



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



Persons from racial and ethnic minority groups receiving medication for opioid use disorder experienced increased difficulty accessing harm reduction services during COVID-19

Robert Rosales^{a,*}, Tim Janssen^a, Julia Yermash^a, Kimberly R. Yap^a, Elizabeth L. Ball^b, Bryan Hartzler^c, Bryan R. Garner^b, Sara J. Becker^a

^a Center for Alcohol and Addiction Studies, Department of Behavioral and Social Sciences, Brown University School of Public Health, 121 South Main Street, Providence, RI 02903, USA

^b Community Health and Implementation Research Program, RTI International, 3040 East Cornwallis Road, P.O. Box 12194, Research Triangle Park, NC 27709-2194, USA

^c Alcohol & Drug Abuse Institute, Department of Psychiatry and Behavioral Sciences, University of Washington, 1107 NE 45th St, Seattle, WA 98105, USA

ARTICLE INFO

Keywords:

COVID-19
Harm reduction
Disparities
Inequity
Opioids

ABSTRACT

Introduction: The COVID-19 pandemic collided with the opioid epidemic and longstanding health inequities to exacerbate the disproportionate harms experienced by persons with opioid use disorder (OUD) who self-identify as from racial and ethnic minority groups. Disrupted access to harm reduction services (e.g., naloxone, sterile syringes, recovery support) is one pathway whereby COVID-19 might exacerbate health disparities. We tested the hypothesis that persons receiving medication for opioid use disorder (MOUD) who self-identify as from racial/ethnic minority groups would experience more disruptions in access to harm reduction services than persons identifying as non-Hispanic White, even when controlling for severity of opioid use and sociodemographics (e.g., education, income, biological sex, age).

Methods: Analyses used data from a cluster randomized trial that had enrolled 188 patients, all of whom had provided baseline data on sociodemographics and severity of opioid use, across eight opioid treatment programs. Data collectors re-contacted participants between May and June 2020 and 133 (71% response rate) agreed to complete a survey about access to harm reduction services.

Results: Twenty-six respondents (20%) identified as from racial/ethnic minority groups (predominantly Black, Hispanic, and/or biracial). Between 7% and 27% of respondents reported disrupted access to harm reduction services. Logistic regressions indicated that persons identifying as from racial/ethnic minority groups were 8–10 times more likely than persons identifying as non-Hispanic White to report reduced access to naloxone and sterile syringes ($p < .01$), even when accounting for potential confounding variables.

Conclusions: This report concludes with a discussion of potential outreach strategies and policies to advance more equitable access to essential harm reduction services.

1. Introduction

The COVID-19 pandemic has become one of the most lethal crises in U.S. history, accounting for many of the deadliest days in U.S. history due to a single catastrophe (Neilson, 2020). Moreover, the pandemic started while the U.S. was in the midst of two other public health crises: the opioid epidemic (Collins et al., 2020) and national reckoning of the harmful effects of systemic racism (Gravlee, 2020). These public health

emergencies are now interacting in synergistic ways.

People who use opioids are at increased risk for the most adverse consequences of COVID-19 due to both direct (e.g., slowed breathing due to opioid use) and indirect (e.g., housing instability, incarceration) pathways (Volkow, 2020). In addition, social distancing orders, while essential in saving lives, have been associated with increased social isolation and unemployment, which are linked to overdose risk (Dasgupta et al., 2018). Indeed, emerging data indicate that overdose rates

* Corresponding author at: Brown University School of Public Health, 121 South Main Street, Providence, RI 02912, USA.

E-mail addresses: robert_rosales@brown.edu (R. Rosales), tim_janssen@brown.edu (T. Janssen), julia_yermash@brown.edu (J. Yermash), kimberly_yap@brown.edu (K.R. Yap), eball@rti.org, bgarner@rti.org (E.L. Ball), hartzb@uw.edu (B. Hartzler), sara_becker@brown.edu (S.J. Becker).

