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Prevalence and correlates of incarceration following emergency medical services response to overdose

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Abstract

Background: To describe the prevalence of incarceration among survivors of non-fatal overdose addressed through an emergency medical services (EMS) response, and compare incarceration by whether the emergency was for opioid-involved or stimulant-involved overdose.

Methods: Administrative records on 192,113 EMS incidents and 70,409 jail booking events occurring between January 1, 2019 and December 31, 2020 in Indianapolis, Indiana were record-linked at the event level. Incarceration taking place within 6-hours of an EMS incident was associated with that incident. Logistic regression was used to calculate adjusted odds ratios (AOR) of incarceration after an overdose.

Results: Among all EMS incidents, 2.6% were followed by incarceration. For overdose EMS incidents, the prevalence of incarceration was 10.0%. Overdose incidents had higher

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Authors contribution

Bradley Ray, PhD – oversaw study design,data analysis, wrote, and mentored Hedden Bethany J. Hedden, MSW – data analysis,wrote, and incorporated co-authors' editsJenniferJ. Carroll, PhD MPH – wrote, edited the article Brandondel Pozo, PhD – wrote, editedthe article KarlaWagner, PhD – edited the article Alex H.Kral, PhD – edited the article Daniel O'Donnell, MD – edited the article Grant Victor, PhD – edited the article Phil Huynh, MPH – coded data

Conflict of interest statement

None.

odds than non-overdose incidents of leading to a charge of felony, booked on a warrant, and transferred to another law enforcement agency upon release. Prevalence of incarceration following a stimulant-involved overdose was 21.3%, compared to 9.3% for opioid-involved overdose survivors. Compared to persons from other EMS incidents, overdose survivors had greater odds of incarceration (AOR=3.48, 95% confidence interval (CI)= 3.22, 3.75, $p < .001$), with opioid-involved overdoses (AOR=3.03, 95% CI=2.76, 3.33, $p < .001$) and stimulant-involved overdoses (AOR=6.70, 95% CI=5.26, 8.55, $p < .001$) leading to higher odds of incarceration.

Conclusion: Incarceration in county jail followed one in ten overdose-involved EMS responses. As illicit drug consumption increasingly involves stimulants, the frequency of incarceration following these events is likely to increase. Policy changes and interventions are needed to reduce incarceration after overdose emergencies.

Keywords

Overdose; EMS; Arrest; Stimulants; Opioids; Police

Despite ongoing efforts to reduce overdose deaths, the United States (U.S.) continues to experience unprecedented rates of overdose mortality with more than 100,000 drug poisoning deaths occurring in the 12-month period ending in April 2021 (Ahmad et al., 2021). This record number has steadily increased over the past 40 years (Jalal et al., 2018). Since 2014, the majority of overdose deaths have been associated with illicitly manufactured fentanyl and related synthetic opioid analogs (Ciccarone, 2021; Gladden, 2016; O'Donnell et al., 2017). Recently, the demographics of fatal overdose has changed, with the rate of overdose deaths among Black Americans now growing faster than that of white Americans (Furr-Holden et al., 2021; Sadler and Furr-Holden, 2019). Another recent trend is the increase in co-use of opioids and stimulants (Al-Tayyib et al., 2017; Gladden, 2019; Glick et al., 2018; Jones et al., 2018; Lockwood et al., 2021; Mars et al., 2015; Strickland et al., 2019) and in overdose deaths involving illicit stimulants, cocaine-involved mortality grew three-fold and stimulant-involved mortality (mostly involving methamphetamine) grew five-fold between 2012 and 2018 (Ciccarone, 2021; Hedegaard, 2021).

