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Healthcare Access and Utilization Among Persons Who Inject Drugs in Medicaid Expansion and Nonexpansion States: 22 United States Cities, 2018

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Abstract

Background.—Medicaid expansion under the Affordable Care Act increased insurance coverage, access to healthcare, and substance use disorder treatment, for many Americans. We assessed differences in healthcare access and utilization among persons who inject drugs (PWID) by state Medicaid expansion status.

Methods.—In 2018, PWID were interviewed in 22 US cities for National HIV Behavioral Surveillance. We analyzed data from PWID aged 18–64 years who reported illicit use of opioids (n = 9957) in the past 12 months. Poisson regression models with robust standard errors were used to estimate adjusted prevalence ratios (aPRs) and 95% confidence intervals (CIs) were used to examine differences by Medicaid expansion status in indicators of healthcare access and utilization.

Results.—Persons who inject drugs in Medicaid expansion states were more likely to have insurance (87% vs 36%; aPR, 2.3; 95% CI, 2.0–2.6), a usual source of healthcare (53% vs 34%; aPR, 1.5; 95% CI, 1.3–1.9), and have used medication-assisted treatment (61% vs 36%; aPR, 1.4; 95% CI, 1.1–1.7), and they were less likely to have an unmet need for care (21% vs 39%; aPR, 0.6; 95% CI, 0.4–0.7) than those in nonexpansion states.

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Conclusions.—Low insurance coverage, healthcare access, and medication-assisted treatment utilization among PWID in some areas could hinder efforts to end the intertwined human immunodeficiency virus and opioid overdose epidemics.

Keywords

healthcare utilization; injection drug use; insurance; Medicaid expansion; medication-assisted treatment

Opioid-involved overdose deaths have increased over the past 2 decades in the United States [1, 2]. Between 2013 and 2017, 35 states and Washington DC saw significant increases in overdose death rates, and in 2017, 68% of the over 70 000 deaths from overdose involved opioids [2]. Persons who inject drugs (PWID), including opioids, are also at increased risk for other health-related consequences, including human immunodeficiency virus (HIV) and hepatitis C virus (HCV) infection. Particularly concerning is an increase in HIV cases in rural areas, which is attributed to injection of opioids; many of these persons were also coinfected with HCV [3, 4]. Many PWID are in need of services that can both treat substance use and provide HIV and hepatitis prevention tools [5–7]. In 2016, of the over 19 million adults needing substance use disorder (SUD) treatment for an alcohol or illicit drug use disorder, only 10% received it [8]. As the opioid crisis continues to evolve, it is critical to ensure that PWID have adequate access to healthcare and SUD treatment services.

More low-income adults have access to healthcare as a result of the Patient Protection and Affordable Care Act (ACA), which allowed states to expand Medicaid eligibility to adults with incomes up to 138% of the federal poverty level. Although Medicaid expansion is associated with increased insurance coverage and access to healthcare among general populations of low-income adults [9–13], to date, only 36 states and the District of Columbia have expanded Medicaid [14].

Persons who inject drugs, a group often characterized by low income [15], could also benefit from improved healthcare access through Medicaid expansion including access to effective HIV and hepatitis prevention and access to treatment for SUD [16]. Several studies [17–19] have demonstrated that Medicaid expansion has had a positive effect in increasing prescriptions for medication-assisted treatment (MAT), an effective treatment for opioid use disorder [20]. However, little is known about how Medicaid expansion affected healthcare access among PWID. This analysis aims to examine differences in healthcare access and utilization by states' Medicaid expansion status among PWID who use opioids.

METHODS

Data

We analyzed data from PWID recruited during the 2018 cycle of National HIV Behavioral Surveillance (NHBS). The NHBS is a cross-sectional survey that monitors behaviors among populations at risk for acquiring or transmitting HIV infection, including PWID. Additional details regarding NHBS sampling methods and eligibility criteria have been described elsewhere [15, 21]. To summarize, 2018 NHBS surveillance activities were conducted in 23 cities with high HIV prevalence. Participants were recruited via respondent-driven sampling

(RDS) and invited to participate in an anonymous interview and HIV test. Interviewers administered the standardized survey, which collects information on a variety of topics including demographics, drug use, HIV testing, general healthcare, and participation in HIV prevention activities. Eligible participants were aged ≥18 years, lived in a participating NHBS city, were able to complete the survey in English or Spanish, and reported injecting drugs not prescribed to them during the 12 months before interview. Injection drug use was confirmed by observing physical indications of recent injection (eg, track marks) and assessing knowledge of injection practices. Activities for NHBS were approved by the US Centers for Disease Control and Prevention [22, 23] and by applicable institutional review boards in each participating city.

