

Prevalence of Testing for Human Immunodeficiency Virus, Hepatitis B Virus, and Hepatitis C Virus Among Medicaid Enrollees Treated With Medications for Opioid Use Disorder in 11 States, 2016–2019

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Background. Limited information exists about testing for human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV) among Medicaid enrollees after starting medication for opioid use disorder (MOUD), despite guidelines recommending such testing. Our objectives were to estimate testing prevalence and trends for HIV, HBV, and HCV among Medicaid enrollees initiating MOUD and examine enrollee characteristics associated with testing.

Methods. We conducted a serial cross-sectional study of 505 440 initiations of MOUD from 2016 to 2019 among 361 537 Medicaid enrollees in 11 states. Measures of MOUD initiation; HIV, HBV, and HCV testing; comorbidities; and demographics were based on enrollment and claims data. Each state used Poisson regression to estimate associations between enrollee characteristics and testing prevalence within 90 days of MOUD initiation. We pooled state-level estimates to generate global estimates using random effects meta-analyses.

Results. From 2016 to 2019, testing increased from 20% to 25% for HIV, from 22% to 25% for HBV, from 24% to 27% for HCV, and from 15% to 19% for all 3 conditions. Adjusted rates of testing for all 3 conditions were lower among enrollees who were male (vs nonpregnant females), living in a rural area (vs urban area), and initiating methadone or naltrexone (vs buprenorphine). Associations between enrollee characteristics and testing varied across states.

Conclusions. Among Medicaid enrollees in 11 US states who initiated medications for opioid use disorder, testing for human immunodeficiency virus, hepatitis B virus, hepatitis C virus, and all 3 conditions increased between 2016 and 2019 but the majority were not tested.

Keywords. testing; Medicaid; opioid use disorder; HIV; hepatitis.

Opioid use disorder (OUD) treatment guidelines recommend a comprehensive medical assessment during OUD treatment initiation, including testing for infectious diseases associated with injection drug use, particularly human immunodeficiency virus

(HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV) [1–5]. These recommendations exist because past or current injection drug use is common among persons who initiate OUD treatment [6] and because highly effective treatments that lower the risk of subsequent morbidity, prevent disease transmission [7–9], and are cost-saving [10–12] exist for all 3 diseases. Medicaid covers approximately 4 in 10 persons with OUD in the United States [13]; however, no multistate studies have examined the prevalence of testing for HIV, HBV, and HCV among Medicaid enrollees with OUD.

Previous studies found that testing for HIV, HBV, and HCV among patients with OUD varies by setting, patient characteristics, and treatment type. For example, a national study of

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substance use disorder treatment facilities in 2017–2020 found that around half offered HIV and HCV testing [14]. Among a national sample of federally qualified health centers, only 15% of persons with OUD received testing for HCV during 2012–2017 [15]. Studies in office-based settings and opioid treatment programs (OTPs) reported testing rates as high as 85%, with variation in testing based on patient characteristics such as age, sex, and race/ethnicity [16–18]. The only prior study of Medicaid enrollees used 2014 claims data from New York and found that testing for HCV among persons with OUD varied by race/ethnicity, sex, and medication type (from 16.2% for buprenorphine to 32.4% for methadone) [19]. Previous studies estimated testing prevalence in a single city or among Medicaid enrollees in a single state and focused on HCV testing. No study has reported testing prevalence for all 3 conditions.

This study used Medicaid data from 11 states from 2016 to 2019 to estimate prevalence and trends in testing for HIV, HBV, and HCV among Medicaid enrollees who initiated medication for opioid use disorder (MOUD) and to estimate differences in prevalence in testing based on enrollee characteristics.

