

Cost-effectiveness of Geographically Targeted HIV Testing in California Emergency Departments

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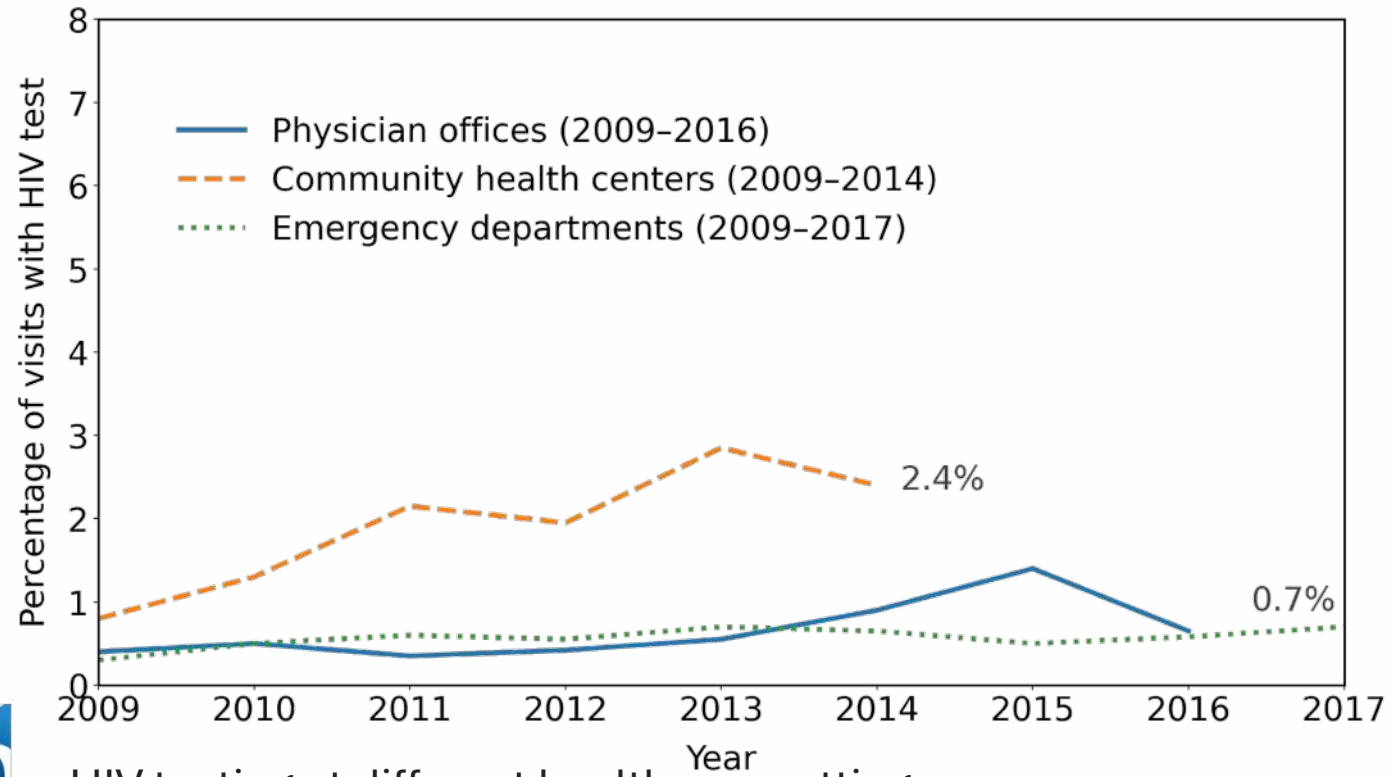
Disclosures

- No relevant financial relationships to disclose
- No discussion of specific drug or surgical treatment recommendations
- Presentation includes original research and published literature
- No commercial funding relevant to this presentation



EDs are important in ending the HIV epidemic

- 21% of U.S. HIV diagnoses in 2023 were stage 3 (AIDS) at diagnosis
- ED serves patients who may have fewer alternative points of care



