



## Policy analysis

## Drug induced homicide laws may worsen opioid related harms: An example from rural North Carolina

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## ABSTRACT

Drug-induced homicide (DIH) laws typically allow for the prosecution of drug distribution resulting in an overdose fatality as equivalent to homicide or manslaughter. Despite vigorous debate about the appropriateness of DIH laws as a response to overdose, the public health impacts of this increasingly common prosecutorial strategy remain unknown. In this policy analysis, we take up the question of how DIH prosecutions impact local persons and communities through the lens of a high-profile DIH conviction that took place in Haywood County, a rural county located in the Appalachian region of western North Carolina. Describing insights gained from two unrelated but overlapping studies carried out in Haywood County, we identify several plausible mechanisms through which DIH laws may negatively impact public health. Among these are disruptions to the local drug market and deterrence from calling 911 when witnessing an overdose. With the number of DIH prosecutions growing rapidly, more research on the public health impacts of DIH laws is urgently needed.

## Introduction

Despite efforts to frame overdose deaths in the United States as a public health issue, law enforcement and criminal justice systems remain deeply involved in punitive responses to substance use—often buoyed by popular narratives that frame certain drug market actors as “victims” and others as “bad guys” (El-Sabawi, 2019). Drug-induced homicide (DIH) laws, which criminally implicate individuals who sell or deliver drugs linked to an overdose death, thereby making that sale or delivery the equivalent with manslaughter or homicide, are policy responses to overdose that hew closely to this moralized narrative.

Exposure to the criminal justice system is generally associated with negative health outcomes, including increased risk of injection initiation (Melo et al., 2018) and fentanyl-related fatal overdose (Brinkley-Rubinstein et al., 2018), reduced likelihood of calling 911 when witnessing an overdose (Koester et al., 2017; Latimore & Bergstein, 2017), reduced utilization of harm reduction services (Davis et al., 2005), and worse retention in treatment for substance use disorders (Kelly et al., 2011). In the spirit of this evidence, some scholars have critiqued DIH laws as harmful to public health, arguing that punitive responses to overdose will directly undermine 911 Good Samaritan Laws (state laws

extending limited criminal immunity to individuals experiencing or reporting an overdose emergency) by deterring overdose bystanders from calling 911 (Beletsky, 2019; Ostrach & Hayes, 2019). People who use drugs have also reported to researchers that they expect DIH laws to deter bystanders from calling 911 and that aggressive DIH prosecution could drive illicit markets further underground, putting consumers at increased risk of violence (Peterson et al., 2019).

In contrast, some public safety professionals have described DIH laws as ideal mechanisms for targeting “kingpin” drug distributors and reducing the risks posed by the illicit drug market by disrupting that market (Phillips, 2020). The best data available, however, indicate that the people most often charged under DIH laws are the friends and family of overdose decedents who are characterized in public media as profiteering “dealers” when, in reality, most people who use drugs also sell or deliver to friends and relatives on occasion (Beletsky, 2019; Peterson et al., 2019). In North Carolina, many District Attorneys have voiced strong disagreement with one another about whether their state’s DIH law (which was debated and subsequently enacted in 2019) nullifies the limited immunity conferred by the state’s 911 Good Samaritan Law and/or deters bystanders from calling 911 (Knopf, 2019).

Despite the vibrancy of these debates, the true public health impacts of DIH laws remain unknown. At best, we can hypothesize those impacts based on previous research investigating the relationship between policing and drug-related crime. Unfortunately, this evidence base is

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also mixed. Some observational data suggest that reductions in violent or drug-related crime have followed both the targeting of repeat or high-risk offenders (Corsaro & McGarrell, 2010; Sechrist & Weil, 2018) and increased state- and local-level sanctions for some specific drug violations (Nguyen et al., 2015; Terry-McElrath et al., 2009). Other mixed-methods analyses have found little evidence of crime or substance use deterrence through increased sanctions and arrests (Bailey, 1983; Friedman et al., 2006, 2011). Some have concluded that deterrence through prosecution simply changes how (not whether) individuals produce or distribute illicit substances, occasionally resulting in increased HIV risk (Friedman et al., 2006) and risks of other drug-related harms (Barratt et al., 2005; Dickinson, 2017) as a result of those market shifts.