<https://doi.org/10.1016/j.jsat.2021.108648>

Received 24 May 2021; Received in revised form 13 August 2021; Accepted 13 October 2021

Available online 30 October 2021

0740-5472/© 2021 Elsevier Inc. All rights reserved.

have increased in more than 40 states since the pandemic (American Medical Association, 2020). Persons from racial/ethnic minority groups are at elevated risk of negative COVID-19-related impacts due to social determinants of health, often inexorably linked to systemic racism (Khazanchi et al., 2020), including increased risk of underlying health conditions; decreased access to COVID-19 testing and care; and decreased ability to socially isolate due to employment and living conditions (Gravlee, 2020). Recent estimates from the Centers for Disease Control and Prevention (CDC, 2020) suggest COVID-19 death rates among Black and Hispanic persons are approximately three times higher than for non-Hispanic White persons. These alarming statistics suggest persons who use opioids from racial/ethnic minority groups may constitute a particularly vulnerable population.

The relationship between the COVID-19 pandemic and overdose risk in racial/ethnic minority populations is multi-faceted. Disrupted access to life-saving harm reduction services such as naloxone distribution, sterile syringes, and recovery support services is one pathway whereby the COVID-19 pandemic might exacerbate disparities. Naloxone distribution to persons who use opioids has been an instrumental, evidence-based approach to minimizing consequences of overdose, and its expansion has been associated with significant reductions in fatalities (Collins et al., 2020). Similarly, provision of sterile syringes to persons who inject heroin is another evidence-based practice shown to reduce transmission of hepatitis, HIV, and other infections (CDC, 2019). Regrettably, the COVID-19 pandemic has led to disruptions in both naloxone distribution and sterile syringe access, as harm reduction programs have reduced their hours (Glick et al., 2020); street outreach teams have ceased or reduced operations (Collins et al., 2020); and opioid treatment programs (OTPs), which commonly provide referrals to harm reduction services, have shifted to take-home doses and telehealth sessions (Becker et al., 2021). Additionally, recovery support services have been disrupted, and while many services have shifted to virtual care (Bergman & Kelly, 2020), the extent to which persons receiving medication for opioid use disorder (MOUD) services in general, and persons from racial/ethnic minority groups in particular, have been able to access such services is unclear.

To explore these complex issues, the current study examined the extent to which the COVID-19 pandemic negatively affected access to harm reduction services (e.g., naloxone distribution, sterile syringes, recovery support services) among persons receiving MOUD who self-identify as from racial/ethnic minority groups. Due to inequities in COVID-19-related impacts (CDC, 2020) and the historically lower access of racial/ethnic minority groups to MOUD (Lagisetty et al., 2019), we hypothesized that respondents self-identifying as from racial/ethnic minority groups would experience greater disruptions to harm reduction services than those identifying as non-Hispanic White. We further hypothesized that racial/ethnic inequities would persist even when accounting for severity of opioid use (e.g., days of opioid use, opioid-related problems) and sociodemographic factors (e.g., education, income, biological sex, age).

2. Material and methods

2.1. Parent study

Analyses used data from a cluster-randomized hybrid effectiveness-implementation trial (grant/clinicaltrials.gov blinded) testing two strategies to implement an evidence-based behavioral intervention in OTPs. When social distancing regulations began in March 2020, the parent study had enrolled and completed baseline assessments with 188 OTP patients who had been inducted on MOUD within the past 30 days. Patients were recruited from six OTPs in Massachusetts and two in Rhode Island; both states used a similar, phased approach to social distancing regulations and experienced similar rates of infection/vaccination throughout the pandemic (Marcelo, 2021; Treisman, 2020). All the OTP locations were within 180 miles from each other.

2.2. Recruitment

In accordance with IRB-approved procedures, data collectors re-contacted enrolled participants between May and June 2020 and invited them to complete a 15–20-minute survey to assess COVID-19-related impacts on their functioning. After providing verbal informed consent, participants completed the survey and received a \$20 rechargeable gift card.

