

Estimating the Cost-effectiveness of Sparsentan Relative to Real-World Renin Angiotensin System Inhibition Standard of Care for Immunoglobulin A Nephropathy: A Patient-Level Microsimulation



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Background

Immunoglobulin A Nephropathy (IgAN) is a rare chronic kidney disease characterized by progressive loss of kidney function.¹⁻³ FILSPARI (sparsentan) is a dual endothelin angiotensin receptor antagonist (DEARA) shown to result in significant reductions in proteinuria and preservation of kidney function in adult patients with IgAN.⁴

Objectives

This analysis evaluated the cost-effectiveness of sparsentan relative to real-world renin-angiotensin system inhibition (RASi) standard of care (SoC) to slow kidney function decline in adults with primary IgAN who are at risk for disease progression.

Methods

- A patient-level microsimulation was parameterized using sparsentan Phase 3 PROTECT clinical trial data.⁴⁻⁶
- The base case had a 60-year horizon, societal perspective, and 3% discount rate.
- Patients transitioned across nine mutually exclusive health states (CKD1-4, Kidney Failure without and with Dialysis, Post-kidney transplant, IgAN recurrence, and Death) (Figure 1).
- At model start, urinary proteinuria excretion rate (UPER) and estimated glomerular filtration rate (eGFR) were jointly sampled via bootstrapping.
- Post-treatment percent reduction in UPER was sampled from PROTECT patient-level data via bootstrapping and applied to the baseline UPER after the first model cycle with real-world RASi SoC modelled as no treatment effect based on IgAN clinical trials.^{4,7-11}
- UPER was utilized to assign an eGFR slope for each patient based on a real-world analysis.¹ eGFR was then calculated at each model cycle, and a corresponding health state assigned.
- Digitized curves, where applicable, and estimates from literature informed all other state transitions and model parameters.¹²⁻¹⁴
- Costs included treatment acquisition, clinical events, adverse events, health state, and non-healthcare (i.e., labor and caregiver costs, time seeking care, and non-medical consumption).
- Total costs and quality-adjusted life-years (QALYs) were estimated for each comparator, and the incremental cost-effectiveness ratio (ICER) of sparsentan relative to real-world RASi SoC was calculated.
- The model utilized generalized cost-effectiveness analysis, with traditional and generalized risk- and severity-adjusted (GRASA) QALYs, annual stacked cohorts, and dynamic pricing for sparsentan acquisition.

Results

For the full societal perspective GCEA base case, sparsentan is dominant relative to real-world RASi SoC, with lifetime cost savings and QALYs gains of \$10,708 and 0.25, respectively.

Sparsentan was either dominant or cost-effective across all scenarios regardless of perspective or QALY type.