Measures

Medicaid Expansion—Our primary exposure was Medicaid expansion status. Classification was based on whether the participant resided in a state that had implemented Medicaid expansion by June 1, 2018 [14]. Sixteen NHBS cities were in states that had expanded Medicaid; of those, most (n = 14) expanded Medicaid immediately after the passing of the ACA, with the remaining 2 implementing expansion by January 1, 2017.

Sample Characteristics—Sample characteristics included gender, age, race/ethnicity, education, employment status, income, disability status, homelessness, insurance type, and HIV status. Education was defined as a categorical variable with 3 levels: less than high school, high school graduate, and greater than high school. Employment was also defined as a categorical variable with 3 levels: employed full or part time, unemployed, or not in the labor force (eg, retired, unable to work for health reasons). Full- and part-time employment were combined into a single category because the percentage of each group that had insurance coverage was similar (62% and 66%, respectively). Household income was dichotomized into greater than or at/or below 138% of the federal poverty level, based on 2018 guidelines [24]. Disability status was measured using the 2011 Department of Health and Human Services data standard as a measure of overall disability, a 6-item measure consistent with the World Health Organization's International Classification of Functioning, that assesses the presence or absence of disability based on self-reported functional limitation in 1 or more domains (hearing, vision, cognition, walking, self-care, and independent living) [25, 26]. Homelessness was defined as living on the street, in a shelter, a single room occupancy hotel, or in a car at any time during the 12 months before interview. A nonreactive HIV rapid test result was considered HIV negative, and a reactive HIV rapid test result was considered HIV positive if confirmed by either a second rapid test or laboratory-based testing.

Healthcare Access—Healthcare access outcomes included current health insurance status, usual source of healthcare, and unmet need for healthcare. Participants who reported having 1 or more sources of healthcare, excluding a hospital emergency department, were classified as having a usual source of healthcare. Unmet need for healthcare was defined as having needed but being unable to obtain healthcare due to cost at any point during the 12 months before interview.

Healthcare Utilization—Healthcare utilization outcomes included indicators of healthcare received during the 12 months before interview, including healthcare provider visit, HIV and hepatitis C testing, participation in a drug treatment program, and use of MAT. Participants who reported that the month and year of their most recent HIV test date was within the 12 months before interview were classified as having had an HIV test in the past 12 months. Because persons with HIV infection do not need HIV testing, analyses of past 12 month HIV testing excluded participants who reported being diagnosed with HIV infection more than 12 months before interview. Respondents provided the year of their most recent HCV test—those who reported testing in 2018 or 2017 were classified as having had a hepatitis C test in the past 12 months. Drug treatment programs were defined as "out-patient, in-patient, residential, detox or 12-step programs." Medication-assisted treatment was defined as "taking medicines like methadone or buprenorphine" in the past 12 months.

Analysis Sample

Analyses were limited to PWID ages 18–64 years, because we assumed universal Medicare coverage for those aged ≥65 years, who reported opioid use (hereafter simply referred to as PWID) during the 12 months before interview and completed the interview. Opioid use was defined as any illicit use of injection or noninjection opioids during the 12 months before interview. Injection opioid use was defined as injecting "speedball, which is heroin and cocaine together," "heroin, by itself," or "painkillers, such as Oxycontin, Dilaudid, morphine, Percocet, or Demerol." Noninjection drug use was defined as a yes to a question asking "… have you used any drugs that were not prescribed for you and that you did not inject?" Noninjection opioid use was defined as misusing "painkillers such as Oxycontin, Vicodin, morphine, or Percocet" or smoking or snorting heroin. Due to differences in Medicaid implementation in US territories, participants interviewed in Puerto Rico were excluded from this analysis [27].

Statistical Analysis

Descriptive statistics were generated to describe the study sample, both overall and by expansion status. We performed χ^2 tests to assess the association between Medicaid expansion and demographic characteristics as well as healthcare access and utilization indicators. We used Poisson regression models with robust standard errors to estimate unadjusted prevalence ratios (PRs), adjusted PRs (aPRs) and 95% confidence intervals (CIs) to examine differences by state expansion status for each indicator of healthcare access and healthcare utilization. Adjusted models included covariates for potential confounders based on the literature (gender, age, race/ethnicity, income, disability status, employment status, and HIV status). In all models, we accounted for the sample design by clustering models on recruitment chain and adjusting for each participant's network size. All analyses were conducted in SAS 9.4 (SAS Institute Inc., Cary, NC).

RESULTS

Demographics

Of the 9957 PWID included in the analysis, 27% lived in states that had not expanded Medicaid. Because all nonexpansion states were in the southern region of the United States,

we explored whether there was a difference between southern and non-southern states that had expanded Medicaid. Finding no differences in expansion states by region (data not shown), southern and non-southern states that expanded Medicaid were combined.

