What models can tell us about ending the opioid crisis

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Why use simulation?

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- NIH HEAL initiative defines a goal of reducing opioid overdose by 40%.
- It is not entirely clear what it would take to reach that ambitious goal.
- Simulation modeling is a powerful tool that allows us to integrate data to project scenarios and counterfactuals
- Models allow us to ask "What if…"
- Models allow us to experiment with an alternate world.

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How do models work?

How do models work?

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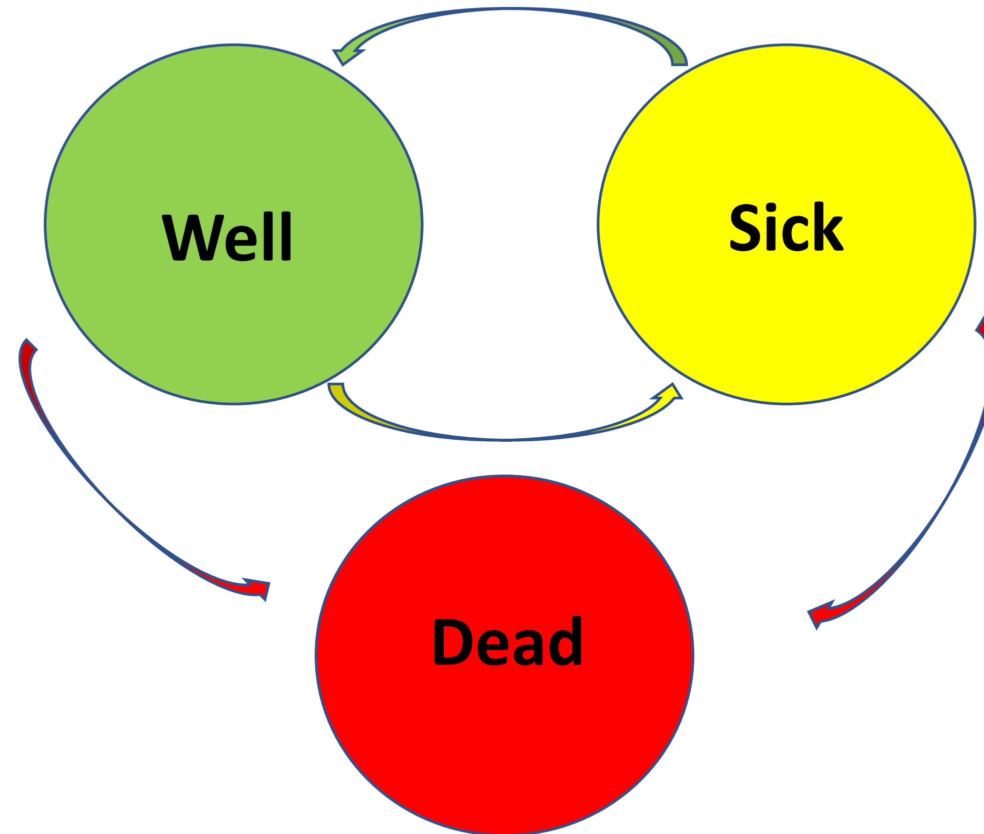

RESPOND Model

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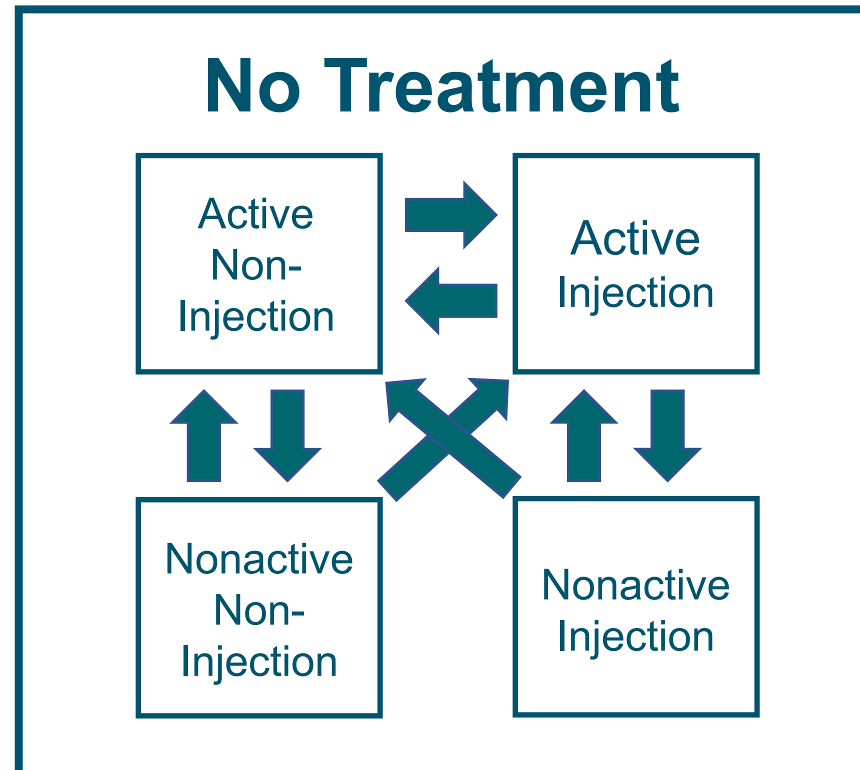

