

The impact of syringe services program closure on the risk of rebound HIV outbreaks among people who inject drugs: A modeling study

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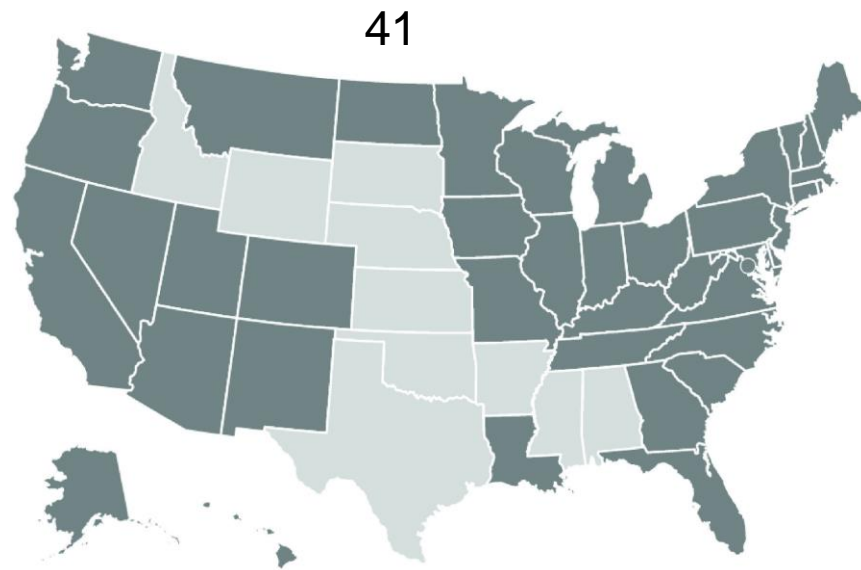
INHSU2021 - Oct 13, 2021



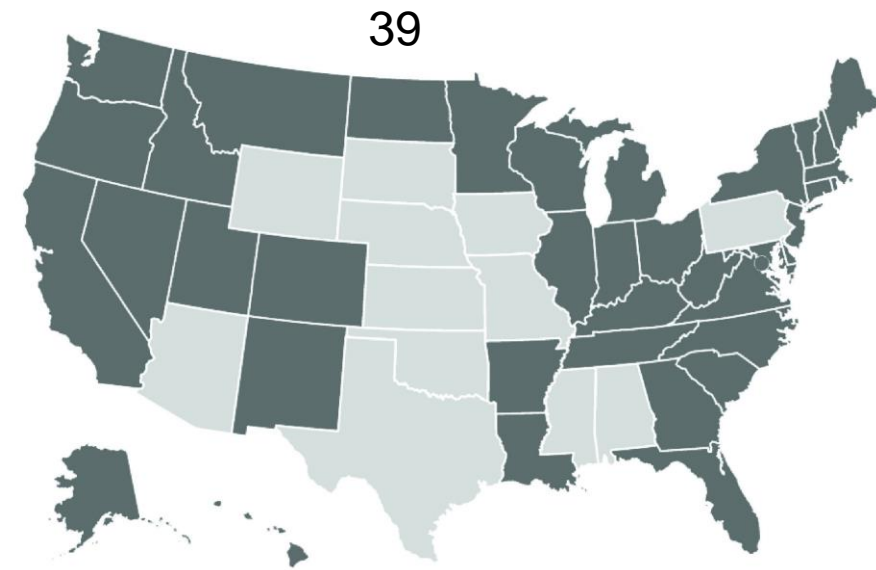
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Introduction – Syringe Services Programs (SSPs) in the US

US states that have syringe services programs (SSPs) and state-level laws that explicitly authorize or are consistent with the legal operation of SSPs, August 1, 2019