Federal and California initiatives for HIV screening

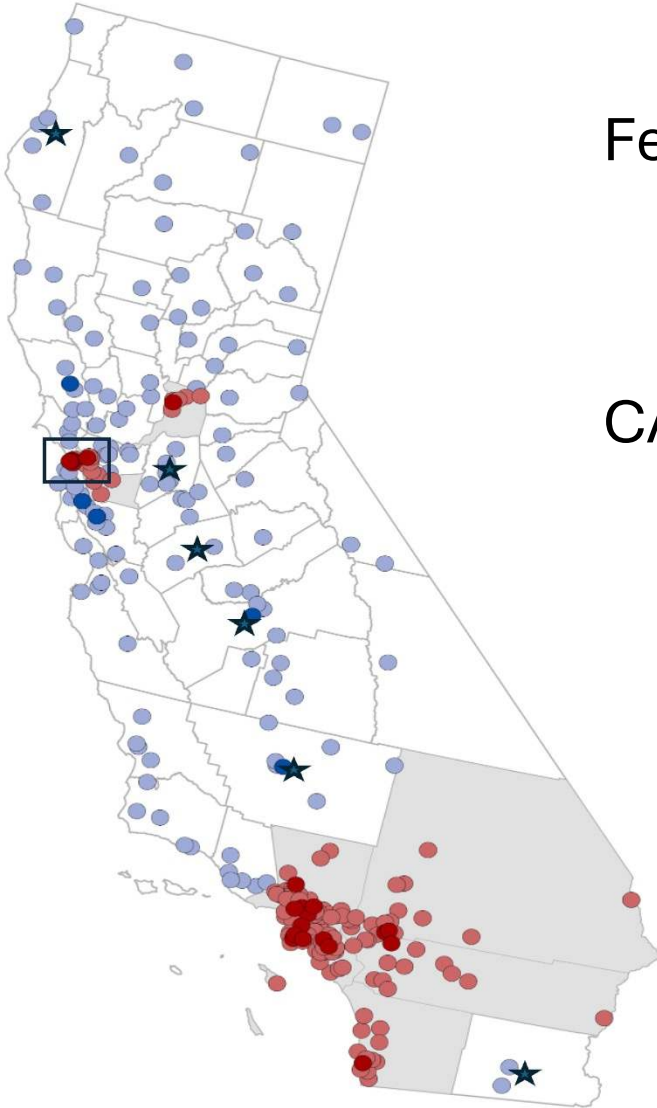
Federal – Ending HIV Epidemic (EHE)

- Focuses on 57 priority jurisdictions highlighted by the CDC, including **8 California counties**

CA – Emergency Department Screening Program (EDSP)

- Funds **28 EDs** spanning 13 California counties, targeting both urban and rural high-burden areas.

- EDs in priority counties
- EDs in non-priority counties
- CDC priority county with no EDSP EDs
- ★ Non-priority counties with EDSP EDs



Which strategy is most cost-effective?

Strategy	Screening sites
Status quo	Routine current practice only
EDSP	CA EDSP-supported EDs
CDC priority	EDs in CDC priority counties
Universal	All California EDs