RESPOND Model

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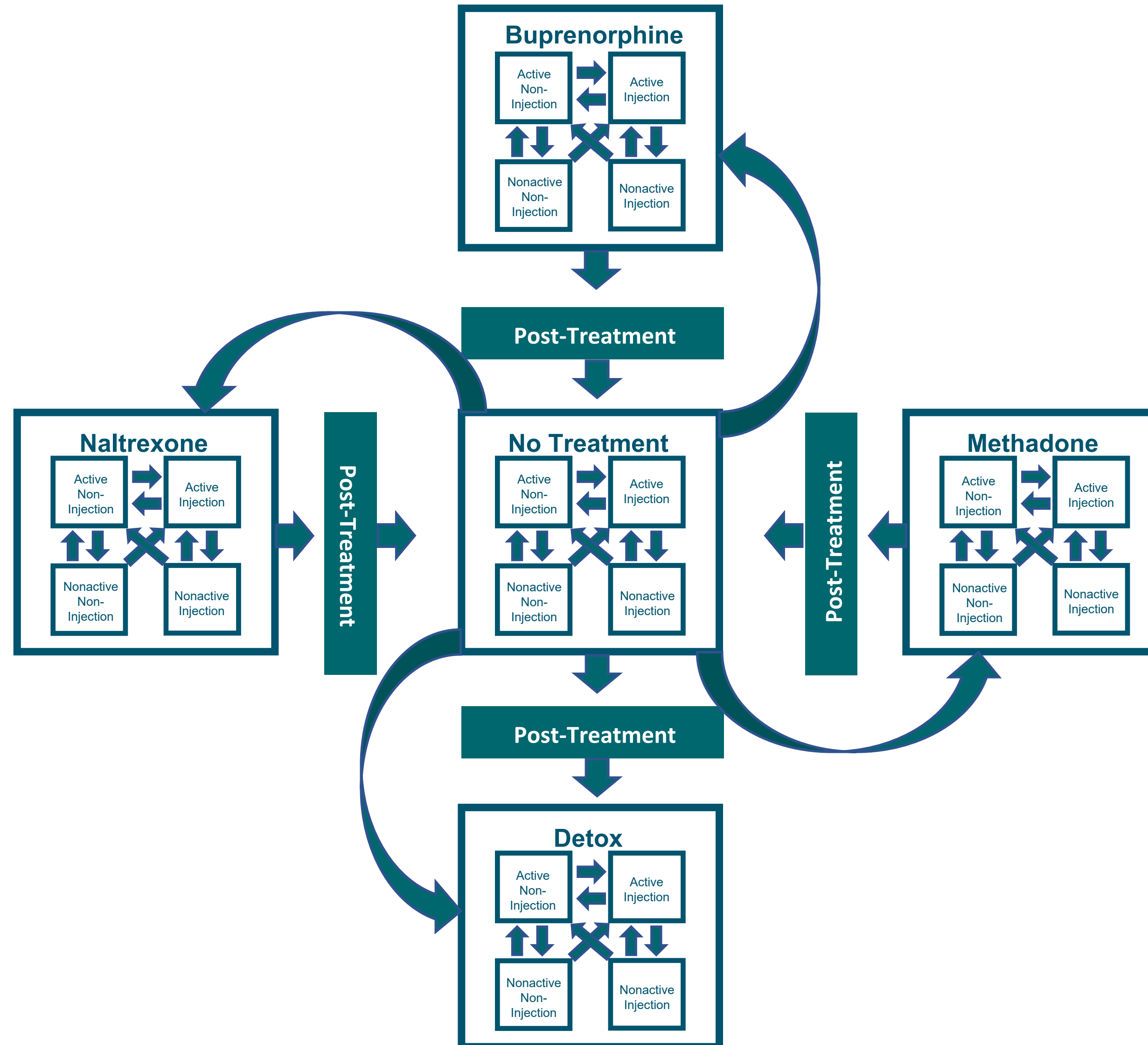

