EXAMINING THE EFFECTS OF INDIANA’S SYRINGE EXCHANGE PROGRAM ON NEW HEPATITIS C AND HIV DIAGNOSES FROM 2015-2017

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EXAMINING THE EFFECTS OF INDIANA’S SYRINGE EXCHANGE PROGRAM ON NEW HEPATITIS C AND HIV DIAGNOSES FROM 2015-2017

CAPSTONE PROJECT PAPER

A paper submitted in partial fulfillment of the requirements for the degree of Master of Public Health in the University of Kentucky College of Public Health
By
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Plainfield, Ind.

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ABSTRACT

In 2015, a rural Indiana county experienced an outbreak of HIV related to intravenous drug use. 181 people were diagnosed with HIV between Oct. 1, 2014 and Nov. 1, 2015. This outbreak prompted the state legislature to implement a policy that legalized syringe exchange programs for the first time ever in Indiana. This capstone attempts to summarize the situation that led to the creation of this policy and the effects of this policy, Indiana Senate Enrolled Act 461 (IN SEA 461). Finally, this capstone makes recommendations for modifying the existing policy or implementing a similar policy in an area experiencing a public health threat like the one in Indiana.
KEYWORDS

Syringe exchange programs, needle exchange programs, syringe and needle exchange programs, Scott County IN, IN SEA 461, HIV, Hepatitis C
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ACRONYMS AND ABBREVIATIONS

HCV: Hepatitis C
HIV: Human immunodeficiency virus
IDU: Intravenous drug use
ISDH: Indiana State Department of Health
PWID: People who inject drugs
SEA: Senate Enrolled Act
SEP: Syringe exchange program
INTRODUCTION

In early 2015, Scott County, Indiana made national news because of an outbreak of HIV among people who inject drugs.\textsuperscript{1} Officials identified eleven new HIV cases in a few months in a county that typically sees fewer than five new HIV diagnoses in a year.\textsuperscript{1} By March 2015, Indiana’s governor had declared a public health emergency through state executive order and authorized the state’s first-ever syringe exchange program in Scott County\textsuperscript{1} and the state legislature passed a policy allowing for syringe exchange programs in counties experiencing similar public health emergencies shortly after.\textsuperscript{ii}

Indiana’s policy, Indiana Senate Enrolled Act 461 (IN SEA 461), allows for syringe exchanges to operate in counties where a public health emergency has been declared.\textsuperscript{iii} The only qualifying public health emergencies in the policy are outbreaks of Hepatitis C or HIV that are spread primarily through intravenous drug use (IDU).\textsuperscript{iii} The policy requires that after a local health department has declared an outbreak of HIV or Hepatitis C and the local authority (e.g., county or local board of health) has agreed to operate a planned syringe exchange program, the public health emergency must be approved by the state health commissioner.\textsuperscript{iii} This constitutes an approval of the syringe exchange program, which are authorized only in counties with declared public health emergencies.\textsuperscript{iii} IN SEA 461 also requires annual renewal of the syringe exchange programs with the state health commissioner, limits a syringe exchange program’s operation to the county for which it is approved, requires a period of a public hearing before local authorities vote to authorize a syringe exchange program, requires data collection and reporting, and requires training on overdose response and safe syringe disposal practices.\textsuperscript{iii} It prohibits using state funds to purchase syringes and needles and prohibits law enforcement officers from using participation in a syringe exchange program as probable cause.\textsuperscript{iii}
Syringe exchange programs (SEPs) have been used since the 1980s to reduce the transmission of HIV and other blood-borne infections related to IDU. SEPs have historically been challenging to implement because of conflicting political goals: discouraging drug use and minimizing the spread of infectious disease caused by IV drug use, or harm reduction. Drug policies of the last 30 years including paraphernalia laws are designed to penalize and discourage drug use. In contrast, harm reduction policies are, according to a 1996 paper by Marlatt, “designed to reduce the harmful consequences of addictive behavior for both drug consumers and for the society in which they live.”

SEPs conflict with federal and some state paraphernalia laws, which make it illegal to possess certain objects with the intent to use them to use drugs, including needles and syringes. SEPs have historically been legally supported by either state policies that exempt needles/syringes from paraphernalia laws in certain circumstances or by public health emergency laws, which give state or local public health officials broad authority to “take necessary action to prevent the spread of disease.” A 1996 legal analysis of SEPs by Burris et al. described the laws that support SEPs and the pros and cons of operating with and without explicit state permission. Burris et al. noted that state policies authorizing SEPs—as Indiana’s policy does—not only authorize SEPs but also “[constitute] an endorsement of the intervention.”

My objectives for this capstone were, first, to examine the public health emergency in Scott County and the policy designed to respond to that emergency. This information will provide context for my second objective, which was to assess the differences in Indiana’s HIV and Hepatitis C diagnoses in counties operating SEPs versus counties not operating SEPs. My final objective is to summarize the effects of Indiana’s SEP policy and make recommendations
for public health officials or legislators considering how to modify the existing policy or how to respond to a public health crisis like that in Scott County.
METHODS

Policy analysis

I analyzed the implementation of SEP policies in Indiana using Eugene Bardach’s eightfold policy analysis framework. The steps of the eightfold policy analysis framework are: define the problem, assemble some evidence, construct the alternatives, select the criteria, project the outcomes, confront the trade-offs, decide, and tell your story. Defining the problem requires framing the issue (what is working or not working) and creating “a definition of a problem that is analytically manageable and that makes sense in light of the political and institutional means available for mitigating it.” I did this by conducting a literature review on the risk of spreading Hepatitis C and HIV through IV drug use and describing the public health emergency in Scott County. To accomplish step 2, assemble some evidence, I researched SEP efficacy in reducing HIV and Hepatitis C transmission and characteristics of SEPs. For step 3, construct the alternatives, I considered alternative approaches to Indiana’s SEP policy informed by other systems. To accomplish step 4, select the criteria, I evaluated the political factors at work in policy adoption alongside the imperative to respond to the HIV outbreak in Scott County. To accomplish step 5, project the outcomes, I performed some means testing analyses to demonstrate differences between the mean new HIV and acute Hepatitis C diagnosis rates in counties operating SEPs and counties not operating SEPs from 2015 to 2017. For step 6, confront the trade-offs, I described the actual implementation of SEPs in Indiana from 2015 to 2017. For step 7, decide, I recommended modifications to Indiana’s SEP policy and options for other states considering responses to a similar public health emergency. For step 8, tell your story, I summarized my findings on the unique characteristics of Indiana’s SEP and recommendations for policymakers and public health stakeholders.