Table 1 contains frequencies and percentages of demographic characteristics of our sample. Two thirds (67%) were male, 28% were aged 30–39, 24% were aged 40–49, and 24% were aged 50–59. Of the sample, 42% were white, 33% were black/African American, and 18% were Hispanic/Latino. In terms of socioeconomic status, the majority (82%) of PWID had incomes at or below 138% of the federal poverty level (the expanded threshold for Medicaid eligibility) and employment was low (16%). Many PWID in the analysis reported having a disability (67%) or experiencing homelessness during the past 12 months (70%). The percentage who tested HIV positive was 6%. Overall, 26% of PWID were uninsured. In Medicaid expansion states, a low percentage (13%) of PWID were uninsured, whereas a much higher percentage had Medicaid coverage (71%). In contrast, in nonexpansion states, a high percentage of PWID were uninsured (63%), and a much lower percentage were enrolled in Medicaid (14%).

Healthcare Access—Even when adjusting for covariates, PWID in Medicaid expansion states were more likely to be insured (87% vs 37%; aPR, 2.3; 95% CI, 2.0–2.6), and to have a usual source of healthcare (53% vs 34%; aPR, 1.5; 95% CI, 1.3–1.9), and were less likely to have an unmet need for care (21% vs 39%; aPR, 0.6; 95% CI, 0.4–0.7) (Table 2).

Healthcare Utilization—For each of our indicators, recent (past 12 months) healthcare utilization was higher among PWID in expansion states compared to those in nonexpansion states. In particular, PWID in expansion states were more likely to have visited a healthcare provider (83% vs 70%; aPR, 1.2; 95% CI, 1.1–1.2), received a hepatitis C test (57% vs 45%; aPR, 1.3; 95% CI, 1.2–1.5), and received an HIV test (59% vs 50%; aPR, 1.3; 95% CI, 1.1–1.5). In addition, PWID in expansion states were more likely to report recent (past 12 months) participation in a drug treatment program (49% vs 32%; aPR, 1.5; 95% CI, 1.2–1.9) and to report taking MAT in the past 12 months (61% vs 36%; aPR, 1.6; 95% CI, 1.3–1.9). Because health insurance coverage can improve access to healthcare services [16, 28], we reran the models for the healthcare utilization outcomes, including insurance status as a covariate. After controlling for health insurance status, the effect of Medicaid expansion status was reduced but still statistically significant for HIV test (aPR, 1.2; 95% CI, 1.1–1.4) and MAT (aPR, 1.4; 95% CI, 1.1–1.6) (data not shown). However, the differences between expansion and nonexpansion states were no longer statistically significant for the following healthcare utilization outcomes: healthcare provider visit, HCV testing, and drug treatment program participation.

DISCUSSION

This analysis of a large sample of PWID who illicitly use opioids in 22 cities throughout the United States found greater access to healthcare and greater use of key healthcare services for those in states that expanded Medicaid, compared to those in nonexpansion states. It is notable that the percentage with insurance coverage was substantially higher among PWID in Medicaid expansion states, as was utilization of MAT, an important and effective [29, 30]

treatment for persons with opioid use disorder. In addition, we found evidence that insurance may mediate the relationship between Medicaid expansion and some healthcare utilization outcomes.

Consistent with studies of the general population of low-income adults [11, 13, 31, 32] and adults with SUD [33], we found that a higher proportion of PWID in expansion states reported being insured than their counterparts in nonexpansion states. In addition, we found that Medicaid coverage was greater among PWID in expansion states, suggesting that Medicaid is needed and used when available. To our knowledge, this is the first report of an association between state Medicaid expansion and coverage among PWID, although similar findings have been reported among low-income adults in the general population [13, 33]. This is particularly important because Medicaid enrollees are more likely than those with other insurance types to access general health services, SUD treatment, and to receive other services traditionally covered by insurance [34, 35].

Health insurance reduces barriers to care, including cost, and increases access to providers [36]. A prior study found that, within 6 months of gaining insurance, more adults reported having a personal doctor and reduced difficulties in paying for healthcare [37]. Likewise, we found that Medicaid expansion was associated with having a usual source of care and a reduced unmet need for care in our sample. More than half of PWID in expansion states reported having a usual source of care, compared to one third of those in nonexpansion states. Having a usual source of healthcare could lead to increased opportunities to engage in the healthcare system, where PWID may be more likely to encounter HIV and HCV prevention resources and messages. Likewise, although one fifth of PWID in expansion states reported an unmet need for care, approximately 2 times as many reported an unmet need in nonexpansion states. These findings are consistent with prior studies, which found increased likelihood of having a regular care source among PWID with Medicaid coverage [16] and low-income adults [31, 32] and lower unmet need for care in Medicaid expansion states [11, 12, 32].