Non-fatal overdose is a risk factor for subsequent fatal overdose and presents a critical touchpoint for linkage to treatment and prevention services (Larochelle et al., 2019; Victor et al., 2021, 2021). In most jurisdictions' emergency medical services (EMS) personnel and law enforcement are both dispatched to all suspected overdose or poisoning-involved emergencies, regardless of the substance type (Koester et al., 2017). When responding to non-fatal overdose, police officers face contradictory mandates: protect public health and enforce criminal drug laws. Police response may lead to arrest and incarceration, which has emerged as a risk factor for overdose when persons are released without treatment or adequate care (Alex et al., 2017; Binswanger, 2013; Binswanger et al., 2007, 2016; Lim et al., 2012; Seal et al., 2001; Victor et al., 2021). Police response to overdose scenes may deter bystanders from calling 911 due to fear of criminal-legal consequences (such as arrest on active warrants or probation or parole violations), loss of housing, and involvement from child welfare authorities (Carroll et al., 2021; Latimore and Bergstein, 2017; Seal et al., 2003; Tobin et al., 2005; Wagner et al., 2019, 2021; Wakeman et al., 2009; Watson et al., 2018), which could have lethal consequences for the overdose victim.

Good Samaritan Laws (GSL) aim to address these barriers to calling 911 by offering limited criminal immunity to individuals who report an overdose or are experiencing an overdose (Carroll et al., 2018). All but three states in the U.S. have some form of a drug-related GSL though specific protections vary between states (Prescription Drug Abuse Policy System, 2021). Research findings on the impact of state GSL on overdose rates has been mixed (Atkins et al., 2019; McClellan et al., 2018; Moallef and Hayashi, 2021; Rees et al., 2019), but large variation in the provisions of GSL across states make such comparative studies challenging. Emerging evidence suggests that only GSL providing immunity from arrest are associated with lower rates of overdose deaths two years after implementation (Hamilton et al., 2021). Inconsistent implementation of GSL has also been a long-standing challenge (Banta-Green et al., 2013; Carroll et al., 2020).

Though GSL are meant to reduce barriers to calling 911 by reducing the criminal-legal outcomes of calling first responders to the scene (Carroll et al., 2018), the true impact of law enforcement involvement in overdose calls-for-service for individuals witnessing or experiencing an overdose remains unclear. Previous studies have examined fatal overdose following incarceration (Mital et al., 2020), but we are not aware of any that have explored incarceration following a non-fatal overdose incident involving EMS. The purpose of this study is to describe the prevalence of incarceration among survivors of non-fatal overdose addressed through an EMS response and compare incarceration by whether the emergency was for opioid-involved or stimulant-involved overdose.

1. Materials and methods

1.1. Study setting

In this study, we analyze data from Marion County, Indiana, home of the state capital Indianapolis and the state's largest county with a population of nearly one million (U.S. Census Bureau, 2020). The prevalence of fatal overdose in Marion County increased by 12.5% between 2018 and 2019, 50.5% between 2019 and 2020, and decreased an estimated 46.3% between 2020 and 2021 (Indiana Department of Health, 2021). Indiana's current combined GSL and naloxone access law went into effect in 2016. That law (IND. CODE ANN. § 16–42–27–2 (g)-(h)), provides immunity from prosecution for drug possession and instructs officers to not take persons into custody, provided the following criteria are met: that person previously obtained and administered naloxone to the overdose victim; stayed on scene while first responders arrived; gave the full name of the overdose victim and any other relevant information to law enforcement, as requested; and fully cooperated with police and EMS personnel. The law does not extend ay protections to the individual who experienced the overdose. The language of the law was updated in 2019 to preserve consistency with Indiana's Controlled Substances Act (IND. CODE ANN. § 35–48–4), but the provisions of the law were not substantively altered by that revision (Assembly, 2022). Additionally important to this setting are drug and syringe service related laws; that is, Indiana has a legal framework for syringe service programs but the possession of syringes is still a felony (IND. CODE ANN. § 16–42–19–18) and possession of other paraphernalia a misdemeanor (IND. CODE ANN. § 35–48–4–8.5).

