

Appendix D. Probabilistic Analysis

A probabilistic approach was used to sample the most pertinent model input parameters from their associated distributions in order to integrate second order uncertainty into the model (Table D1). These input parameters were chosen with the help of many stakeholders, including policymakers.

At a willingness-to-pay (WTP) of \$50,000/QALY, there is a 97.75% chance that the PGx-guided treatment is cost-effective over a 20-year period (Figure D1).

Table D1. List of parameters in Probabilistic Analysis

Parameters	Mean (SE/95% CI)	Distribution	Reference
Risk ratio for full remission (PGx-guided treatment vs. current SoC)	1.46 (1.02; 2.08)	Lognormal	Bunka et al., 2023 ¹
Risk ratio of partial remission (PGx-guided treatment vs. current SoC)	1.2 (0.96; 1.51)	Lognormal	Calculated based on Bunka et al., 2023 ¹
Risk ratio of total discontinuation (PGx-guided treatment vs. current SoC)	0.89 (0.78; 1.01)	Lognormal	Bunka et al., 2023 ¹
Risk ratio of discontinuation due to adverse event (PGx-guided treatment vs. current SoC)	0.43 (0.16; 1.17)	Lognormal	Calculated based on Bunka et al., 2023 ¹
Utility of patients with refractory MDD	0.57 (0.52; 0.6)	Beta	Sobocki et al., 2006 ²
Utility of patients with mild MDD	0.57 (0.54; 0.61)	Beta	Kolovos et al., 2017 ³
Utility of patients with moderate MDD	0.52 (0.49; 0.56)	Beta	
Utility of patients with severe MDD	0.39 (0.35; 0.43)	Beta	
Utility of patients after remission	0.7 (0.67; 0.73)	Beta	
Utility of patients in well health state	0.8 (0.01)	Beta	Bansback et al., 2012 ⁴
Cost of refractory MDD care	\$5286 (558)	Gamma	MSP ⁵ , DAD ⁶ , PharmaNet ⁷ and NACRS ⁸ (2015-2020)
Spontaneous remission of untreated patients	0.17 (0.04)	Gamma	Calculated from placebo arm of the RCTs included in Cipriani et al., 2018 ⁹ according to expert's opinion

Note: SoC = Standard of care; MSP = Medical Service Plan; DAD = Discharge Abstract Database; NACRS = National Ambulatory Care.