Overview of analysis

Discrete-time microsimulation model of individuals presenting to the ED

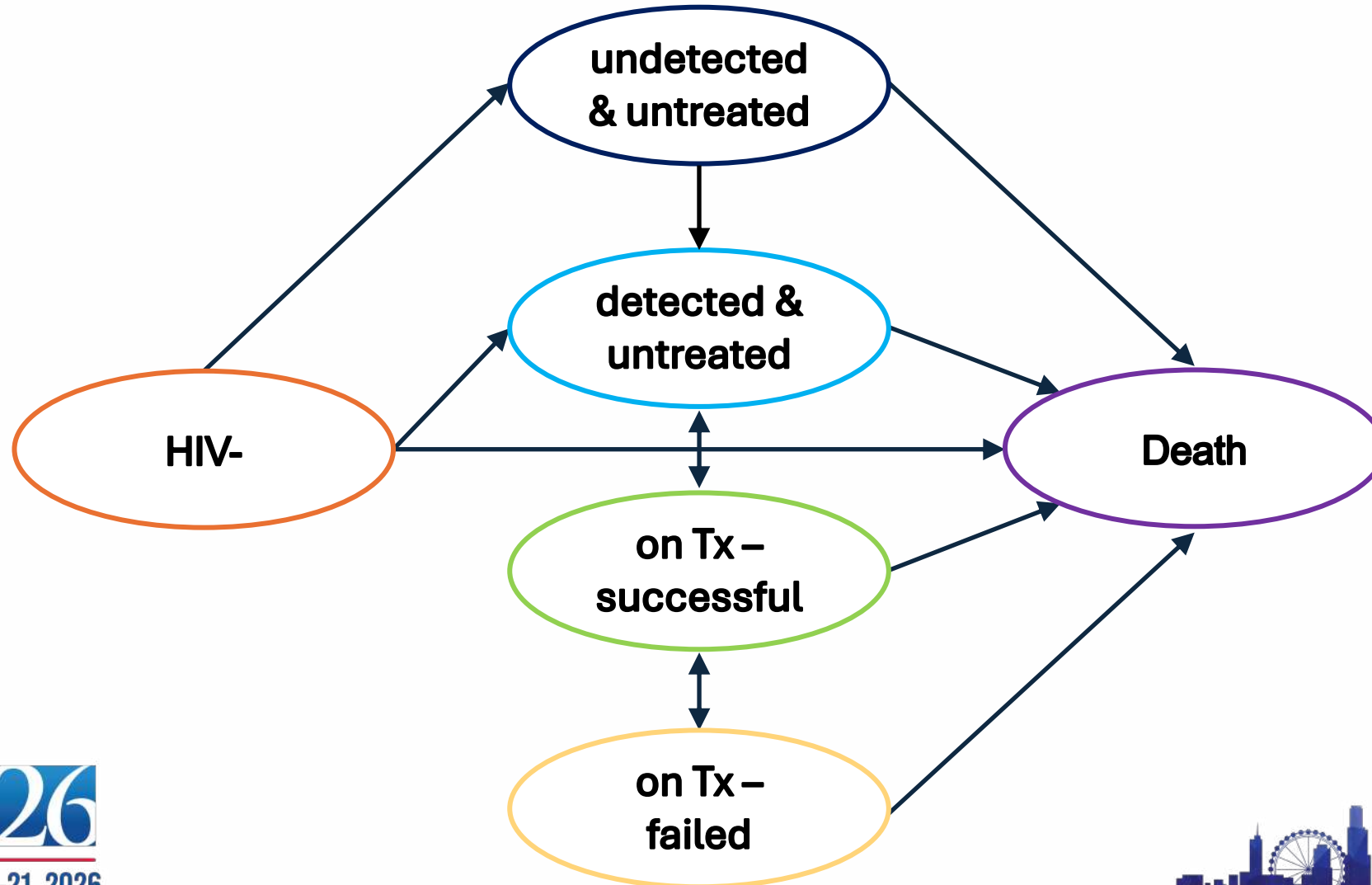
- Demographics: age, sex

Outcomes:

- Primary: Quality-adjusted life years (QALYs) and costs
- Secondary: total number of tests and test positivity rate