● States where SSPs are operating



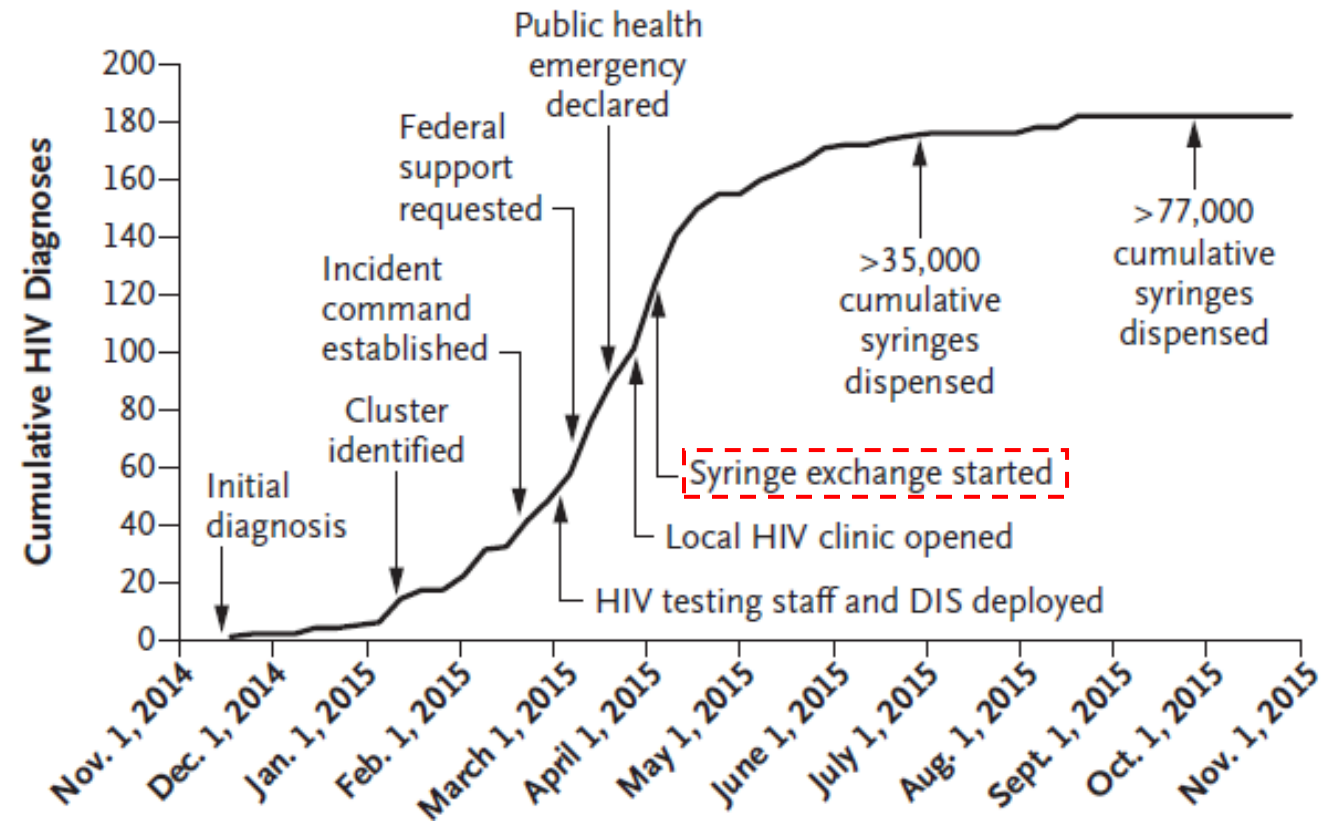
● States where laws explicitly authorize or are consistent with the legal operation of SSPs

Source: Fernández-Viña, Marcelo H., et al. "State laws governing syringe services programs and participant syringe possession, 2014-2019." *Public Health Reports* 135.1_suppl (2020): 128S-137S.

Introduction - SSP in Scott County, Indiana



- HIV outbreak in Scott County in 2015
- Incidence rate over 50 times that of the national average
- The state's 1st SSP authorized to operate in April, 2015



Source: https://www.wdrb.com/news/eight-more-cases-of-hiv-confirmed-in-scott-county-indiana/article_683031b0-02cb-5273-8f10-2d3cbca503c6.html

Peters, Philip J., et al. "HIV infection linked to injection use of oxymorphone in Indiana, 2014–2015." *New England Journal of Medicine* 375.3 (2016): 229-239.