In this policy analysis, we consider how DIH prosecutions impact local persons and communities through the lens of a recent, high-profile DIH conviction in Haywood County, North Carolina, located in the western Appalachian region of the state. In the sections below, we provide a demographic and epidemiologic profile of Haywood County; then, we describe key state and local policies and summarize events surrounding the 2018 DIH conviction of a local resident; finally, we postulate several individual- and community-level impacts this DIH prosecution may have had in Haywood County. Our discussion of these potential impacts is scaffolded by ethnographic data collected through systematic research among people who use drugs in Haywood County. Though preliminary, these data point to plausible mechanisms through which DIH prosecutions may negatively impact public health outcomes by (1) increasing the volatility of the local drug market; (2) changing individual drug use behaviors, such as the amount paid to maintain a drug habit or the frequency of injection events; and (3) deterring life-saving overdose response strategies, such as calling 911, especially among those with closer ties to the individuals involved in the DIH case. That some of these mechanisms may appear counterintuitive to proponents and opponents of DIH laws, alike, only highlights the urgency of our need to systematically investigate these questions and build an evidence base to describe how DIH laws shape the epidemiology of overdose and other substance-use related harms.

### Drug overdose, policy, and prosecution in Haywood County, North Carolina

Haywood County is home to approximately 60,000 residents, of which nearly 80% are white and an estimated 14% live at or below the poverty line (Haywood County, NC |Data USA, 2020). The North Carolina Department of Health and Human Services ranks the fatal opioid overdose rate in Haywood County among the top 20% in the state (North Carolina Department of Health and Human Services, 2021b). Historically, rates of fatal opioid overdose across North Carolina began rising from a yearly average of about 7–8 per 100,000 population in 2014, peaking at 18.3 per 100,000 in 2017, and then slowly declining over the next two years to 17.2 per 100,000 in 2019; Haywood County, by contrast, has seen an acceleration in opioid-related deaths during this period of state-wide decline, with county-wide rates of fatal opioid overdose climbing from 21.3 per 100,000 in 2017 to 27.3 per 100,000 in 2019 (North Carolina Department of Health and Human Services, 2021b).

Heroin (diacetylmorphine) has played a relatively small role in fatal opioid overdose in Haywood County, accounting for less than 6% of all unintentional poisoning deaths prior to 2017 and approximately 15% in 2018 and 2019 (North Carolina Department of Health and Human Services, 2021a). From 2010 to 2016, about half of all unintentional poisonings in Haywood County were primarily attributed to commonly prescribed opioids and another 10–20% to benzodiazepines; since 2017, however, the majority of fatal poisonings in the county have been associated with synthetic opioids other than methadone, such as fentanyl and fentanyl analogs, mirroring state-wide trends in synthetic opioid-associated deaths (North Carolina Department of Health and Human Services, 2021a).

Syndromic data indicate that the rate of opioid overdose-related emergency department (ED) visits in Haywood County has been volatile in the last decade, dramatically rising and falling in ways that appear to be in step with major policy changes at the state and local level. In 2013, the county rate of opioid-related ED visits per 100,000 population hit a 10-year low of 27.3, below the statewide average of 35.3 (North Carolina Department of Health and Human Services, 2021b). That same year, the North Carolina General Assembly passed the state's first 911 Good Samaritan Law (NC § 90-96.2), which, under certain conditions, provides limited immunity from criminal prosecution (but no explicit immunity from arrest) for minor drug and drug paraphernalia possession to people who call 911 to report an overdose (Hoban, 2013). In the four years following the enactment of the 911 Good Samaritan Law, the rate of opioid overdose-related ED visits in Haywood County climbed sharply, peaking at 162.1 per 100,000 population in 2017, more than double the state-wide rate of 75.0 (North Carolina Department of Health and Human Services, 2021b). These trends reversed the following year. As rates of fatal overdose skyrocketed in Haywood County, the number of opioid overdose-related ED visits per 100,000 population fell precipitously to 129.1 in 2018 and again to 86.7 in 2019, a decline of nearly 50% in less than two years (North Carolina Department of Health and Human Services, 2021b). A plausible explanation for these rapidly diverging indicators (which we discuss in more detail below) is that enthusiasm for calling 911 from the scene of an overdose, which had been at first inflated by the enactment of the state-wide 911 Good Samaritan Law, was subsequently chilled by changes in prosecutorial strategies and law enforcement procedures at the local level.