What would it take?

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JAMA Network | Open

Original Investigation | Substance Use and Addiction

Projected Estimates of Opioid Mortality After Community-Level Interventions

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Approach

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Use model to simulate 3 tools to end the crisis:

1. Initiate more people on MOUD
2. Improve retention on MOUD
3. Distribute more naloxone

Experiment with different community types

1. Rural vs. Urban
2. Different degrees of existing infrastructure

What would it take to get to 40%

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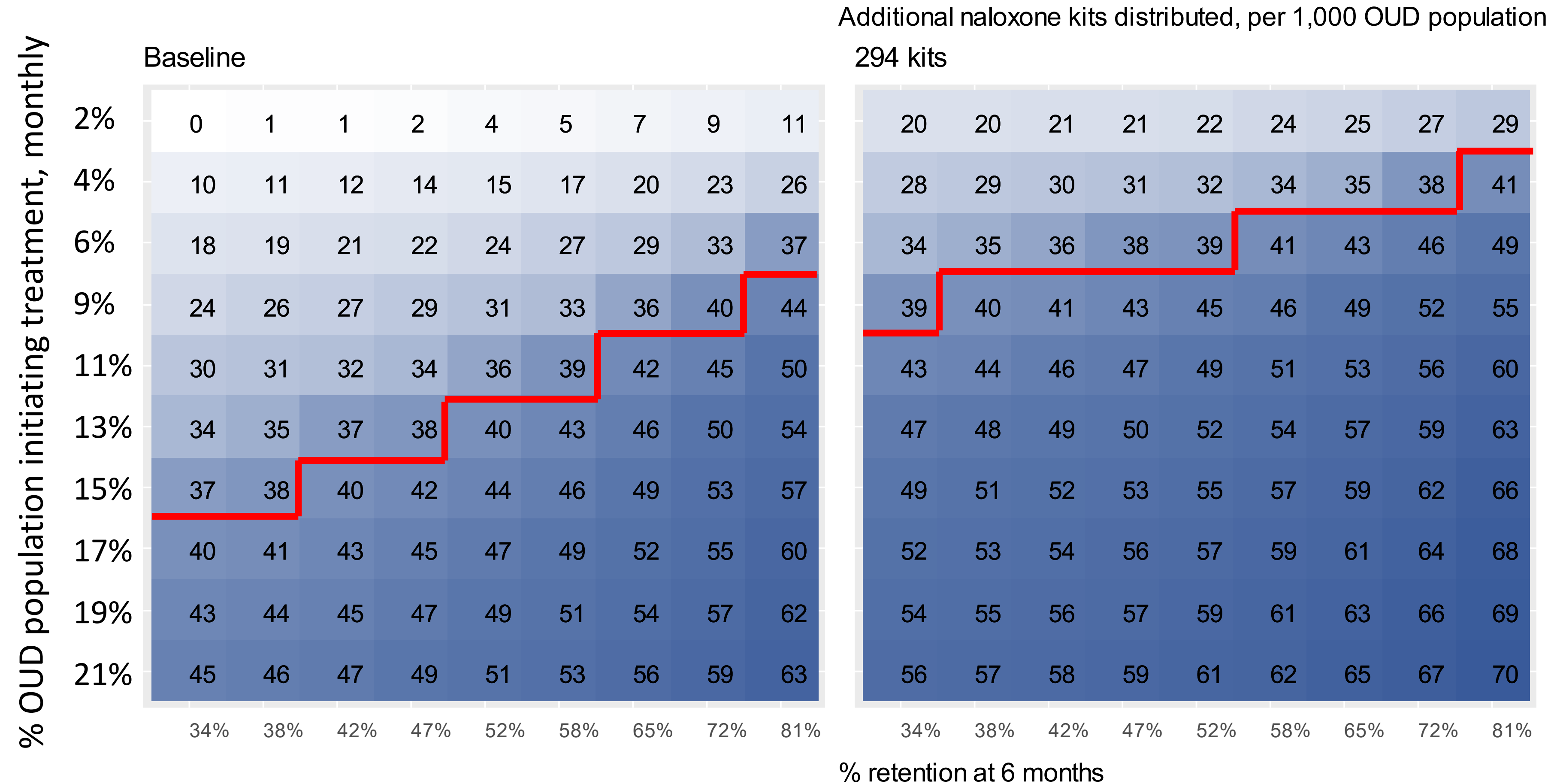