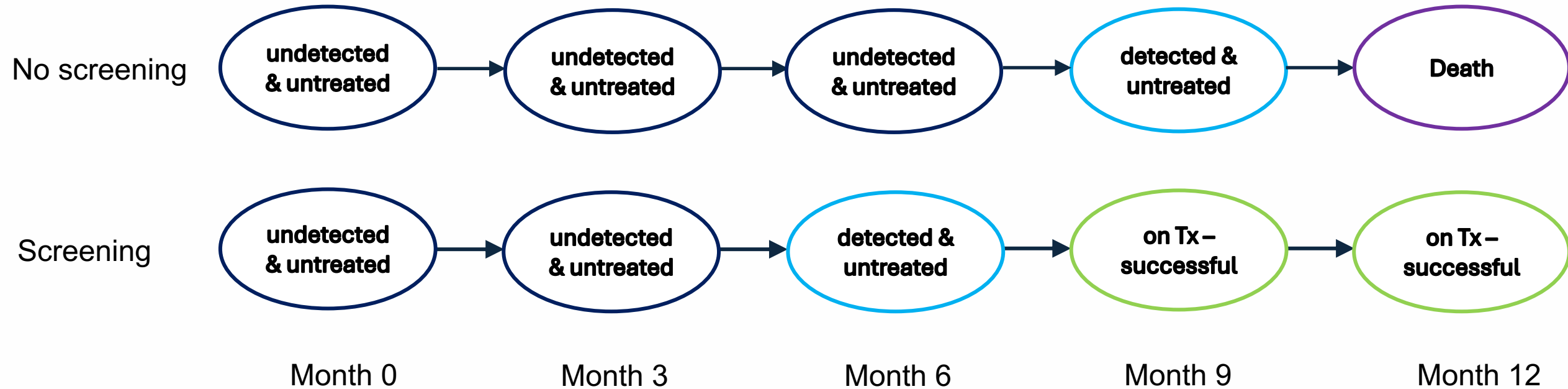
Model schematics



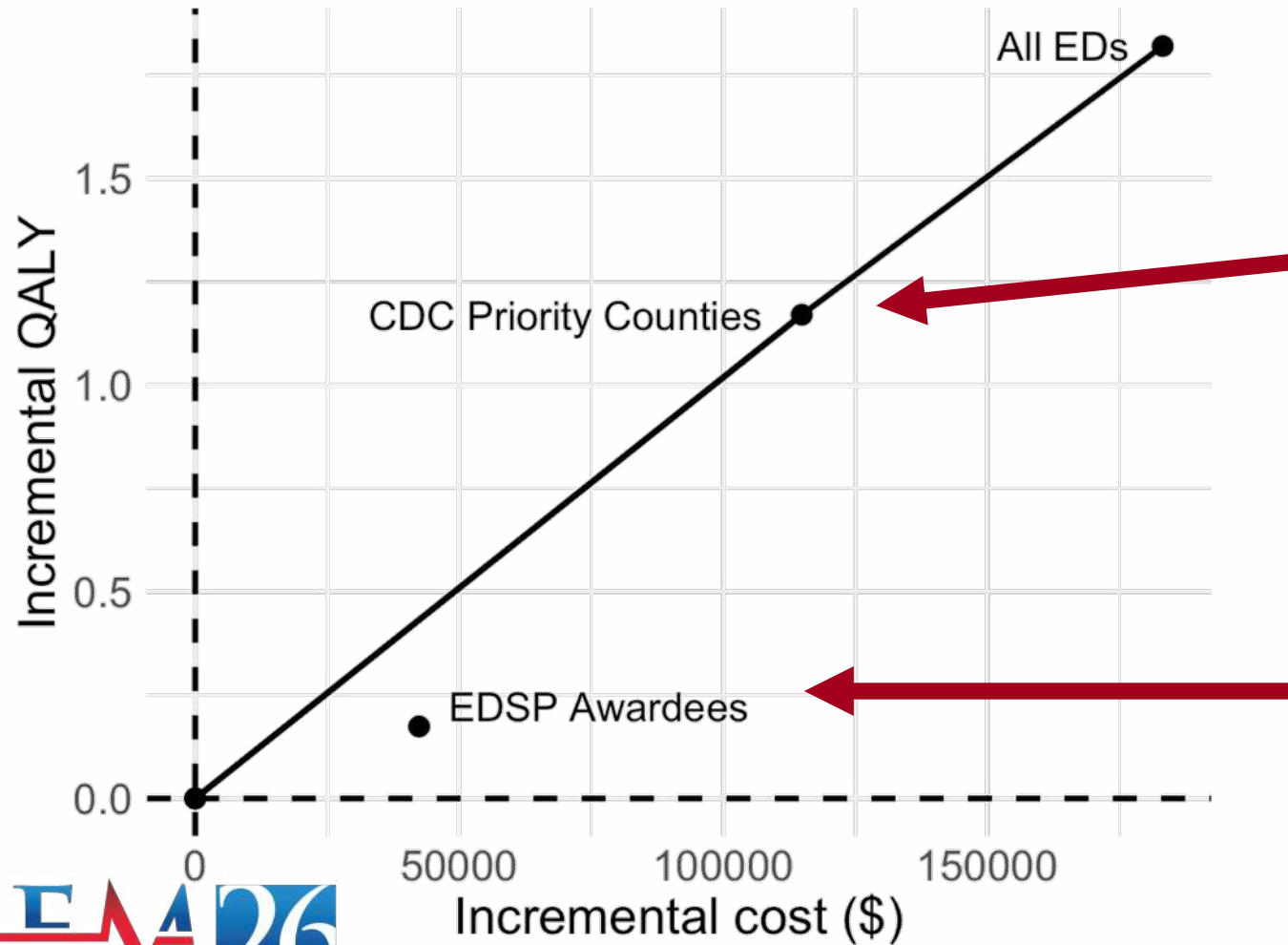
An example of an individual in simulation