Haywood County saw its first major conviction for drug distribution in connection with a fatal overdose in 2018. In August of that year, the defendant, previously found guilty on felony drug possession charges and sentenced to 18 years, was officially indicted for second-degree murder for an overdose death attributed to substances the defendant allegedly supplied. The defendant offered an Alford plea (a plea in which the defendant concedes that the prosecution has enough evidence to convict, similar to a plea of “no contest,” but does not admit guilt) and was sentenced to 25–31 years, to be served concurrently with the prior sentence (Perrotti, 2018b).

Autopsy reports indicated that the decedent, only 20 years old at the time of their death, died of toxicity from fluoro-isobutryl fentanyl and gabapentin (a synthetic fentanyl analog and a non-opioid analgesic, respectively); the decedent had also been discharged from a short-term detoxification facility the same day they experienced this fatal overdose (Perrotti, 2018b). Leaving short-term detoxification without access to medications for opioid use disorder is a known risk factor for fatal overdose (Chang & Chen, 2018; Strang et al., 2003; Wines et al., 2007). Haywood County District Attorney Welch, who pursued this murder charge, focused her narrative on the defendant, telling local media that “heroin<sup>1</sup> laced with fentanyl is a death sentence” and characterizing the defendant as “a danger to the community,” (Perrotti, 2018b). She argued in her indictment that the defendant's actions were made “with malice” (Perrotti, 2018a). The trial garnered enough public attention to inspire state representative Dean Arp (representative to District 69, near the city of Charlotte, about 160 miles east of Haywood County) to draft and sponsor North Carolina's state-level DIH law, which removed the legal requirement of demonstrating malice when securing this kind of conviction; Representative Arp collaborated with District Attorney Welch in drafting the initial bill (Stone, 2019).

### The challenges of discerning the public health impact of DIH laws

Although DIH laws trace their lineage to the height of the “War on Drugs” in the 1980s, their use has dramatically increased over the past

<sup>1</sup> Post-mortem toxicology indicated that the decedent had not consumed heroin prior to their death (Perrotti, 2018b).

few years—by one metric, increasing as much as 700% between 2012 and 2017 (Health in Justice, 2019). Current enthusiasm for these laws is often rooted in the perception that can effectively “make fentanyl bad for business”<sup>2</sup> by increasing the certainty, severity, and swiftness of enforcement action—the cornerstones of deterrence theory (Braga & Weisburd, 2015)—in response to the distribution of illicit opioids, especially fentanyl-contaminated “bad batches.”

Testing this hypothesis is inherently challenging, because conducting meaningful surveillance of the illicit drug market is, itself, inherently challenging. Most available data characterizing the illicit drug market come from law enforcement agencies operating at the national level—such as the Drug Enforcement Administration’s annual National Drug Threat Assessment (U.S. Drug Enforcement Administration, 2021). Drug market surveillance at the local level is complicated by several factors, including the extremely poor accuracy of tools commonly used by police departments for presumptive analyses of drug seizures (Green et al., 2020) and the significant expenses and lag times—often as long as half a year—that characterize confirmatory testing in state and federal forensic laboratories (Strom et al., 2011). In brief, it is hard to know precisely what the local drug market looks like or how it is changing except at least a year in retrospect, and, even then, the data are severely limited.