Study Question and Objectives



Study question

The operation of SSP is subject to:

- Two-year sunset clause
- A lack of social and political support
- Impact of COVID-19 pandemic

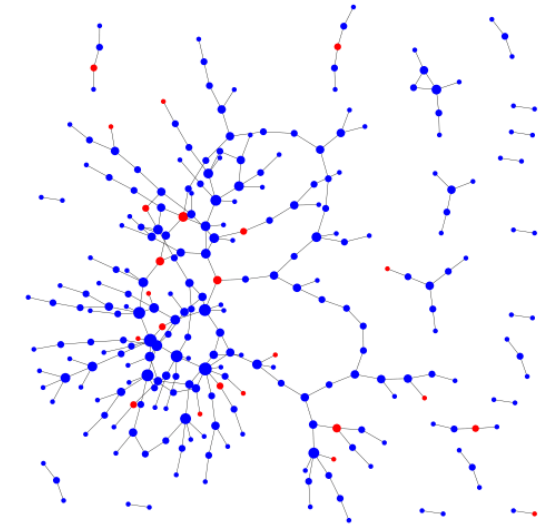
Objectives

To examine:

- The impact of the permanent or temporary closure of SSP
- To what extent there could be a rebound outbreak of HIV

Agent-based Model (ABM)

- A stochastic, individual-based modeling approach
- Simulate the behaviors and interactions of individuals within networks to determine population-level outcomes
- **TITAN** (Treatment of Infection and Transmission in Agent-Based Networks), a previously published ABM, was adapted and extended
- Transmission networks (PWID, non-PWID)
 - Syringe sharing
 - Sexual contact



Modeling Scenarios (2020-2025)

Persistent operation

- Persist: 2021-2025
- At current service levels: reaching 237 PWID a year

Permanent closure

- Fully suspended: 2021-2025

Delayed closure

- Extension for an additional two year: 2021-2022
- Closure in the remaining period: 2023-2025