Reduced cost barriers and having a usual source of healthcare can lead to increases in utilization of preventative services [38]. This analysis also found that Medicaid expansion was associated with several indicators of healthcare utilization relevant for PWID, including healthcare provider visit, recent (past 12 months) testing for HCV and HIV, as well as participation in a drug treatment program and use of MAT. These findings are among the first to provide evidence that Medicaid expansion increases healthcare utilization among PWID—prior research focused on low-income adults [32] or provided mixed results, because some utilization outcomes were greater in expansion states, whereas there was no difference based on expansion status for others [13]. For 3 utilization outcomes—healthcare provider visit, HCV testing, and drug treatment program participation—insurance status played a key role in facilitating increases in expansion states. Our finding that the association between expansion and each of these outcomes was no longer statistically significant after controlling for insurance status suggests that health insurance accounts, in part, for the increased use of these services among PWID in expansion states. This finding may be particularly important when considering methods to expand HCV prevention and treatment for PWID. Substance use is associated with increased risk for HCV infection,

especially among younger persons [39]. States with expanded Medicaid have taken an important step in HCV control, but those PWID in nonexpansion states and the remaining uninsured persons in all states, regardless of expansion status, could benefit from additional interventions. Scaling up of MAT and syringe service programs [40] have been found to be both cost-effective [41] and to prevent reoccurring HCV infection [42].

A prior study found that PWID who were insured were more likely to have received buprenorphine for MAT compared with PWID who were uninsured [16]. In our analysis, the percentages of PWID who had received HIV testing and who had used MAT were higher in expansion states and remained higher, even after controlling for insurance status, suggesting that factors beyond insurance may play important roles in accessing these services. There are several factors that contribute to the complex relationship between insurance status and healthcare utilization among PWID. For example, some PWID might receive HIV testing in nonclinical settings [15] that do not require insurance coverage. Although increases in insurance coverage and having a usual source of care are important steps in ensuring access, other barriers, such as lack of prescribing healthcare providers, might complicate access to MAT for PWID in expansion, as well as nonexpansion, states.

Despite need, MAT use among PWID has been found to be low in some settings [28], and access varies at the state and local levels. Fewer state plans, for example, cover methadone than buprenorphine and naltrexone [43], limiting the reach of MAT to those who may benefit from methadone treatment programs. As more PWID gain insurance coverage via expansion, service offerings must also expand. A 2016 study found that despite an increase in offering of MAT services at treatment facilities over time, approximately two thirds of facilities do not offer MAT, and only 6% offer all 3 medications (methadone, buprenorphine, and naltrexone) approved for MAT [44]. In comparison to private for-profit facilities, nonprofit and state, local, county, community, or tribal government facilities were less likely to offer MAT. Facilities that received federal, state, county, or local funds, or provided free services to clients were also less likely to offer MAT. This is particularly concerning because cost is a primary reason for not receiving SUD treatment [8], and those in nonexpansion states may be in higher need of low-cost or free services. Limited MAT availability may be one reason why utilization of MAT is not higher. Facilities and providers serving low-income PWID populations may consider increasing MAT services and referrals.

Although the finding that Medicaid expansion is associated with increased care access and utilization is promising, many PWID still lack care and treatment. Although the ACA included provisions for increased coverage of SUD treatment, to date, 14 states have not expanded Medicaid. As demonstrated in this analysis, many of those are in the south, where disparities in HIV burden already exist [45]. In addition, in many states, substance use treatment needs far exceed state capacity to provide treatment [6]. Despite the work still to be done, the results of this analysis support the growing evidence that Medicaid expansion plays a key role in PWID’s access to general healthcare and substance use treatment, including MAT, which is used to treat opioid use disorder. States may consider expanding Medicaid as a step to combat the nationwide opioid overdose epidemic.

This analysis has several limitations. First, the NHBS PWID sample is not nationally representative. Persons who inject drugs were sampled in participating NHBS cities, and our results may not be generalizable to PWID in other cities or to all PWID within the states in which they were interviewed. Not all states are represented in the NHBS sample, and some states had greater representation. Because our analyses did not use RDS sampling weights, it is possible that subgroups are over- or underrepresented. However, all models were clustered on RDS recruitment chain and adjusted for participant network size to help account for sampling bias. Second, our analytic sample was limited to participants who reported any illicit use of opioids during the 12 months before interview, because opioid use disorder diagnosis was not assessed. Some participants included in our analyses might not meet diagnostic criteria for opioid use disorder. Third, data were based on self-report during face-to-face interviews and are subject to recall error and social desirability bias. For instance, some participants might have reported MAT used that was not prescribed for them or other nonmedical use. However, a recent study that used similar measures of MAT use found that nonmedical use of MAT was rare [28]. Fourth, factors unmeasured by this analysis, including state-level political factors, may affect healthcare access and utilization among PWID and states' decisions to expand Medicaid. Because we were unable to adjust for these factors, it is possible that Medicaid expansion does not completely account for greater healthcare access and utilization access within expansion states. Likewise, the NHBS survey does not include measures to assess all key healthcare services of importance for PWID, particularly access to and utilization of mental healthcare. As a result, we were unable to assess the impact of Medicaid expansion on these services. Finally, NHBS data are cross-sectional, and thus they may not support causal inferences.