Further, attempts to assess the impacts of DIH laws on the illicit drug supply are subject to something like an “uncertainty principle.” There is broad consensus that the opacity and unpredictability of the illicit drug supply is, itself, a source of overdose risk. In more precise terms, using an illicitly obtained drug product with undetermined or unknown fentanyl content may be more dangerous than knowingly and intentionally using fentanyl (Carroll et al., 2017; Rhodes et al., 2019; Silverstein et al., 2019; Weicker et al., 2020). Thus, if efforts to monitor the local drug market are successful and drug consumers’ knowledge of the local drug supply subsequently improves, the overdose risk posed by that supply may be reduced, even if the levels of potency or contamination in the local drug supply are not. In other words, evaluating the impacts of DIH laws on the drug market by monitoring that market may, itself, mediate the risks that market poses to consumers. This would complicate our ability to tease out any market effects directly attributable to DIH laws.

Understanding the impacts of DIH laws on local drug markets, then, requires a more nuanced approach that accounts for the lived experience and expertise of regular drug market participants—including consumers and distributors—who make or are proximal to those who do make decisions about the content of local supplies. This approach is also subject to limitations, such as positional awareness, recall bias, frequency bias, and the postulation of conjecture as fact. Yet, we contend that any study of the impact of DIH laws on local drug supplies must account for the knowledge and insights of these key stakeholders.

### Potential impacts on the illicit drug supply

We conducted formal interviews with residents of Haywood County who reported current injection opioid use at recruitment in July 2019, approximately 11 months after the 2018 sentencing of the local defendant. Insights provided by informants in these interviews shed light on possible impacts of this case on the local drug supply. These interviews were collected in the context of a large, cross-sectional study designed to assess differences in harm reduction and overdose prevention service needs across eight North Carolina counties—including Haywood County (PI: J.C.). Inclusion criteria for the study included: (1) being at least 18 years old; and (2) receiving services from the statewide syringe services program (SSP) operated by the North Carolina Harm Reduction Coalition (NCHRC) in one of the eight counties included in the study.<sup>3</sup>

<sup>2</sup> Chauncey Parker, Director, New York/New Jersey High Intensity Drug Trafficking Area. Personal communication.

<sup>3</sup> This protocol was approved by the Institutional Review Board at Elon University (Elon, North Carolina).

The number of interviews was limited (only 3 were recorded and transcribed in Haywood County; 2 self-reported as female, 1 as male, all between the ages of 18 and 30 years old) as they were only intended to provide contextual information to assist in interpreting the results of a survey on service needs given to a representative sample of SSP participants across the state. The subject of the 2018 conviction and sentencing of a local resident for second-degree murder emerged organically in the first of the three interviews conducted. The interviewer (J.C.) proactively broached this topic in subsequent interviews. Each of the interviewees reported being independently aware of this case and/or having a personal relationship with the individual charged and convicted.

In interviews, participants expressed a deep, moral ambivalence about the appropriateness of prosecuting one community member for the unintentional overdose death of another. They expressed sympathy with the person convicted, suggesting that culpability for the fatal overdose could not be so straightforwardly assigned:

*Um, I think, personally, like, if someone is going to do a drug, they’re going to do a drug. And it’s on them [the drug consumer] definitely.*

One interviewee expressed a sense of solidarity with the person convicted, appealing to their mutual connection as people who use drugs and have lived experience with chemical dependency:

*And I feel sorry for [them] you know what I mean? In a way, because, hell, [they] was just, [they] got high too you know?*

Interviewees also expressed doubt about whether someone who was selling or delivering drugs would have the capacity to know with certainty what substances or contaminants those drugs contained. One even suggested that a consumer who failed to take precautions and subsequently experiences an accidental overdose could harm their distributors by making them the targets of law enforcement action.

