



## THE FLORIDA STATE UNIVERSITY COLLEGE OF MEDICINE



GRAND ROUNDS – FALL 2018

# The State Level Impact of SEP Laws on Disease Transmission

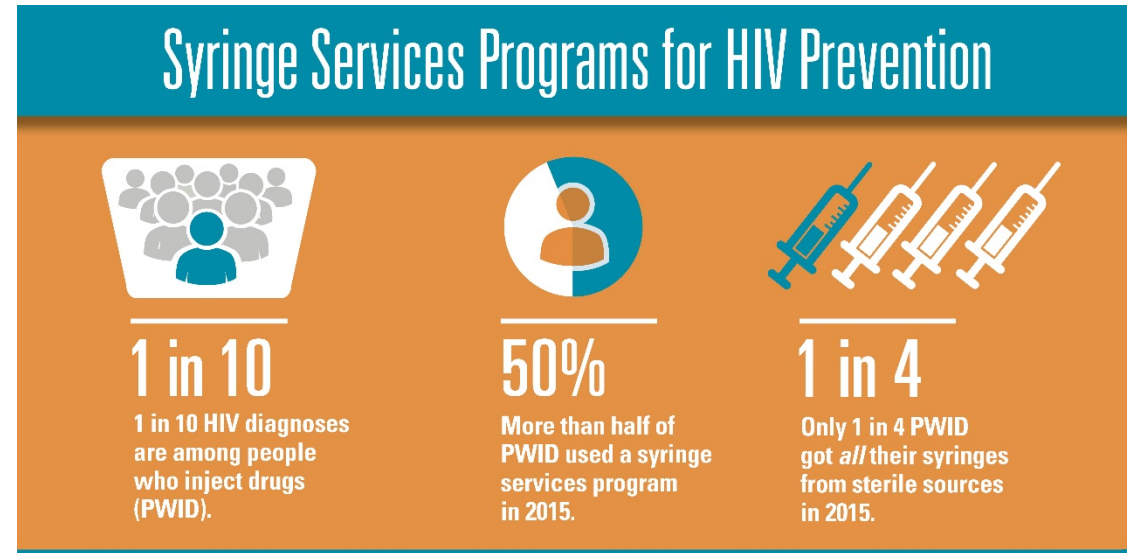
Ian Motie

Dr. Henry Carretta, PhD, MPH

Dr. Leslie Beitsch, MD, JD

# The Opioid Epidemic and SEPs

- The opioid epidemic and subsequent increased injection drug use has led to a disproportionate increase in viral disease transmission
- Syringe/needle exchange programs (SEP) allow people who inject drugs (PWID) to exchange their used needles for sterile devices, interrupting disease transmission



SOURCE: Vital Signs, December 2016

**Vital**<sup>CDC</sup>**signs**<sup>TM</sup>  
[www.cdc.gov/vitalsigns/hiv-drug-use](http://www.cdc.gov/vitalsigns/hiv-drug-use)