1.2. Data sources

We acquired data on 911 calls-for-service to which EMS was dispatched from the Indianapolis Emergency Medical Services (IEMS), which covers over 90% of Marion County, between January 1, 2019 and December 31, 2020 (N = 206,803). We then removed cases with incomplete demographic data (age, race-ethnicity, and sex), those involving children 12 years old or younger who are not detained in jails, those who died on scene or during transport, and those with missing key identifiable information. This produced a 7.1% loss in the data for a final sample of 192,113 unique EMS incidents. We then record-linked these incidents to jail booking data from the Marion County Sheriff's Office over the same two-year period (233,845 charges across 70,409 unique booking events). Data were merged using name (first and last), date-of-birth, and the calendar date and precise time of both events (EMS and jail). We considered an EMS incident and subsequent incarceration to be associated if they occurred within 6-hours of one another and looked across a 24-hour range, rather than calendar day, to capture persons incarcerated in the early morning following an EMS incident. Analyses were conducted on deidentified data pursuant to the record linkage procedures. This protocol was reviewed and approved by the Wayne State University institutional review board (#21053589).

1.3. Measures

The main outcome of interest is incarceration in the county jail within 6-hours following an EMS response and whether the odds of incarceration changed when the response is suspected to be overdose-involved. Information in the chief complaint, secondary complaint, and mechanism of injury (all reported by EMS) were used to create three measures to examine prevalence of incarceration: (1) any overdose, (2) opioid-involved overdose, and (3) stimulant-involved overdose. *Overdose survivors* represents all instances of a suspected overdose, including those where the initial call-for-service was identified as an overdose, as well as those where the call was not overdose related but where naloxone, the opioid-agonist, was ultimately administered and the person was ultimately resuscitated. Out of all EMS incidents analyzed (n = 192,113), 4.9% (n = 9508) were coded as overdose survivors per this definition. Among these, we created two additional typologies: *opioid-involved*, where suspected heroin and synthetic opioids were reported, along with all those where naloxone was administered, and *stimulant-involved*, which included cocaine or amphetamines. These are not conclusive or exhaustive lists of the underlying substances involved in these incidents but instead represent EMS appraisals and show that nearly two-thirds (64.2%; n = 6106) of overdose survivors were opioid-involved while only 4.2% (n = 404) were stimulant-involved. There were 63 cases that fit the criteria for both opioid- and stimulant-involved, representing 1.0% of the opioid-involved incidents and 15.6% of stimulant-involved incidents. Among the nearly one-third of overdose survivors who were neither opioid- or stimulant-involved (n = 3061) most were coded as "unspecified" (n = 1217) followed by alcohol (n = 659) and synthetic marijuana (n = 638) and cannabis (n = 127). Additional measures from EMS data are limited but include demographic information on *age, race-ethnicity* (Black/African American, Hispanic, Asian, American Indian/Pacific Islander, Caucasian, and Unknown), and *sex* (female, male). Cases missing this information were not included for subsequent record-linkage.

Jail data contains information on the specific charges for each jail booking event along with the date and precise time of the booking and release if one had occurred. Each of the charges included at booking are classified as a misdemeanor or a felony and as the result of new offense or a warrant issued from the courts on an outstanding offense. Dates of the booking event were used to calculate the time from the EMS incident to incarceration as well as length of jail stay. Importantly, not all persons have a release date. About half (50.6%; n = 35,628) were released to another law enforcement agency (e.g., probation, another facility, prison) with 30.4% (n = 21,417) released on their own recognizance and 12.7% (n = 8976) after paying bond and had a release date; however, 4.8% (n = 3392) were serving a sentence in jail, 1.4% (n = 978) had incomplete booking information, 16 persons died in custody, and 2 escaped, none of whom had a release date listed in the booking records.