Literature review
To accomplish several steps of the policy analysis, I conducted an extensive literature review. I searched the National Library of Medicine online database as well as Google Scholar for peer-reviewed articles from the last 30 years describing the history of SEPs, SEP policies, and the SEP effectiveness in preventing the spread of HIV/HCV. I conducted searches using terms including “syringe exchange programs”; “syringe exchange program effectiveness”; “syringe exchange program HIV”; “syringe exchange program Hepatitis C”; “syringe exchange program history”; “Scott County HIV”; and “Indiana syringe exchange program.” To confirm the operation of Indiana SEPs, I used the ISDH website as a starting point to find a list of counties operating SEPs as of March 2019. I created a timeline of SEP openings and closings within the study period (2015-2017) by searching Google for news articles.

Quantitative analysis

I performed quantitative analysis using SPSS with publicly available data from the Indiana State Department of Health (IDSH). The data include the number of new HIV diagnoses from 2012 to 2017 by county and at the state level. The data also include acute Hepatitis C diagnoses by county and at the state level from 2012-2017 as well as the rate of fatal overdoses from any opioid from 2012 to 2017.
RESULTS

Step 1: Define the Problem

Public Health Risks of IV Drug Use

The HIV outbreak in Scott County, Indiana was mostly tied to IDU—of the 181 people newly diagnosed with HIV by November 1, 2015, 173 (95.6 percent) reported injecting any drugs at all.¹ 167 of these patients (92.3 percent) were also infected with Hepatitis C (HCV).² A team of researchers from the Indiana State Health Department defined an outbreak-related case as any laboratory-confirmed HIV diagnosis after October 1, 2014 for a person either residing in Scott County or who was identified as a syringe-sharing or sexual partner by another case patient.³ The researchers described the average case-patient as 34 years old, male (57.5 percent, 104/181), white (98.9 percent, 179/181), and residing in Scott County (89.5 percent, 162/181).³

Affected Population

Scott County ranks 91 out of 92 Indiana counties in health outcomes (with 1/92 being best health outcomes and 92/92 being worst health outcomes) according to County Health Rankings from the University of Wisconsin’s Population Health Institute.⁴ It ranks in the bottom 15 counties in almost all health factors and health outcomes assessed by County Health Rankings except physical environment factors (e.g., air pollution).⁴ The United States Census Bureau 2013-2017 American Community Survey 5-year estimates indicate that 13.7 percent of Scott County residents live in poverty and the unemployment rate is 5.6 percent.⁵ In Indiana, 14.7 percent of residents live in poverty, and the unemployment rate is 9.4 percent.⁵

Risk of Similar Outbreaks

The HIV outbreak in Scott County fits into a larger trend in bloodborne infections like HIV and HCV related to IDU in rural parts of the country. Researchers from the Centers for Disease Control (CDC) have found in separate studies that the incidence of HCV is increasing
nationwide, especially in rural areas.\textsuperscript{xi, xii} One study by Suryaprasad et al. examined acute HCV infection data reported to the CDC and found that the incidence of HCV increased nationwide from 2006 to 2012, with a 13 percent annual increase over the study period in non-urban counties versus a 5 percent yearly increase in urban counties.\textsuperscript{xi} 30 of 34 states reporting acute HCV data in both 2006 and 2012 reported higher incidence of acute HCV in young people (defined as people under 30) in 2012 than in 2006.\textsuperscript{xi} The researchers also mapped the available county-level data and found that of 102 counties that reported an HCV incidence of more than 10 per 100,000 people in 2012, 89 percent of these counties were east of the Mississippi River and many were located in the Appalachian region.\textsuperscript{xi}

Zibbell et al., another team of CDC researchers, analyzed data from Kentucky, West Virginia, Virginia, and Tennessee to assess the link between IDU and HCV infection, finding a 364 percent increase in acute HCV infections in these four states from 2006 to 2012.\textsuperscript{xii} IDU was reported in 73 percent of cases with available risk factor information.\textsuperscript{xii} Both teams of researchers make recommendations to address the increase in acute HCV infections noting that IDU is also a risk factor for HIV infection.\textsuperscript{xiii} Recommended interventions include improved HCV surveillance, syringe exchange programs, behavioral health services, and opioid substitution therapy.\textsuperscript{xii}

\textit{Step 2: Assemble Some Evidence}

\textit{Variation in SEP Structures}

SEPs have been used as a strategy to reduce infections among people who inject drugs since the 1980s when the first SEPs opened in the Netherlands.\textsuperscript{iv} SEP structures vary significantly. For example, some programs require SEP participants to register in a database, while others do not; some SEPs offer a 1-to-1 syringe exchange in which a participant receives
one sterile syringe/needle in exchange for one used syringe/needle, while others offer as many syringes as a participant would like up to a limit. SEPs also provide a place to link PWID with relevant services, including opioid substitution therapy and other treatment programs, social services, and clinical care. SEPs can be in any number of physical settings, sometimes clinical but not always. The variation in program structure makes it difficult to empirically assess the effectiveness of SEPs overall in reducing HIV/HCV infections among PWID. Most of the literature pertains to the efficacy of individual SEP structures in accomplishing a given program objective.

A 2010 systematic review by Jones et al. attempted to determine which types of SEPs are effective by drawing on studies of SEPs in the United States, United Kingdom, Canada, France, and Australia and found that there was not enough evidence to determine effectiveness because of the variation in program settings and structures. The researchers recommended further research on specific program settings, structures, and services to empirically determine effectiveness in achieving different outcomes (e.g., reduced HIV/HCV transmission, participants receiving behavioral/clinical health services, reduced syringe sharing).