Infographic from Centers for Disease Control and Prevention

# Significance of SEP and SEP Laws



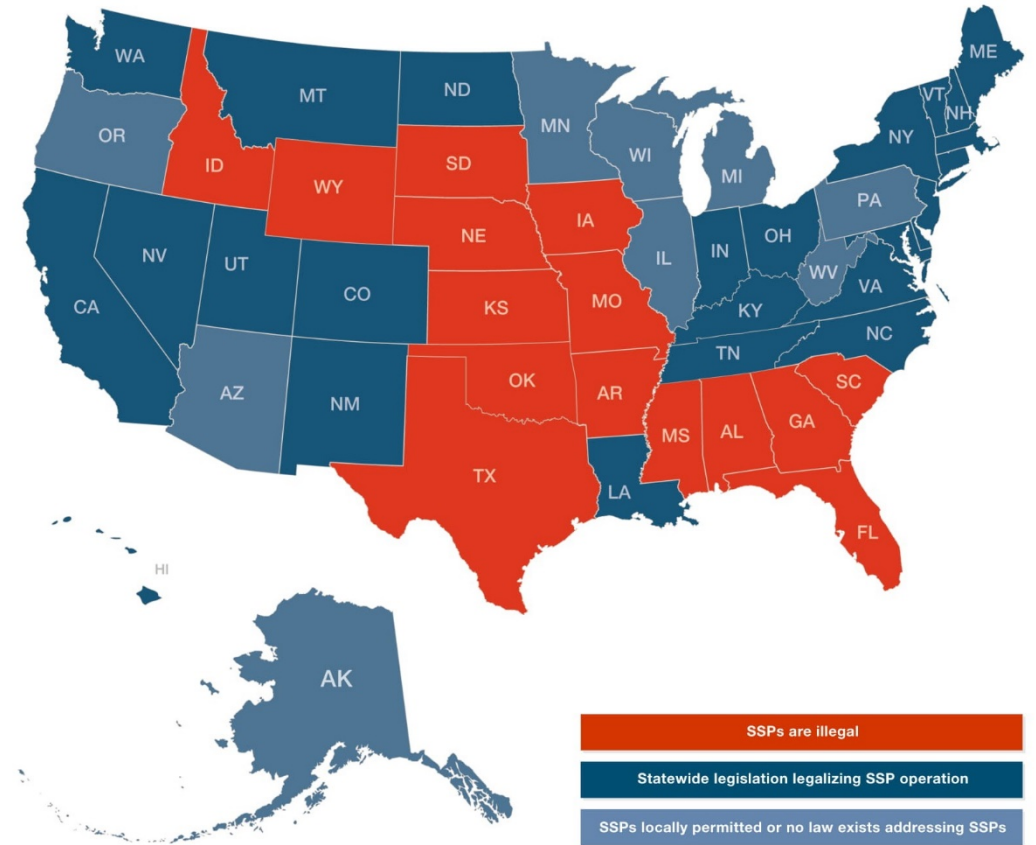
- Advocated by the World Health Organization and the CDC
- SEPs require state-level legislation in order to be enacted
- Some SEPs can operate via local laws or laws that decriminalize “drug paraphernalia”
- As of 2017, SEPs are illegal in 15 states

# Research Project

- Our goal: take advantage of natural experiment and investigate the effects of SEPs and the types of laws that enact them on the transmission of infectious diseases
  - Hepatitis B (HBV)
  - Hepatitis C (HCV)
  - HIV
- Our hypothesis: implementing state-level laws that legalize SEP will lead to a greater reduction in the rate of transmission of HBV, HCV, and HIV within those states compared to states without any laws

# SEP Legal Status of the States

- Reviewed and compiled statute data for all states and D.C. for years 1983-2016 via Lexis Nexis
  - Search terms: (syring\* OR needl\*) AND (exchang\* OR servic\*)
- Created three categories for legal status
  - 0 = SEP are illegal
  - 1 = SEP are locally permitted without statewide legislation OR syringes/needles are decriminalized
  - 2 = SEP are legalized by state-wide legislation
- Example: Washington was 0 for 1983-1987, 1 for 1988-2001, and 2 for 2002-2016



Map created by the American Foundation for AIDS Research

# Infectious Disease Transmission Data

- Gathered using publicly available de-identified data via online databases/archives from the CDC
- HBV and HCV: diagnostic data acquired for years 1983-2016 using annual Mortality Morbidity Weekly Reports
  - HCV referred to as “Hepatitis, non-A, non-B” prior to 1994
- HIV: diagnostic data acquired for years 2008-2016 using AtlasPlus platform
  - Data specific to transmission via injection drug use

# Conducting the Study

- Diagnostic and statute data placed together in analysis tables for each disease studied
- The analysis for each disease used a conditional state fixed effects negative binomial model to examine the relationship between the number of transmission events by state and year, while controlling for state population estimates and type of SEP law