*And [the person convicted] didn’t know. Like, I’m not going to say I have sold heroin, but something like that, you know, and I would be absolutely devastated if somebody did overdose or something, and it would be on me or something. I would be absolutely devastated. That’s why I, like—you know, someone who does do that would have to be sure to know who they’re selling to, know that that person is careful. Know that they’re not just going go you know off the deep end and just do whatever.*

This is an interesting reversal of the common stereotype—one which District Attorney Welch used to justify charges of second-degree murder—that drug suppliers are the ones who expose their consumers (and the wider community) to risk of harm.

When asked about the impact of this conviction on the community, interviewees reported divergent responses. One interviewee suggested that, had any impact been felt, things were now back to normal:

*Ah, no. No everybody pretty much acts the same, like, you know. Because that was a long, long time ago.*

At the same time, this interviewee reported regular fluctuations in the price and quality of the local drug supply, emphasizing unpredictable drops in quality over the past two years:

*Um, the prices are like it just, [sighs] oh man it—it’s difficult. Somebody, no, somebody like can, somebody can charge you up to \$40.00 for just a single point [0.1g] you know? And some people charge only, like, \$20.00, you know, for a single point. And it’s not always, you know, quality, you know, over quantity or anything. It’s, it’s, it’s difficult.*

Another interviewee echoed the sentiment that the local drug supply had recently been in flux, but directly attributed this volatility to the DIH conviction. Specifically, they reported that local drug sellers began diluting the batches they were selling, influenced by the outcome of the case:

*Interviewer: Yeah. How has that changed things? You said it shook things up, so.*



*Interviewee: Oh, just like, really people being scared of, of selling anyone anything too strong, you know? And the quality of things, I think people maybe started cutting, ah, their stuff a little bit more because, because they don't want to go to prison for the rest of their lives.*

When asked about how they had adapted to this weakened drug supply, this interviewee replied,

*Mmm, I mean, obviously it sucks, because you just spent your money on it, you know? Um, but you just realize, it's the name of the game, you know. You win some, you lose some...Now you go out and buy more.*

In other words, purchasing larger quantities of their drug of choice for regular use was characterized as a typical response to wide-spread dilution of the local drug supply. Collectively, these reports suggest the possibility of two relationships: one between the publicity of the DIH conviction and manipulation of the local drug supply, another between a changing drug supply and adaptive strategies engaged by consumers to navigate those changes.

Those relationships, in turn, suggest several mechanisms by which this conviction may have impacted public health outcomes. First, the 2018 conviction may have reduced overdose risk in the short-term by producing a less potent drug supply. Alternatively, it may have increased the risk of overdose in the short-to-medium-term by rendering the drug supply less predictable, thus creating more opportunity for local consumers to fatally miscalculate a safe dose. Either way, our data appear to be congruent with earlier research indicating that deterrent effects, when they manifest, may only change how, not whether, local drug sellers manage their supply—a response to drug market interdiction that has been widely observed in other contexts (Dickinson, 2017; Friedman et al., 2011).

Second, if drug consumers respond to a weakened drug supply by simply purchasing more drugs for personal use, risk of overdose may also be exacerbated by an increased number of injection events, increased cost of regular opioid use, and/or inability to safely navigate an unpredictable drug supply—especially if the strength or purity of that supply re-normalizes and increases unexpectedly (Silverstein et al., 2019). Further, a weaker drug supply and more frequent injection events may both increase the financial costs associated with maintaining a steady level of opioid use, which may, in turn, worsen many other individual- and community-level economic, public health, and public safety outcomes.

### Potential impacts on overdose response

Since July 2018, we have also been collecting observational data through another ongoing ethnographic study of harm reduction and syringe access efforts across western North Carolina, including the operation of the NCHRC SSP and a law enforcement-assisted diversion (LEAD) program in Haywood County. That research has put the primary investigator of the study (B.O.) in regular contact with public health officials; LEAD staff; and SSP staff, volunteers, and participants, for three years running. Data collection has included participant-observation and semi-structured interviews with LEAD and SSP staff and with SSP volunteers and participants.<sup>4</sup>

In the framework of this study, LEAD and SSP staff and SSP volunteers in Haywood County reported a strong and steady stream of complaints from participants detailing negative experiences with local law enforcement at the scene of an overdose. Multiple participants reported knowing someone who had been arrested for possession of drugs or drug paraphernalia after law enforcement responded to a 911 call reporting an overdose. Others reported being personally arrested on these grounds. Still others reported being handcuffed, being searched, and

having their homes searched by responding officers at the scene of an overdose. One particularly noteworthy incident in the eyes of SSP staff involved SSP participants being arrested at the scene of an overdose and spending several consecutive days in the Haywood County Detention Center before being released without charges.