**Effectiveness of SEPs in Reducing HIV/HCV Transmission**

Another systematic review by Abdul-Quader et al. attempted to identify commonalities in SEPs that are effective in reducing HIV/HCV infection. The researchers note that IDU is one of the most effective modes of HIV and HCV transmission. SEPs make sterile syringes more readily available for PWID, ideally resulting in fewer instances of syringe sharing—therefore, one measure of SEP effectiveness in preventing HIV/HCV transmission is reduced syringe sharing behavior. The researchers identified studies that reported reduced syringe sharing behavior in Switzerland, New Zealand, and the United States (specifically, Connecticut). Their
findings indicate that “significant public health benefits” can be seen when at least 50 percent of the population of PWID receives at least ten sterile syringes per year.\textsuperscript{xv} The authors conclude that accessible and large-scale SEPs are important for HIV prevention, especially at the beginning of an epidemic of IDU-related disease.\textsuperscript{xv}

Programmatic differences also prevented Platt et al. from drawing substantive conclusions in a 2017 systematic review and meta-analysis examining the effects of SEPs and opioid substitution therapy (OST) on the incidence of HCV.\textsuperscript{xvi} The researchers found that the evidence of the effects of SEPs (as a standalone service or in combination with OST programs) on the incidence of HCV is inconclusive.\textsuperscript{xvi} The researchers suggest that further research should account for variation in program structures, specifically, “the degree to which the [SEP] meets individuals’ requirement for needles and syringes.”\textsuperscript{xvi}

\textit{Urban versus Non-Urban SEPs}

Research has also suggested differences in urban and non-urban SEPs. In a 2018 systematic analysis, Paquette and Pollini attempted to describe the role of IDU in HIV/HCV transmission in non-urban areas of the US, characterize what is known about the available services related to HIV/HCV for PWID in non-urban areas, and identify areas to fill gaps in knowledge on HIV/HCV transmission, IDU, and HIV/HCV services in non-urban areas.\textsuperscript{xvii} The researchers noted the role of cultural differences between IDU in urban and non-urban areas, as HIV/HCV are products of “risk environments.”\textsuperscript{xvii} For example, urban and non-urban areas may differ in the types of drugs that are available or preferred, the types of services available for PWID and the ease of accessibility (e.g., availability of public transit), and social norms.\textsuperscript{xvii} The researchers found that there are the small number of studies examining IDU in nonurban populations between 1990 and 2016 (n=34).\textsuperscript{xvii} A 2015 study by Des Jarlais et al. cited in the
Paquette and Pollini study found that only 20 percent of SEPs nationwide are located in rural areas, while 9 percent are located in suburban areas, and that non-urban SEPs generally have fewer participants and fewer resources than their urban peers, creating access problems and forcing PWID to rely on other sources to obtain sterile needles (e.g., pharmacy sales where available, other PWID). In the context of the other literature that shows the rise of HCV in non-urban areas and the risk of HIV outbreaks, as in Scott County, this systematic review demonstrates a pressing need for more research on non-urban SEPs to understand and address structural differences between urban and non-urban SEPs. More research could inform policies that better address public health threats to non-urban PWID.

**Effect of Funding on SEPs**

One variable that has been found to influence the effectiveness of SEPs is funding. A 2015 paper by Bramson et al. examined the link between public funding for SEPs on HIV incidence. In performing a systematic review, the researchers found that public funding for SEPs was associated with low rates of new HIV diagnoses or lower-than-expected rates of new HIV diagnoses. Conversely, they found that lack of public funding for SEPs was associated with high rates of new HIV diagnoses or raising the expected rates of new HIV diagnoses. Public funding of SEPs was also positively correlated with numbers of syringes distributed (public funding resulted in more syringes distributed, R²=0.52), as well as with provision of other health services to PWID including HIV counseling and testing, HCV testing, condom distribution, and overdose prevention services.

Public funding of SEPs was banned in the United States from 1988 to 2015 except for a brief period from 2009 to 2011, and a 2015 partial reversal of the ban allows using federal funds for SEP operation but not supplies. According to a 2018 policy analysis by Showalter, the
federal funding ban was put into place in the 1980s, and the political debate over its implementation relied on “morality politics,” or conflicting priorities among lawmakers rooted in moral/ethical beliefs.\textsuperscript{xx} The funding ban endured as more evidence on the effectiveness of SEPs emerged from other countries.\textsuperscript{xx} Bramson et al. noted in their analysis of SEP funding that the federal funding ban “served as both a political message in opposition to SEPs and as a limiting factor for the funding of SEPs in areas that support these programs.”\textsuperscript{xix}

\textit{Step 3: Approaches to SEPs and Alternatives to SEPs}

\textit{Harm Reduction Policies}

As previously mentioned, SEPs are a harm reduction policy.\textsuperscript{iv} Harm reduction policies are often framed as conflicting with anti-drug policies; however, both types of policies ultimately strive for abstinence from substance use.\textsuperscript{iv} Harm reduction policies allow for a “step-down approach” where PWID can receive services that protect individual and societal health without fear of legal repercussions.\textsuperscript{iv} Harm reduction advocates also promote easy access to services—programs should be structured to seek out those who would benefit, meet them where they are, and reduce the stigma associated with needing harm reduction services.\textsuperscript{iv} Therefore, advocates’ ideal harm reduction programs should be relatively easy to establish and access and operate with cooperation from police and other authorities attempting to enforce anti-drug policies—that is, people who need harm reduction services should not be targeted by law enforcement for violating drug laws.

\textit{Extrajudicial Operation}

Leaders of SEPs operating without explicit legal authorization have been arrested for violation of paraphernalia laws in various states.\textsuperscript{vi} However, courts have historically sided with the operators of such exchanges under the authority granted to public health agencies by public
These laws broadly give authority to public health agencies “to take necessary action to prevent the spread of disease.” Operating without legal permission under the assumption that public health emergency laws are sufficient is a potential alternative to seeking explicit legal permission through a local or state legislature. Such operations can be less effective because they cannot seek state funding and they could be forced to stop operating, temporarily or permanently, because of legal challenges. Some advantages of seeking legal permission for a SEP from a local/state legislature are that legal authorization may allow for more resources and also effectively endorses the SEP; however, legislative action is a lengthy process that might not allow a public health agency to respond to an ongoing crisis. Legislative approval also may come with requirements like distribution limits, location requirements, limits or requirements on the scope of services offered, and data collection/reporting requirements that burden the operators of the SEP, especially if state funds are not approved for SEPs.