METHODS

Data Sources

We obtained data from 11 states (Delaware, Kentucky, Maryland, Maine, Michigan, North Carolina, Ohio, Pennsylvania, Virginia, West Virginia, and Wisconsin) in the Medicaid Outcomes Distributed Research Network [20, 21], formed in 2017 from a subset of states with membership in 2 multistate policy networks (State University Partnership Learning Network and Medicaid Medical Directors Network) [22]. These states accounted for 18.1 million (21%) Medicaid enrollees, had largely adopted Affordable Care Act (ACA) Medicaid expansion [22], and included 6 of the 10 states that ranked highest in overdose death rates in 2019 [23]. University partners obtained claims and enrollment data on a census of enrollees directly from their state's Medicaid agency. A data coordinating center (University of Pittsburgh) distributed identical statistical software code to each university partner, who then applied this code to their state's Medicaid data using a common data model and returned aggregate results for pooled analyses. This approach generated standardized Medicaid data analyses across partner states without sharing individual-level data. Each university partner received institutional review board exemption.

Study Population

We included enrollees with OUD aged 12–64 years not dually eligible for Medicare and enrolled in Medicaid for ≥ 1 month with full medical benefits between 1 January 2016 and 31 December 2019. We identified enrollees with OUD using *International Classification of Diseases, Tenth Revision, Clinical Modification* (ICD-10) diagnosis codes F11.xxx recorded at any time during

the study period [24]. We restricted analyses to enrollees who initiated MOUD (see Initiation of medication for opioid use disorder) with continuous full benefit enrollment in Medicaid for at least 90 days prior to and 90 days after initiation. Therefore, analyses were restricted to MOUD episodes initiated between Q2 2016 through the end of Q3 2019.

Initiation of MOUD

For each person-year, we constructed an indicator of initiation of an MOUD treatment episode during that calendar year. We defined initiation as the first medical encounter for MOUD since January preceded by a gap in MOUD use of ≥ 30 days. Encounters for MOUD included prescription dispensations for formulations indicated by the US Food and Drug Administration for treatment of OUD (eg, buprenorphine, buprenorphine/naloxone, oral naltrexone, injectable naltrexone) and captured in retail pharmacy claims and/or procedure codes for administration in office-based settings or treatment facilities (see Appendix 1 and 2). We captured methadone treatment using procedure codes recorded in federally certified OTPs. We did not include outpatient pharmacy claims for methadone because these likely represent analgesic treatment. We determined MOUD coverage (in days) using prescription dispense dates and days' supply from pharmacy claims and service begin and end dates for office- or facility-based administration of MOUD. For injectable naltrexone, we determined MOUD coverage assuming a standard 30-day supply. To better identify MOUD initiation for OUD, we excluded enrollees who did not have at least 1 OUD diagnosis in the 6 months before or after the MOUD initiation date.

Testing for HIV, HBV, and HCV

We constructed indicators for HIV, HBV, and HCV tests that occurred within 14 days prior to and 90 days after MOUD initiation (primary analysis). If each of these 3 tests occurred within this window, we created an indicator for having received all 3 tests. We allowed for testing to occur up to 14 days prior to capture scenarios where testing and the MOUD prescription order occurred during the same clinical encounter, but prescriptions were dispensed up to 2 weeks later. We also created indicators for tests that occurred within 14 days prior and 365 days after the MOUD initiation encounter as a secondary analysis, as the US Centers for Disease Control and Prevention and US Preventive Services Task Force recommend routine or annual testing for persons at high risk for these infections [25–27]. As enrollees with MOUD initiation in 2019 did not have a full 12 months of follow-up in our data, we calculated prevalence estimates for this measure among initiation episodes from 2016 to 2018.

For all analyses, we removed enrollees with existing diagnoses (before 14 days prior to MOUD initiation) for each condition from the analytic cohort to better approximate testing

in persons without the condition. We identified existing diagnoses by scanning all medical claims data as far back as 1 January 2016 (though the duration of enrollment in Medicaid prior to MOUD initiation varied among enrollees). For the analysis of all 3 tests, we excluded persons with prior diagnoses for any of the 3 conditions.