One hundred thirty-three participants (71%) completed this COVID-19 survey. Thirteen (10%) participants identified as Hispanic ethnicity. The most represented racial minority groups were Black ($n = 6$) and biracial ($n = 5$), followed by Alaska Native/Native-American ($n = 2$), Pacific Islander ($n = 2$), and Asian ($n = 1$). In total, 26 (20%) participants identified as from racial/ethnic minority groups. At six of the OTPs, the proportion of racial/ethnic minority patients ranged from 19% to 25%, and at two OTPs fewer patients self-identified as minorities (7–10%). COVID-19 survey respondents were representative of the parent study sample, with the exception that noncompleters were more likely to identify as male.

2.3. Measures

2.3.1. Baseline survey

Upon enrollment, participants answered questions about their sociodemographics (e.g., racial/ethnic identity, education, income, biological sex, and age) and recent substance use. The baseline survey contained the well-validated Timeline Followback Interview (Sobell & Sobell, 1992), which assessed days of use of heroin, prescription opioids, and other drugs over the past 30 days. Finally, the survey contained a brief measure of opioid-related problems, an 11-item scale adapted from the well-validated Global Appraisal of Individual Needs Substance Problem Scale (Dennis et al., 2003; Riley et al., 2007). Items on the opioid-related problems scale correspond with symptoms of an opioid use disorder. Consistent with guidelines in the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2013), two problems suggest a mild disorder, four or five problems suggest a moderate disorder, and six or more problems suggest a severe disorder.

2.3.2. COVID-19 survey

The study modeled the cross-sectional COVID-19 survey after the Epidemic-Pandemic Inventory (Grasso et al., 2020) and contained binary (yes/no) questions designed to inventory ways that the pandemic had affected respondents across multiple domains. Three specific questions assessed whether COVID-19 had disrupted access to naloxone, sterile syringes, and recovery support services (see Supplementary table for exact items).

2.4. Statistical analysis

The analytical sample was COVID-19 survey completers ($n = 133$). Preliminary analyses found that neither assessment timing (span between enrollment and COVID-19 survey), condition (assignment to implementation strategy), nor treatment dosage (number of sessions received at the OTP) were associated with the focal items. Thus, analyses pooled data across conditions and did not include either timing or number of sessions.

Primary analyses were logistic regressions predicting access to each harm reduction service. Dependent variables were “yes” responses, indicating that respondents experienced increased difficulty accessing harm reduction services during the COVID-19 pandemic. Independent variables included belonging to a racial/ethnic minority group (yes/no), sociodemographics (education, income, sex, age), and severity of opioid use (sum days of heroin and prescription opioid use, count of opioid-related problems). Due to missing data (17% of participants), final analyses did not include income: the pattern of results was identical with income included.

3. Results

Table 1 presents sociodemographics of survey respondents, as well as bivariate comparisons between those identifying as from racial/ethnic marginalized groups and non-Hispanic White. Rates of opioid use were high at baseline. Heroin use was more common in the sample than prescription drug use, with participants using heroin 14.5 days ($SD = 12.8$) and prescription drugs 10.4 days ($SD = 12.7$) on average. The average number of problems endorsed on the opioid problem index was 6.4 ($SD = 4.4$), consistent with criteria for a severe opioid use disorder. Overall rates of disrupted access to harm reduction services included: naloxone (7%), sterile syringes (8%), and recovery support services (27%).

Regression results (Table 2) indicated that persons identifying as from racial/ethnic minority groups were significantly more likely to report difficulty accessing naloxone and sterile syringes, even when controlling for severity of opioid use and sociodemographic variables. More specifically, respondents identifying as from racial/ethnic minority groups had approximately 10 times greater odds of reporting disruptions in naloxone access and 8 times greater odds of reporting disruptions in sterile syringe access, relative to those identifying as non-Hispanic White.