California allowed SEPs to operate under public health emergency laws until 2000 when its legislature passed AB 136 to explicitly authorize SEP operation in jurisdictions experiencing a public health emergency. Similar to Indiana’s policy, this required a public health emergency declaration and local approval of SEP plans. In the years following the approval of the SEP policy, the number of SEPs in the state increased from 24 to 35 from 2000 to 2002, the proportion of “unapproved” SEPs declined from 54 to 40 percent, more than 1 million additional syringes were exchanged per year, and budgets increased 50 percent. However, none of the highest-need areas (defined as counties with the highest rates of IDU-related AIDS cases) started SEPs in the study period, which leads to questions about whether the confusion about the policy requirements or other factors contributed to a lack of action in these areas.

Other Services for PWID
SEPs are not the only service available explicitly designed to reduce disease, injury, and deaths among PWID. One 2018 study by Pitt, Humphreys, and Brandeau estimated the 5- and 10-year effects on life years (LYs), quality-adjusted life years (QALYs), and projected opioid deaths of the following policies/practices: operating SEPs; making Naloxone (an antidote to opioid overdose) more widely available; codifying limits on opioid prescription practices; rescheduling or reformulating opioid medications; monitoring prescription opioid dispensation; offering excess opioid disposal services; offering psychosocial treatment; and offering medication assisted therapy. In the 5-year estimate, Naloxone availability avoided the most opioid-related deaths among the interventions studied compared to the status quo (not implementing any interventions), reducing projected opioid deaths by 4 percent (averting 10,200 projected deaths). Syringe exchange programs are estimated to independently avoid 2,700 heroin/opioid deaths over five years compared to the status quo. In the 10-year analysis, opioid deaths averted by Naloxone and SEPs grew proportionally according to the base projection in the 5-year estimate. Policies affecting opioid supply, like prescription monitoring and limited prescribing practices, were shown to avert total opioid deaths in the 5-year analysis but, when examining the deaths attributed to prescription opioids versus heroin, increased heroin deaths as users of prescription opioids would likely turn to heroin, causing harm to this population. The researchers concluded that policies that increase access to treatment for addiction or services that mitigate harms of opioid use (including SEPs) are “immediately and uniformly beneficial, with no negative impact on LYs, QALYs, or addiction deaths.”

Step 4: Select the Criteria

Political factors
While the initial HIV cases were identified in Scott County in February 2015, it took until March 26, 2015 for Governor Mike Pence to declare a public health emergency and legally permit the operation of a local, short-term (30-day) syringe exchange program. Gov. Pence publicly waivered on his support for a syringe exchange program in Scott County, and upon signing the executive order allowing the Scott County SEP to operate said, “I do not support needle exchange as an anti-drug policy, but this is a public health emergency.”

SEPs are often controversial because of the perceived conflict with existing drug and paraphernalia laws. The United States’ first SEPs started in Washington in 1988 and New York in 1992, and as of 2017, 18 states and the District of Columbia explicitly legalized SEPs in state policies while three additional states (including Indiana) legalized SEPs under certain circumstances. It is important to understand policy dissemination to understand the spread of SEPs across the country.

A 2006 analysis by Volden examined the spread of the Children’s Health Insurance Program (CHIP) policies from state-to-state by pairing and comparing states on several variables hypothesized to be related to the likelihood of policy adoption. CHIP is a federal program that offers grants to incentivize states to set up health insurance programs for children in families with incomes between the Medicaid threshold and 200 percent of the federal poverty level, with the federal government covering 65 to 80 percent of costs. CHIP allows for variation in waiting periods, coverage levels, and family income thresholds, and Volden’s analysis examined these variables to describe the dissemination of policy across states. Volden’s analysis found that policies are more likely to be emulated in Republican-controlled states if the original state is also Republican controlled, and also found correlations with similar ideological leanings, per capita income, managed care structures, and budgetary constraints. Importantly, Volden also
found that evidence of policy success was important for spreading policies from state to state, especially for policies implemented by legislatures and not administrators.\textsuperscript{xxvi} This suggests that in formulating its SEP policy, Indiana may have looked to states that were politically or demographically similar and/or states that had SEP policies that were successful in reducing rates of disease transmitted by IDU.

\textit{Advocacy}

Research on the dissemination of SEPs has identified factors that predict the presence of a SEP in a given community. In one study, Tempalski et al. hypothesized that various local political, socioeconomic, and community resource variables would affect the distribution of SEPs in selected metropolitan areas (MSAs) with data available from the Beth Israel National Survey of Syringe Exchange Programs.\textsuperscript{xxvii} The results showed that the presence of an AIDS Coalition to Unleash Power (ACT UP) chapter, a higher percentage of men who have sex with men, and a higher percentage of residents with a college education were predictors of the presence of a SEP in a given MSA.\textsuperscript{xxvii} This speaks to the importance of grassroots organizing in establishing SEPs, because the weak associations of variables related to SEP need seems to suggest that SEP policies are the result of activism rather than need for SEP policies.\textsuperscript{xxvii}

\textit{Social Construction of Target Populations}

The people who benefit from the presence of SEPs are primarily PWID who benefit from having access to sterile syringes and other services provided by a SEP. The beneficiaries of a given policy are an important consideration according to Schneider and Ingram’s 1993 paper about the social construction of a target population.\textsuperscript{xxviii} Social construction refers to the characteristics ascribed to certain groups, like veterans, the elderly, and people who use drugs.\textsuperscript{xxviii} Schneider and Ingram created a matrix to use to examine the social construction of
different groups, their power and their expected benefits from public policy. Drug users would likely be classified as “deviants” in this matrix, which is a group that can expect to be burdened as a result of policies. That PWID are the primary beneficiaries of SEPs also partially explains the slow adoption of SEP policies across the country and the delay between identifying the HIV outbreak in Scott County and authorizing and implementing the local SEP.

The policy “burden” for deviants is also evident in the federal funding ban. When the federal funding ban was implemented in 1988, the majority of PWID who were affected by HIV/AIDS were living in coastal, urban locations—lawmakers not representing these districts could ignore IDU-related HIV/AIDS because it did not impact their constituents. By 2015, when the ban was partially lifted, outbreaks of HIV and HCV among PWID had occurred in non-urban settings, motivating certain lawmakers to prioritize this public health issue affecting their constituencies. The Showalter analysis of the federal funding ban provides some key takeaways, one of which is that the history of the HIV/AIDS epidemic and the relatively recent shift in affected or at-risk populations informed policy changes over time, including lifting the federal funding ban and the dissemination of SEPs. As different populations were affected and the social construction of those populations changed, attitudes and policies changed.