Covariates

We constructed indicators of the following enrollee characteristics: age at MOUD initiation (12–20, 21–34, 35–44, 45–54, and 55–64 years); combined sex and pregnancy indicators (male, female not pregnant, and female pregnant); and race/ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, and other/unknown/missing), the latter self-reported by enrollees during the Medicaid enrollment process based on fixed categories. Pregnancy status, at any point during the calendar year, was determined by identifying delivery-related claims and estimating pregnancy status for each month of the calendar year using gestational length information from ICD-10 diagnosis codes. We examined race/ethnicity given evidence of disparities in testing rates [15, 19]. We included an indicator of rural or urban residence, defined from residence ZIP Code at MOUD initiation using rural urban commuting area codes [28]. We created standardized, mutually exclusive eligibility groups based on Medicaid eligibility during the month of MOUD initiation as follows: “disabled,” adults with disability-related Medicaid eligibility; “adolescents and young adults,” persons aged 12–20 years old; “expansion adults,” adults newly eligible under the ACA Medicaid expansion; and “nondisabled adults,” traditionally eligible nondisabled adults. We categorized MOUD initiation episodes by medication type, creating 3 mutually exclusive groups: buprenorphine, methadone, and naltrexone. We included indicators for any mental health diagnosis and any non-ODU and non-nicotine substance use disorder diagnosis in the 90 days prior to the MOUD initiation episode. Finally, we created indicators for year of MOUD initiation and months of continuous Medicaid enrollment before (since January 2016) and after (up to 12 months later) initiation as model adjustment variables.

Analyses

State-specific Analyses

We used a 2-stage procedure to estimate global absolute change in 90-day and 365-day testing prevalence during the study period for each measure and to estimate adjusted rate ratios (aRRs) for testing by enrollee characteristics. The first stage included calculating state-specific estimates and their standard errors by year using a uniform SAS (version 9.4) statistical program. For enrollee characteristic models, each state used Poisson regression to model the aRR for each testing measure. Although we included only the first MOUD initiation episode of each calendar year per enrollee, some enrollees initiated MOUD in multiple years. Therefore, we used generalized

estimating equations [29] to account for potential dependency across multiple observations per individual. We used QICu of model fit for 1 state (Pennsylvania) to identify the independence structure as the optimal working correlation structure. Models were adjusted for age, sex and pregnancy status, race/ethnicity, eligibility group, rural vs urban residence, year, other substance use disorder, mental health diagnoses, and months of Medicaid enrollment pre-MOUD initiation. We collapsed the 4-level eligibility group to 2 levels (enrollees with vs without disabilities) to avoid collinearity between eligibility group and age group. Models for 365-day testing also included length of Medicaid enrollment post-MOUD initiation to adjust for incomplete 12-month follow-up for MOUD initiation episodes in 2019.

Random Effects Meta-Analysis

For the second stage, we conducted random effects meta-analyses to pool state-specific estimates, adopting validated methods [30]. Random effects meta-analysis provides a more conservative estimate of the standard error compared with the fixed effect and is appropriate for pooling heterogeneous estimates. We estimated global mean effects by averaging the individual estimates from states weighted by the inverse of their variances. We estimated between-state variances due to potential heterogeneity across states to construct confidence intervals (CIs) using the Hartung–Knapp–Sidik–Jonkman method [31]. We reported 95% confidence mean effects across states as well as 90% prediction intervals [32], which denote the range within which estimates would fall for 90% of states if a different sample of states were drawn. We completed meta-analyses in R (3.6.2) using package *metaphor* (2.4–0). Per the terms of state agreements, we de-identified state-level results.

Sensitivity Analysis

We conducted a sensitivity analysis among 4 of the 11 states by restricting the study cohort to enrollees with 12 months or more of continuous enrollment prior to MOUD initiation. These states were selected because of their large Medicaid population, which allowed for stable estimates from multivariable models even with a smaller sample size. We did this to see how our findings would change if we could better identify prior diagnoses for removal from the testing denominator.