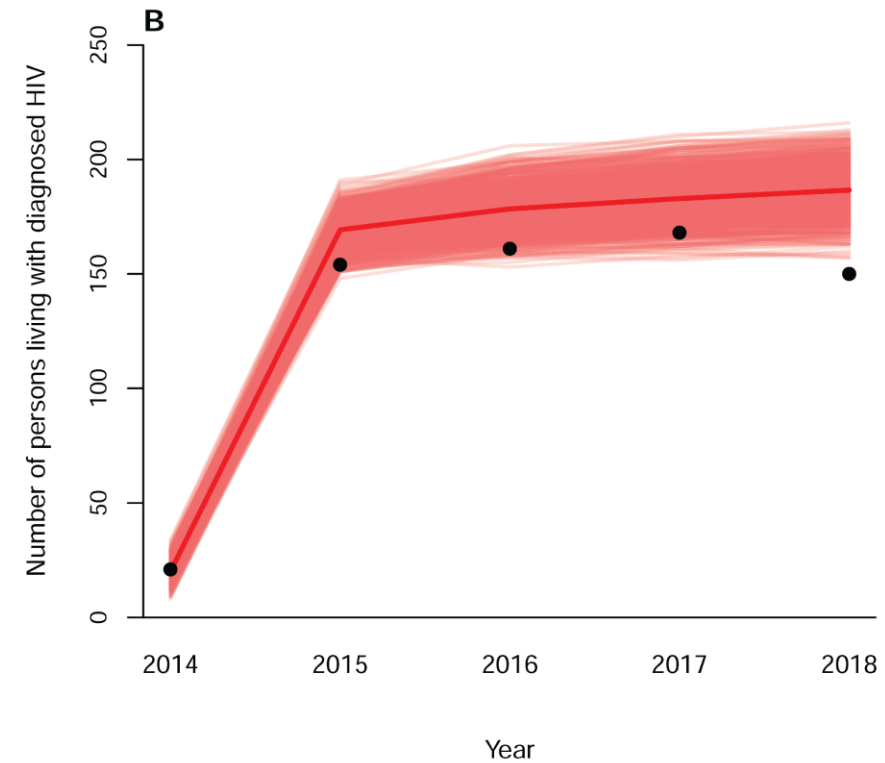
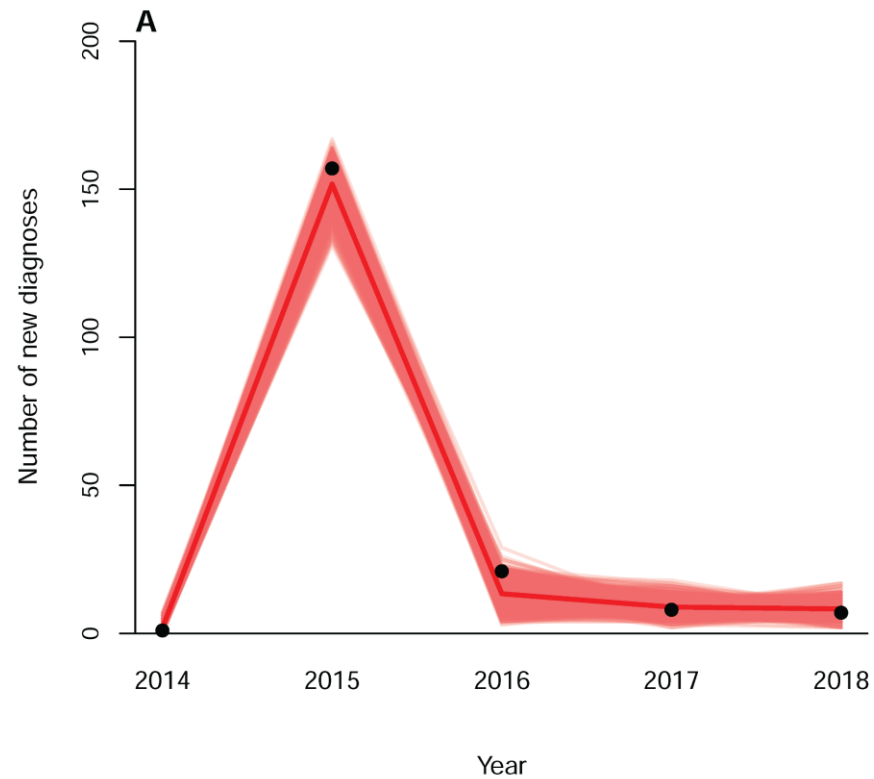
Temporary closure

- Impact of COVID-19
- Temporary service interruption: Apr 2020 - Mar 2021
- Return to pre-interruption levels after Apr 2021