Male, 35, HIV+



Main Results: Cost-effectiveness

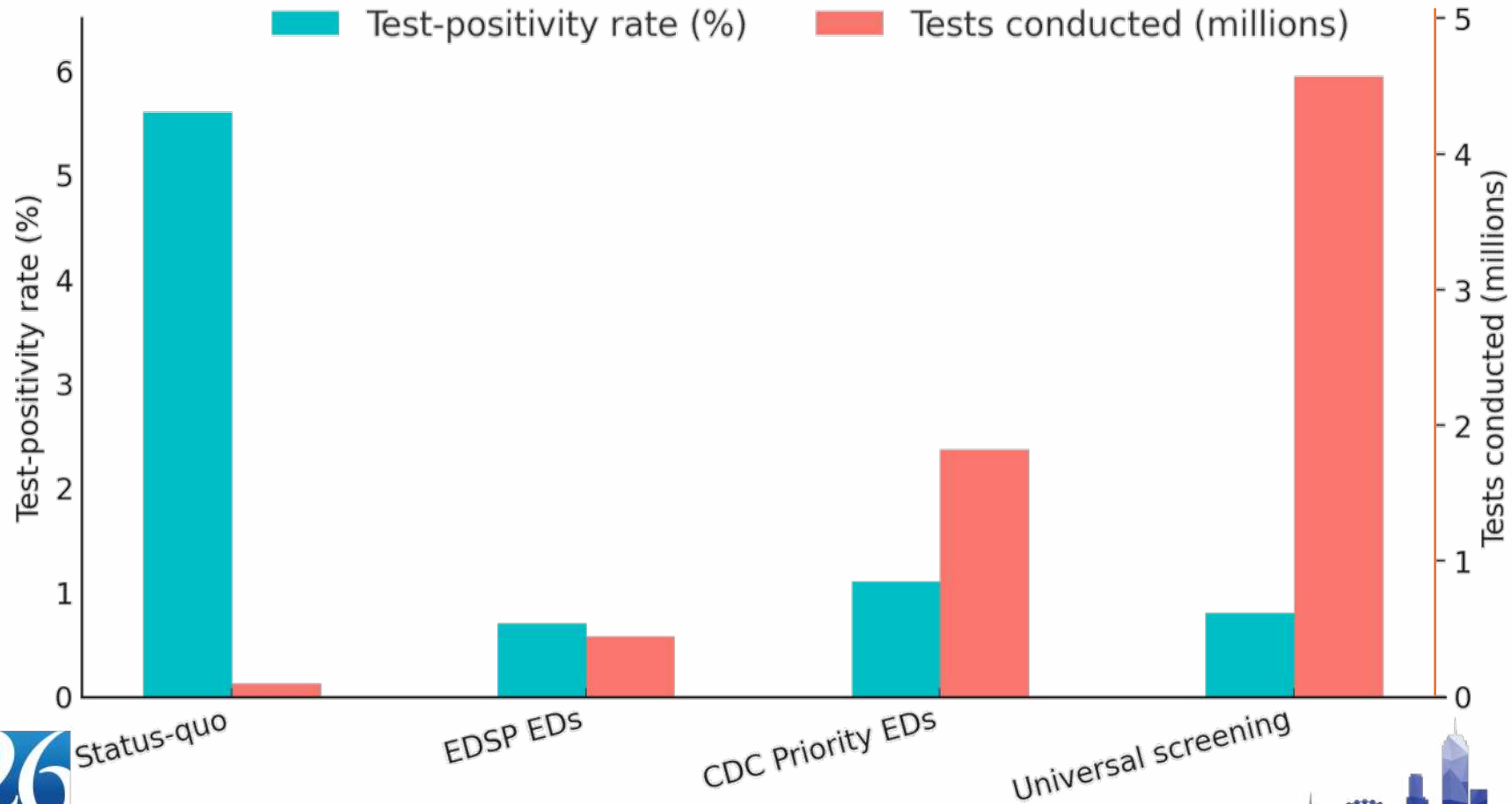


At roughly \$98,000 per QALY, screening in CDC priority jurisdictions appears cost-effective under conventional U.S. thresholds.

Screening in EDSP is least preferred strategy.



Tradeoff between reach and efficiency



Limitations / Next steps

We did not model:



ED-specific HIV prevalence (we used county-level prevalence as a proxy)



Heterogeneity in HIV risk across patient subgroups presenting to the ED



Cases averted by earlier diagnosis



Conclusions and Implications

Findings: Screening in EDs under CDC priority counties may be more efficient than the EDSP approach or universal screening.

Discussion: What would make targeted HIV screening in priority-county EDs feasible in routine practice?



Collaborators



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Thank you for listening!

Questions or comments?