RESULTS

Characteristics of Study Population

This study included 505 440 episodes of MOUD initiation from 2016 to 2019 among 361 537 Medicaid enrollees aged 12–64 years in 11 states (Supplementary Table 1). After removing enrollees with a prior diagnosis of HIV, HBV, or HCV, the study included 390 053 episodes of MOUD initiation among 297 079 enrollees (Table 1). The percentage of enrollees who initiated MOUD that were aged 35–44 years grew over the

Table 1. Characteristics of 297 079 Medicaid Enrollees With Medication for Opioid Use Disorder Initiation Episode Without a Prior Diagnosis of Hepatitis B Virus, Hepatitis C Virus, or Human Immunodeficiency Virus in 11 States, 2016–2019

Characteristic	2016 Q2–Q4		2017 Q1Q4		2018 Q1Q4		2019 Q1–Q3	
	N	%	N	%	N	%	N	%
Total ^a	82 604 (Annualized 109 863)	100.0	109 225	100.0	110 739	100.0	87 485 (Annualized 116 355)	100.0
Medication at initiation episode								
Buprenorphine	50 597	61.3	68 279	62.5	72 258	65.3	58 983	67.4
Methadone	19 720	23.9	23 567	21.6	22 621	20.4	16 760	19.2
Naltrexone	12 287	14.9	17 379	15.9	15 860	14.3	11 742	13.4
Age group, y								
12–20	1587	1.9	1822	1.7	1715	1.5	1096	1.3
21–34	46 214	55.9	58 164	53.3	55 740	50.3	41 888	47.9
35–44	21 578	26.1	30 266	27.7	32 486	29.3	26 786	30.6
45–54	9982	12.1	14 142	12.9	15 120	13.7	12 752	14.6
55–64	3243	3.9	4831	4.4	5678	5.1	4963	5.7
Gender								
Female	43 427	52.6	55 799	51.1	57 001	51.5	43 673	49.9
Male	39 177	47.4	53 426	48.9	53 738	48.5	43 812	50.1
Race/Ethnicity								
Non-Hispanic White	67 588	81.8	88 102	80.7	87 500	79.0	67 729	77.4
Non-Hispanic Black	8002	9.7	11 357	10.4	13 165	11.9	11 399	13.0
Hispanic	1886	2.3	2902	2.7	3081	2.8	2552	2.9
Others	1860	2.3	2612	2.4	2933	2.6	2386	2.7
Missing/Unknown	3268	4.0	4252	3.9	4060	3.7	3419	3.9
Eligibility group ^b								
Disabled	7661	9.3	10 772	9.9	11 914	10.8	9249	10.6
Adolescents and young adults	1427	1.7	1581	1.4	1488	1.3	931	1.1
Expansion adults	45 488	55.1	61 516	56.3	60 875	55.0	51 936	59.4
Nondisabled adults	28 028	33.9	35 356	32.4	36 462	32.9	25 369	29.0
Pregnant during the year								
No	76 684	92.8	102 053	93.4	103 858	93.8	83 728	95.7
Yes ^c	5920	7.2	7172	6.6	6881	6.2	3757	4.3
Living area								
Urban	60 416	73.1	80 004	73.2	80 655	72.8	63 510	72.6
Rural	22 188	26.9	29 221	26.8	30 084	27.2	23 975	27.4
Comorbidity ^d								
Anxiety disorder	29 407	35.6	37 634	34.5	37 123	33.5	29 149	33.3
Mood disorder	31 464	38.1	40 033	36.7	39 226	35.4	30 826	35.2
Schizophrenic and other psychotic disorders	3706	4.5	4999	4.6	5070	4.6	4182	4.8
Nonopioid substance use disorder	34 033	41.2	44 109	40.4	43 924	39.7	34 258	39.2

^aNon-dual Medicaid enrollees with at least 1 month of full benefit enrollment during each calendar year, opioid use disorder diagnosis, first medication for opioid use disorder initiation episode for the year (preceded by at least 30-day gap), and with continuous eligibility for at least 3 months prior and at least 3 months post-initiation episode. For 2016 and 2019, annualized numbers were calculated by multiplying the number of enrollees by 4/3.

^bUsed hierarchy from eligibility group protocol for enrollees with multiple categories during each month.