Results - Calibration

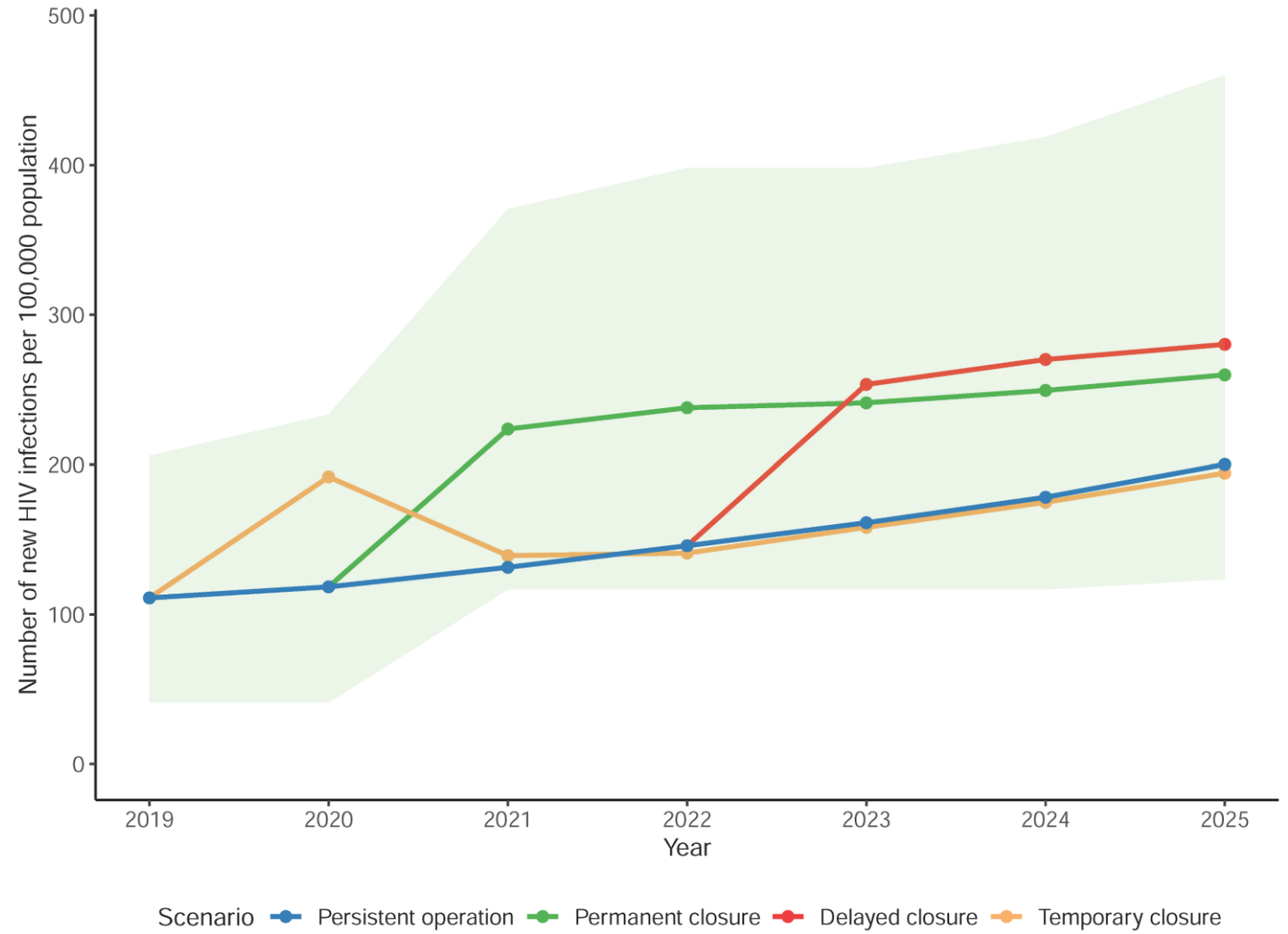
Calibration **targets** (2015-2018):

- Annual number of new HIV diagnoses
- Number of persons living with diagnosed HIV