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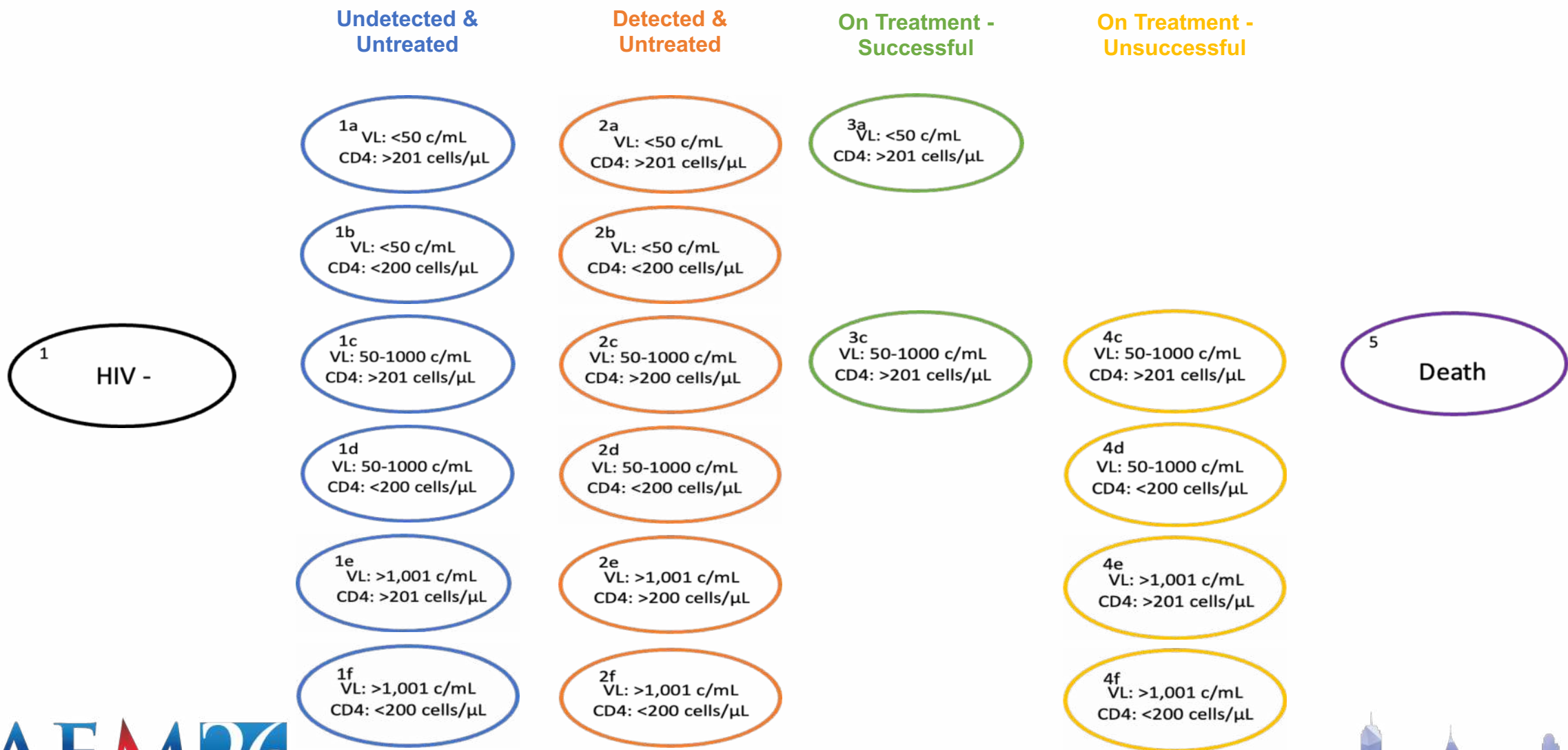
Appendix