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What we learned

1. There is no single intervention that can end the crisis.
2. Naloxone is necessary, but not sufficient to end the crisis
3. Retention in care is critical to the effort

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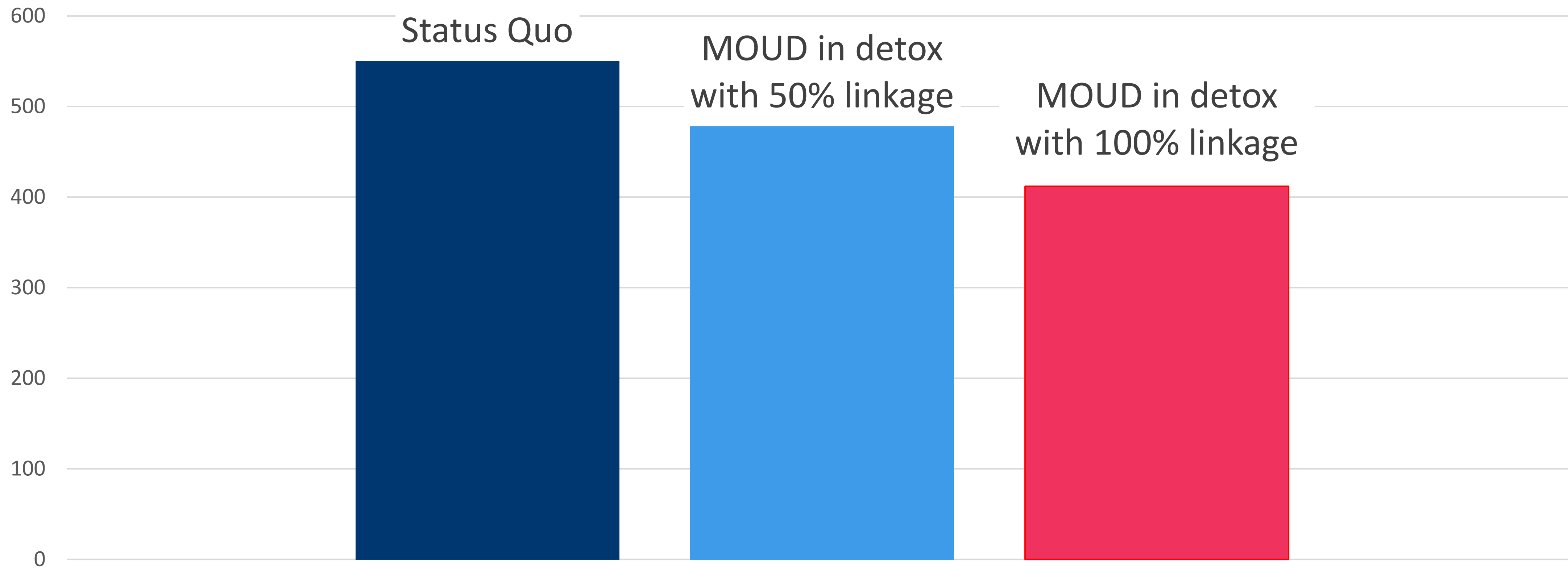
We need to identify venues to expand initiation AND improve retention on MOUD.

Acute Detox?

- Over 600,000 acute detox admissions annually in U.S.
- Only a small minority of detox programs initiate MOUD.
- The period immediately following detox is dangerous.
- What would the world look like if we used detox as a venue for MOUD?