4. Discussion

Study results confirmed the hypothesis that MOUD patients identifying as from racial/ethnic minority groups experienced greater disruptions in access to naloxone and sterile syringes than those identifying as non-Hispanic White. In addition, findings confirmed the hypothesis that neither severity of opioid use nor sociodemographic variables accounted for inequities in access.

Overall, only 7–27% of the patient sample reported disruptions in harm reduction services, providing encouraging data that most patients were able to access services throughout the pandemic. Of note, analyses

found disparate access for naloxone and sterile syringes, whereas recovery support services had more equitable access. These findings are concerning given that naloxone and sterile syringes are both evidence-based interventions that reduce risk of lethal overdose and potentially lethal infections (CDC, 2019; Collins et al., 2020). Notably, access to naloxone and sterile syringes often requires in-person attendance and/or administration by a health professional, both of which could be affected by structural barriers that disproportionately affect marginalized populations, such as lack of childcare or transportation, medical mistrust, and inequitable service provision by health professionals (Collins et al., 2020; Glick et al., 2020; Gravlee, 2020).

Findings regarding disruptions in access to recovery support services were more challenging to interpret. While the absence of differential rates of disruption in such services was certainly encouraging from a health disparities perspective, the fact that 27% of MOUD patients reported disruptions in service remains cause for concern. The unprecedented shift toward virtual delivery of recovery support services in the early days of the pandemic (Bergman & Kelly, 2020) might have diminished any pre-existing barriers that had disproportionately affected persons from racial/ethnic minority groups (e.g., lack of transportation, travel distance), but shifting to reliance on remote/virtual service provision might have introduced or magnified more universal barriers to access. Future work should explore the specific barriers that affected one in four MOUD patients seeking recovery support services.

Several limitations affect the interpretation of these results. First, the survey was voluntary, and while no systematic differences existed between completers and noncompleters, noncompleters may have been more likely to experience barriers to harm reduction services. Second, our sample of persons identifying as from racial/ethnic minority groups was small and precluded a nuanced examination of racial and ethnic differences. Of note, the current sample was more diverse than a recent state-wide evaluation of MOUD programs from the same region, which found that 95% of patients were non-Hispanic White (Rawson, 2017), demonstrating our ability to over-sample racial/ethnic minorities. The paucity of racial/ethnic minority patients in MOUD treatment programs in New England may reflect structural barriers to accessing care. Third, confidence intervals in the current study were wide, which reflects the small sample and may partially be a consequence of the exponential transformation of the logit scale estimates used to obtain odds ratios. A larger sample of participants in MOUD would be able to more accurately inform the extent of the effect of the disruptions in harm reduction services. Fourth, the cross-sectional nature of the study and lack of control group precludes inferences as to whether the observed disruptions in harm reduction services affected subsequent risk of overdose. Finally, since the survey did not ask about the participants' residence, analyses did not assess whether the significant findings reflected structural issues such as the distance from harm reduction services to racial/ethnic minority neighborhoods. Future work by our team will assess the participants' location of residence and track opioid-related outcomes over time.

The racial/ethnic minority group in this study was heterogeneous, containing individuals identifying as Black, Hispanic, biracial, Native American, Asian, and Pacific Islander. As such, the main effects found here do not necessarily indicate homogeneous risk processes, but rather provide a signal that MOUD patients from racial/ethnic marginalized groups reported disproportionate difficulty accessing harm reduction services during early months of the pandemic. Our ability to detect large effects in such a small sample highlights the need for further work in this area. In particular, future work should move beyond documenting racial/ethnic differences by systematically studying forms of oppression based on nationality and skin color that may decrease racial and ethnic minority populations' access to MOUD and harm reduction services (Boyd et al., 2020).

