/A | 6 | 579,678 | 12.562 | 10.855 | 11,813 | ext dom |
| DD | Instant | CD4 | N/A | 6 | 561,822 | 12.996 | 11.240 | 13,506 | dom |
| EE | Instant | Confirmatory | 10,000 | 6 | 565,813 | 12.883 | 11.135 | 12,522 | dom |
| FF | Instant | Confirmatory | 1,000 | 6 | 563,697 | 12.944 | 11.190 | 12,863 | dom |
| GG | Instant | Virologic | 10,000 | 12 | 559,142 | 13.092 | 11.330 | 13,873 | dom |
| HH | Instant | Virologic | 1,000 | 12 | 544,014 | 13.343 | 11.565 | 15,785 | dom |
| II | Instant | Virologic | 10,000 | 6 | 558,211 | 13.132 | 11.368 | 14,868 | dom |
| JJ | Instant | Virologic | 1,000 | 6 | 541,443 | 13.396 | 11.615 | 16,962 | dom |

ICER: Incremental cost-effectiveness ratio. QALY: Quality-adjusted life years. Confirmatory: Viral load test performed only if CD4 meets WHO criteria for changing ART regimen based on CD4 count (CD4 falls below baseline or falls >50% from peak on antiretroviral therapy). Ext dom: extended dominance, less cost-effective than the next most effective strategy. Dom: dominated strategy, meaning it is less effective and more costly than at least one alternative.