1.4. Statistical analysis

Using IBM SPSS Statistics V.27 (IBM Corp., Armonk, NY, United States) we conducted descriptive statistics on demographic measures of all persons involved in EMS incidents along with the prevalence, timing, and charge characteristics for those booked and detained in the county jail within 6-hours of that incident. We then look at incarceration outcomes separately for those involved in an overdose and conduct bivariate analyses (chi-square and t-tests) between key incarceration variables including charge level, booking type, and release type. Among overdose survivors we examine prevalence and trends of incarceration for opioid-involved and stimulant-involved incidents separately before conducting a series of logistic regression models predicting incarceration while adjusting for demographics with an a priori significance level ($p < .05$) used as our cutoff across all analysis.

2. Results

The sample of all EMS incidents (N = 192,113) was comprised of persons with an average of 50.2 years of age (standard deviation [SD]=20.2, median=50.0, interquartile range [IQR]=32, range 13–109). About half of all persons were female (49.2%), and the majority were Caucasian (53.0%), with just over two-fifths (43.6%) Black/African American, 2.6% Hispanic, 0.7% Asian, and 0.1% American Indian or Pacific Islander. Overall, 2.6% (n = 5061) of persons who had an EMS response, regardless of suspected overdose, were booked in jail within the 6-hour cut-off period. Incarceration did not vary by race-ethnicity though females were significantly more likely than males to be incarcerated (2.8% and 2.5% respectively, $\chi^2 = 13.91$, Cramer's V=.009, p <[0.001. The fastest time to incarceration was 11 min with 82.4% (n = 4170) occurring less than two hours after EMS arrival on scene.

Persons who were incarcerated following any EMS incident received an average of 4.3 charges each (SD=3.7, median=4.0, IQR=4.0, range 1–77) with more than half (58.6 %) receiving at least one felony charge and 15.3 % booked on an outstanding warrant; among all jail detainees during the study period the average booking had 3.4 charges (SD=2.9, median=2.0, IQR=0, range 1–116), with 56.2 % (n = 39,540) having least one felony charge and 27.8 % (n = 19,605) on an outstanding warrant. Resisting law enforcement, public intoxication, operating a vehicle while intoxicated, possession of a syringe, and theft were the top five charges listed among those who were incarcerated following an EMS incident

and represent nearly one-third (32.8 %) of all charge types (n = 22,187). Among those persons for whom a release date was supplied (n = 4995) the average length of jail stay was 19.5 days (SD=51.2, median=2.0, IQR=8.0, range 0–654) with 44.3 % released within 48-hours and 75.1 % within one week. Similar to overall trends among jail detainees, about half (50.2 %) were released to another law enforcement agency, 34.1 % on their own recognizance, and 10.7 % after paying bond Table 1.

The prevalence of incarceration among all overdose survivors was 10.0 % (n = 955)—more than four times the prevalence for other EMS incidents (2.2 %; χ^2 = 2141.2, Cramer's V=.106, p <[0.001. Bivariate analyses revealed that, when incarcerated, overdose survivors were significantly more likely to be charged with a felony (66.9 % and 56.7 %; χ2 = 33.2, Cramer's V=.081, p <[0.001, booked on an existing warrant (21.0 % and 14.0 %; χ2 = 30.1, Cramer's V=.077, p <[0.001, and released to another law enforcement agency (54.7 % and 49.2 %; χ2 = 21.8, Cramer's V=.066, p <[0.001, relative to other EMS incidents that preceded incarceration. Unlawful possession of syringe, possession of a narcotic drug, public intoxication, resisting law enforcement, and possession of paraphernalia (other than a syringe) were the top five charges listed among those who were incarcerated following an overdose and account for 40.8 % of all the charges (n = 4588).