Table 1
Socio-demographic and clinical characteristics by racial/ethnic status.

| Continuous variables | Total sample (n = 133) | | Non-Hispanic White (n = 107) | | Racial/ethnic minorities (n = 26) | | p-Value |
|--|------------------------|------|------------------------------|------|-----------------------------------|------|---------|
| | M | SD | M | SD | M | SD | |
| Age | 36.0 | 9.8 | 36.0 | 10.2 | 36.2 | 7.8 | .93 |
| Past 30-day prescription opioid use days | 10.4 | 12.7 | 11.0 | 12.9 | 7.9 | 11.7 | .24 |
| Past 30-day heroin use days | 14.5 | 12.8 | 15.0 | 12.8 | 12.8 | 13.1 | .44 |
| Count of opioid problems | 6.4 | 4.4 | 6.4 | 4.4 | 6.3 | 4.5 | .91 |
| Categorical variables | Total sample (n = 133) | | Non-Hispanic White (n = 107) | | Racial/ethnic minorities (n = 26) | | p-Value |
| | n | % | n | % | n | % | |
| Biological sex | | | | | | | |
| Male | 53 | 39.8 | 41 | 38.3 | 12 | 46.2 | .46 |
| Female | 80 | 60.2 | 66 | 61.7 | 14 | 53.8 | |
| Educational attainment | | | | | | | |
| Less than high school | 24 | 18.0 | 16 | 15.0 | 8 | 30.8 | .14 |
| High school or equivalent | 62 | 46.6 | 53 | 49.5 | 9 | 34.6 | |
| Some college or more | 47 | 35.3 | 38 | 35.5 | 9 | 34.6 | |
| Increased difficulty accessing... | | | | | | | |
| Naloxone | 9 | 6.8 | 4 | 3.7 | 5 | 19.2 | .005 |
| Sterile syringes | 11 | 8.3 | 5 | 4.7 | 6 | 23.1 | .002 |
| Recovery support services | 36 | 27.1 | 28 | 26.2 | 8 | 30.8 | .64 |

Table 2

Logistic regression analyses predicting increased disruption to harm reduction services during COVID-19 (N = 133).

| Predictors | Naloxone | | Sterile syringes | | Recovery support | |
|--------------------------|----------|--------------|------------------|--------------|------------------|-----------|
| | AOR | 95% CI | AOR | 95% CI | AOR | 95% CI |
| Racial/ethnic status | 9.89 | 1.95–49.95** | 7.87 | 1.87–33.02** | 1.32 | 0.49–3.54 |
| Past 30-day opioid use | 1.04 | 0.99–1.08 | 1.00 | 0.95–1.03 | 1.01 | 0.98–1.03 |
| Count of opioid problems | 1.14 | 0.90–1.43 | 1.16 | 0.95–1.42 | 1.10 | 0.98–1.23 |
| College attainment | 0.47 | 0.08–2.62 | 2.43 | 0.60–9.72 | 0.81 | 0.33–1.97 |
| Biological sex | 0.93 | 0.20–4.23 | 1.32 | 0.30–5.65 | 0.60 | 0.26–1.38 |
| Age | 0.99 | 0.90–1.08 | 0.95 | 0.86–1.03 | 0.98 | 0.93–1.02 |

Note. AOR = adjusted odds ratios; 95% CI = 95% confidence intervals.

** p < .01.

5. Conclusion

This study identified marked disparities in access to harm reduction services—MOUD patients self-identifying as from racial/ethnic minority groups had 8 to 10 times greater odds of reporting disruptions in access to naloxone and sterile syringes during the COVID-19 pandemic than those identifying as non-Hispanic White. Removing regulatory barriers to expand naloxone and sterile syringe access through community-based distribution (Davis & Carr, 2020) and through OTPs, which continued to dispense MOUD throughout the pandemic, could potentially address disparities by facilitating more efficient distribution through networks of patients and front-line treatment programs (Collins et al., 2020). Conversely, implementing low-barrier access to MOUD, such as rapid or telehealth induction of suboxone treatment, in existing syringe or naloxone distribution programs could be another option to streamline access to essential services, as research has shown low-barrier services to be associated with reductions in racial/ethnic disparities in access to MOUD (Lee et al., 2019). Offering harm reduction and MOUD services concurrently could potentially serve to address disproportionate systemic and structural barriers to care that marginalized MOUD patients experience.