^cPregnant during 2019 is an undercount because not all dates of delivery for 2020 have been identified yet.

^dAny diagnosis within 90 days prior to the medication treatment for opioid use disorder initiation episode.

study period (26% to 31%). The percentage of enrollees with MOUD initiating with buprenorphine increased from 61% to 67%, while the percentage with methadone decreased from 24% to 19%; initiation with naltrexone remained at approximately 14% across study years.

Prevalence of Testing by Year

From 2016 to 2019, overall, testing within 90 days of MOUD initiation for HIV increased from 20% to 25%, for HBV from

22% to 25%, for HCV from 24% to 27%, and for all 3 conditions from 15% to 19%. The absolute change in pooled testing prevalence from 2016 to 2019 for each outcome was approximately +5 percentage points, although 1 state (L) showed a decrease in testing for HBV and no increase for HIV and HCV (Figure 1). Three states (A, E, I) had substantially higher testing rates than the other 8 states throughout the study period (Supplementary Figure 1). When we extended the duration of follow-up from 90 days to 365 days from MOUD

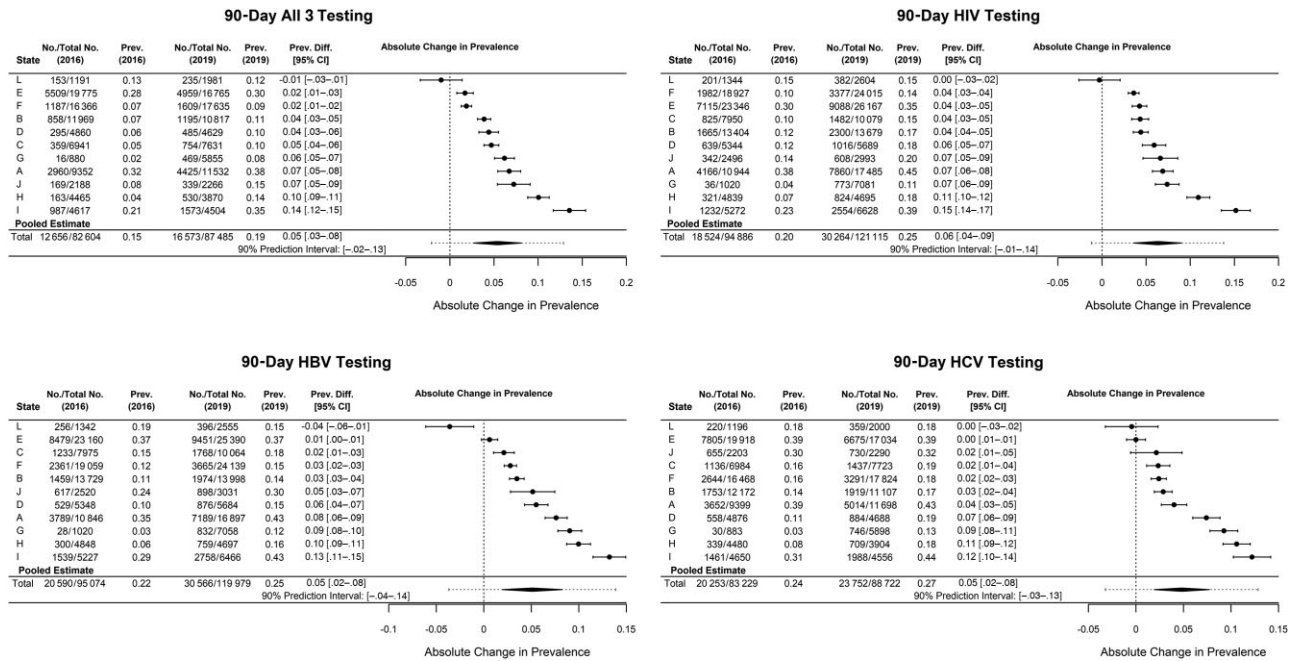


Figure 1. Unadjusted changes in prevalence of testing for HIV, HBV, HCV, and all 3 conditions within 90 days among Medicaid enrollees with medication for opioid use disorder (MOUD) initiation episode in 11 states, 2016–2019. States are represented with letters to prevent identification. Denominators for testing prevalence include enrollees diagnosed with OUD who initiated MOUD (with buprenorphine, methadone, or naltrexone) and had at least 3 months of continuous enrollment in Medicaid after their index claim for MOUD and had no previous diagnosis of the viral infection being examined. State-level prevalence (data points) and prevalence differences are displayed (error bars). Random effects meta-analyses were used to estimate global prevalence differences for each measure across the 11 states, along with 95% CIs (diamond) and 90% prediction intervals (error bars). Prediction intervals denote the range within which prevalence differences would fall for 90% of US states if a different set of states were to be drawn. Abbreviations: CI, confidence interval; HBV, hepatitis B virus; HCV, hepatitis C virus. HIV, human immunodeficiency virus.

initiation testing prevalence, estimates were 50% to 70% higher (Supplementary Figures 2 and 3).