Incarceration prevalence was 9.3 % following opioid-involved overdose EMS incidents and 21.3 %. following stimulant-involved incidents. Unlawful possession of a syringe was the top charge for both overdose types though for opioid-involved incidents the second most common was possession of a narcotic drug and for stimulant-involved events resisting law enforcement. Trends of 7-day rolling averages of incarceration prevalence following overdose during the two-year study period reveal an average high of 4.3 % among all EMS incidents with a sharp decline in March 2020, following the COVID-19 pandemic stay-at-home orders; incarceration prevalence subsequently increased, but did not reach pre-COVID levels (Fig. la). The prevalence of incarceration for overdose survivors peaked in January 2020 at 24.1 % (Fig. 1b). Opioid-involved incidents follow a similar pattern that remains lower than before the pandemic. We further examined incarceration following other overdose types (i.e., cannabis and alcohol) and found rates (10.8 % and 9.7 % respectively) similar to all overdose survivors (10.0 %) and half that of stimulant-related overdoses (21.3%).

Logistic regression modelling found that age is negatively associated with incarceration for an EMS call-for-service [adjusted odds ratio (AOR)= 0.96, 95% confidence interval (CI)= 0.95, 0.96, p < .001], that females had significantly higher odds of incarceration (AOR=1.11, 95% CI=1.05, 1.17, p < .001) than males, and that Black (AOR=0.82, 95% CI=0.76, 0.87, p < .001) and Hispanic (AOR=0.60, 95% CI=0.51, 0.72, p < .001), but not Asian or American Indian or Pacific Islanders, had significantly lower odds of incarceration than Caucasians. Subsequent models controlled for these factors to look at the odds for overdose survivors, and both opioid- and stimulant-involved overdose survivors, as compared to other EMS incidents (Table 2). Overdose survivors had significantly greater odds of incarceration compared to other EMS incidents (AOR=3.48, 95% CI=3.22, 3.75, p < .001). Model 2 examined opioid-involved overdose survivors and found significantly higher odds than other EMS incidents, though not as high as for all overdose survivors combined (AOR=3.01, 95%

CI=2.76, 3.33, p < .001). Model 3 compared stimulant-involved overdose survivors to all EMS incidents and found significantly higher odds of detention—nearly twice that of all overdose-survivors (AOR=6.07, 95% CI=5.26, 8.55, p < .001).

3. Discussion

During the 24-month period between January 1, 2019 and December 31, 2020, one out of every ten overdose survivors in Marion County, Indiana, was detained in the county jail within 6-hours of EMS arrival on the scene, which is nearly four times higher than that of all EMS incidents. We found that most overdose survivors were incarcerated within two hours of the emergency medical response with many released within a matter of hours or days, often on their own recognizance and with no bond. Nearly one out of every five incarcerated overdose survivors were booked on an active warrant; importantly though, this finding comes from Indiana which at the time of analysis does not have GSL that provide adequate protections against criminal-legal consequences during overdose incidents. To reduce overdose deaths and improve public health responses to the overdose epidemic, legal protections must be strengthened. The methods used in this study could be leveraged to assess the effectiveness of any such legislative changes.

Overdose incidents were most likely to be classified in EMS data as opioid-involved. However, findings show dramatically higher prevalence of incarceration for stimulant-involved overdose incidents with more than one out of five resulting in incarceration. This is troubling given recent increases in stimulant-involved fatal overdose (Ciccarone, 2021) and gaps in the evidence base for effective standards of identification and care for these incidents. There are no known medicines for reversing stimulant intoxication or to effectively treat stimulant use disorder (Trivedi et al., 2021), and research has shown that persons experiencing stimulant intoxication are more susceptible to arrest and other police-related harms (Bailey et al., 2016). Effective police responses to suspected stimulant-involved overdoses remain unclear and uninformed by rigorous research (Du et al., 2017), though the utility and consequences of automatically dispatching law enforcement to overdose calls is questionable, especially when EMS personnel already have more effective, though not yet evidence-based, strategies for responding to stimulant-involved emergencies (Hayase et al., 2006; Solano et al., 2021).