CONCLUSIONS

In conclusion, PWID who illicitly use opioids living in states that expanded Medicaid are more likely to access and utilize care, including MAT. Furthermore, insurance status played a role in whether PWID visited providers, received HCV testing, or accessed drug treatment programs. Because cost is a key barrier to these services, PWID in states that have not expanded Medicaid may need more low-cost insurance options. Without improved healthcare coverage, these differences in healthcare access and utilization may persist and impede efforts to curb the intertwined opioid overdose, HIV, and HCV epidemics.

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References

1. Kolodny A, Courtwright DT, Hwang CS, et al. The prescription opioid and heroin crisis: a public health approach to an epidemic of addiction. Annu Rev Public Health 2015; 36:559–74. [PubMed: 25581144]
2. Scholl L, Seth P, Kariisa M, Wilson N, Baldwin G. Drug and opioid-involved overdose deaths — United States, 2013–2017. MMWR Morb Mortal Wkly Rep 2019; 67:1419–27.
3. Conrad C, Bradley HM, Broz D, et al. Community out-break of HIV infection linked to injection drug use of oxymorphone — Indiana, 2015. MMWR Morb Mortal Wkly Rep 2015; 64:443–4. [PubMed: 25928470]
4. Peters PJ, Pontones P, Hoover KW, et al. HIV infection linked to injection use of oxymorphone in Indiana, 2014–2015. N Engl J Med 2016; 375:229–39. [PubMed: 27468059]
5. Canary L, Hariri S, Campbell C, et al. Geographic disparities in access to syringe services programs among young persons with hepatitis C virus infection in the United States. Clin Infect Dis 2017; 65:514–7. [PubMed: 28402431]
6. Jones CM, Campopiano M, Baldwin G, McCance-Katz E. National and state treatment need and capacity for opioid agonist medication-assisted treatment. Am J Public Health 2015; 105:e55–63.
7. Zibbell JE, Iqbal K, Patel RC, et al. ; Centers for Disease Control and Prevention (CDC). Increases in hepatitis C virus infection related to injection drug use among persons aged ≤30 years - Kentucky, Tennessee, Virginia, and West Virginia, 2006–2012. MMWR Morb Mortal Wkly Rep 2015; 64:453–8. [PubMed: 25950251]
8. Park-Lee E, Lipari RN, Hedden SL, Kroutil LA, Porter JD. Receipt of services for substance use and mental health issues among adults: results from the 2016 national survey on drug use and health. NSDUH Data Review. Rockville, MD: Substance Abuse and Mental Health Treatment Services Administration (SAMHSA); 2017: pp 1–35. Available at: https://www.samhsa.gov/data/sites/default/files/NSDUH-DR-FFR2-2016/NSDUH-DR-FFR2-2016.htm
9. Antonisse L, Garfield R, Rudowitz R, Guth M. The effects of Medicaid expansion under the ACA: updated findings from a literature review. Kaiser Family Foundation, issue brief, August, 2019. Washington, DC. Available at: https://www.kff.org/medicaid/issue-brief/the-effects-of-medicaid-expansion-under-the-aca-updated-findings-from-a-literature-review-august-2019. Accessed 26 August 2019.
10. Kominski GF, Nonzee NJ, Sorensen A. The Affordable Care Act's impacts on access to insurance and health care for low-income populations. Annu Rev Public Health 2017; 38:489–505. [PubMed: 27992730]
11. Simon K, Soni A, Cawley J. The impact of health insurance on preventive care and health behaviors: evidence from the first two years of the ACA Medicaid expansions. J Policy Anal Manage 2017; 36:390–417. [PubMed: 28378959]
12. Wen H, Druss BG, Cummings JR. Effect of Medicaid expansions on health insurance coverage and access to care among low-income adults with behavioral health conditions. Health Serv Res 2015; 50:1787–809. [PubMed: 26551430]
13. Wherry LR, Miller S. Early coverage, access, utilization, and health effects associated with the Affordable Care Act Medicaid expansions: a quasi-experimental study. Ann Intern Med 2016; 164:795–803. [PubMed: 27088438]
14. Kaiser Family Foundation. Status of state action on the Medicaid expansion decision. Available at: https://www.kff.org/state-category/health-reform/medicaid-and-health-reform-health-reform/. Accessed 9 September 2019.