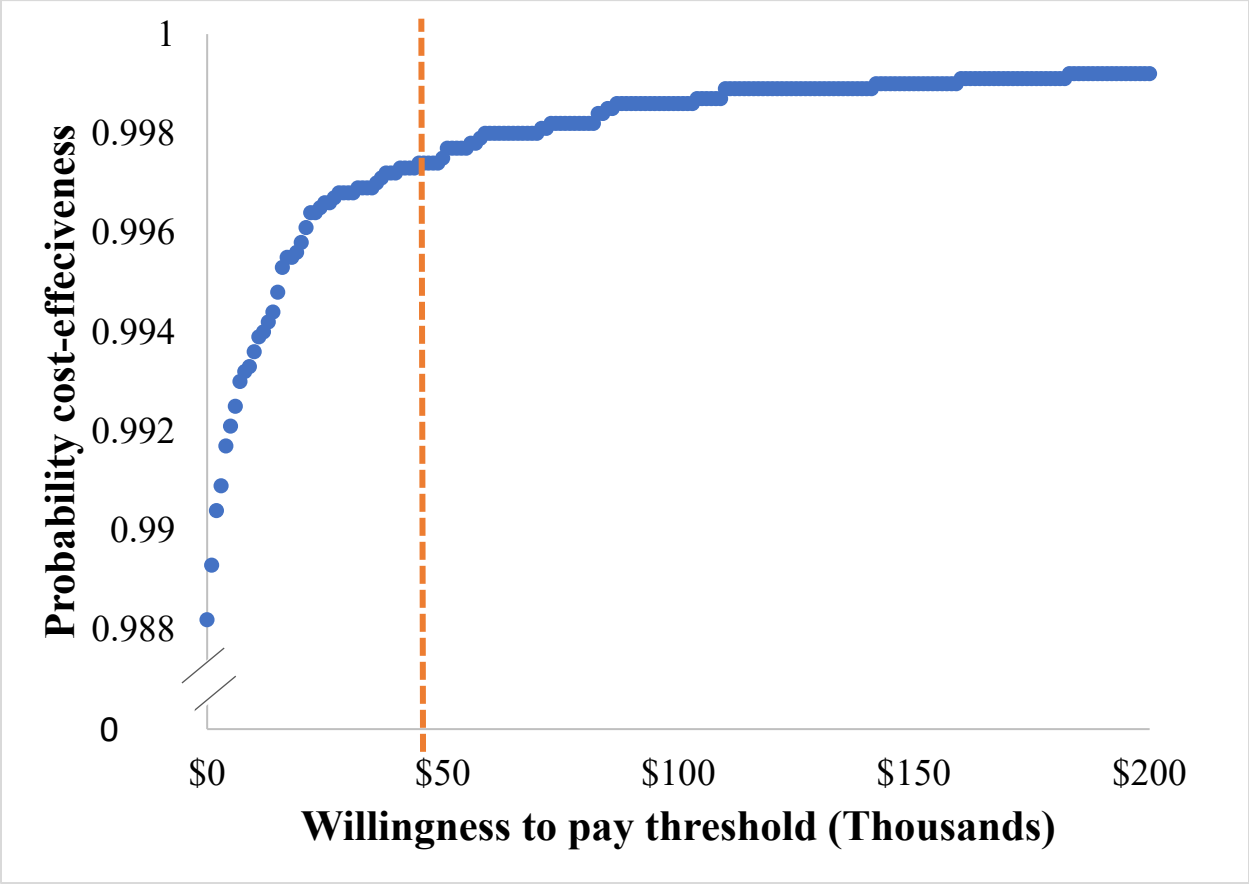


Figure D1: Cost-effectiveness acceptability curve. There is a 99.75% chance that the PGx-guided strategy is cost-effective over 20 years at a willingness-to-pay (WTP) threshold of \$50,000 per QALY (shown by the red dashed line).

References

1. Bunka M, Wong G, Kim D, Edwards L, Austin J, Doyle-Waters MM, et al. Evaluating treatment outcomes in pharmacogenomic-guided care for major depression: A rapid review and meta-analysis. *Psychiatry research*. 2023:115102.
2. Sobocki P, Ekman M, Agren H, Krakau I, Runeson B, Martensson B. Health-related quality of life measured with EQ-5D in patients treated for depression in primary care. *Value Health*. 2007;10(2):153-60.
3. Kolovos S, Bosmans JE, van Dongen JM, van Esveld B, Magai D, van Straten A, et al. Utility scores for different health states related to depression: individual participant data analysis. *Qual Life Res*. 2017 Jul;26(7):1649-58.
4. Bansback N, Tsuchiya A, Brazier J, Anis A. Canadian valuation of EQ-5D health states: preliminary value set and considerations for future valuation studies. *PLoS One*. 2012;7(2):e31115.
5. British Columbia Ministry of Health [creator] (2021): Medical Services Plan (MSP) Payment Information File. V2. Population Data BC [publisher]. Data Extract. MOH (2021). <http://www.popdata.bc.ca/data>
6. Canadian Institute for Health Information [creator] (2021): Discharge Abstract Database (Hospital Separations). V2. Population Data BC [publisher]. Data Extract. MOH (2021). <http://www.popdata.bc.ca/data>
7. British Columbia Ministry of Health [creator] (2021): PharmaNet. V2. British Columbia Ministry of Health [publisher]. Data Extract. Data Stewardship Committee (2021). <http://www.popdata.bc.ca/data>
8. Canadian Institute for Health Information [creator] (2021): National Ambulatory Care Reporting System. V2. Population Data BC [publisher]. Data Extract. MOH (2021). <http://www.popdata.bc.ca/data>
9. Cipriani A, Furukawa TA, Salanti G, Chaimani A, Atkinson LZ, Ogawa Y, et al. Comparative efficacy and acceptability of 21 antidepressant drugs for the acute treatment of adults with major depressive disorder: a systematic review and network meta-analysis. *Focus*. 2018;16(4):420-9.