Step 5: Project the Outcomes

Indiana’s SEP policy requires that a declaration of a public health emergency concerning HCV or HIV outbreaks related to IV drug use be approved by the state health commissioner. This requirement appears to prohibit the implementation of SEPs in counties that have yet to experience a disease outbreak. This suggests that, when compared to counties without SEPs, counties with SEPs will have higher incidences of acute HCV and HIV until enough time has passed to allow the intervention to disseminate among affected populations. My hypothesis is
that counties operating SEPs at any point in 2015 to 2017 will have higher mean new HIV diagnosis rates per 100,000 people as well as higher mean rates of acute HCV per 100,000 people than counties without SEPs.

*Mean county-level new HIV diagnosis rate, acute HCV rate*

The range of new HIV diagnosis rates in all 92 Indiana counties from 2012-2017 is 0 per 100,000 to 661.2 per 100,000, the latter of which is the 2015 new HIV diagnosis rate in Scott County at the peak of the outbreak (see Table 1). The mean new HIV diagnosis rate in counties operating a SEP (from here on, SEP counties) at any point from 2015-2017 is 42.71 per 100,000. The mean new HIV diagnoses per 100,000 grouped by SEP status and year are described in Table 2 and illustrated in Figure 1. The mean new HIV diagnosis rate in counties not operating a SEP (from here on, non-SEP counties) at any point from 2015-2017 is 1.466. These means are skewed by the inclusion of two outliers identified by SPSS, which are the rate of new HIV diagnoses in Scott County in 2015 and 2016 (661.2 and 88.4 per 100,000, respectively).

Excluding the Scott County 2015 data point, the mean new HIV diagnosis rate of SEP counties from 2015 to 2017 is 10.158 new HIV diagnoses per 100,000. Removing the other outlier data point from Scott County in 2016, the mean rate is 5.811 new HIV diagnoses per 100,000 for SEP counties from 2012 to 2017 (see Table 1).

| Table 1 – Descriptives of County-level Indiana new HIV diagnoses rates per 100,000, 2015-2017 |
|---------------------------------|---------------------|---------------------|
| **Range**                       | 0                   | 661.2               |
| **SEP county mean**             | 42.71               |
| **Non-SEP county mean**         | 1.466               |
| **SEP county mean excluding Scott Co. in 2015** | 10.158               |
| **SEP county mean excluding Scott Co. in 2015 and 2016** | 5.811             |
Table 2 – Mean new HIV diagnoses per 100,000 grouped by SEP status and year

<table>
<thead>
<tr>
<th>Year</th>
<th>SEP</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>Non SEP</td>
<td>88</td>
<td>1.608</td>
<td>4.0468</td>
<td>.4314</td>
</tr>
<tr>
<td></td>
<td>SEP</td>
<td>4</td>
<td>167.650</td>
<td>329.0408</td>
<td>164.5204</td>
</tr>
<tr>
<td>2016</td>
<td>Non SEP</td>
<td>85</td>
<td>1.298</td>
<td>3.6662</td>
<td>.3977</td>
</tr>
<tr>
<td></td>
<td>SEP</td>
<td>7</td>
<td>15.186</td>
<td>32.4380</td>
<td>12.2604</td>
</tr>
<tr>
<td>2017</td>
<td>Non SEP</td>
<td>83</td>
<td>1.488</td>
<td>3.9790</td>
<td>.4368</td>
</tr>
<tr>
<td></td>
<td>SEP</td>
<td>9</td>
<td>8.589</td>
<td>10.1983</td>
<td>3.3994</td>
</tr>
</tbody>
</table>

Figure 1 – Mean new HIV diagnoses per 100,000 grouped by SEP status and year
Independent samples t-tests show no significant differences between the mean new HIV diagnoses per 100,000 in 2015 and 2016 in counties operating SEPs and counties not operating
SEPs, assuming unequal variances (including the outlier data points from Scott County in 2015 and 2016) (see Table 3). However, there is a significant difference in the means of SEP and non-SEP counties in 2017 (p=0.000), a year in which there are no statistical outliers. This suggests that the differences in the mean new HIV diagnoses in 2017 are attributable to more than chance—further studies on characteristics of SEP counties and non-SEP counties could shed light on reasons for the mean differences.

Table 3 – Independent samples t-test comparing mean county-level new HIV diagnoses rates per 100,000 in SEP counties versus non-SEP counties grouped by year (2015-2017)

<table>
<thead>
<tr>
<th>Year</th>
<th>Test</th>
<th>Sig. (2-tailed)</th>
<th>Mean Difference</th>
<th>Std. Error Diff.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>Equal variances assumed</td>
<td>.000</td>
<td>-166.042</td>
<td>30.7795</td>
</tr>
<tr>
<td>2015</td>
<td>Equal variances not assumed</td>
<td>.387</td>
<td>-166.042</td>
<td>164.5210</td>
</tr>
<tr>
<td>2016</td>
<td>Equal variances assumed</td>
<td>.000</td>
<td>-13.8881</td>
<td>3.5759</td>
</tr>
<tr>
<td>2016</td>
<td>Equal variances not assumed</td>
<td>.301</td>
<td>-13.8881</td>
<td>12.2668</td>
</tr>
<tr>
<td>2017</td>
<td>Equal variances assumed</td>
<td>.000</td>
<td>-7.1009</td>
<td>1.7074</td>
</tr>
<tr>
<td>2017</td>
<td>Equal variances not assumed</td>
<td>.071</td>
<td>-7.1009</td>
<td>3.4274</td>
</tr>
</tbody>
</table>

The range of acute HCV diagnoses in all counties in Indiana from 2015 to 2017 is 0 per 100,000 to 16.5 per 100,000 (see Table 3). The mean acute HCV rate for SEP counties at any point from 2015 to 2017 is 2.31 per 100,000, while the mean for non-SEP counties over the same time is 0.57 per 100,000. The mean acute HCV diagnoses rates grouped by year and SEP status are described in Table 4 and illustrated in Figure 2. An independent sample t-test shows that, when comparing the mean acute HCV rates of the non-SEP counties versus the SEP counties and assuming equal variances, the difference between the means is statistically significant in 2017.
(p=0.000) but not 2016 or 2015 (see Table 5). This suggests that the difference in mean acute HCV diagnoses between SEP counties and non-SEP counties is attributable to more than chance, and further analyses should examine characteristics of these counties that explain the mean differences.