GSL are intended to address fears of criminal-legal consequences, including incarceration, that deter bystanders from seeking medical assistance for a drug-related emergency (Carroll et al., 2018). The incarceration of people at risk of subsequent fatal overdose is categorically antithetical to the overdose-prevention goals of the GSL. Arrest can delay transport to medical services, impede medical care, and further degrade health (Brinkley-Rubinstein and Cloud, 2020; Victor et al., 2021; Victor et al., 2021). During the study period, the Marion County jail provided neither medications for opioid use disorder nor naloxone to returning citizens (Davidson et al., 2018; Wagner et al., 2015). And though any incarceration increases risk of overdose (Mital et al., 2020), periods of 30 days or less are associated with the greatest risk (Loeliger et al., 2018). Given the rapid turnaround in jail observed in this study, many individuals who were dependent on opioids likely went through painful withdrawal in jail and faced significant challenges finding treatment upon release (Alex et al., 2017;

Wakeman and Rich, 2018) thus, the practice of arresting persons who have just survived a non-fatal overdose seems particularly pernicious.

Our study identified some differences across race-ethnicity and gender. The existence of race-ethnicity and gender-based disparities in police use of force and arrest in the U.S. is indisputable (Wright & Headley, 2020), and it is well documented that police aggression, prior negative interactions with police, and general distrust of first responders discourage calling 911, undermining the efficacy of GSL (Koester et al., 2017; Latimore and Bergstein, 2017). Our study cannot speak to the differences in EMS utilization or willingness to call 911 across race-ethnicity and/or gender, a subject that has, to date, not been sufficiently researched, though post-hoc analysis suggests that at the intersection, it is Black/African American females with the highest rate of incarceration (2.9%). Analogous research suggests that the social identities of overdose survivors and bystanders matter deeply in shaping emergency response and prevention strategies (Carroll et al., 2021). Future research should seek to better understand these relationships and their impact on emergency response and incarceration.

Although more research is needed, promising models for non-law enforcement emergency crisis response are emerging (El-Sabawi and Carroll, 2021), as are corresponding efforts to change policies and procedures about who responds to overdose incidents that avoid incarceration (Davis, 2020; Department of Social Services: C.R.I.S.E.S. Grant Pilot Program, 2021; Folley, 2021; Ghosh, 2021). Though equipping officers with naloxone is widely supported (Bureau of Justice Assistance, 2014), research suggests officers are not administering naloxone to overdose victims, ostensibly because EMS is co-arriving or preceding police arrival on scene (Carroll et al., 2020). Given this, and evidence that punitive attitudes some officers hold towards overdose victims endure—or worsen—through public health-oriented overdose response training (Winograd et al., 2020), the question of whether or not police should ever be dispatched to an overdose-related incident in areas with reliable EMS is valid and timely. In settings where police response is key to reduce fatalities, police leadership should instruct officers to leverage their considerable powers of discretion following an overdose in support of public health goals (del Pozo et al., 2021).

Like other studies that use administrative data, we are limited by the nature of that data. Records used in this study are limited to personal information collected by EMS and jail staff, along with the time-of-event, and are subject to error. We do not have data on the detention of other individuals who may have witnessed the overdose, who may have been booked into jail. Research suggests that such arrests do indeed occur, despite it not being observable in our data (Carroll et al., 2020). Thus, our estimated prevalence of detention following an overdose incident is surely an undercount. The inclusion for arrest at 6-hours after the time of EMS response also contributes to this undercount; while this time frame leaves us confident the arrests were indeed related to the medical event, and accounts for possible investigative or medical treatment delays, it would exclude some. Lengthening the time frame could capture arrests unrelated to the EMS response so we report this conservative time frame. We were also limited to booking data from the jail in Marion County, though the service district overlaps with the corresponding EMS data. We cannot use these data to evaluate specific EMS policies and practices, as there is no formal

public guidance on when or why emergency call operators dispatch police. Despite these limitations, our use of EMS data follows similar approaches used by prior studies (Ajumobi et al., 2021).

