

The Cost-Effectiveness of Get Checked Online vs Clinic-based Testing for the Screening of HIV in GBMSM in Metro Vancouver

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BACKGROUND:

- Early diagnosis and linkage to care can avert HIV transmissions and contribute to reduced HIV-related morbidity and mortality
- Get Checked Online (GCO) is an innovative online testing service aiming to increase uptake and frequency of testing as well as the capacity and efficiency of currently available screening services

OBJECTIVE:

- To assess the current cost-effectiveness (CE) of GCO and for different GCO uptake scenarios compared to clinic-based testing among gay, bisexual, and other men who have sex with men (GBMSM) in Metro Vancouver (see figure1).

METHODS:

Model Design

- A dynamic compartmental model was developed in Python™ 2.7 to conduct a cost utility analysis (CUA)
- As shown in figure 2, the analysis models the chances of an individual to become infected with HIV and, then, to be diagnosed and/or progress through the disease pathway based on natural history of the disease
- The analysis undertook a healthcare payer perspective, including direct costs in 2017 Canadian dollars in a lifetime horizon (30 years); costs and benefits were discounted at a 1.5% discount rate
- Base case scenario assumes a 4.7% GCO adoption and the migration of 74.1% and 43.9 % of non/infrequent testers to annual testers among the high and low-risk populations, respectively

Costs and Utility Inputs (see Table 1)

- Screening costs were based on GCO and STI/HIV BCCDC clinic data
- Disease-related costs leveraged from local published estimates on drug-related (including HIV/AIDS drugs and administration) and non-drug related costs (including hospitalizations, physician billings, laboratory tests, and non-HIV/AIDS related drugs)
- Utilities were derived from a CUA assessing the cost-effectiveness of expanding HIV testing in low-prevalence, high-income settings

RESULTS:

- GCO HIV screening test is 47.5% less expensive than clinic-based testing (\$30.47 vs \$57.99)
- In a 30-year time horizon, the increase in testing frequency and number of patients treated after diagnosis due to GCO implementation increases overall costs marginally improving quality-adjusted life years (QALYs; see table 2)
- The base case scenario, achieved an incremental cost-effectiveness ratio (ICER) per QALY of \$27 199 which is below Canada's willingness-to-pay (i.e. \$50,000); GCO is cost-effective vs standard of care at different time horizons and at increased uptake (see figures 3 and 4).

CONCLUSIONS:

- Expanding HIV testing for GBMSM through increasing uptake of GCO is a cost-effective alternative to expanding clinic-based services.
- We noted that difference in total costs might be smaller if a battery of STI tests is considered which in turn may adversely affect our CE estimate.
- For the next phase of CE analysis we will expand our model to include sexually transmitted infection testing and consider other comparative testing models (e.g., routine testing in health care settings)