**Table 4 – Descriptives of County-level Indiana new HCV diagnoses rates per 100,000, 2015-2017**

<table>
<thead>
<tr>
<th>Range</th>
<th></th>
<th>0</th>
<th>16.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEP county mean</td>
<td></td>
<td>2.31</td>
<td></td>
</tr>
<tr>
<td>Non-SEP county mean</td>
<td></td>
<td>0.57</td>
<td></td>
</tr>
</tbody>
</table>

**Table 5 – Mean acute HCV diagnoses per 100,000 grouped by SEP status and year**

<table>
<thead>
<tr>
<th>Year</th>
<th>SEP</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>Non SEP</td>
<td>88</td>
<td>.382</td>
<td>1.4989</td>
<td>.1598</td>
</tr>
<tr>
<td></td>
<td>SEP</td>
<td>4</td>
<td>1.550</td>
<td>3.1000</td>
<td>1.5500</td>
</tr>
<tr>
<td>2016</td>
<td>Non SEP</td>
<td>85</td>
<td>.745</td>
<td>2.4508</td>
<td>.2658</td>
</tr>
<tr>
<td></td>
<td>SEP</td>
<td>7</td>
<td>1.100</td>
<td>2.9103</td>
<td>1.1000</td>
</tr>
<tr>
<td>2017</td>
<td>Non SEP</td>
<td>83</td>
<td>.592</td>
<td>1.8568</td>
<td>.2038</td>
</tr>
<tr>
<td></td>
<td>SEP</td>
<td>9</td>
<td>3.589</td>
<td>4.6700</td>
<td>1.5567</td>
</tr>
</tbody>
</table>

**Figure 2 – Mean acute HCV diagnoses per 100,000 grouped by SEP status and year**
Table 6 – Independent samples t-test comparing mean county-level new HCV diagnosis rates per 100,000 in SEP counties versus non-SEP counties grouped by year (2015, 2016, 2017)

<table>
<thead>
<tr>
<th>Year</th>
<th>Test</th>
<th>Sig. (2-tailed)</th>
<th>Mean Difference</th>
<th>Std. Error Diff.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>Equal variances assumed</td>
<td>.151</td>
<td>-1.1682</td>
<td>.8071</td>
</tr>
<tr>
<td>2015</td>
<td>Equal variances not assumed</td>
<td>.507</td>
<td>-1.1682</td>
<td>1.5582</td>
</tr>
<tr>
<td>2016</td>
<td>Equal variances assumed</td>
<td>.717</td>
<td>-.3553</td>
<td>.9768</td>
</tr>
<tr>
<td>2016</td>
<td>Equal variances not assumed</td>
<td>.763</td>
<td>-.3553</td>
<td>1.1317</td>
</tr>
<tr>
<td>2017</td>
<td>Equal variances assumed</td>
<td>.000</td>
<td>-2.9973</td>
<td>.7910</td>
</tr>
<tr>
<td>2017</td>
<td>Equal variances not assumed</td>
<td>.091</td>
<td>-2.9973</td>
<td>1.5699</td>
</tr>
</tbody>
</table>

It is important to present the acute HCV analysis with the caveat that HCV data might be reported inconsistently—for example, in Scott County in 2015 ISDH data reports 0 acute HCV cases. However, studies on the HIV outbreak from 2015 identify several patients with HCV (without specifying if cases are acute or chronic). This casts doubts on the accuracy of the HCV data reported from the state that would be resolved with more information about Indiana’s state and local surveillance practices. Such information was not collected for this study.

*Step 6: Confront the Trade-Offs: Actual Implementation of SEPs in Indiana*

*Implementation of SEPs in Indiana*

Indiana’s SEP policy requires three levels of approval. Health departments must first determine that there is an outbreak of disease caused primarily by IDU in the county (with no clarification in the policy on what constitutes an outbreak), declare a public health emergency, and draft plans to implement a local SEP. Second, a local power like a board of health or county commissioners must vote to approve the declaration of a public health emergency and the syringe exchange plans. Finally, the plans and declaration are sent to the state health
commissioner for review and approval of the public health emergency, which constitutes an approval of the planned SEP.ii

From 2015 to 2017, nine counties launched syringe exchange programs (see Table 6),ii,xxix while 24 counties engaged in SEP planning activities from April 2015 to May 2016, according to a qualitative study done by Meyerson et al. on SEP implementation in Indiana.ii

Table 7 – Indiana counties operating syringe exchange programs 2015-2017

<table>
<thead>
<tr>
<th>County</th>
<th>Month/year opened</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scott</td>
<td>April 2015xxx</td>
<td></td>
</tr>
<tr>
<td>Madison</td>
<td>Aug. 2015xxxi</td>
<td>Defunded by local authorities in 2017xxxi</td>
</tr>
<tr>
<td>Fayette</td>
<td>Nov. 2015xxii</td>
<td></td>
</tr>
<tr>
<td>Monroe</td>
<td>Feb. 2016xxxiii</td>
<td></td>
</tr>
<tr>
<td>Wayne</td>
<td>Aug. 2016xxiv</td>
<td></td>
</tr>
<tr>
<td>Lawrence</td>
<td>Dec. 2016xxv</td>
<td>Closed by local authorities in 2017xxxvi</td>
</tr>
<tr>
<td>Allen</td>
<td>Nov. 2016xxxviii</td>
<td></td>
</tr>
<tr>
<td>Clark</td>
<td>Jan. 2017xxxviii</td>
<td></td>
</tr>
<tr>
<td>Tippecanoe</td>
<td>Aug. 2017xxxix</td>
<td></td>
</tr>
</tbody>
</table>

Health officials interviewed about SEP implementation procedures for Meyerson et al.’s study spoke of concerns with Indiana’s policy. A common concern was confusion about the annual re-authorization process; lack of epidemiologic data at a local level to determine if a county is experiencing a public health emergency; lack of funding for both SEP services and lack of additional funding for local health services (like increased HIV testing to identify public health emergencies) at the time; and rejection of SEP plans involving resource-sharing including mobile distribution centers.ii These concerns will be discussed in steps 7 and 8.