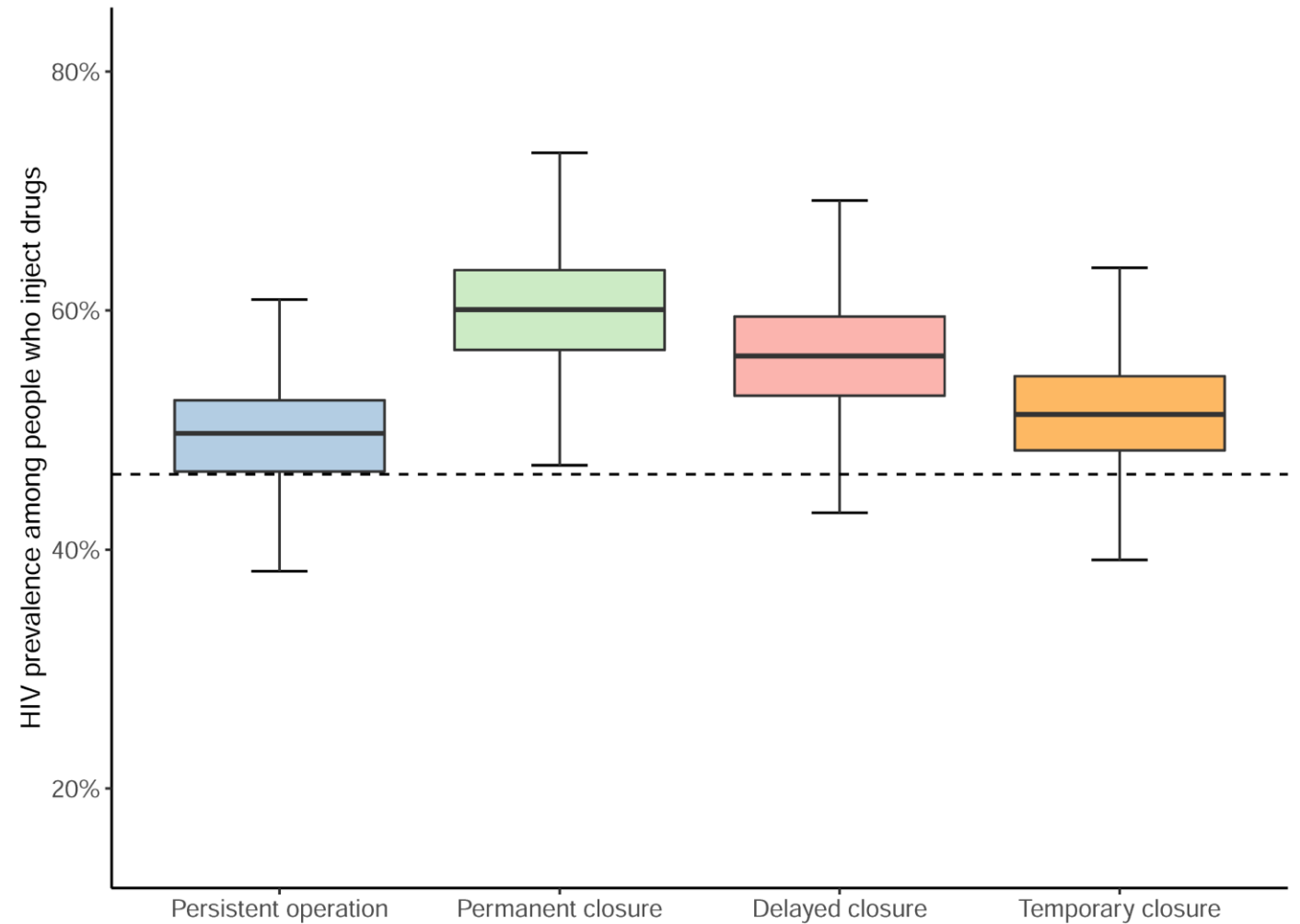
Results – Number of New HIV Infections

- Permanent
 - Up by 57.7% during 2021-2025
- Delayed
 - Up by 37.9% during 2021-2025
- Temporary
 - 12 (33%) more infections during 2020-2021



