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## Increased HIV testing in people who use drugs hospitalized in the first wave of the COVID-19 pandemic

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### ABSTRACT

People who use drugs (PWUD) often experience barriers to preventative health care. During the COVID-19 pandemic, due to lapses in harm reduction services, several public health experts forecasted subsequent increases in diagnosis of HIV in PWUD. As many inpatient hospitals reworked patient flow during the COVID-19 surge, we hypothesized that HIV testing in PWUD would decrease. To answer this question, we compiled a deidentified list of hospitalized patients with electronic medical record indicators of substance use—a positive urine toxicology screen, prescribed medications to treat opioid use disorder, a positive CIWA score, or a positive CAGE score—admitted between January, 2020 and August, 2020. The outcome of interest was HIV test completion during inpatient hospitalization. The study used logistic regression to examine associations between type of substance use and receipt of HIV test. The study grouped substance use type into four groups (1) opioids (oxycodone, fentanyl, or other opiates) or opioid use disorder treatments (methadone, buprenorphine, naltrexone); (2) stimulant use (cocaine or amphetamines); (3) alcohol use (presence of a positive CAGE or CIWA score or alcohol present on toxicology screen); and (4) benzodiazepine use (benzodiazepines present on toxicology screen). The proportion of PWUD who were tested for HIV increased from 10.4% in January, 2020 to 28.2% in April, 2020 and back down to 12% in August. Notably, there was an inverse trend over time for number of people hospitalized with drug use, from 259 in January to a nadir of 85 in April, and then up to 217 in August, 2020. Contrary to our hypothesis, HIV testing increased during the COVID-19 pandemic, and we discuss explanations for this finding. The decrease in HIV testing post-pandemic peak is a reminder that we must work to develop interventions that lead to sustained high rates of HIV testing for all people, and especially for PWUD.

### 1. Introduction

People who use drugs (PWUD) often experience barriers to health care, including HIV testing. Public health experts forecasted that HIV transmission in PWUD would increase with the COVID-19 pandemic, as a result of decreased access to harm reduction services, the negative psychological impact of social isolation, and overall disruption to preventative health care delivery to PWUD (Becker & Fiellin, 2020; Carrico et al., 2020; Hochstatter et al., 2020; Jenkins et al., 2020). Massachusetts (MA) was particularly hard hit by COVID-19, and key dates in the MA COVID-19 timeline include shut down of all but essential services on March 23, 2020 (City of Boston, 2020), peak COVID-19 infection rates in mid-April (Massachusetts Department of Public Health, 2020), and re-opening of several business types on July 6 (Massachusetts

Department of Health, 2020; Decosta-Klipa, 2020). Our research team has been tracking HIV testing rates in people hospitalized with electronic medical record (EMR) indicators of substance use at Tufts Medical Center (TuftsMC) in Boston, MA, since 2017 when HIV outbreaks occurred in several nearby communities (Cranston, 2019; Cranston et al., 2019). Equipped with this database, we hypothesized that as the general flow of patient care in the hospital shifted to COVID-19-related care in March 2020, the number of HIV tests ordered for hospitalized PWUD would decrease. We also hypothesized that HIV testing after the COVID-19 surge would return to pre-surge rates.

### 2. Methods

We receive IRB approval to collect data from all PWUD

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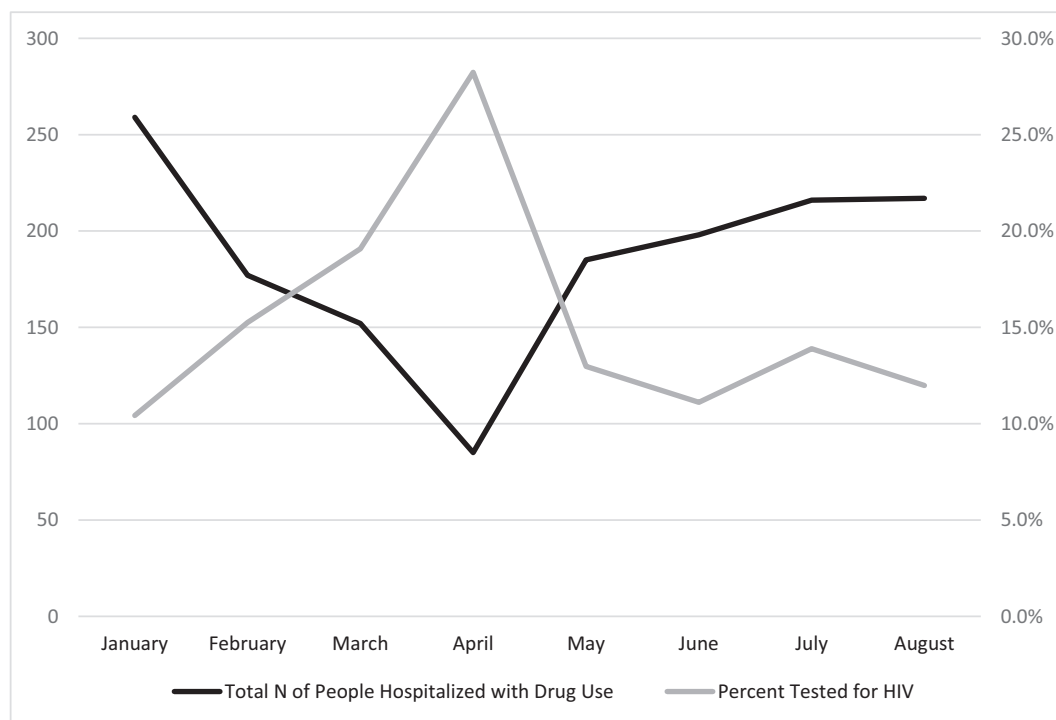