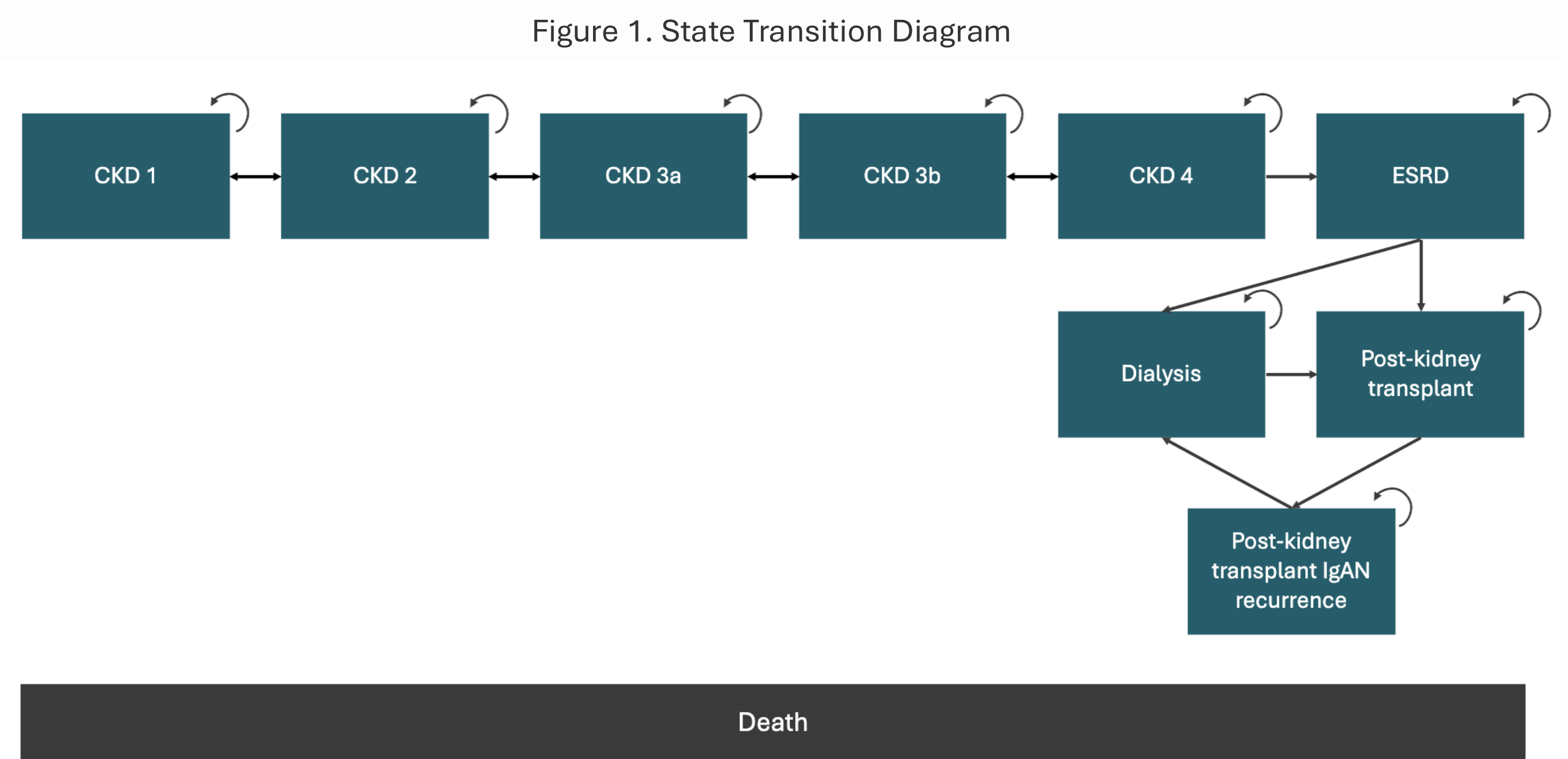
Conclusion

Sparsentan is a valuable option for treating adult patients with IgAN. It dominates real-world RASi SoC from a US societal perspective and is expected to be cost-effective from a US payer perspective at a willingness-to-pay of \$150,000/QALY.