Overdoses among 40,000 detox patients 12-month follow-up



Reduction in drug overdose death in MA, ten-year follow-up

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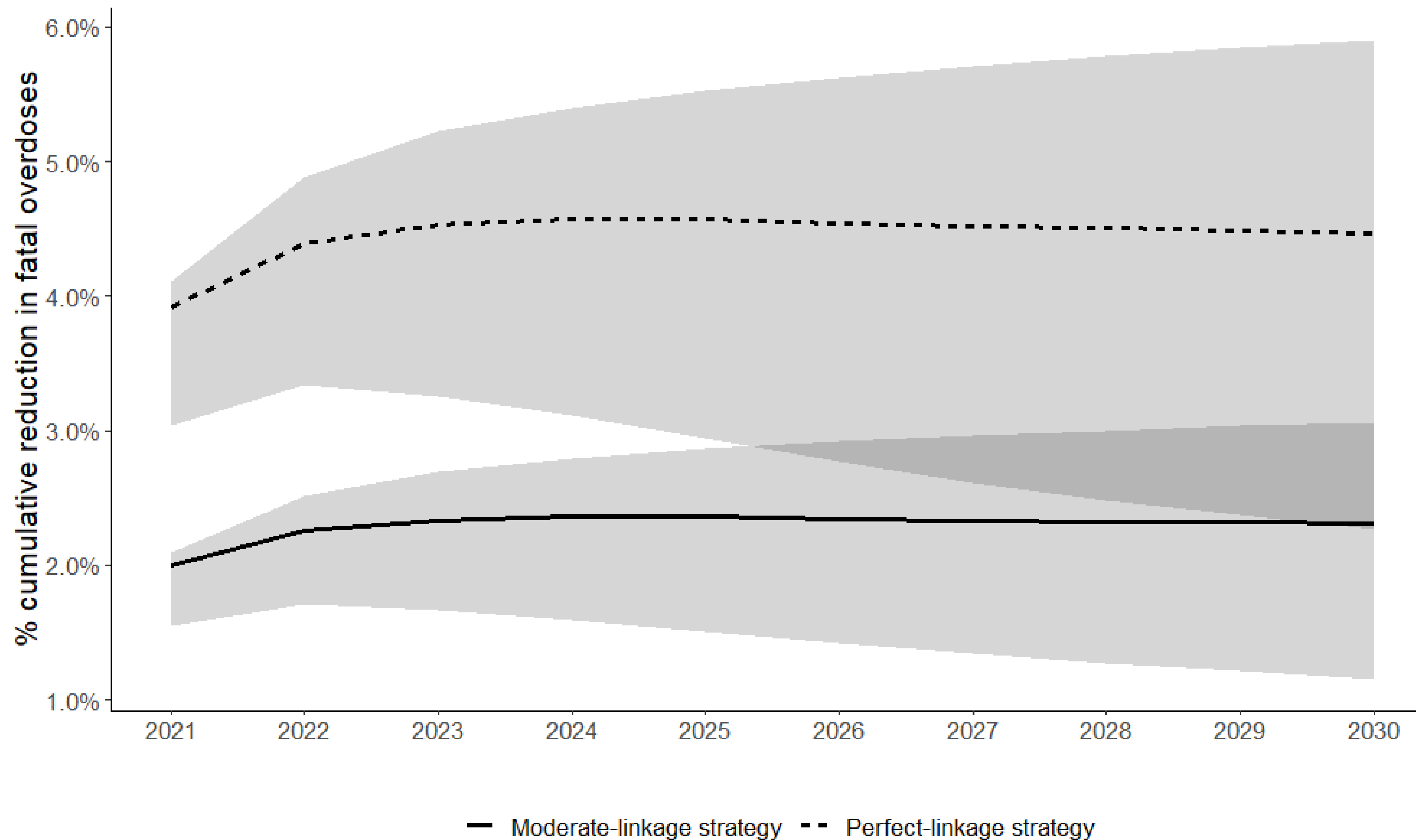

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There is no single intervention to end the opioid crisis.

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What about SSPs?