**Figure C1. All strategies using progression model only.**

**Table C2. Results of transmission model simulation for all monitoring strategies evaluated.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Letter on Figure C2 | ART initiation thres-hold (CD4 cells/ul) | Monitor strategy | Viral load switch thres-hold (copies/ml) | Monitor freq (mos.) | Discounted cost of care and treatment (USD) | Total discounted life years | Total discounted QALYs | New infections over 20 years | Died of AIDS over 20 years | New infections per infected per year | Cost of care and treat-ment per infected per year ($) | ICER  ($/ QALY) |
| A | 200 | None | N/A | N/A | 8,316,591,361 | 737,061,369 | 735,593,979 | 1,679,374 | 807,636 | 0.0819 | 545 | Ref |
| B | 200 | Clinical | N/A | 6 | 8,796,015,785 | 737,164,187 | 735,696,756 | 1,667,496 | 791,163 | 0.0813 | 576 | ext dom |
| C | 200 | CD4 | N/A | 6 | 9,006,366,860 | 737,230,205 | 735,759,308 | 1,670,656 | 783,652 | 0.0812 | 588 | dom |
| D | 200 | Confirm | 10,000 | 6 | 8,880,997,251 | 737,221,232 | 735,748,988 | 1,680,690 | 786,196 | 0.0815 | 579 | dom |
| E | 200 | Confirm | 1000 | 6 | 8,945,202,788 | 737,227,843 | 735,756,188 | 1,675,050 | 784,616 | 0.0813 | 584 | dom |
| F | 200 | Virologic | 10,000 | 12 | 9,397,617,950 | 737,315,031 | 735,858,372 | 1,627,302 | 766,878 | 0.0797 | 619 | dom |
| G | 200 | Virologic | 1000 | 12 | 9,999,899,925 | 737,403,635 | 735,964,328 | 1,563,195 | 746,559 | 0.0777 | 667 | dom |
| H | 200 | Virologic | 10,000 | 6 | 9,865,248,594 | 737,336,531 | 735,880,964 | 1,621,583 | 763,316 | 0.0795 | 651 | dom |
| I | 200 | Virologic | 1000 | 6 | 10,483,580,766 | 737,423,908 | 735,986,127 | 1,555,710 | 742,935 | 0.0774 | 700 | dom |
| J | 350 | None | N/A | N/A | 8,862,218,073 | 737,664,045 | 736,187,460 | 1,523,526 | 721,609 | 0.0764 | 596 | 919 |
| K | 350 | Clinical | N/A | 6 | 9,262,118,372 | 737,749,638 | 736,272,122 | 1,518,114 | 708,577 | 0.0760 | 621 | ext dom |
| L | 350 | CD4 | N/A | 6 | 9,709,686,203 | 737,822,707 | 736,344,429 | 1,513,474 | 698,818 | 0.0756 | 651 | dom |
| M | 350 | Confirm | 10,000 | 6 | 9,469,347,021 | 737,815,554 | 736,336,155 | 1,522,449 | 700,948 | 0.0759 | 634 | dom |
| N | 350 | Confirm | 1000 | 6 | 9,525,179,293 | 737,821,042 | 736,342,305 | 1,517,202 | 699,567 | 0.0758 | 639 | dom |
| O | 350 | Virologic | 10,000 | 12 | 10,026,358,525 | 737,907,525 | 736,444,554 | 1,463,402 | 681,632 | 0.0739 | 680 | dom |
| P | 350 | Virologic | 1000 | 12 | 10,637,603,225 | 737,997,185 | 736,552,525 | 1,397,244 | 661,732 | 0.0716 | 731 | dom |
| Q | 350 | Virologic | 10,000 | 6 | 10,553,434,000 | 737,928,861 | 736,467,154 | 1,457,235 | 678,196 | 0.0737 | 717 | dom |
| R | 350 | Virologic | 1000 | 6 | 11,177,782,331 | 738,016,648 | 736,574,367 | 1,388,148 | 658,019 | 0.0713 | 770 | dom |
| S | 500 | None | N/A | N/A | 9,266,466,258 | 737,934,710 | 736,453,092 | 1,423,498 | 678,783 | 0.0730 | 636 | 1,522 |
| T | 500 | Clinical | N/A | 6 | 9,631,148,563 | 738,013,431 | 736,530,136 | 1,420,979 | 667,477 | 0.0727 | 659 | ext dom |
| U | 500 | CD4 | N/A | 6 | 10,129,547,778 | 738,082,907 | 736,599,966 | 1,412,880 | 657,625 | 0.0723 | 694 | ext dom |
| V | 500 | Confirm | 10,000 | 6 | 9,887,138,505 | 738,075,583 | 736,591,360 | 1,421,997 | 659,793 | 0.0726 | 677 | 4,489 |
| W | 500 | Confirm | 1000 | 6 | 9,942,508,201 | 738,080,862 | 736,597,258 | 1,416,851 | 658,447 | 0.0724 | 681 | ext dom |
| X | 500 | Virologic | 10,000 | 12 | 10,466,048,108 | 738,162,533 | 736,694,755 | 1,363,434 | 641,585 | 0.0705 | 725 | ext dom |
| Y | 500 | Virologic | 1000 | 12 | 11,061,481,772 | 738,247,130 | 736,797,862 | 1,299,091 | 622,865 | 0.0682 | 777 | dom |
| Z | 500 | Virologic | 10,000 | 6 | 11,031,472,778 | 738,183,911 | 736,717,470 | 1,356,797 | 638,067 | 0.0702 | 765 | dom |
| AA | 500 | Virologic | 1000 | 6 | 11,641,511,646 | 738,267,369 | 736,820,589 | 1,289,240 | 618,951 | 0.0678 | 819 | dom |
| BB | Instant | None | N/A | N/A | 10,269,690,111 | 738,186,952 | 736,660,875 | 1,272,651 | 637,769 | 0.0684 | 734 | ext dom |
| CC | Instant | Clinical | N/A | 6 | 10,644,192,626 | 738,264,771 | 736,736,993 | 1,271,177 | 626,712 | 0.0682 | 759 | ext dom |
| DD | Instant | CD4 | N/A | 6 | 11,233,400,430 | 738,343,266 | 736,817,425 | 1,258,338 | 615,328 | 0.0675 | 803 | ext dom |
| EE | Instant | Confirm | 10,000 | 6 | 10,962,792,206 | 738,334,816 | 736,807,010 | 1,268,591 | 617,720 | 0.0679 | 783 | 4,988 |
| FF | Instant | Confirm | 1000 | 6 | 11,022,456,231 | 738,340,344 | 736,813,486 | 1,262,865 | 616,299 | 0.0677 | 788 | ext dom |
| GG | Instant | Virologic | 10,000 | 12 | 11,619,458,198 | 738,426,961 | 736,917,659 | 1,207,835 | 598,785 | 0.0656 | 841 | ext dom |
| HH | Instant | Virologic | 1000 | 12 | 12,254,684,858 | 738,514,990 | 737,026,042 | 1,142,956 | 579,853 | 0.0631 | 899 | 5,898 |
| II | Instant | Virologic | 10,000 | 6 | 12,294,428,755 | 738,449,692 | 736,942,290 | 1,199,825 | 594,947 | 0.0652 | 891 | dom |
| JJ | Instant | Virologic | 1000 | 6 | 12,930,942,330 | 738,540,370 | 737,054,783 | 1,131,146 | 575,109 | 0.0626 | 952 | 23,529 |

ICER: Incremental cost-effectiveness ratio. QALY: Quality-adjusted life years. Confirmatory: Viral load test performed only if CD4 meets WHO criteria for changing ART regimen based on CD4 count (CD4 falls below baseline or falls >50% from peak on antiretroviral therapy). Ext dom: extended dominance, less cost-effective than the next most effective strategy. Dom: dominated strategy, meaning it is less effective and more costly than at least one alternative.

**Figure C2. All strategies using transmission model.**

**Table C3. Progression model results comparing ART initiation at 350 cells/ul versus 200 cell/ul for alternative monitoring strategies.**

|  |  |  |  |
| --- | --- | --- | --- |
| Monitoring strategy and ART initiation threshold (CD4 cells/ml) | Mean discounted costs  (2008 USD) | Mean discounted QALYs | Cost-effectiveness ratio ($/QALY) |
| No monitoring |  |  |  |
| 200 | $5,712 | 9.901 | Reference |
| 350 | $5,876 | 10.093 | 857 |
| Clinical monitoring only |  |  |  |
| 200 | $11,425 | 10.657 | Reference |
| 350 | $11,792 | 10.852 | 1,877 |
| CD4 monitoring only |  |  |  |
| 200 | $12,979 | 11.032 | Reference |
| 350 | $13,475 | 11.240 | 2,388 |

QALY: Quality-adjusted life years.