As there is no pharmacological response to suspected stimulant-involved overdoses available to lay persons (like naloxone for opioids), we may be undercounting these incidents. Future work should focus on refining the identification and validation of suspected substances reported by first responders and explore the role additional factors not available in our data, such as location, time of day, responder attitudes towards drug use (McClellan et al., 2018), outstanding warrants (Koester et al., 2017), district policies concerning prosecution (Carroll et al., 2021), and other criminalizing elements of the scene (Lowder et al., 2020). More work is needed on the role of emergency dispatch as the *first*, first responders of these calls-for-service, specifically impacts of agency policy and practice, as well as how emergency dispatch frames these events by soliciting and interpreting key information. Despite these limitations, this study provides novel findings regarding incarceration following an overdose outcome and furthered a new means of evaluating the effectiveness of GSL.

4. Conclusion

These findings illustrate the noteworthy potential for iatrogenic effects following police involvement in EMS overdose incidents. Prior research has thoroughly documented the reality that people witnessing an overdose—especially people who use drugs—fear that they and/or the overdose victim will face criminal-legal consequences, incarceration, parole violation, and even prosecution for murder if they make a 911 call to report an overdose (Carroll et al., 2021; Jakubowski et al., 2018; Koester et al., 2017; Latimore and Bergstein, 2017; Wagner et al., 2019). This study provides empirical evidence that incarceration following an EMS overdose event is common, with those affected by a stimulant-involved overdose most at risk. The adverse effects of criminal-legal involvement may continue to exacerbate the overdose mortality epidemic, especially if the consumption of illicit stimulants continues to rise. Policy changes and public health-oriented interventions are needed to reduce the subsequent incarceration of people who use drugs when medical help is sought for an overdose. Future research should continue to evaluate non-police crisis response models for overdose and, in particular, for events that involve stimulant drugs. Absent such models, and in other cases where police are dispatched to respond to overdoses, state and local policies should guide discretionary police decisions away from arrest and toward responses supported by evidence and known to improve health outcomes. Such policies may include limiting the power of police whenever appropriate, emphasizing the protection of life over concerns such as the enforcement of comparably minor offenses. Though there are many avenues for achieving these goals, strengthening the protections of—and the scope of persons protected under-state GSL – is likely an efficient and effective starting point.

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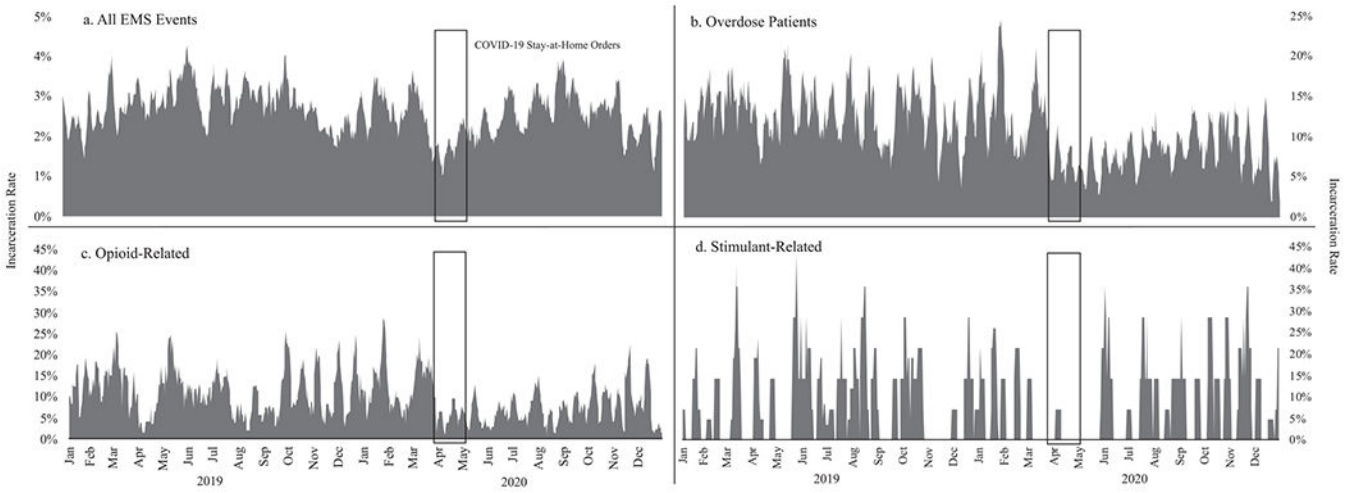

Fig. 1.