Fig. 1. HIV testing frequency in people who use drugs admitted to the hospital during the COVID-19 pandemic.

hospitalizations at TuftsMC between January 1, 2017 through August 30, 2020. The study define PWUD hospitalizations as having one of the following: a positive toxicology screen for fentanyl, amphetamines, cocaine, opiates, oxycodone, methadone, buprenorphine, benzodiazepines, or alcohol; or having a score of 8 or more on the CIWA scale and/or a score of 2 or more on the CAGE scale; or having been prescribed methadone, buprenorphine, naltrexone, acamprosate, or disulfiram. We analyzed the data for January 1, 2017, through December 31, 2019, calculating the average number of hospitalizations per month, and the average HIV testing frequency. Focusing on dates before and after the COVID-19 surge in MA (January 1, 2020 to August 31, 2020) we compared the total number of PWUD hospitalized each month and the percentage of people tested each month for HIV. We created an indicator variable (Y/N) for each of the substance use types, including (1) opioids (oxycodone, fentanyl, or other opiates) or opioid use disorder-related medications (methadone, buprenorphine, naltrexone); (2) stimulant use (cocaine or amphetamines); (3) alcohol use (presence of a positive CAGE or CIWA score, alcohol present on toxicology screen, or medication to treat alcohol use disorder); and (4) benzodiazepine use (benzodiazepines present on toxicology screen). These categories of use are not exclusive, so individuals could be counted in more than one category. We examined the relationship between type of substance use and HIV test receipt in a logistic regression.

### 3. Results

Between January 1, 2017, and December 2019, there were 6637 PWUD hospitalizations and an HIV test occurred during 13.7% hospitalizations. Between January 1, 2020, and August 31, 2020, there were 1489 PWUD hospitalizations. The number of people with EMR indicators of drug use who were admitted to the hospital decreased monthly during the January to April period (from 259 patients to 85), then increased to 185 patients in May and to 217 patients in August (Fig. 1).

In January 2020, 10.4% of PWUD were tested for HIV. This percentage increased over the following four months: 15.3% in February, 19.1% in March, and peaking at 28.2% in April. Then, from May through August, the frequency

of HIV testing decreased back to 12%. The absolute number of HIV tests remained constant per month (mean = 26.1, SD = 2.7). Out of the total 1489 PWUD hospitalizations, indicators of alcohol use were present in 364 (24%), opioid use in 712 (48%), stimulant use in 250 (17%), and benzodiazepine use in 218 (15%). Hospitalization with stimulant use (OR: 2.70, CI = 1.90, 3.81), and benzodiazepines (OR: 1.53, CI = 1.03, 2.23) were significantly associated with increased odds of HIV testing, but not alcohol or opioid use.

### 4. Discussions

This is one of the first studies to show a decrease in overall hospitalizations among PWUD during the first COVID-19 surge. We found that, contrary to our initial hypothesis, the proportion of PWUD hospitalizations with HIV testing increased when COVID-19 cases initially peaked. When fewer PWUD are hospitalized, perhaps each patient can receive more medical attention. TuftsMC operated at a low bed occupancy for a few weeks before the surge, and health care staff may have had the time to ensure PWUD received HIV testing. However, during the surge itself it seems unlikely that health care staff had this time. Since health care staff were concerned that people with HIV may have heightened risk for severe illness from COVID-19 (Shiau et al., 2020), offering the HIV test to PWUD may have become critical to assessing patients' morbidity and mortality risk, and determining eligibility into clinical trials. When people came into the hospital with drug use and fevers, there may have been a greater need to exclude alternative etiologies for fever, such as acute HIV infection. In addition, many PWUDs experienced long length of stay due to challenges with discharge planning due to COVID-19, which may have provided more time for the medical teams to order an HIV test. Health care staff may have done more HIV testing during the surge because the PWUD who were hospitalized during COVID-19 were different as a group than those hospitalized before and after the peak. As the pandemic progressed past the peak period, the number of hospitalized PWUD increased and the frequency of testing decreased.