15. Centers for Disease Control and Prevention. HIV infection, risk, prevention, and testing behaviors among persons who inject drugs—national HIV behavioral surveillance: injection drug use, 20 U.S. cities, 2015. HIV surveillance special report 18. Revised edition. Published May 2018. Available at: http://www.cdc.gov/hiv/library/reports/hiv-surveillance.html. Accessed 25 August 2019.
16. Feder KA, Krawczyk N, Mojtabai R, Crum RM, Kirk G, Mehta SH. Health insurance coverage is associated with access to substance use treatment among individuals with injection drug use: evidence from a 12-year prospective study. J Subst Abuse Treat 2019; 96:75–81. [PubMed: 30466552]
17. Wen H, Hockenberry JM, Borders TF, Druss BG. Impact of Medicaid expansion on Medicaid-covered utilization of buprenorphine for opioid use disorder treatment. Med Care 2017; 55:336–41. [PubMed: 28296674]
18. Mojtabai R, Mauro C, Wall MM, Barry CL, Olfson M. The Affordable Care Act and opioid agonist therapy for opioid use disorder. Psychiatr Serv 2019; 70:617–20. [PubMed: 31035894]
19. Sharp A, Jones A, Sherwood J, Kutsa O, Honermann B, Millett G. Impact of Medicaid expansion on access to opioid analgesic medications and medication-assisted treatment. Am J Public Health 2018; 108:642–8. [PubMed: 29565661]
20. National Academies of Sciences Engineering and Medicine. Medications for Opioid Use Disorder Save Lives. 2019. Washington, DC: The National Academies Press. Available at: 10.17226/25310. Accessed 9 September 2019.
21. Lansky A, Abdul-Quader AS, Cribbin M, et al. Developing an HIV behavioral surveillance system for injecting drug users: the National HIV Behavioral Surveillance System. Public Health Rep 2007; 122 (Suppl 1):48–55.
22. Centers for Disease Control and Prevention. Guidelines for defining public health research and public health non-research—revised October 4, 1999. Available at: https://www.cdc.gov/os/integrity/docs/defining-public-health-research-non-research-1999.pdf Accessed 26 August 2018.
23. Department of Health and Human Services. Protection of Human Subjects. CFR 45, Part 46. Revised January 2009. Available at: http://www.hhs.gov/ohrp/humansubjects/guidance/45cfr46.html. Accessed 26 August 2019.
24. U.S. Department of Health and Human Services. U.S. Department of Health and Human Services. Annual update of the HHS poverty guidelines. Federal Register; 2018. Available at: https://www.govinfo.gov/content/pkg/FR-2018-01-18/pdf/2018-00814.pdf. Accessed 26 August 2019.
25. U.S. Department of Health and Human Services. Implementation guidance on data collection standards for race, ethnicity, sex, primary language, and disability status. Available at: https://aspe.hhs.gov/pdf-report/hhs-implementation-guidance-data-collection-standards-race-ethnicity-sex-primary-language-and-disability-status; 2011. Accessed 25 August 2019.
26. World Health Organization. Towards a common language for functioning, disability and health: ICF the international classification of functioning, disability, and health. Geneva: World Health Organization, 2002.
27. Hall C, Rudowitz R, Gifford K. Medicaid in theterritories: program features, challenges, and changes. Available at: https://www.kff.org/report-section/medicaid-in-the-territories-program-features-challenges-and-changes-issue-brief/. Accessed 6 September 2019.
28. Tsui JI, Burt R, Thiede H, Glick SN. Utilization of buprenorphine and methadone among opioid users who inject drugs. Subst Abus 2018; 39:83–8. [PubMed: 28796591]
29. Mattick RP, Kimber J, Breen C, Davoli M. Buprenorphine maintenance versus placebo or methadone maintenance for opioid dependence. Cochrane Database Syst Rev 2008; 16:1–44.
30. Substance Abuse and Mental Health Services Administration. Medication and counseling treatment. 2019. Available at: https://www.samhsa.gov/medication-assisted-treatment/treatment#medications-used-in-mat. Accessed 10 October 2019.
31. Sommers BD, Gunja MZ, Finegold K, Musco T. Changes in self-reported insurance coverage, access to care, and health under the Affordable Care Act. JAMA 2015; 314:366–74. [PubMed: 26219054]