In recent years, SSP staff had dedicated significant time and energy on outreach educating participants about the provisions of North Carolina's 911 Good Samaritan Law. Staff believed, based on regular communication with participants, that local people who use drugs possessed sufficient knowledge about the existence and the specific provisions of the law. Staff were, therefore, concerned that these patterns of negative law enforcement interactions at the scene of overdoses would have a chilling effect on residents' willingness to call 911. North Carolina's law does not provide immunity from arrest at the scene of an overdose (NC § 90-96.2), and anecdotal reports of civilians being detained, searched, and arrested at the scene of an overdose have been common since data collection began in 2018.

It is not possible to extrapolate from our data whether this pattern of negative law enforcement interactions was a recent development or a long-standing pattern in Haywood County. Data collection only began in 2018, and the SSP staff who have contributed to the study began harm reduction, outreach, and overdose prevention work that same year, which prevents meaningful comparison of the frequency or intensity of these reports before that time. We do note, however, that SSP staff report participants regularly responding to their 911 Good Samaritan Law education efforts with declarations that they will never call 911 when witnessing an overdose due to the expectation that they will inevitably be arrested by responding officers. These declarations have been substantiated in at least one alleged incident, when a few participants told SSP staff that they had recently fled the scene of an overdose due to fear of arrest. We also note that opioid-overdose related ED visits declined by more than 50% in the two years between 2017 and 2019 (North Carolina Department of Health and Human Services, 2021b), which may indicate a reduction in opioid-overdose related 911 calls during that time. Importantly, in the interim between the 2018 case in Haywood County and the enactment of the state-wide DIH law in late 2019, SSP staff reported that participants were largely unaware that a DIH law was being developed by state representatives but were intimately familiar with the details of the local case.

Haywood is a small, sparsely populated county with tight-knit social networks. Like the interviewees from the state-wide study (above), many SSP participants personally knew and maintained social relationships with the local defendant of the 2018 DIH case. Some knew the defendant very well. Over time, SSP staff began to discern, based on their regular community interactions and outreach efforts, that the participants with closest interpersonal ties to the defendant in the 2018 DIH case were more likely to state their refusal to call 911 when witnessing an overdose and to state that refusal more adamantly. When reporting these observations to the study investigator, SSP and LEAD staff hypothesized that the social proximity to the defendant was associated with greater awareness of the risk and likelihood of arrest, stronger belief that arrest could result in similarly severe charges, and/or heightened fear responses to those potential outcomes due to their social and emotional connections to the 2018 case.

Taken as a whole, these reports from SSP staff suggest a relationship between the 2018 DIH case and overdose response behavior in Haywood County. We cannot say, based on our research activities, whether the DIH case emboldened more aggressive policing of people who use drugs or whether aggressive policing and aggressive prosecution of people who use drugs are both symptomatic of long-standing tensions in this community. However, in the context of aggressive policing of people who use drugs and anecdotal observation that social proximity to a defendant convicted in a DIH case predicts greater reluctance to call 911 when witnessing an overdose, we may reasonably hypothesize that high-profile DIH prosecutions could increase the risk of an accidental

<sup>4</sup> This protocol was approved by the Institutional Review Board at Mission Hospital (Asheville, North Carolina). These interviews have not yet been fully transcribed and, thus, are not excerpted in this article.

overdose resulting in a fatality in the immediate social network of the defendant. Indeed, if the goal of DIH laws is to deter people who use drugs by solidifying perceptions of the certainty, severity, and swiftness of enforcement action (Braga & Weisburd, 2015), then these prosecutions may, in fact, have measurable deterrent effect—but against potentially life-saving overdose response strategies, not against drug market participation.