In the post-COVID peak phase, PWUD still have difficulties accessing medication for opioid use disorder and harm reduction services, such as sterile syringes; these difficulties may increase their risk of overdose

and/or HIV infection. PWUD who had symptoms of acute HIV may have delayed seeking care for their health needs due to fear of contracting COVID-19 in the hospital, or concern that their symptoms represented COVID-19; and these people may present to the hospital for other issues, like bacterial infections, overdose management or psychiatric treatment.

We must act now to increase HIV testing in all people in the hospital, but especially in PWUD. Since 2018, this team worked to increase HIV testing in PWUD, but this is the first time that testing frequencies have risen. We have offered several explanations for this increase, but need to identify what worked during the surge to increase HIV testing rates during periods without a COVID-19 surge. We plan to share the results with our clinician and leadership stakeholders to learn their perspectives on facilitators and barriers to HIV testing and operational strategies that might achieve sustained increases in testing in the hospital.

We must acknowledge potential limitations of our study. The study identified the cohort through EMR indicators of substance use—toxicology reports, prescribed medications for addiction treatment, and tools for screening for alcohol use disorder and assessing alcohol withdrawal severity. From these indicators, we cannot determine whether individuals formally met DM-V criteria for substance use disorder. Neither can we determine whether individuals were hospitalized for substance use or medical treatment. In addition, individuals who were prescribed opioids for pain and had a positive urine toxicology screen for the prescribed opioid would have been included and misclassified as a PWUD, as would individuals who were prescribed benzodiazepines. Individuals who may have been prescribed medication for opioid use disorder were also included in the cohort of PWUD. Additionally, we included people with indicators of alcohol use disorder in the cohort of PWUD, although they are not typically included in the group of people who use “illicit” drugs and are not considered as high risk for HIV as people who inject drugs. We were unable to determine method of drug use; therefore, we cannot determine the percentage of people who injected drugs. Finally, these data represent hospitalizations rather than individual people, meaning that one individual could have been admitted every month and received an HIV test at one hospitalization, but the other hospitalizations would not have been linked to an

HIV test.

Every health care encounter with a PWUD is an opportunity for HIV testing and linkage to treatment. Regardless of the COVID-19 case rates, health care systems must use these encounters with PWUD to test for HIV and link to treatment.

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## References

- Becker, W. C., & Fiellin, D. A. (2020). When epidemics collide: Coronavirus disease 2019 (COVID-19) and the opioid crisis. *Annals of Internal Medicine*, 173(1), 59–60. doi: 10.7326%2FM20-1210.
- Carrico, A. W., Horvath, K. J., Grov, C., et al. (2020). Double jeopardy: Methamphetamine use and HIV as risk factors for COVID-19. *AIDS and Behavior*, 24, 3020–3023. doi: 10.1007%2Fs10461-020-02854-w.
- City of Boston. (2020). Coronavirus disease (COVID-19) timeline. Boston.gov.
- Cranston K. (2019). Update on the Lowell/Lawrence HIV outbreak among people who inject drugs. mass.gov.
- Cranston, K., Alpren, C., John, B., et al. (2019). Notes from the field: HIV diagnoses among persons who inject drugs - northeastern Massachusetts, 2015–2018. *MMWR. Morbidity and Mortality Weekly Report*, 68(10), 253–254.
- Decosta-Klipa N. (2020). Phase 3 of the Massachusetts reopening plan will begin Monday. Here's what that means. Boston.com.
- Hochstatter, K. R., Akhtar, W. Z., Dietz, S., et al. (2020). Potential influences of the COVID-19 pandemic on drug use and HIV care among people living with HIV and substance use disorders: Experience from a pilot mHealth intervention. *AIDS and Behavior*, 1–6. doi: 10.1007%2Fs10461-020-02976-1.
- Jenkins, W. D., Bolinski, R., Bresett, J., et al. (2020). COVID-19 during the opioid epidemic - exacerbation of stigma and vulnerabilities. *The Journal of Rural Health*. <https://doi.org/10.1111/jrh.12442>.
- Massachusetts Department of Health. (2020). Reopening Massachusetts: May 18, 2020. mass.gov.
- Massachusetts Department of Public Health (2020). COVID-19 Dashboard [press release]. mass.gov.
- Shiau, S., Krause, K. D., Valera, P., Swaminathan, S., & Halkitis, P. N. (2020). The burden of COVID-19 in people living with HIV: A syndemic perspective. *AIDS and Behavior*, 24(8), 2244–2249.