Testing Based on Enrollee Characteristics

Figure 2 shows the random effects meta-analysis global aRRs for testing for all 3 conditions within 90 days of MOUD initiation. After adjustment, testing was lower among enrollees who were male (vs female, not pregnant; aRR=0.95, 95% CI, .91–.99), lived in a rural area (vs urban; aRR=0.92, 95% CI, .84–1.00), and initiated MOUD with methadone (vs buprenorphine; aRR=0.43, 95% CI, .25–.73) or naltrexone (vs buprenorphine; aRR=0.70, 95% CI, .57–.86). Conversely, testing was higher among those aged 12 to 20 years (vs 21 to 34; aRR=1.20, 95% CI, 1.07–1.35), female and pregnant (vs female, not pregnant; aRR=1.74, 95% CI, 1.37–2.21), with a co-occurring substance use disorder (aRR=1.19, 95% CI, 1.07–1.31), and who initiated MOUD in 2018 (vs 2016; aRR=1.29, 95% CI, 1.01–1.64) or 2019 (vs 2016; aRR=1.73, 95% CI, 1.23–2.43). Cochran Q tests were significant ($P < .05$) for nearly all model coefficients, showing heterogeneity in aRRs across states.

When each of the conditions is considered individually, we found that the results for HIV, HBV, and HCV testing within 90 days (Supplementary Figures 4–6) were similar to the results

for all 3 tests within 90 days. The results for testing within 90 days were also similar to the secondary analysis results, examining testing prevalence within 365 days of MOUD initiation (Supplementary Figures 7–10).

The sensitivity analysis that was restricted to enrollees with at least 12 months of continuous enrollment prior to MOUD initiation yielded results similar to those from our primary analysis for enrollee characteristics (Supplementary Figures 11–14) and prevalence of testing by year (data not shown).

DISCUSSION

Using data from 11 state Medicaid programs, we found an increase in 90-day testing for HIV, HBV, HCV, and all 3 tests among persons who initiated MOUD from 2016 to 2019. However, three-quarters of those who initiated MOUD were not tested for each condition within 90 days, highlighting room for improvement in meeting testing recommendations and missed opportunities for curing HCV, managing HBV and HIV, and reducing transmission [33].

Establishing on-site testing may represent a first step to improve testing rates for persons with OUD in clinical settings without these tests readily available [17, 18, 34]. In addition, state Medicaid programs can consider implementing integrated