32. Winkelman TNA, Chang VW. Medicaid expansion, mental health, and access to care among childless adults with and without chronic conditions. J Gen Intern Med 2018; 33:376–83. [PubMed: 29181792]
33. Olfson M, Wall M, Barry CL, Mauro C, Mojtabai R. Impact of Medicaid expansion on coverage and treatment of low-income adults with substance use disorders. Health Aff (Millwood) 2018; 37:1208–15. [PubMed: 30080455]
34. Mojtabai R, Feder KA, Kealhofer M, et al. State variations in Medicaid enrollment and utilization of substance use services: results from a National Longitudinal Study. J Subst Abuse Treat 2018; 89:75–86. [PubMed: 29706176]
35. Orgera K, Tolbert J. The opioid epidemic and Medicaid's role in facilitating access to treatment. Available at: https://www.kff.org/medicaid/issue-brief/the-opioid-epidemic-and-medicaids-role-in-facilitating-access-to-treatment/. Accessed 26 August 2019.
36. Mojtabai R Insurance loss in the era of the Affordable Care Act: association with access to health services. Med Care 2019; 57:567–73. [PubMed: 31299024]
37. Sommers BD, Musco T, Finegold K, Gunja MZ, Burke A, McDowell AM. Health reform and changes in health insurance coverage in 2014. N Engl J Med 2014; 371:867–74. [PubMed: 25054609]
38. Okoro CA, Zhao G, Fox JB, Eke PI, Greenlund KJ, Town M. Surveillance for health care access and health services use, adults aged 18–64 years — behavioral risk factor surveillance system, United States, 2014. MMWR Surveill Summ 2017; 66:1–42.
39. Centers for Disease Control and Prevention. Surveillance for viral hepatitis—United States, 2015. Available at: https://www.cdc.gov/hepatitis/statistics/2015surveillance/index.htm. Accessed 9 September 2019.
40. Fraser H, Vellozzi C, Hoerger TJ, et al. Scaling up hepatitis C prevention and treatment interventions for achieving elimination in the United States: a rural and urban comparison. Am J Epidemiol 2019; 188:1539–51. [PubMed: 31150044]
41. Barbosa C, Fraser H, Hoerger TJ, et al. Cost-effectiveness of scaling-up HCV prevention and treatment in the United States for people who inject drugs. Addiction 2019; 114:2267–78. [PubMed: 31307116]
42. Springer S Hepatitis C Virus reinfection rate among persons who use drugs and are maintained on medication treatment for opioid use disorder. Clin Infect Dis 2019; 70:2703–5.
43. Andrews CM, Grogan CM, Smith BT, et al. Medicaid benefits for addiction treatment expanded after implementation of the Affordable Care Act. Health Aff (Millwood) 2018; 37:1216–22. [PubMed: 30080460]
44. Mojtabai R, Mauro C, Wall MM, Barry CL, Olfson M. Medication treatment for opioid use disorders in substance use treatment facilities. Health Aff 2019; 38:14–23.
45. Watson M, Johnson SD, Zhang T, Oster A. Characteristics of and trends in HIV diagnoses in the deep south region of the United States, 2012–2017. AIDS Behav 2019; 23(Suppl 3):224–32. [PubMed: 31473847]

Table 1.

Characteristics of PWID Who Illicitly Used Opioids[a] by State Medicaid Expansion Status: 22 US Cities, 2018

	State Medicaid Expansion Status						
	Nonexpansion		Expansion		All		
Sample Characteristics	No.	Col.%	No.	Col.%	No.[b]	Col.%	*P* Value[c]
All	2680	100.0	7277	100.0	9957	100.0	
Gender							.0007
Male	1872	69.9	4836	66.5	6708	67.4	
Female	796	29.7	2372	32.6	3168	31.8	
Transgender	12	0.4	69	0.9	81	0.8	
Age							<.0001
18–29	373	13.9	1155	15.9	1528	15.3	
30–39	645	24.1	2131	29.3	2776	27.9	
40–49	624	23.3	1726	23.7	2350	23.6	
50–59	717	26.8	1677	23.0	2394	24.0	
60–64	321	12.0	588	8.1	909	9.1	
Race/Ethnicity							<.0001
Black	1309	48.9	1970	27.1	3279	32.9	
Hispanic/Latino[d]	372	13.8	1420	19.5	1792	18.0	
White	861	32.2	3317	45.5	4178	42.0	
Other[e]	137	5.1	564	7.8	701	7.0	
Education							.0180
<High School	782	29.2	2052	28.2	2834	28.5	
High School Diploma/GED	1153	43.0	2988	41.1	4141	41.6	
>High School	745	27.8	2235	30.7	2980	29.9	
Employment Status							<.0001
Unemployed	1378	51.4	3636	50.0	5014	50.4	
Employed (full or part time)	568	21.2	976	13.4	1544	15.5	
Not in labor force/Other[f]	734	27.4	2665	36.6	3399	34.1	
Household Income as Percentage of FPGL							<.0001
>138	524	19.6	1181	16.2	1705	17.1	

