



Quantifying Overdose Prevention Touchpoints in Michigan

In an effort to inform policy and practices in Michigan the Center for Behavioral Health and Justice (CBHJ) sought to quantify overdose rates at two touchpoints: **incarceration in county jail** and **a resuscitation from emergency medical services**. Incarceration has emerged as a life-threatening risk factor for overdose, especially for those with opioid use disorder (OUD). Research from the CBHJ [suggests](#) that more than one in five overdose deaths in the community are recently released jail detainees.¹⁻⁵ Additionally, several studies have highlighted the risk of fatal overdose following a non-fatal overdose event,⁶ which has sparked the development of numerous post overdose response programs.⁷

To examine our first touchpoint, incarceration, we used booking and release data from multiple time periods, which varied across 11 jail facilities in Michigan, between 1/5/2018 and 6/8/2021. This includes records on 13,805 detainees, with follow-up data on mortality from vital records. While the date range for release varied by facility, our preliminary analysis focuses only on 30 days, 60 days, 90 days and 365 days post release. As shown in Table 1, during the 365-day follow-up period there were 178 deaths (1.29% of all detainees); of which 30.90% were overdose related. The overall overdose-rate 365 days post-release was 0.40% or 400 per 100,000 which is 16.39 times the state overdose rate. This rate varied significantly by jail facility, with three having no overdose deaths and the facility with the highest rate at 0.524%. Table 1 displays prevalence for mortality at 30, 60, and 90-day time points as well.

Table 1. Mortality among returning citizens by time points post-release (N=13,805)

	Deaths	Overdose-related deaths
At 30 days post-release	21 (0.15%)	6 (0.04%)
At 60 days post-release	40 (0.29%)	16 (0.12%)
At 90 days post-release	55 (0.40%)	22 (0.16%)
At 365 days post-release	178 (1.29%)	55 (0.40%)

Note: Time points are cumulative categories, e.g. sum of deaths at 60 days post-release necessarily includes deaths at 30 days post-release; ICD-10 codes for underlying causes of death X40-44, X60-64, X85, Y10-14 were considered overdose-related deaths per [CDC guidelines](#).

The second touchpoint looked at non-fatal overdose responses through emergency medical services (EMS). Here we used data from a large metropolitan area in Michigan where we record linked to vital records naloxone administrations by EMS over an approximately 29-month period (January 1st, 2018, through June 9th, 2020). This included 5,825 non-fatal overdoses among 4,690 successfully resuscitated patients, and excluded those dead-on-arrival cases and incidents not associated with identifiable information. We again focus on 30, 60, 90 and 365-day time points and found that during the 365-day follow-up period, 13.28% of those who experienced a nonfatal overdose went on to die (623 of 4,690). Of these deaths, 33.39% (208 of 623) were overdose-related, which suggests a 365-day follow-up overdose-related mortality rate of 4.44% (208 of 4,690).

Table 2. Mortality by time point post-nonfatal overdose incident (N=4,690)

	Deaths	Overdose-related deaths
At 30 days post-release	216 (4.6%)	69 (1.5%)
At 60 days post-release	284 (6.1%)	94 (2.0%)
At 90 days post-release	330 (7.0%)	112 (2.4%)
At 365 days post-release	623 (13.3%)	208 (4.4%)

Note: Time points are cumulative categories; ICD-10 codes for underlying causes of death X40-44, X60-64, X85, Y10-14 were considered overdose-related deaths per [CDC guidelines](#).



Recent research suggests that implementing screening and medications for OUD for detainees could reduce thousands of overdose deaths yearly.⁸ The [OTE MOUD in Jail Model](#) aims to address this gap by implementing a standardized OUD screening tool at booking, all three FDA approved medications, psychosocial services, and discharge planning. By integrating jail and vital death records the CBHJ has developed a method to understand jail program effectiveness on mortality outcomes. Future efforts will focus on further examining the association between jail OUD practices and overdose mortality.

Fatal overdose following a non-fatal event are much higher in this analysis than those reported in the prior literature⁶ and speak to the need for post-overdose response programs. Since January 2020 the CBHJ has facilitated the implementation of a Proactive Response to Overdose and Appropriate Connections to Treatment (PROACT) where first responders notify treatment providers of an overdose event and recovery coaches follow up with survivors at their respective stages of change. If direct contact was made, patient engagement was measured as either “low” (i.e., received information, fentanyl test strips and/or naloxone), “medium” (i.e., interest in syringe services), or “high” (i.e., interest in substance use disorder services). Given direct contact in Kent or Monroe counties, over 80% engaged with treatment providers to a “low” or “medium”, or “high” level. While preliminary evidence on PROACT is positive it speaks to the potential for broader statewide integration of fatal and non-fatal overdose events⁹ to understand whether specific post-overdose practices are associated with reduced mortality.

References

1. Alex B, Weiss DB, Kaba F, Rosner Z, Lee D, Lim S, et al. [Death After Jail Release: Matching to Improve Care Delivery](#). J Correct Health Care. 2017 Jan 1;23(1):83–7.
2. Binswanger IA. [Mortality After Prison Release: Opioid Overdose and Other Causes of Death, Risk Factors, and Time Trends From 1999 to 2009](#). Ann Intern Med. 2013 Nov 5;159(9):592.
3. Binswanger IA, Stern MF, Deyo RA, Heagerty PJ, Cheadle A, Elmore JG, et al. [Release from Prison — A High Risk of Death for Former Inmates](#). New England Journal of Medicine. 2007 Jan 11;356(2):157–65.
4. Lim S, Seligson AL, Parvez FM, Luther CW, Mavinkurve MP, Binswanger IA, et al. [Risks of Drug-Related Death, Suicide, and Homicide During the Immediate Post-Release Period Among People Released From New York City Jails, 2001–2005](#). American Journal of Epidemiology. 2012 Mar 15;175(6):519–26.
5. Victor G, Zettner C, Huynh P, Ray B, Sights E. [Jail and Overdose: Assessing the Community Impact of Incarceration on Overdose](#). Addiction. 2021;
6. Ray BR, Lowder EM, Kivisto AJ, Phalen P, Gil H. [EMS naloxone administration as non-fatal opioid overdose surveillance: 6-year outcomes in Marion County, Indiana](#). Addiction. 2018 Dec;113(12):2271–9.
7. Formica SW, Apsler R, Wilkins L, Ruiz S, Reilly B, Walley AY. [Post opioid overdose outreach by public health and public safety agencies: Exploration of emerging programs in Massachusetts](#). International Journal of Drug Policy. 2018 Apr 1;54:43–50.
8. Macmadu A, Adams JW, Bessey SE, Brinkley-Rubinstein L, Martin RA, Clarke JG, et al. [Optimizing the impact of medications for opioid use disorder at release from prison and jail settings: A microsimulation modeling study](#). International Journal of Drug Policy. 2021 May 1;91:102841.
9. Lowder EM, Amlung J, Ray BR. [Individual and county-level variation in outcomes following non-fatal opioid-involved overdose](#). J Epidemiol Community Health. 2020 Jan 9;jech-2019-212915.