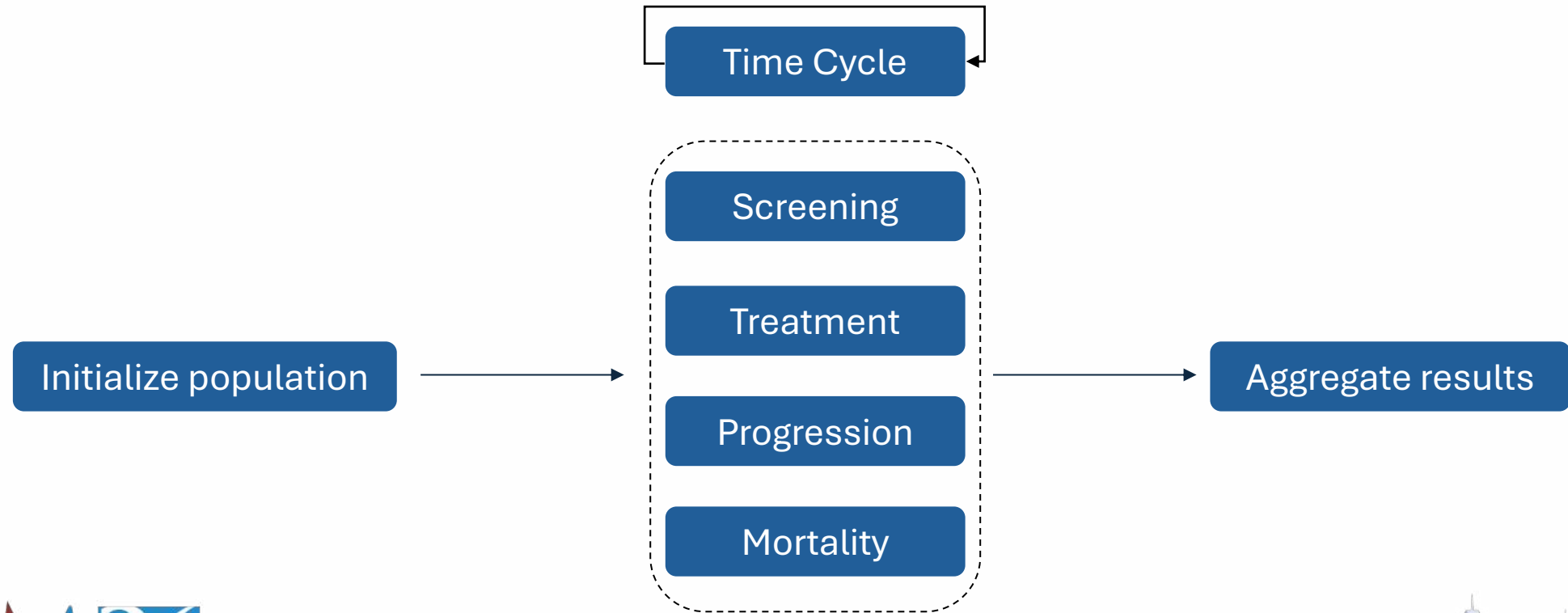
Health State Definitions

State	CD4	Viral Load	
A	>201	<50	Asymptomatic HIV
B	<200	<50	AIDS
C	>201	50-1000	Symptomatic HIV
D	<200	50-1000	AIDS
E	>201	>1001	Symptomatic HIV
F	<200	>1000	AIDS





Microsimulation



Main Parameters

Parameter	Value	Range
HIV prevalence (%)	0.14 - 1.52	[0.12, 0.16] – [1.44, 1.59]
HIV care costs, annual, by HIV severity (\$, 2024 USD)	18,900 – 61,400	[16,800, 21000] – [56,500, 66,300]
HIV utility values, by HIV severity	0.72 - 0.96	[0.66, 0.78] - [0.92, 1.00]
Mortalities (HIV-, HIV+, VL unsuppressed) , 3-month probability (%)	age-, sex-specific	-
Background testing rate, 3-monthly rate (%)	2.5	[1.4, 3.6]
Linkage to care (%)	82	[60, 95]
Retention in care, 5 years (%)	58	[49, 66]
Probability suppressed on treatment (%)	66	[64, 68]
Probability of late failure on treatment, over 6 years (%)	10.1	[8.9, 11.2]

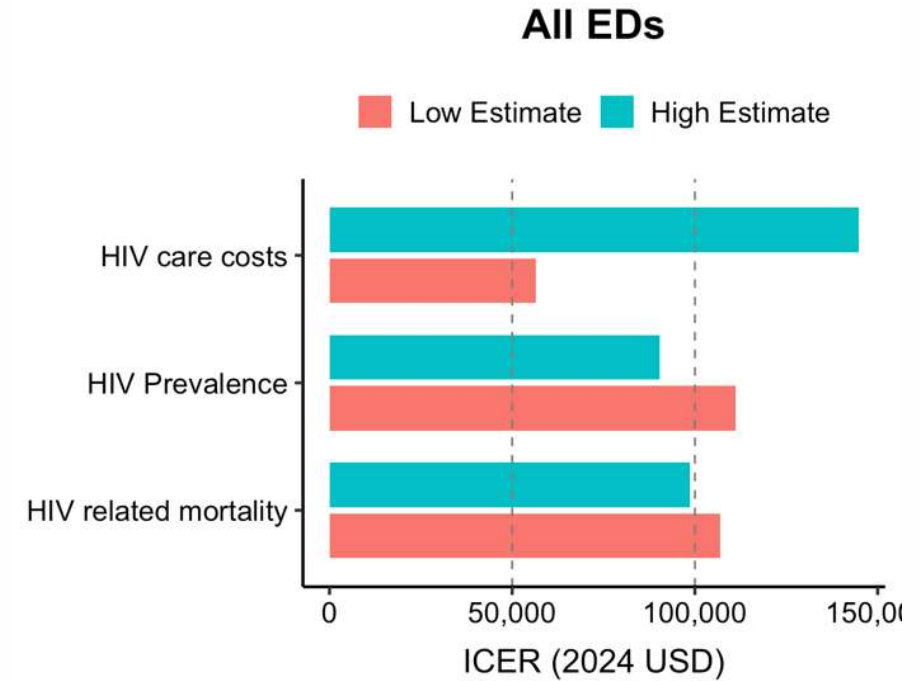
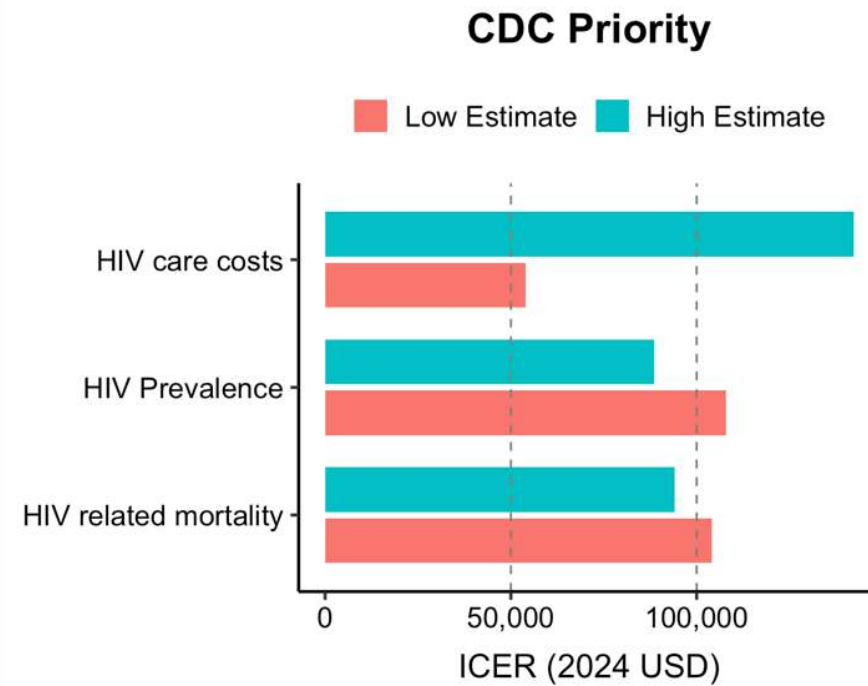