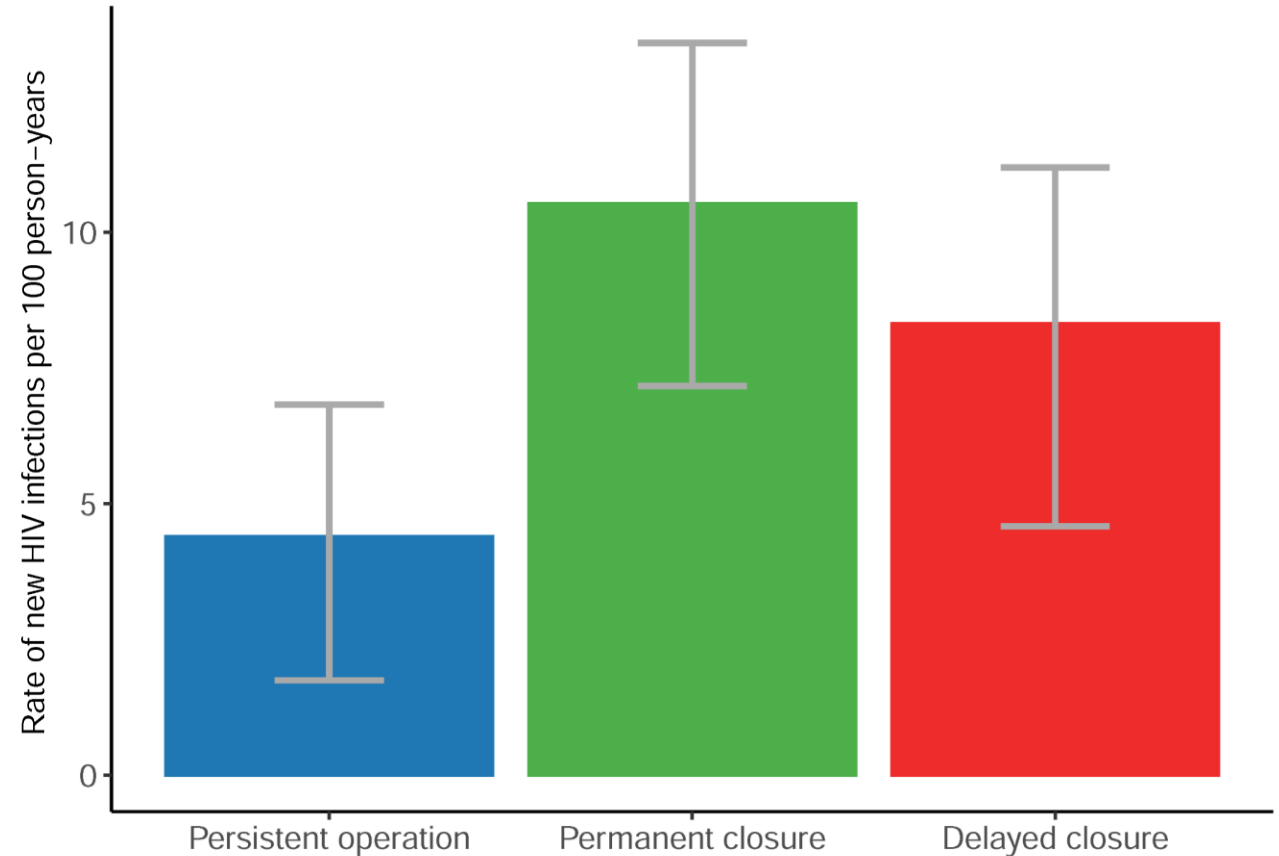
Results – HIV Prevalence among PWID in 2025

- Persistent
 - 49.7% [41.4% - 58.8%]
- Permanent
 - 60% [50.5%-68.9%]
- Delayed
 - 56.1% [47% - 65.5%]



Sensitivity Analysis on Reduced HIV Prevalence by 85%

- Among PWID
- Permanent closure
 - 166.9% more HIV infections
 - 139.7% higher incidence rate per 100 person-years
- Delayed closure
 - 103.2% more HIV infections
 - 89.2% higher incidence rate per 100 person-years



Conclusions

- Temporary interruption and permanent closure of existing SSPs operating in rural US may lead to “rebound” HIV outbreaks among PWID
- To maintain control of the HIV epidemic, it will be necessary to sustain existing or implement new SSPs in combination with other prevention interventions
- It will be necessary to overcome all the social and structural barriers in the US

Acknowledgements

Co-authors

- Williams C. GOEDEL, PhD
- S. E. BESSEY, MS
- Mark N. LURIE, PhD
- Sandro GALEA, PhD
- Alison P. GALVANI, PhD
- Samuel R. FRIEDMAN, PhD
- Bohdan NOSYK, PhD
- Brandon D.L. MARSHALL, PhD

People, Place & Health Collective

- **Brandon D.L. Marshall**
- Jeese Yedinak
- Williams C. GOEDEL
- Xiao Zang
- Maxwell Krieger
- S. E. Bessey
- Carolyn Park
- Jacqueline Goldman
- Seashore Li
- Tania Lobo Paz
- Abdullah Shhipar
- Roxxanne Newman
- Esther Moon

Disclosure

**Xiao Zang / Brown University School of Public Health
/ People, Place & Health Collective**

We have NOTHING to disclose or any conflicts of interest with the presented material in this presentation

Thank You

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