- Syringe Service Programs serve active injection drug users
- Among the highest risk population
- Semi-clinical environment that could be a platform for care
- Few SSP offer MOUD now

Overdose deaths

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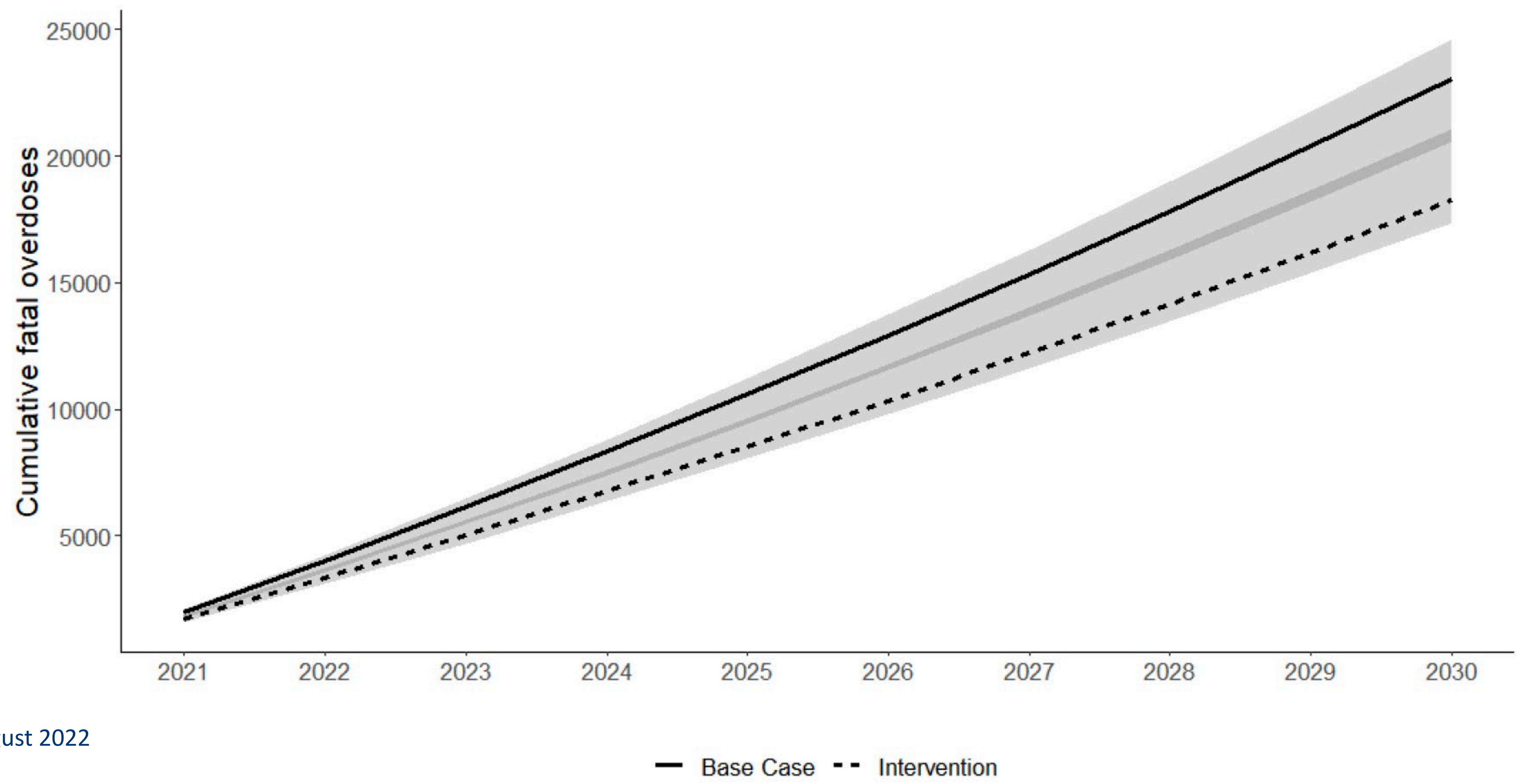
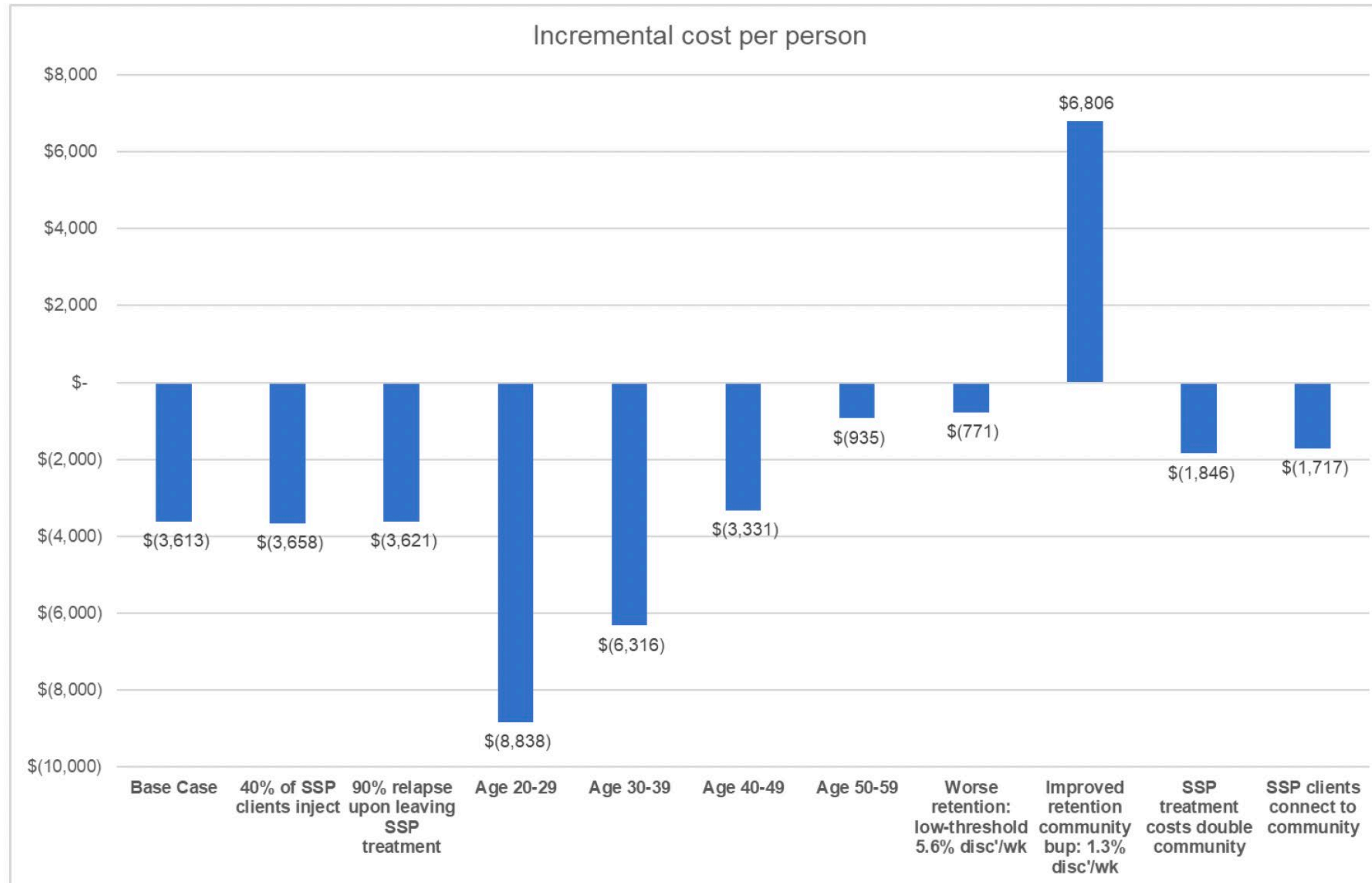
Figure 4. Cumulative fatal overdoses from 2020 to 2030 within probabilistic sensitivity analyses comparing the status quo scenario (i.e., no low-threshold treatment out of SSPs) to the base intervention scenario.



Cost savings

Figure 2. Incremental cost per person compared to the status quo scenario for selected sensitivity analyses.



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What we learned

1. Syringe service programs are uniquely well positioned to address the overdose crisis
2. Leveraging syringe services to provide treatment services as well could actually SAVE money!
3. Retention is critical and central to the advantage SSP offers

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- Residential drug treatment programs
- Emergency Departments
- Correctional Settings
- Mobile vans
- Where else?

Where else can we go with MOUD?

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Summary

- Simulation models are a powerful tool to characterize a world without an OUD crisis.
- There is no single solution to the crisis, we need all available tools.
- Expanding the reach of MOUD is essential.
- Initiation is only half the task (if that) RETENTION in care drives many outcomes.
- The economics are on our side, but the cost of stigma is high