Incremental Cost-effectiveness Ratio

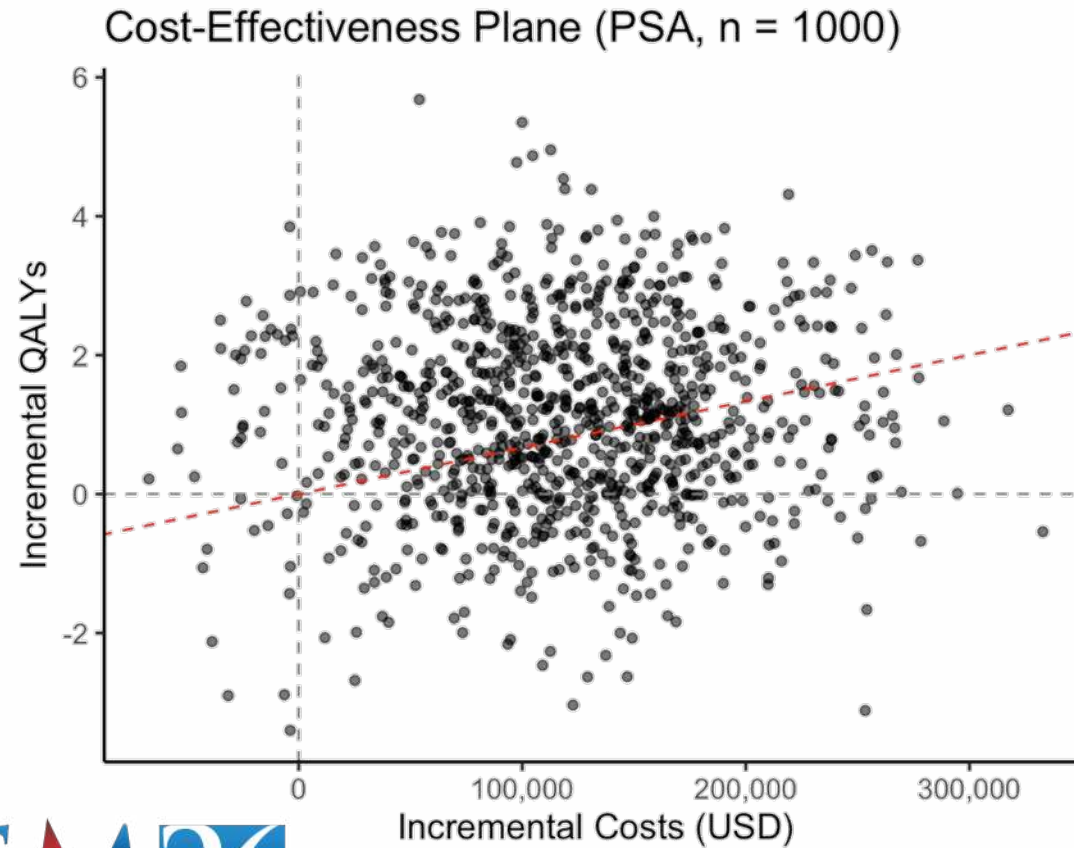
Strategy	Costs	QALYs	Δ in Costs	Δ in QALYs	ICER
Status quo	414,363	9.757			
EDSP Awardees	432,302	9.931	17,939	0.174	103,144
CDC Priority	529,215	10.927	96,913	0.996	97,302
All EDs	597,547	11.577	68,332	0.649	105,288



One-way Sensitivity Analysis



Probabilistic Sensitivity Analysis



51.8 % of simulations fell below the
\$100,000/ QALY gained threshold;

63.1 % fell below the \$150,000/ QALY
gained threshold.