Step 7: Decide—Recommend modifications

Indiana’s SEP policy differs from neighboring states in that it requires a declaration of a public health emergency related to HIV or HCV infections. In Ohio and Kentucky, two comparison states selected for this analysis, decisions about implementing SEPs are made
entirely at the local level without requiring any such declaration or state-level approval. This appears to be the most notable difference between Indiana and its neighbors—whereas HIV and HCV surveillance data can inform decisions about SEPs in other states, HIV and HCV surveillance data is required in Indiana to prove a need for a SEP. This adds a hurdle to establishing a SEP in Indiana in addition to gaining buy-in from local political leaders and community members and allocating resources to SEP operation. One local health authority quoted in Meyerson et al.’s qualitative study noted that communicable disease data is managed entirely by ISDH for some counties without the capacity to do their surveillance. This means that if, for example, ISDH acute HCV data is incomplete or not regularly updated, counties without the capacity to do local surveillance may not be able to prove a need for a SEP using state HCV data. Improved surveillance and consistent reporting practices could give Indiana’s local health authorities the tools to quickly assess the need for SEPs and implement programs, and this could be accomplished by allocating funding for HIV and HCV testing and reporting services in the SEP policy.

The SEP policy could also be amended to allow additional health measures that indicate the prevalence of drug use in a community, including hospital discharges for overdoses and overdose deaths, to serve as indicators of a public health emergency related to IDU. This would help local health authorities assess the need for SEPs without relying entirely on the state’s HCV or HIV data. In an analysis of ISDH data on overdose deaths from any opioid from 2012 to 2017 alongside acute HCV rates and new HIV diagnosis rates from 2012 to 2017, overdose deaths were shown to positively and significantly correlate with the rate of acute HCV diagnoses (p=0.002, Pearson correlation coefficient=0.965, n=6) (see Table 7). While this is a small sample size, it demonstrates the possibility that data other than rates of HIV/HCV are available and
suitable to predict the prevalence of drug use in a community and the subsequent risks of disease outbreaks.

Table 8 – Correlations, county-level new HIV diagnosis rates, acute HCV rate, fatal overdoses of any opioid rate per 100,000, 2012-2017

<table>
<thead>
<tr>
<th></th>
<th>New HIV diagnoses rate</th>
<th>Acute HCV rate</th>
<th>Fatal ODs of any opioid rate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>New HIV diagnoses rate</strong></td>
<td>Pearson Correlation</td>
<td>.080</td>
<td>.223</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.880</td>
<td>.671</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td><strong>Acute HCV rate</strong></td>
<td>Pearson Correlation</td>
<td>.080</td>
<td>.965</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>1</td>
<td>.002</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td><strong>Fatal ODs of any opioid rate</strong></td>
<td>Pearson Correlation</td>
<td>.223</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.671</td>
<td>.002</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

This finding is also reflected in a 2016 study by Van Handel et al. that identified the following variables associated with county-level acute HCV rates nationwide: drug overdose deaths per 100,000, prescription opioid sales per 100,000, median per capita income, percent of white, non-Hispanic race/ethnicity, and unemployment among the population 16 years of age or older. Future discussions of policy modification should consider allowing counties to use criteria other than HIV/HCV to declare a public health emergency, or eliminating the public health emergency criteria altogether. As is, “outbreak” and “public health emergency” are undefined and the only defined requirement is that the outbreak must be related to IDU. In the absence of timely and accurate data on new HIV and acute HCV diagnoses, health departments should be empowered to use their available resources and local knowledge to determine the prevalence of IDU in their communities, assess the risk to public health, and determine whether SEPs are an appropriate response. Allowing additional reporting data may also allow county
hospitals to get involved in the SEP planning process. County hospitals would be able to report relevant measures to their local health departments, allowing local health departments to benefit from the surveillance and reporting capabilities of their county’s hospitals.

The other notable difference in Indiana’s policy is the annual renewal requirement. Policies in Ohio and Kentucky do not require renewal—decisions to start and end programs are made by local authorities. The annual renewal requirement confused some local health authorities included in Meyerson et al.’s qualitative study of SEPs in Indiana, with some pointing out that if SEPs effectively reduced new HIV or HCV diagnoses, then counties would seem to no longer meet the public health emergency criteria. Local health authorities also pointed out that the annual renewal requirement imposes burdens on their local health departments’ resources, requiring significant time spent on the renewal process that should ideally be spent fulfilling other health department functions. Modifying the policy to allow approvals to be valid until local or state health authorities decide otherwise would relieve health departments, especially smaller health departments, of the burden of devoting resources to the annual renewal process. If it results in continued SEP operation, removing the annual renewal requirement might also allow accurate assessment of SEP effects over time with fewer potential interruptions in SEP services.

Indiana’s policy imposes a jurisdictional limit on SEPs, limiting the operation a SEP to the county for which it is approved, meaning that counties are not allowed to share resources in the form of mobile or traveling SEPs. Meyerson et al. identified at least one incidence of a multi-county SEP being rejected because of the jurisdictional limitations. This presents logistical challenges for health departments with fewer resources and forces counties to rely primarily on their assessment, assurance, and policy development capabilities, which is significant because local health departments are county health departments in Indiana. This means that each of the
92 counties has its own health department with different resources and therefore different capabilities to effectively fulfill each of the three core functions of public health. Local health departments lacking the assessment or policy development capabilities to determine the need for a SEP and create plans for implementation are effectively prohibited from using SEPs as an intervention, as any resource-sharing agreements that may support other health department activities appear to be prohibited for SEPs.

Indiana’s SEP policy was modified in the 2017 legislative session to provide an option for counties to approve their public health emergency declarations locally. This removes an additional barrier by eliminating the requirement to seek state approval—however, it still provides the option to seek state approval and maintains the requirement to establish a public health emergency based on HIV and/or HCV diagnoses. The modified policy also extends the renewal period to every two years, instead of one year, and extends the policy expiration to July 1, 2021.

Table 8 shows some selected SEP characteristics identified in steps 1 through 6 of the policy analysis and describes how Indiana’s SEP policy does or does not meet these characteristics. Any of these characteristics could be areas for further review and modification in discussions about revising Indiana’s SEP policy or implementing a similar policy.