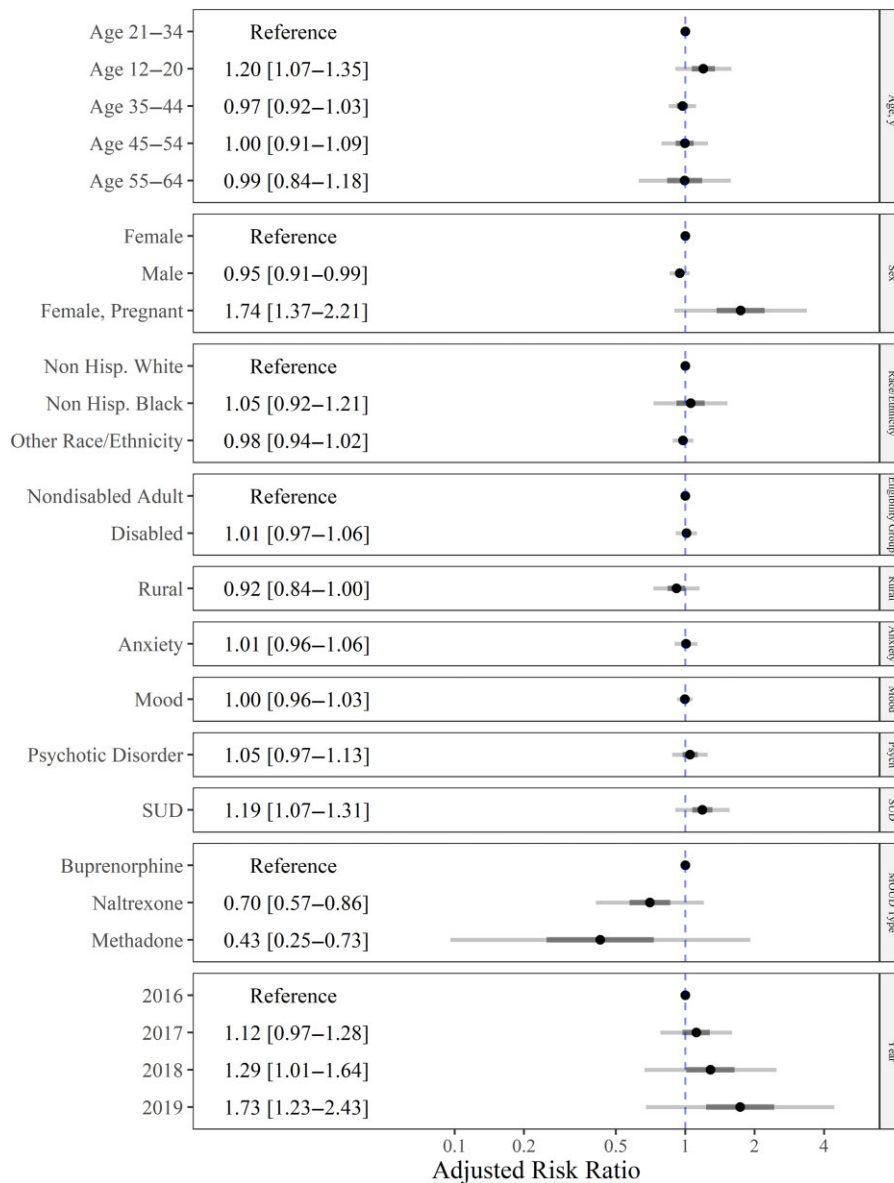


Figure 2. Random effects meta-analysis adjusted risk ratios for prevalence of testing for all 3 conditions (human immunodeficiency virus, hepatitis B virus, and hepatitis C virus) within 90 days of medication for opioid use disorder (OUD) initiation among 297 079 Medicaid enrollees in 11 states, 2016–2019. Adjusted prevalence ratios (log scale) were estimated from random effects meta-analysis. Data points and error bars represent the global prevalence ratios and 95% confidence intervals of the global prevalence ratios across states. The lightly shaded bars represent 90% prediction intervals, which denote the range within which prevalence ratios would fall for 90% of states if a different set of states were to be drawn. Other race/ethnicity includes Hispanic, Native Hawaiian, Pacific Islander, American Indian, Alaska Native, and Asian. SUD includes non-OUD and non-nicotine substance use disorders such as alcohol-related disorders; cannabis-related disorders; sedative-, hypnotic-, or anxiolytic-related disorders; cocaine-related disorders; other stimulant-related disorders; hallucinogen-related disorders; inhalant-related disorders; other psychoactive-related disorders; and abuse of nonpsychoactive substances. Abbreviations: MOUD, medication for opioid use disorder; SUD, substance use disorder.