### A call to prioritize research on the public health impacts of DIH laws

Though our data are limited and provisional, they are nevertheless suggestive of several plausible mechanisms through which DIH laws might be causally connected to measurable changes in public health outcomes. First, DIH laws may reduce overdose risk by encouraging drug suppliers to dilute the substances they sell, creating a weaker drug supply. Second, DIH laws may increase overdose risk by producing unpredictable fluctuation in the drug market, of which that initial dilution may be only the first phase. Third, these changes in the quality of the local drug supply may produce concomitant changes in patterns of drug buying and drug consumption, including but not limited to changes in cost of maintaining a regular opioid habit, changes in route of administration, or changes in injection frequency, all of which may alter the risks of individual outcomes like injury, infection, or financial stress. Fourth, DIH laws may have a chilling effect on those who could call 911 during an overdose, thus undermining the impacts of 911 Good Samaritan Laws, and that chilling effect may be disproportionately felt by members of the defendant's social network(s). Nevertheless, the mechanisms by which DIH laws may impact public health remain unexplored and untested. The need for comprehensive research that can validate or invalidate these hypotheses—or that can generate new hypotheses not captured here—is immediate and great.

A plausible mechanism linking outcome to exposure (such as the mechanisms proposed here linking DIH prosecutions with individual- and community-level public health outcomes) is one of the nine criteria laid out by statistician Austin Bradford Hill for establishing a causal relationship—necessary but insufficient on its own for making causal claims (Bradford Hill, 1965). Current social science research on substance use and the illicit drug market provide a second Bradford Hill criteria: analogy. Studies carried out across the United States indicate that strong social ties between drug distributors and consumers may be protective against overdose (Carroll et al., 2020; McKnight & Des Jarlais, 2018; Rhodes et al., 2019) and that interaction with the criminal justice system is, itself, a likely driver of under-treatment and overdose (Brinkley-Rubinstein et al., 2017, 2018; Mital et al., 2020). DIH prosecutions may be reasonably expected to disrupt social ties, reduce trust between participants in the local drug market, and expose more persons to the criminal justice system through their direct or indirect proximity to the case. The other seven criteria<sup>5</sup> for causality must be assessed through novel research.

Importantly, that research must account not only for trends in the epidemiology of substance use-related harms but also for the lived experiences of law enforcement professionals, prosecutors, community members, and (above all) people who buy, sell, and use illicit drugs where DIH laws are enacted. Quantitative research is indispensable for evaluating the community- and individual-level impacts of DIH laws, but only committed, ethnographic research among these key populations will allow us to answer key questions like: How acutely and for how long are the psychological impacts of DIH prosecutions felt? Do these impacts stem from a DIH law's very existence, from the ways in which that law may be designed, or from whether charges are ultimately made by local prosecutors? How are those effects mediated by social proximity to the

decendent, social proximity to the defendant, the media attention a case receives, or the narrative tone in which that coverage is framed? Finally, how do policing practices, harm reduction practices, and prosecutorial strategies intersect to augment or mediate the public health impacts of each?

According to research conducted by the Health in Justice Action Lab, an estimated 2534 prosecutions under DIH laws took place between 1975 and 2017, nearly 80% of which occurred since 2013 (Health in Justice, 2019). As the number of DIH prosecutions increases, the impacts of those prosecutions on public health—positive or negative—may be amplified as well. If we hope to curb the number of accidental drug overdose death—which continue to climb at unprecedented rates (National Center for Health Statistics, 2021)—we must create meaningful, actionable knowledge about what those impacts truly are.

### Declarations of Interest

The authors have no competing interests to declare.

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<sup>5</sup> Strength of effect, consistency, specificity, temporality, dose-response, coherence, the ability to test through experiment (Bradford Hill, 1965).

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