# Results

Disease Transmission and Type of SEP Laws				
SEP Law Status	Exposure*	Mean Transmission Rates in State Population per 100,000 Residents	p-value	95% Exact Poisson Confidence Limits
Hepatitis B 1983-2016				
Illegal	1,246 state-years	120.67	Ref	120.25 - 121.09
Local law or decriminalized	212 state-years	35.39	0.000	35.04 - 35.75
Legalized state-wide	276 state-years	23.04	0.000	22.77 - 23.31
Hepatitis C 1993-2016				
Illegal	393 state-years	12.18	Ref	12.04 – 12.33
Local law or decriminalized	197 state-years	11.13	0.000	10.93 – 11.33
Legalized state-wide	268 state-years	7.54	0.000	7.38 – 7.69
HIV PWID** 2009-2016				
Illegal	231 state-years	6.85	Ref	6.72 – 6.98
Local law or decriminalized	95 state-years	5.63	0.000	5.46 – 5.80
Legalized state-wide	133 state-years	9.32	0.000	9.21 – 9.55

\* state-years = number of states in category x number of years observed for each state

\*\*Observing transmission rates of HIV among individuals who use injection drugs

# HBV Transmission and Type of SEP Laws

SEP Law Status	Exposure*	Mean Transmission Rates in State Population per 100,000 Residents	P-value	95% Exact Poisson Confidence Limits
Illegal	1,246 state-years	120.67	Ref.	120.25 - 121.09
Local law or decriminalized	212 state-years	35.39	0.000	35.04 - 35.75
Legalized state-wide	276 state-years	23.04	0.000	22.77 – 23.31

\* state-years = number of states in category x number of years observed for each state

# HCV Transmission and Type of SEP Laws

SEP Law Status	Exposure*	Mean Transmission Rates in State Population per 100,000 Residents	P-value	95% Exact Poisson Confidence Limits
Illegal	393 state-years	12.18	Ref.	12.04 – 12.33
Local law or decriminalized	197 state-years	11.13	0.000	10.93 – 11.33
Legalized state-wide	268 state-years	7.54	0.000	7.38 – 7.69

\* state-years = number of states in category x number of years observed for each state

# HIV Transmission via Injection Drugs and Type of SEP Laws

SEP Law Status	Exposure*	Mean Transmission Rates in State Population per 100,000 Residents	P-value	95% Exact Poisson Confidence Limits
Illegal	231 state- years	6.85	Ref.	6.72 – 6.98
Local law or decriminalized	95 state- years	5.63	0.000	5.46 – 5.80
Legalized state-wide	133 state- years	9.32	0.000	9.21 – 9.55

\* state-years = number of states in category x number of years  
observed for each state

# Discussion

- Strong evidence that needle exchange at a population health level may impact disease transmission
- Limitations exist within the study
  - Cross sectional longitudinal study design cannot demonstrate causation
  - Disease transmission vectors may not be controlled
  - Number of SEPs within a state
  - All SEPs may not operate the same
- Although further research is needed, this is a meaningful observation that may contribute towards consideration of SEP adoption to reduce harm.

# Acknowledgements

- Dr. Leslie Beitsch, MD, JD
- Dr. Henry Carretta, PhD, MPH
- Dr. Gregory Todd, MD, JD
- Maheen Islam, M2

# References

- Centers for Disease Control and Prevention. “HIV Among People Who Inject Drugs.” 22 Feb. 2018.
- Centers for Disease Control and Prevention. “Syringe Service Programs for Persons Who Inject Drugs in Urban, Suburban, and Rural Areas.” *Morbidity and Mortality Weekly Report*, 2015.
- Centers for Disease Control and Prevention. “Syringe Services Programs.” 19 Apr. 2018.
- World Health Organization. “Policy Brief: Provision of Sterile Injecting Equipment to Reduce HIV Transmission.” 2004.
- Centers for Disease Control and Prevention. “HIV Among People Who Inject Drugs.” 22 Feb. 2018.
- The Foundation for AIDS Research. “Syringe Services Programs and the Opioid Epidemic.” 3, Nov. 2017.