Figure 1: Screening protocols

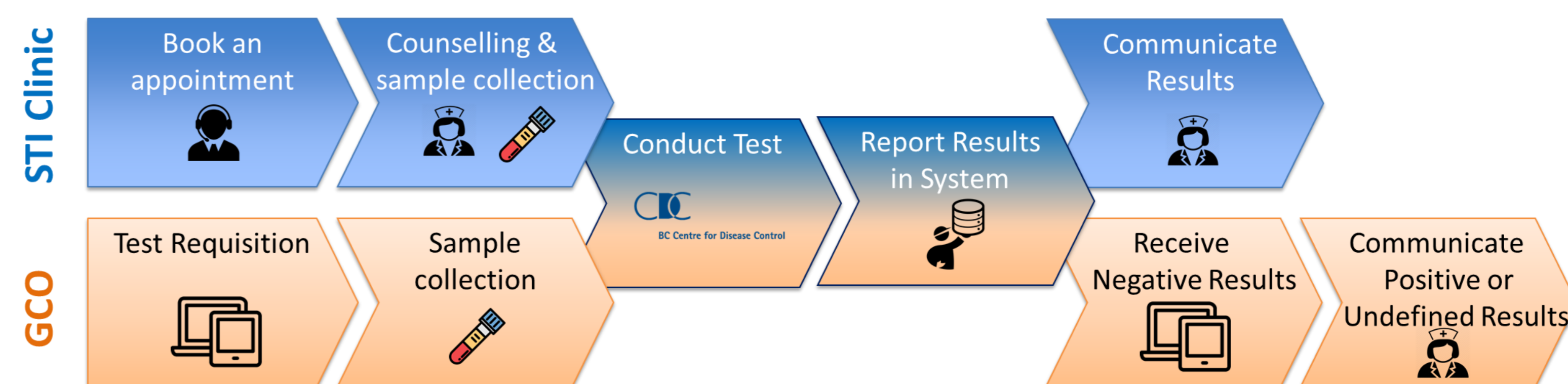


Figure 2: Model structure

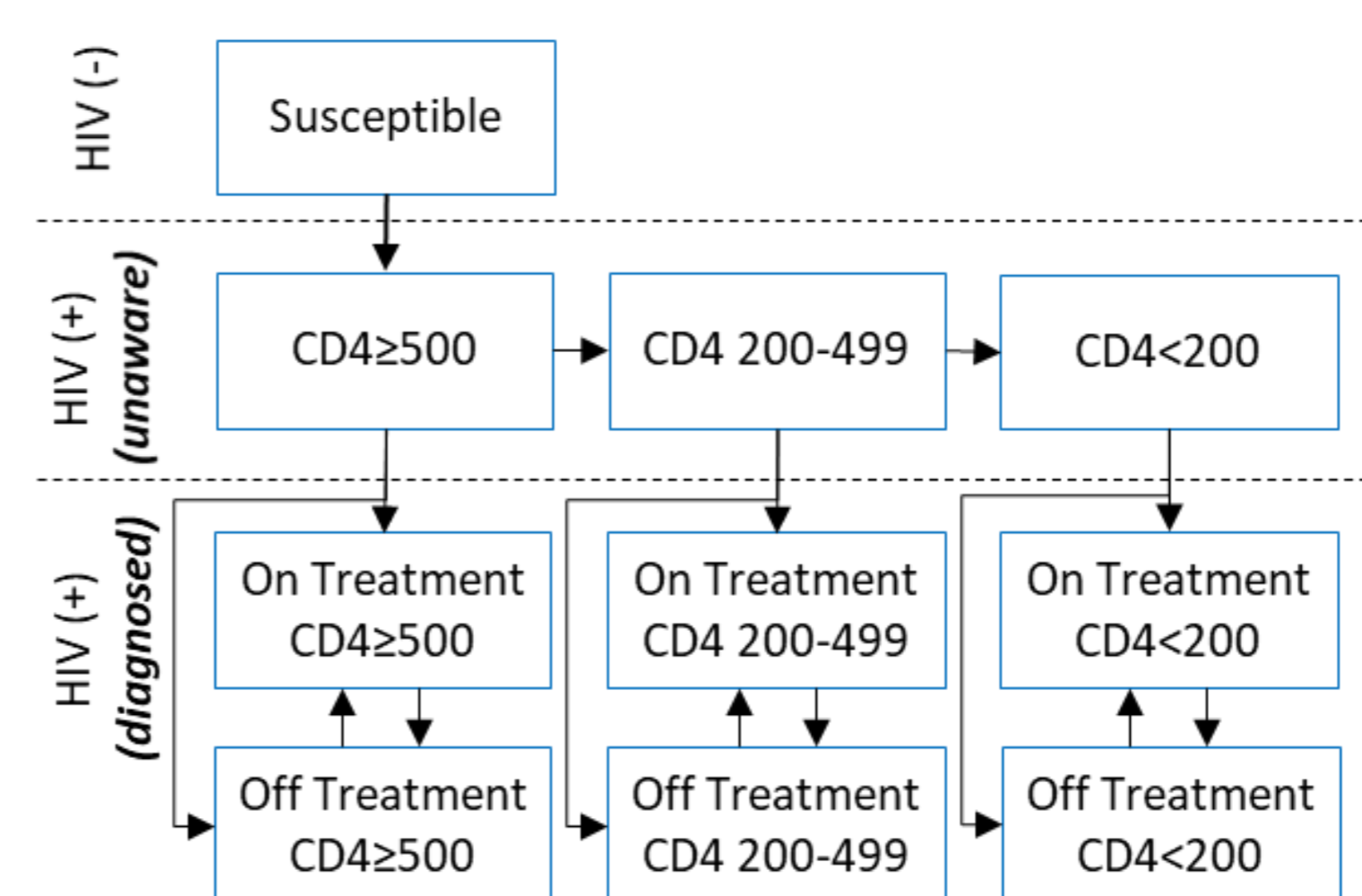


Table 1: Cost & utility inputs

State	Annual Cost (2017 \$CAD)			Utility		
	CD4>500	CD4: 200-499	CD4<200	CD4>500	CD4: 200-499	CD4<200
Not infected*	\$5,409.82			1.00		
HIV (+) Unaware	\$6,698.66	\$10,198.62	\$14,294.73	0.89 (0.85-0.95)	0.72 (0.70-0.80)	0.72 (0.60-0.75)
HIV (+) Diagnosed Off Treatment	\$7,790.17	\$13,118.04	\$20,260.69	0.89 (0.85-0.95)	0.72 (0.70-0.80)	0.72 (0.60-0.75)
HIV (+) Diagnosed On Treatment	\$26,180.25	\$29,544.32	\$38,267.15	0.89 (0.85-0.95)	0.83 (0.82-0.87)	0.82 (0.82-0.87)