Sample Characteristics	State Medicaid Expansion Status						
	Nonexpansion		Expansion		All		
	No.	Col.%	No.	Col.%	No.[b]	Col.%	*P* Value[c]
≤138	2131	79.5	6049	83.1	8180	82.2	
Disability Status							.0001
No disability	961	35.9	2314	31.8	3275	32.9	
Has a disability	1716	64.0	4954	68.1	6670	67.0	
Homeless (past 12 months)							<.0001
No	904	33.7	2106	28.9	3010	30.2	
Yes	1776	66.3	5170	71.0	6946	69.8	
HIV Status							<.0001
Negative	2459	91.8	6844	94.0	9303	93.4	
Positive	206	7.7	376	5.2	582	5.8	
Census Region							<.0001
Northeast	.	.	2201	30.2	2201	22.1	
Midwest	.	.	954	13.1	954	9.6	
South	2680	100.0	1554	21.4	4234	42.5	
West	.	.	2568	35.3	2568	25.8	
Insurance Type							<.0001
Uninsured	1698	63.4	916	12.6	2614	26.3	
Medicaid only	387	14.4	5136	70.6	5523	55.5	
Medicare only	116	4.3	332	4.6	448	4.5	
Private plan only	117	4.4	161	2.3	278	2.8	
Other, including multiple	356	13.3	678	9.3	1034	10.4	

Abbreviations: Col., Column percent; FPGL, Federal Poverty Guidelines; GED, General Educational Diploma; HIV, human immunodeficiency virus; PWID, persons who inject drugs.

[a] Illicit use of opioids refers to use of injection or noninjection opioids. Injection opioid use was defined as injecting “speedball, which is heroin and cocaine together,” “heroin, by itself, or “painkillers, such as Oxycontin, Dilaudid, morphine, Percocet, or Demerol.” Noninjection opioid use was defined as misusing “painkillers such as Oxycontin, Vicodin, morphine, or Percocet” or smoking or snorting heroin.

[b] Variable categories might not sum to total due to missing responses.

[c] *P* value from χ^2 test.

[d] Hispanics/Latinos may be of any race.

[e] “Other” includes American Indian/Alaska Native, Asian, Native Hawaiian/Pacific Islander, and multiple races.

[f] Includes homemaker, full-time student, retired, and other.

Table 2.

Healthcare Access and Utilization Among PWID Who Illicitly Use Opioids[a] by State Medicaid Expansion Status: 22 US Cities, 2018

	Non-Medicaid Expansion States			Medicaid Expansion States			Unadjusted	Adjusted
Healthcare Access and Utilization Outcomes	**Total**	**No.**	**%**	**Total**	**No.**	**%**	**PR (95% CI)[b]**	**aPR (95% CI)[c]**
Healthcare Access								
Currently insured	2676	978	36.5	7237	6321	87.3	2.4 (2.1–2.7)	2.3 (2.0–2.6)
Usual source of healthcare	2669	911	34.1	7205	3836	53.2	1.6 (1.3–1.8)	1.5 (1.3–1.9)
Unmet need for healthcare (past 12 months)	2679	1042	38.9	7275	1513	20.8	0.5 (0.5–0.6)	0.6 (0.4–0.7)
Healthcare Utilization								
Healthcare visit (past 12 months)	2679	1885	70.4	7278	6052	83.2	1.2 (1.1–1.2)	1.2 (1.1–1.2)
Hepatitis C test (past 12 months)	2587	1159	44.8	7076	3996	56.5	1.3 (1.1–1.4)	1.3 (1.2–1.5)
HIV test (past 12 months)[d]	2519	1260	50.0	6960	4082	58.7	1.2 (1.0–1.4)	1.3 (1.1–1.5)
Drug treatment program (past 12 months)	2680	849	31.7	7275	3595	49.4	1.6 (1.4–1.8)	1.5 (1.2–1.9)
Medication-assisted treatment (past 12 months)	2678	965	36.0	7277	4459	61.3	1.7 (1.6–1.9)	1.6 (1.3–1.9)

Abbreviations: aPR, adjusted prevalence ratio; CI, confidence interval; HIV, human immunodeficiency virus; PR, prevalence ratio; PWID, persons who inject drugs.

[a] Illicit use of opioids refers to use of injection or noninjection opioids. Injection opioid use was defined as injecting “speedball, which is heroin and cocaine together,” “heroin, by itself, or “painkillers, such as Oxycontin, Dilaudid, morphine, Percocet, or Demerol.” Noninjection opioid use was defined as using “painkillers such as Oxycontin, Vicodin, morphine, or Percocet” or smoking or snorting heroin.

[b] All models were clustered on recruitment chain and adjusted for the participant’s personal network size and Medicaid expansion status.

[c] Adjusted for gender, age, race/ethnicity, income, disability status, employment status, HIV status, and census region, in addition to variables included in the unadjusted models.

[d] Denominator limited to participants who did not self-report a previous positive HIV test result.