Trends in Incarceration following an Emergency Medical Services Incident and by Overdose Type, Marion County, Indiana, 2019–2020.

Table 1

Individual Characteristics and Incarceration Factors following an Emergency Medical Services Incident and by Overdose Type.

Individual Characteristics	**All EMS Events**		**Overdose Survivors**		**Opioid-Involved**		**Stimulant-Involved**	
	N = 192,113		**n = 9508**		**n = 6106**		**n = 404**	
	Mean (SD)		**Mean (SD)**		**Mean (SD)**		**Mean (SD)**	
Age	50.2	20.2	38.0	13.3	38.6	12.9	35.1	10.0
Race-Ethnicity	**N (%)**		**N (%)**		**N (%)**		**N (%)**	
Black	83,798	43.6%	2752	28.9%	1360	22.3%	92	22.8%
Caucasian	101,750	53.0%	6540	68.8%	4644	76.1%	294	72.8%
Hispanic	5012	2.6%	188	2.0%	93	1.5%	18	4.5%
Asian	1300	0.7%	18	0.2%	3	0.0%	0	0.0%
American Indian/Pacific Islander Sex	253	0.1%	10	0.1%	6	0.1%	0	0.0%
Female	94,525	49.2%	4571	48.1%	2789	45.7%	198	49.0%
Male	97,588	50.8%	4937	51.9%	3317	54.3%	206	51.0%
Incarceration	5061	2.6%	955	10.0%	570	9.3%	86	21.3%
Incarceration Factors	**Mean (SD)**		**Mean (SD)**		**Mean (SD)**		**Mean (SD)**	
Length of Jail Stay (days)	19.5	51.2	18.9	48.8	17.8	43.6	24.9	53.6
	N (%)		**N (%)**		**N (%)**		**N (%)**	
Charge Level (Any Felony)	2968	58.6%	639	66.9%	418	73.3%	60	69.8%
Booking Type (Warrant)	774	15.3%	201	21.0%	123	21.6%	14	16.3%
Release Type								
Own Recognizance	1728	34.1%	299	31.3%	166	29.1%	21	24.4%
On Bond	542	10.7%	83	8.7%	50	8.8%	11	12.8%
Other Law Enforcement Entity	2541	50.2%	522	54.7%	327	57.4%	50	58.1%
Sentenced to Serve Time	164	3.2%	42	4.4%	22	3.9%	3	3.5%
Not Released / Unknown	86	1.7%	9	0.9%	5	0.9%	1	1.2%

Table 2

Logistic Regression Models Predicting Incarceration following an Emergency Medical Services Response, Marion County, Indiana, 2019–2020.

Overdose Measures	*B (SE)*		AOR (95% CI)
Model 1: Overdose Survivors (Ref: other EMS incidents)	1.25 (0.04)	***	3.48 (3.22–3.75)
Model 2: Opioid-Involved (Ref: other EMS incidents)	1.10 (0.48)	***	3.03 (2.76–3.33)
Model 3: Stimulant-Involved (Ref: other EMS incidents)	1.90 (0.12)	***	6.70 (5.26–8.55)

NOTES: N = 192,113 with 5061 incarceration events. Adjusted odds ration [AOR]. All models include a continuous measure of age and measures of sex (1 =female) and race-ethnicity (1 =Black, 2 =Hispanic, 3 =Asian, 4 =American Indian/Pacific Islander, and white as reference category).

*** $p < .001$.