Role of funding sources

Funding for this study was provided by National Institute on Drug Abuse (NIDA) Grant R01DA046941, awarded to Multiple Principal Investigators Becker and Garner, and the dual-funded National Institute on Minority Health and Health Disparities (NIMHD) and National Institutes of Health (NIH) Office of the Director Grant K08MD015289, awarded to Principal Investigator Rosales. NIDA, NIMHD, and the NIH Office of the Director had no role in the study design, collection, analysis or interpretation of the data, writing the manuscript, or the decision to submit the paper for publication.

CRedit authorship contribution statement

RR and SB conceived of this analysis. SB and BG conceptualized the parent study and obtained funding. SB and BG supervised study conduction including data collection, data management, data analysis, and quality control. JY and KRY collected survey data. ELB and BH are study co-investigators and contributed to study data collection, oversight, and management. RR and TJ conducted data cleaning, preparation, and analysis. SB completed the first draft of the manuscript with analytic support and revisions from RR and TJ. All authors contributed substantially to multiple rounds of review and revision, and approved the final submission.

Declaration of competing interest

The authors have no conflicts of interest to disclose.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jsat.2021.108648>.

References

- American Medical Association. (2020). Issue brief: Reports of increases in opioid-related overdose and other concerns during COVID pandemic. <http://www.asapnys.org/wp-content/uploads/2020/07/Issue-brief-Reports-of-increases-in-opioid-related-overdose-and-other-concerns-during-COVID-pandemic.pdf>.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). American Psychiatric Publishing. <https://doi.org/10.1176/appi.books.9780890425596>
- Becker, S. J., Garner, B. R., & Hartzler, B. J. (2021). Is necessity also the mother of implementation? COVID-19 and the implementation of evidence-based treatments for opioid use disorders. *Journal of Substance Abuse Treatment*, 122, Article 108210. <https://doi.org/10.1016/j.jsat.2020.108210>
- Bergman, B. G., & Kelly, J. F. (2020). Online digital recovery support services: An overview of the science and their potential to help individuals with substance use disorder during COVID-19 and beyond. *Journal of Substance Abuse Treatment*, 120, Article 108152. <https://doi.org/10.1016/j.jsat.2020.108152>
- Boyd, R. W., Lindo, E. G., Weeks, L. D., & McLemore, M. R. (2020). On racism: A new standard for publishing on racial health inequities. <https://www.healthaffairs.org/doi/10.1377/hblog20200630.939347/full/>.
- Centers for Disease Control and Prevention. (2019). Summary of information on the safety and effectiveness of Syringe Services Programs (SSPs). <https://www.cdc.gov/ssp/syringe-services-programs-summary.html>.
- Centers for Disease Control and Prevention. (2020). Hospitalization and death by race/ethnicity. <https://www.cdc.gov/coronavirus/2019-ncov/covid-data/investigations-discovery/hospitalization-death-by-race-ethnicity.html>.
- Collins, A. B., Ndoye, C. D., Arene-Morley, D., & Marshall, B. D. L. (2020). Addressing co-occurring public health emergencies: The importance of naloxone distribution in the era of COVID-19. *International Journal of Drug Policy*, 83, Article 102872. <https://doi.org/10.1016/j.drugpo.2020.102872>
- Dasgupta, N., Beletsky, L., & Ciccarone, D. (2018). Opioid crisis: No easy fix to its social and economic determinants. *American Journal of Public Health*, 108(2), 182–186. <https://doi.org/10.2105/AJPH.2017.304187>
- Davis, C. S., & Carr, D. (2020). Over the counter naloxone needed to save lives in the United States. *Preventive Medicine*, 130, Article 105932. <https://doi.org/10.1016/j.ypmed.2019.105932>
- Dennis, M. L., Titus, J. C., White, M. K., Unsicker, J. I., & Hodgins, D. (2003). Global appraisal of individual needs: Administration guide for the GAIN and related measure. Chestnut Health Systems. www.chestnut.org/li/gain/gadm1299.pdf.
- Glick, S.N., Prohaska, S.M., LaKosky, P.A., Juarez, A.M., Corcorran, M.A., & Des Jarlais, D.C. (2020). The impact of COVID-19 on Syringe Services Programs in the United States. *AIDS and Behavior*, 24(9), 2466–2468. doi:10.1007/s10461-020-02886-2.
- Grasso, D. J., Briggs-Gowan, M. J., Ford, J. D., & Carter, A. S. (2020). The Epidemic-Pandemic Impacts Inventory (EPII). University of Connecticut School of Medicine. <https://health.uconn.edu/psychiatry/wp-content/uploads/sites/51/2020/05/EPII-Main-V1.pdf>.
- Gravlee, C. C. (2020). Systemic racism, chronic health inequities, and COVID-19: A systemic in the making? *American Journal of Human Biology*, 32(5), Article e23482. <https://doi.org/10.1002/ajhb.23482>
- Khazanchi, R., Evans, C. T., & Marcelin, J. R. (2020). Racism, not race, drives inequity across the COVID-19 continuum. *JAMA Network Open*, 3(9), Article e2019933. <https://doi.org/10.1001/jamanetworkopen.2020.19933>
- Lagisetty, P. A., Ross, R., Bohnert, A., Clay, M., & Maust, D. T. (2019). Buprenorphine treatment divide by race/ethnicity and payment. *JAMA Psychiatry*, 76(9), 979–981. <https://doi.org/10.1001/jamapsychiatry.2019.0876>
- Lee, C. S., Rosales, R., Stein, M. D., Nicholls, M., O'Connor, B. M., Loukas Ryan, V., & Davis, E. A. (2019). Brief report: Low-barrier buprenorphine initiation predicts treatment retention among Latinx and non-Latinx primary care patients. *The American Journal on Addictions*, 28(5), 409–412. <https://doi.org/10.1111/ajad.12925>