References

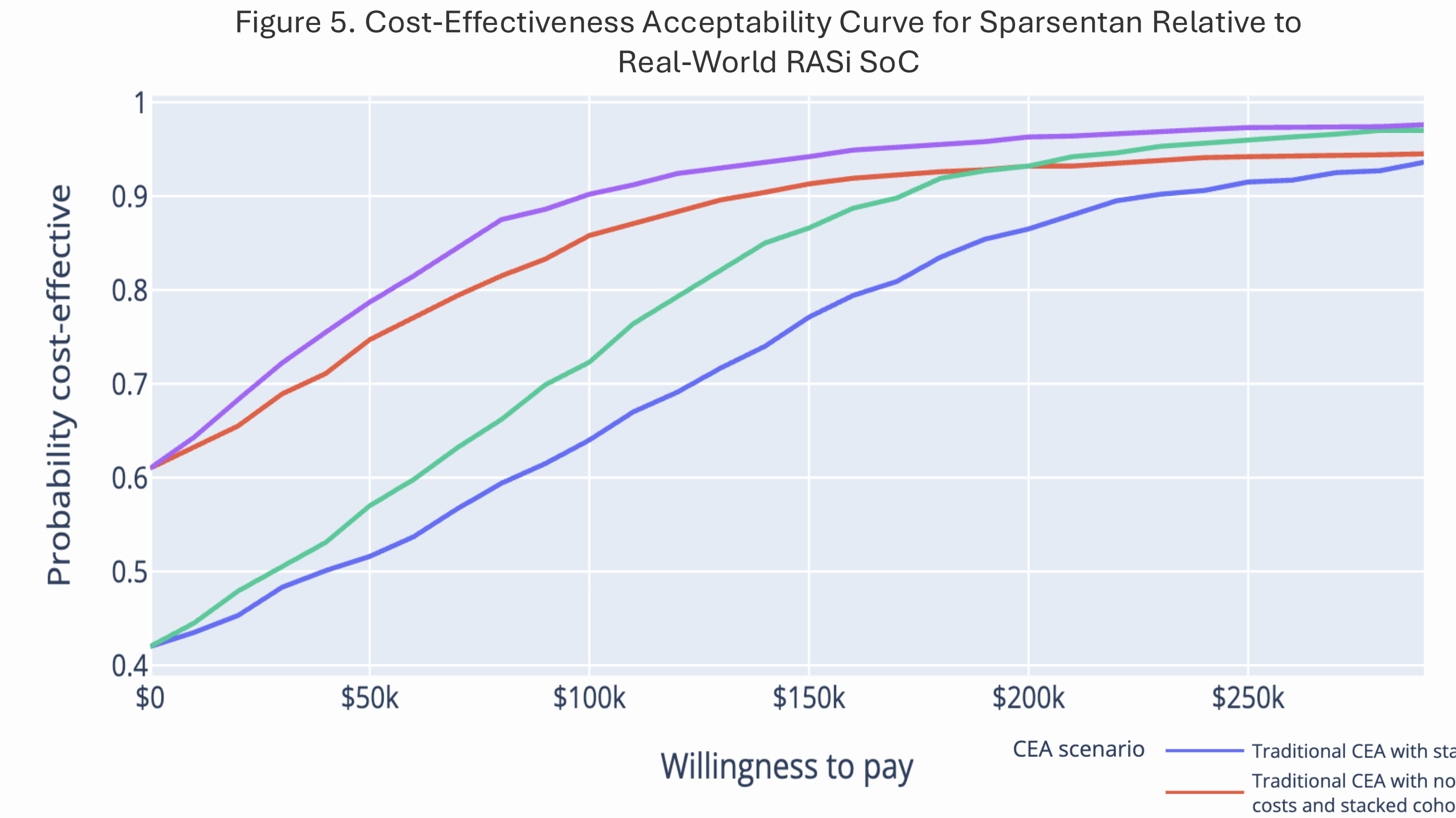
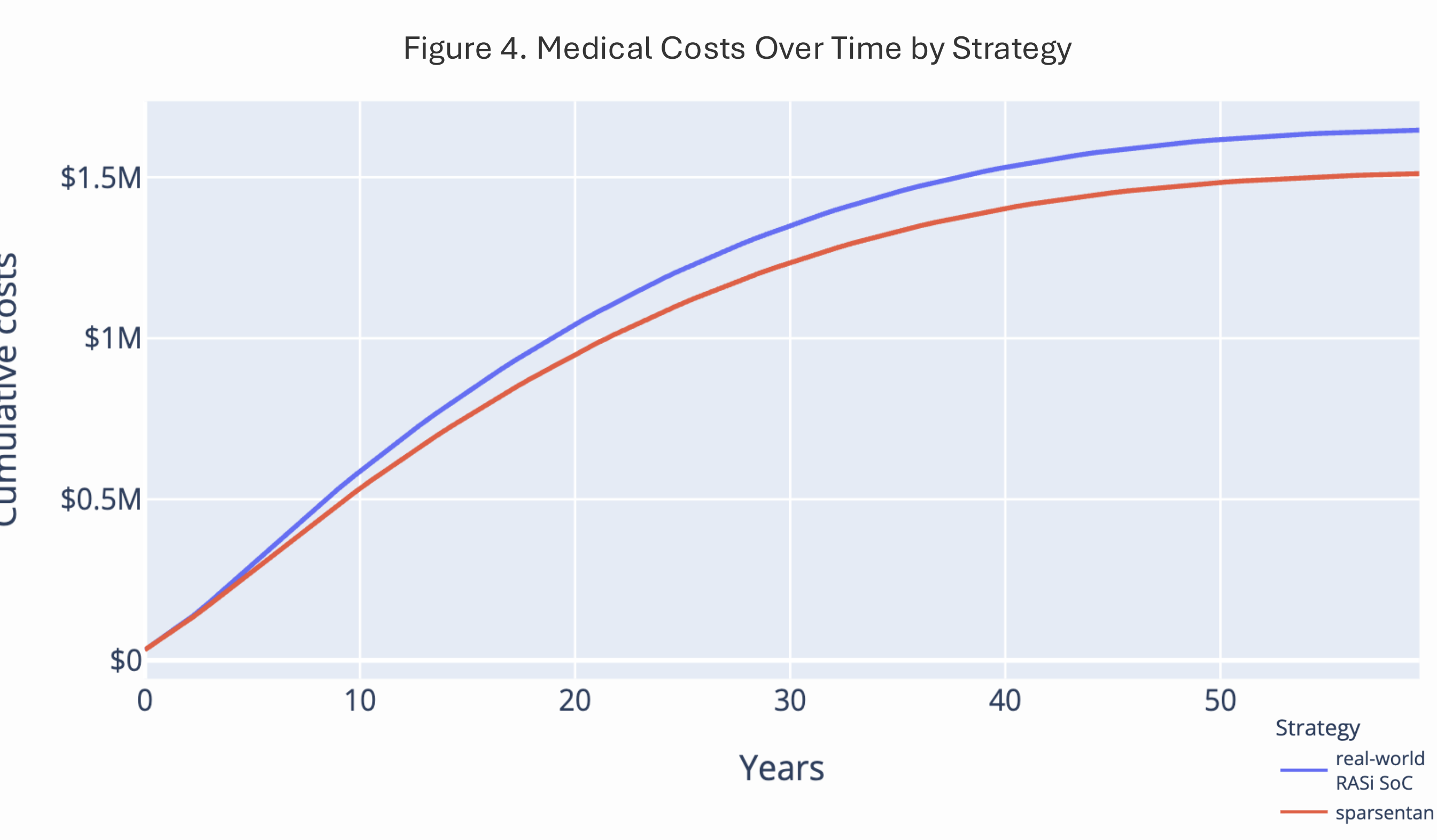