Table 2: Results (30-year time horizon)

Scenario	Costs (2017 CAD)	QALYs	ICER (QALY)
Base case	\$90 059 (-\$420 836, \$273 987)	3 (0,6)	\$27 199 (-\$14 119, \$101 391)
10% GCO uptake	\$173 108 (-\$1 117 903, \$575 864)	7 (0,14)	\$25 760 (-\$17 050, \$100 569)
15% GCO uptake	\$289 905 (-\$1 688 523, \$869 540)	11 (0,21)	\$27 997 (-\$16 155, \$105 689)

Figure 3: ICER (QALY) as a function of time

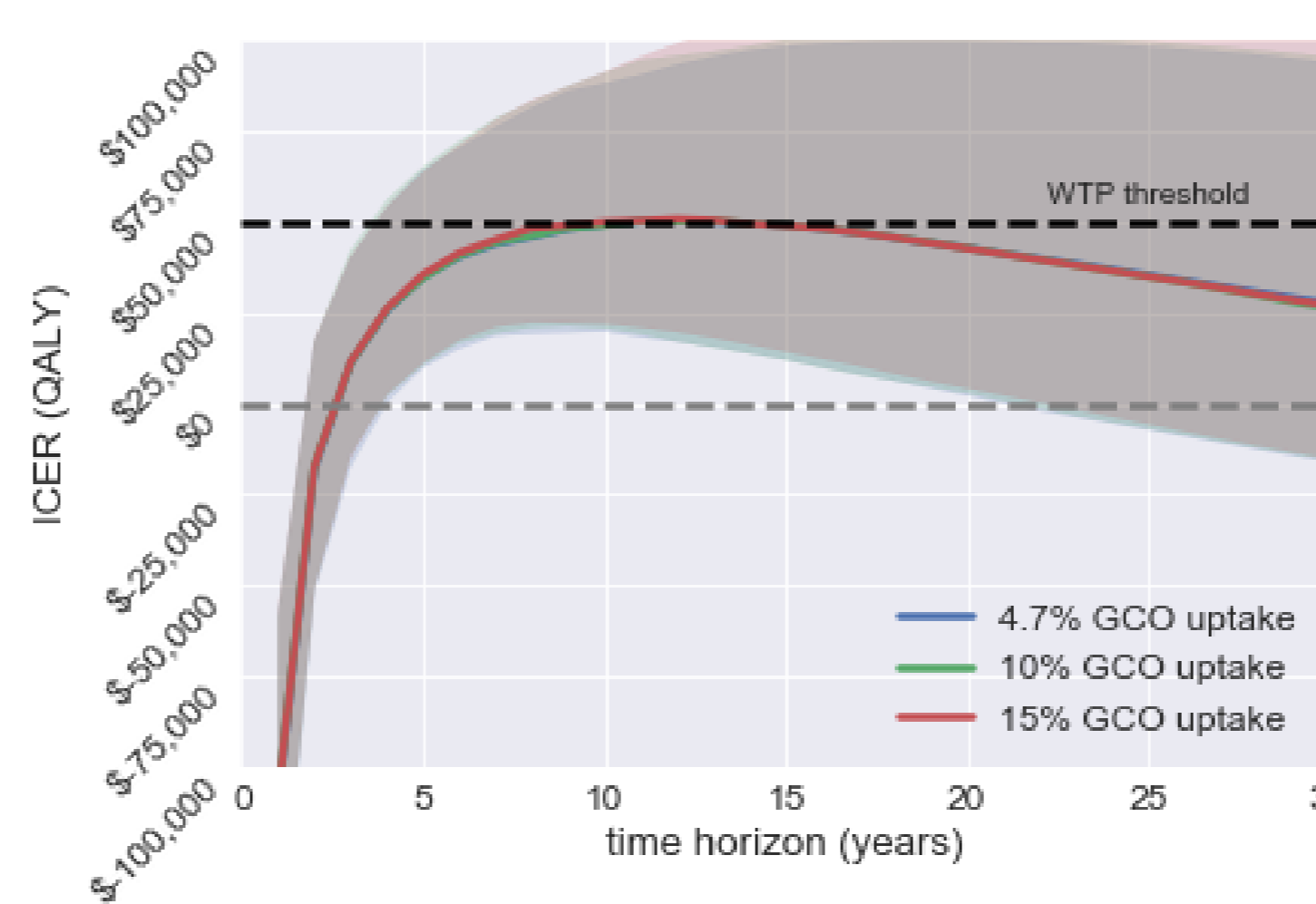
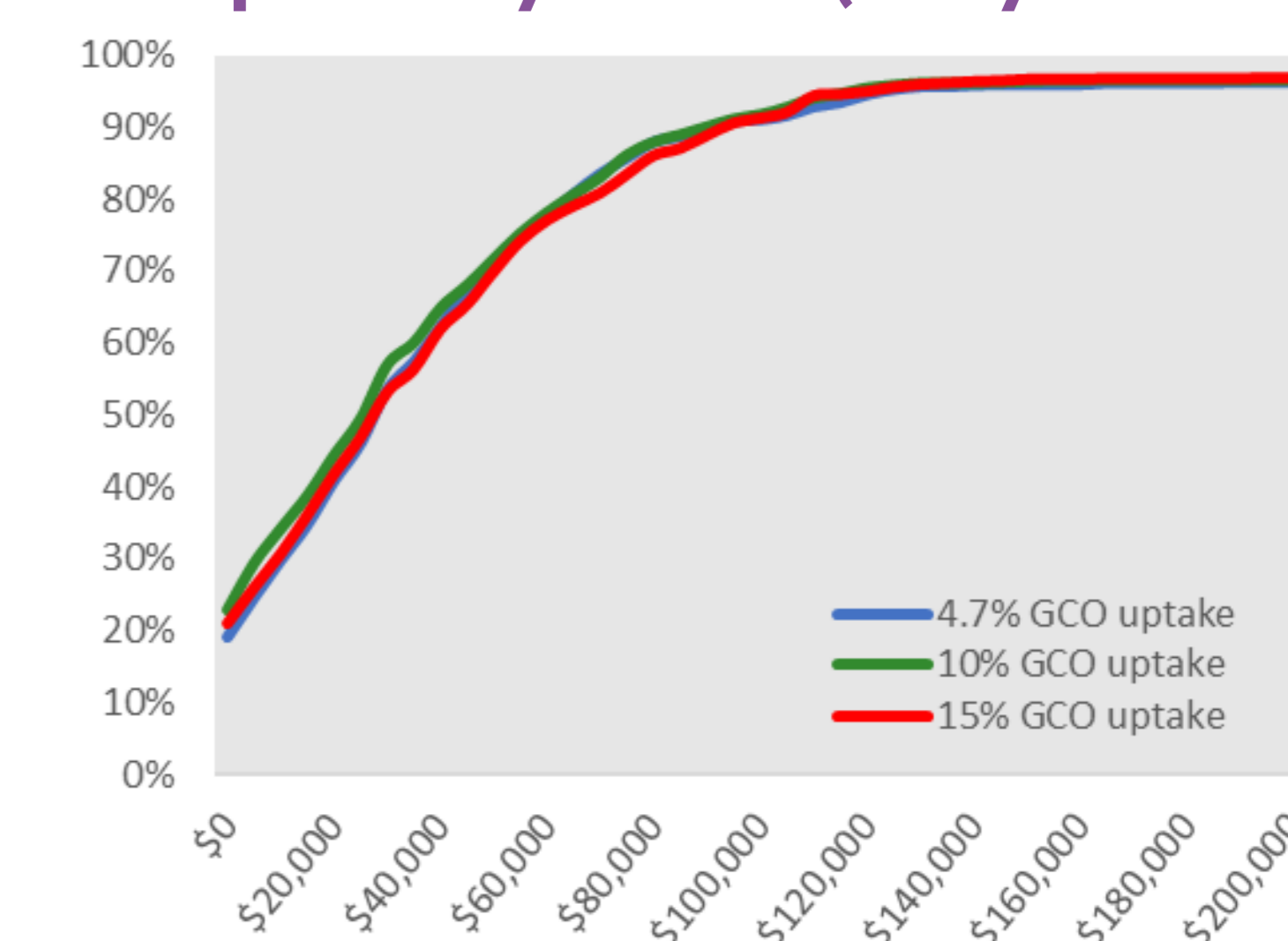


Figure 4: Cost-effectiveness acceptability curve (30-yr horizon)



LIMITATIONS:

- Screening costs consider only HIV-related tests; further analyses should be made to understand the economical impact of incorporating the full battery of STI tests
- Potential loss of exclusivity among patented drugs was not considered
- Viral load was not modelled explicitly
- Analysis may not reflect Canadian population preferences accurately given the lack of HIV-related utility studies in Canadian general population

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