- Marcelo, P. (2021, June 5). New England's success against COVID-19 could be a model. Associated Press. <https://apnews.com/article/ct-state-wire-coronavirus-pandemic-health-0b72b1d4df9f79d6629546ede29cbd6b>.
- Neilson, S. (2020). These are the 20 days in the past 100 years when America saw the most deaths from a single catastrophe. Over half are in the past 2 weeks. Business Insider. <https://www.businessinsider.com/days-with-most-us-catastrophe-deaths-16-this-year-2020-12>.
- Rawson, R. A. (2017). Vermont Hub-and-Spoke model of care for opioid use disorders: An evaluation. Vermont Department of Health. https://www.healthvermont.gov/sites/default/files/documents/pdf/ADAP_Hub_and_Spoke_Evaluation_2017_1.pdf.
- Riley, B. B., Conrad, K. J., Bezruczko, N., & Dennis, M. L. (2007). Relative precision, efficiency and construct validity of different starting and stopping rules for a computerized adaptive test: The GAIN substance problem scale. *Journal of Applied Measurement, 8*(1), 48–64.
- Sobell, L. C., & Sobell, M. B. (1992). Timeline follow-back: A technique for assessing self-reported alcohol consumption. In R. Z. Litten, & J. P. Allen (Eds.), *Measuring alcohol consumption: Psychosocial and biochemical methods* (pp. 41–72). Humana Press. https://doi.org/10.1007/978-1-4612-0357-5_3.
- Treisman, R. (2020, December 1). Northeast: Coronavirus-related restrictions by state. NPR. <https://www.npr.org/2020/05/01/847331283/northeast-coronavirus-related-restrictions-by-state>.
- Volkow, N. D. (2020). Collision of the COVID-19 and addiction epidemics. *Annals of Internal Medicine, 173*(1), 61–62. <https://doi.org/10.7326/M20-1212>