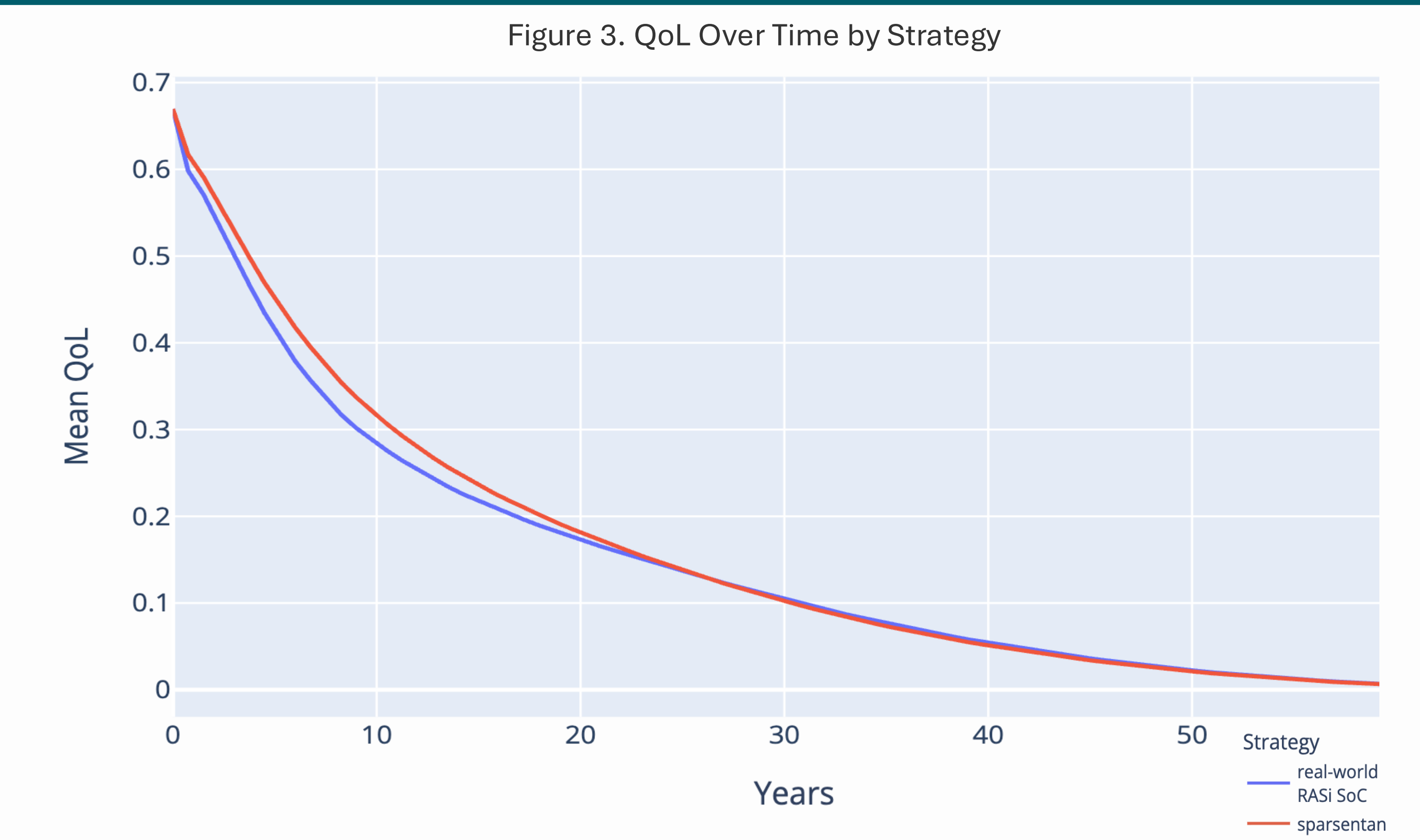
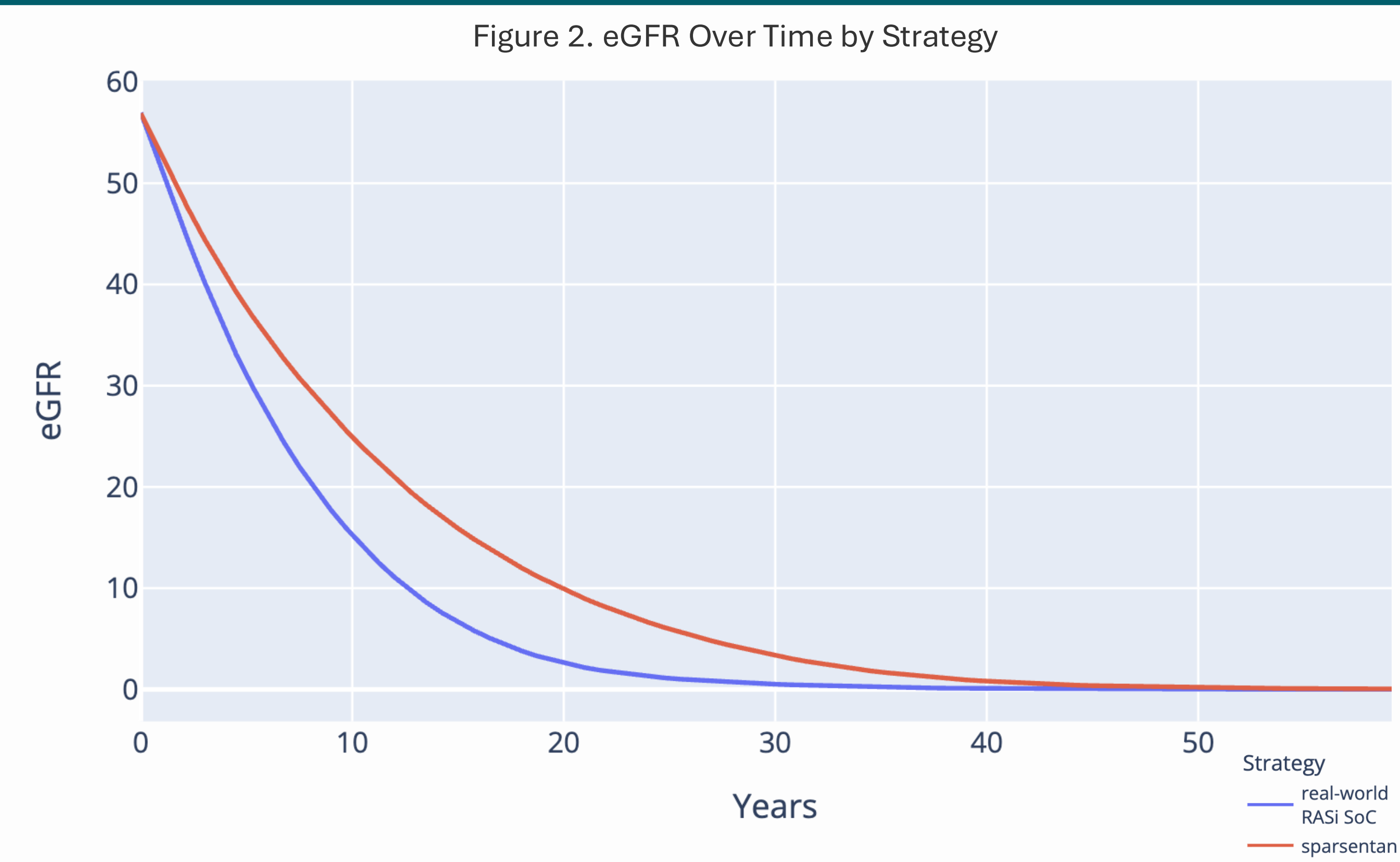
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Methods Continued