<table>
<thead>
<tr>
<th>Table 9 – Selected SEP characteristics compared to Indiana’s SEP policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy characteristic</td>
</tr>
<tr>
<td>------------------------</td>
</tr>
<tr>
<td>Data collection</td>
</tr>
<tr>
<td>Public funding</td>
</tr>
<tr>
<td><strong>Lack of interference from law enforcement</strong></td>
</tr>
<tr>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td><strong>Legal authorization</strong></td>
</tr>
<tr>
<td><strong>Increase access to other services that mitigate harms of IDU</strong></td>
</tr>
</tbody>
</table>
DISCUSSION and CONCLUSION

Step 8: Tell Your Story—Discussion

The HIV outbreak in Scott County was effectively contained within 2 years of the implementation of a local SEP—Scott County’s rate of new HIV diagnoses per 100,000 was a statistical outlier in the 2015 and 2016 but not 2017. The influx of local, state, and federal resources dedicated to identifying and treating new HIV cases and preventing further HIV cases certainly impacted this finding as well, though I was unable to control for these variables in this analysis. IN SEA 461 appears to have helped adequately address the public health crisis that led to its creation in Scott County. In all Indiana counties operating SEPs, the analyses in section 5 seem to indicate that there are meaningful differences in the mean HIV and HCV rates starting in 2017.

There are three requirements in Indiana’s SEP policy that differentiate it from other similar policies and may potentially affect the public health benefits of SEPs. First, Indiana’s SEP policy imposes multiple levels of permission on local health departments seeking to establish SEPs. Second, the policy mandates periodic renewal. Third, the policy effectively prohibits multi-jurisdictional SEPs by specifying that SEPs can only operate in the jurisdiction seeking approval.

Health departments with the political and resource capital to implement a SEP may not be able to meet the public health emergency requirement if they cannot prove that they have an HIV/HCV outbreak related to IDU. The public health emergency requirement appears to force counties with a known population of people with HIV or HCV acquired through other modes of transmission to wait and see if HIV or HCV spreads to a population of PWID—it does not appear to allow SEPs as a preventive measure before an outbreak. Consider the example of Marion County, which consists almost entirely of the city of Indianapolis and received approval
for its SEP in summer 2018. News articles from prior to the implementation indicate that the need for continued and comprehensive surveillance was at least partly responsible for the delay in developing SEP plans for Marion County.

Literature shows that SEPs are effective at reducing syringe-sharing behavior and, at a certain saturation point, can provide significant public health benefits. Implementing a SEP and reaching the saturation point at which SEPs are effective may be more challenging for health departments with few resources in the form of community assets like harm reduction coalitions or health care providers willing to support SEPs, staff members to fulfill the assessment and policy development functions required to get approval or re-approval of a SEP, or funds to cover supplies or operational costs. Prohibiting multi-jurisdictional SEPs further disadvantages communities lacking the above-mentioned resources, creating barriers to SEP implementation and success in those communities.

Another characteristic of Indiana’s SEP policy is that it prohibits SEPs from using state funds to purchase needles and syringes. Previously cited research show that publicly funded SEPs perform better relative to their non-publicly funded peers. However, funding bans are not uncommon and a federal funding ban was maintained until 2015, and even today federal funds cannot be used for needles and syringes. If Indiana wanted to explore options to improve public health outcomes through SEPs, reconsidering the state funding ban may be a point of discussion for future policy modifications.

Allowing local health departments to assess their local needs and capabilities to provide SEPs using criteria other than HIV/HCV cases, sharing resources across multiple jurisdictions when needed, and removing the renewal requirement could improve results from Indiana’s program and bring it in line with policies in neighboring states experiencing similar public health
threats. Allowing state funding to support any SEP needs including needles and syringes would differentiate Indiana’s policy from its neighboring states, but could positively impact its outcomes by mitigating the financial barriers to operating SEPs.

This study also identifies areas for further research to clarify the effects of SEPs and characteristics of local communities and health departments that lead to successful SEPs. Further areas of research identified in this study include the association between health department budgets and/or staffing levels and the likelihood SEP implementation, the association between presence of a local advocacy group and SEP implementation, and a description of resource-sharing agreements to deliver other public health services in Indiana and the existing frameworks that could support resource-sharing SEPs if the policy were to be modified to allow them.

Limitations

There are several limitations to this study. First, ISDH data for HCV seems to be inaccurate. This is potentially due to surveillance issues at the local and state level.

I was also unable to account for other variables related to the spread of HIV and acute HCV, and these analyses did not consider race, age, gender, or mode of transmission. There are also likely other policies and programs available to address IDU and help control the spread of HIV/HCV caused by IDU. An accurate analysis of this policy’s effects would have to account for services linking people with HIV/HCV testing and treatment, HIV/HCV prevention efforts, and other services designed to control the spread of these particular infections. The presence of such services would likely affect the rates of new HIV diagnoses and acute HCV cases.

Finally, Indiana’s SEP policy is relatively new—as of publication, IN SEA 461 was implemented four years ago and the modified policy was implemented two years ago. It is difficult to assess the outcomes of this policy with so few years of data to analyze. Allowing the
policy to continue should allow future researchers to more clearly identify trends and describe the effects of Indiana’s SEP policy.

Conclusion

Indiana’s SEP policy was formulated as a response to an outbreak of HIV related to IDU in a rural county. SEPs were illegal in Indiana until 2015, and adoption of SEPs has been slow, with 9/92 counties reporting operating a SEP at any point in the first three years of the program. The HIV outbreak in Scott County was contained in 2017, the first year in which Scott County’s HIV infection rate was not a statistical outlier, though it was not possible in this assessment to determine if this is because of the local SEP alone or in combination with other public health services (e.g., HIV testing, treatment). In some ways, Indiana’s SEP policy does not align with policy characteristics associated with successful SEPs identified in the literature. In other ways, Indiana’s policy includes characteristics that could lead to improved public health outcomes, like SEP data collection and reporting and overdose treatment. The policy was already modified once in the 2017 legislative session. This analysis provides context for analyzing the effects of the policy to date and suggestions for future discussions about modifying Indiana’s policy or creating policies in areas experiencing a public health emergency similar to the one in Scott County.
REFERENCES


xlv Laws Related to Syringe Exchange | Policy and Programs | Division of Viral Hepatitis | CDC. (n.d.). Retrieved from https://www.cdc.gov/hepatitis/


APPENDIX A
BIOGRAPHICAL SKETCH

Katherine Youngen is a Master of Public Health student in the College of Public Health in the Health Management and Policy concentration. She holds a Bachelor of Arts in Public Relations and a Bachelor of Arts in French from Butler University in Indianapolis, Indiana.