healthcare payment models to increase the availability of funding for these tests and promote testing using quality improvement tools, such as electronic health record order sets and provider prompts [35–37]. Medicaid programs with managed care entities could implement supportive initiatives, such as provider education, performance measure reporting (with testing rates as performance measures), or care coordination [38]. The White House’s National HIV/AIDS Strategy 2022–2025

includes federal policy goals for HIV, but there is still a need for integrated and coordinated approaches to increasing prevention, care, testing, and treatment of HBV and HCV [39]. Testing remains warranted because effective treatments are available for all 3 infections and Medicaid programs generally cover these costs, though many programs restrict treatment due to budget constraints [40, 41]. Because access to treatment can be challenging, particularly for persons with public

insurance [42], concurrently initiating treatment for OUD and treatment for HCV may be an effective care model [43].

Few estimates of testing in Medicaid populations prior to our study exist. However, our study's results are similar to those from a study that used 2014 New York Medicaid claims, which found higher HCV testing among females and those with co-occurring medical conditions [19]. Yet, unlike the New York study, we found lower HCV testing among persons who initiated methadone treatment in OTPs compared with initiation with buprenorphine [19]. Also unlike prior studies, we did not find consistently higher testing rates among persons of non-Hispanic Black, Hispanic, or other race(s) compared with non-Hispanic White persons, though we were only able to model race/ethnicity as a 3-level variable [15, 19]. We found that persons living in rural areas who initiated MOUD were less likely to be tested, which has not been previously reported, though challenges with access to prevention and treatment for HIV and HCV for persons with OUD in rural areas has been noted [44].

Lower testing rates observed among persons who initiated methadone or naltrexone warrant further investigation. Lower testing in OTPs that dispense methadone, relative to office-based settings where buprenorphine is provided, could reflect a lack of on-site testing. A national survey of US treatment facilities found that only approximately 60% of OTPs offered testing for HIV and 65% for HCV in 2020 [14]. Known barriers to integration of on-site HIV and HCV testing in these settings include covering the costs of these tests, insufficient staffing levels, a federal regulation that prevents sharing information between substance use providers and medical providers [45], and lack of an integrated healthcare payment [34]. These barriers may also occur in office-based treatment settings, but no national examinations of this exist.

Our study has some limitations. We relied on diagnosis codes for opioid-related disorders, which have limited sensitivity and specificity for OUD [46, 47]. In addition, history of past or current injection drug use is not readily identifiable in claims data. Injection drug use history may better define persons in need of testing than OUD in general [6]. We examined initiation of MOUD and did not assess testing conducted upon initiation of other types of treatment, such as behavioral health counseling, or where testing services were not reimbursed by Medicaid (eg, free care clinics, public health testing programs). We investigated whether tests were part of bundled services covered for methadone OTP treatment, but each state Medicaid agency confirmed that their state's bundle did not include tests for HIV, HBV, and HCV (personal written communications with each state). Excluding persons with prior HCV infection from testing prevalence calculations may have erroneously removed persons eligible for repeat testing because of reinfection. Finally, our study findings are based on analysis of 11 states. Testing prevalence, trends, or enrollee

characteristics associated with testing may differ in other states, especially those without Medicaid expansion.

In conclusion, the present study represents the first multi-year, multistate study to estimate testing rates for HIV, HBV, and HCV among Medicaid enrollees initiating MOUD. Using a distributed research network in 11 states, we found that 90-day testing for HIV, HBV, HCV, and all 3 conditions increased from 2016 to 2019 among enrollees who initiated MOUD. However, approximately three-quarters of enrollees were not tested for each condition and testing rates differed by enrollee characteristics.

Supplementary Data

Supplementary materials are available at *Clinical Infectious Diseases* online. Consisting of data provided by the authors to benefit the reader, the posted materials are not copyedited and are the sole responsibility of the authors, so questions or comments should be addressed to the corresponding author.

Notes

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