Scenario	Scenario Name	Scenario Description	Perspective
Base Case	Full GCEA	GRASA QALYs, dynamic pricing for drug acquisition costs, stacked cohorts, and non-healthcare costs	Societal
Scenario 1	Traditional CEA with non-healthcare costs and stacked cohorts	Traditional QALYs, dynamic pricing for drug acquisition costs, stacked cohorts, and non-healthcare costs	Societal
Scenario 2	GRACE with stacked cohorts	GRASA QALYs with dynamic pricing for drug acquisition costs and stacked cohorts	Payer
Scenario 3	Traditional CEA with stacked cohorts	Traditional QALYs with dynamic pricing for drug acquisition costs and stacked cohorts	Payer

Results Continued



Metric	Scenario	Real-World RASi SoC, mean (95% CI)	Sparsentan, mean (95% CI)	Incremental
Total Effects	Base Case	3.31 (2.67; 3.85)	3.56 (2.95; 4.14)	0.25 (-0.01; 0.53)
Total Effects	Scenario 1	3.10 (2.48; 3.59)	3.27 (2.72; 3.78)	0.18 (-0.07; 0.42)
Total Effects	Scenario 2	3.31 (2.67; 3.85)	3.56 (2.95; 4.14)	0.25 (-0.01; 0.53)
Total Effects	Scenario 3	3.10 (2.48; 3.59)	3.27 (2.72; 3.78)	0.18 (-0.07; 0.42)
Total Costs	Base Case	\$322,876 (\$130,012; \$605,452)	\$312,167 (\$140,102; \$590,786)	-\$10,708 (-\$79,670; \$48,121)
Total Costs	Scenario 1	\$322,876 (\$130,012; \$605,452)	\$312,167 (\$140,102; \$590,786)	-\$10,708 (-\$79,670; \$48,121)
Total Costs	Scenario 2	\$600,606 (\$380,962; \$892,523)	\$606,874 (\$412,440; \$888,855)	\$6,269 (-\$71,404; \$73,504)
Total Costs	Scenario 3	\$600,606 (\$380,962; \$892,523)	\$606,874 (\$412,440; \$888,855)	\$6,269 (-\$71,404; \$73,504)

Metric	Scenario	Sparsentan Relative to Real-World RASi SoC, mean (95% CI)
ICER	Base Case	Dominant
ICER	Scenario 1	Dominant
ICER	Scenario 2	\$24,624
ICER	Scenario 3	\$35,158

Dominant = Less costly and more effective

